

City of San Diego

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BD/RIR/CG

REQUEST FOR PROPOSAL (RFP)



FOR WATER DEPARTMENT SECURITY UPGRADE DESIGN-BUILD CONTRACT

RFQ NO.: Security Upgrades for the City of San Diego Design-Build Contract – 5171

BID NO.: K-12-5463-DBA

RFP NO.: 5463

TASK ORDER NO.: 1

WBS NO.: S-11105, S-11107

CLIENT DEPARTMENT: 2013

COUNCIL DISTRICT: CITYWIDE

PROJECT TYPE: BL, BJ

PROPOSAL DUE:

**12:00 NOON
OCTOBER 18, 2011
CITY OF SAN DIEGO
PUBLIC WORKS DEPARTMENT
1200 THIRD AVENUE, SUITE 200, MS 56P
SAN DIEGO, CA 92101
ATTN: CONTRACT SPECIALIST**

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1.0 INTRODUCTION

- 1.1 This is the City of San Diego's (City) second step (in a 2-step process) in the selection process to provide Design-Build services for the **Water Department Security Upgrade** (Project)
- 1.2 This RFP is being issued to the selected firms for this selection process exclusively. These firms are:
1. Siemens
 2. Stronghold Engineering
 3. Southern Contracting Company Inc.

Proposals from any other firms will not be considered for this process and will be rejected as unsolicited Proposals.

The City has determined the following licensing classification(s) for this contract:

Option	Classification(s)
1	CLASS A
2	CLASS C10

The Bidder shall satisfy the licensing requirement by meeting at least one of the listed options.

The Design-Builder shall ensure that Design-Builder's license(s) shall be valid when Proposal is submitted. Failure to comply with this requirement will result in:

- a) The rejection of the Proposal.
 - b) Removal of the Design-Builder from the short-list (for As-Needed Design-Build project).
- 1.3 Engineer's Estimate – The Engineer's estimate of the most probable price for this contract is \$4,500,000.
- 1.4 This RFP describes the Project, the required scope of Work and Services, the Design-Builder selection process, and the minimum information that shall be included in the Proposal. Failure to submit information in accordance with this RFP's requirements and procedures may be cause for disqualification.
- 1.5 Any architectural firms, engineering firms, specialty consultants, or individuals retained by the City to assist in drafting the RFPs or the Project's preliminary design shall not be eligible to participate in the competition with any Design-Build Entity without the prior written consent of City. Any architectural firms, engineering firms, specialty consultants, or individuals retained by the City to assist in drafting any Reference Documents, such as the Water Department's Master Plan and any other document that was not prepared specifically for this contract, are considered to be eligible to participate.

2.0 EQUAL OPPORTUNITY

- 2.1** All information provided and requirements set forth in Section 2 of the Request for Qualifications (RFQ) for the Project shall apply to this RFP process. The Design-Builder shall review the information, data, and documentation provided in the Design-Builder's Statement of Qualification (SOQ) and changes shall be identified in the Proposal; otherwise the information, as previously submitted, will be deemed complete and accurate.
- 2.2** As set forth in this RFP, the City is dedicated to the principles of equal opportunity in the workplace and in subcontracting. It is the City's expectation that firms doing business with the City have, and are able to demonstrate, the same level of commitment.
- 2.3** The Design-Builders are encouraged to take positive steps to diversify and expand their subcontractor solicitation base and to offer contracting opportunities to all eligible certified Subcontractors in accordance with the City's EOCP requirements included in the Contract Documents.
- 2.4** The City has determined a **10% mandatory SLBE-ELBE** subcontracting participation. The City has also determined a **voluntary subcontractor participation of 10%**, equating to **20% in total**, to enhance competition and maximize subcontracting opportunities. Percentages are based on the Contract Price.

The Proposal shall be deemed **non-responsive** if it fails to meet the the mandatory subcontracting participation shown above on the Subcontractor and Supplier listings submitted with the Bid or to submit good faith effort documentation within 1 Working Day after the Public Ranking meeting if Contractor fails to meet the SLBE-ELBE goal.

The Design-Builders' commitment to the City's principles of equal opportunity in achieving the desired subcontractor participation levels will be evaluated as specified in the RFP. See Attachment B, "Proposal Submittal Requirements and Selection Criteria" for more information.

3.0 PROJECT BACKGROUND AND DESCRIPTION

See Attachment A.

4.0 SCOPE OF WORK AND SERVICES

Work and Services required of the Design-Builder include those during design, construction, and startup of the Project. The Design-Builder shall provide all management, supervision, labor, services, equipment, tools, supplies, temporary facilities, and any other item of every kind and description required for the complete design and construction and operation of the Project, as described in Attachment A.

5.0 SELECTION PROCESS

Each Design-Builder shall submit separate "Technical" and "Price" Proposals as described in this RFP.

5.1 Technical Proposal Requirements

5.1.1 Failure to comply with this section will render the Design-Builder's submittal invalid and disqualify it from this selection process.

5.1.2 The Technical Proposal shall be concise and well organized and shall demonstrate the Design-Builder's qualifications and experience applicable to the Project. Type size and margins for text pages shall be in accepted standard formats for desk top publishing and word processing and result in no more than 500 words per page.

NOTE: A cover letter may be submitted but SHALL not contain any information that is a required element of the Technical Proposal (i.e. acknowledgement of addenda)

5.1.3 The Design-Builder shall certify that the documentation required under the Work Force Report and Equal Employment Opportunity (EEO) Plan and the Subcontractor Documentation of the RFQ remains correct and accurate. If any changes or modifications are required to the aforementioned documents, they shall be documented in the Work Force Report and EEO Plan forms included in the Contract Documents as attachments and submitted with the Proposal.

The EOCP information not revealing the Contract Price shall be submitted with the Technical Proposal.

5.1.4 The Technical Proposals submitted in response to this RFP shall be in accordance with the requirements listed in Attachment B. The contents of the Proposal shall be organized consistent with the Attachment B.

5.2 Price Proposal Requirements

5.2.1 One executed original, clearly marked on the cover, of the Price Proposal shall be submitted in a separate sealed envelope. Refer to Attachment 'D' of this RFP for the Price Proposal form to be used.

5.2.2 The Price Proposal shall be signed by an individual or individuals authorized to execute legal documents on behalf of the Design-Builder.

5.2.3 The lowest proposed price is not the determining factor for award of this contract. See Attachment 'B' for criteria from which the proposals will be evaluated.

5.2.4 In case of discrepancies, written numbers will govern over numerical. The summation of all lump sum, unit prices, allowances and any other priced items will govern over the total price in case of discrepancies between the two.

5.2.5 Certain EOCP information (i.e., Subcontractors and Suppliers listings) that indicates the dollar value of the portions of the work to be performed by the Subcontractors and Suppliers shall be submitted as part of the Price Proposal.

5.3 Submittal Requirements

5.3.1 Technical Proposal

5.3.1.1 The Technical Proposal shall be received no later than the time and date shown on the cover of this RFP.

5.3.1.2 One executed original, clearly and conspicuously marked on the cover, and 6 copies are to be submitted in a sealed package marked “Technical Proposals” clearly and conspicuously in its face. The following information will be clearly marked on the outside of each package:

Name of Design-Builder

Project Title

“Technical Proposal” Package Number (e.g., 1 of 16, 2 of 16, etc.)
Marked “CONFIDENTIAL” (in red)

5.3.1.3 The Technical Proposal shall be signed by an individual or individuals authorized to execute legal documents on behalf of the Design-Builder.

The Design-Builder shall provide the names of the principal individual owners of the firm. In the event the firm is employee owned or publicly held, then the fact shall be stated and the names of the firm’s principals or officers shall be provided.

5.3.1.4 Failure to comply with the requirements of this RFP may result in disqualification.

5.3.1.5 Technical Proposals and modifications thereto received subsequent to the hour and date specified above will render the Design-Builder’s submittal invalid and will cause its disqualification from this selection process.

5.3.1.6 Proposals that deviate from the RFP and Bridging Documents supersede the RFP in accordance with 2-5.2, “Precedence of Contract Documents.”

Design elements which deviate from the scope of Work, City’s design guidelines, or material substitution which differs from the Approved Material List shall be highlighted in accordance with Attachment B, “Exception to this RFP” of the Proposal and brought to City’s attention during the presentation and interview.

5.3.1.7 Questions about the meaning or intent of the Contract Documents as related to the scope of Work and of technical nature shall be directed to the Project Manager prior to the Proposal Due Date. Interpretations or clarifications considered necessary by the Project Manager in response to such questions will be issued by Addenda, which will be mailed or delivered to all parties.

Questions received less than 14 days prior to the Proposal due date may not be answered. Only questions answered by formal written addenda will be binding. Oral and other interpretations or clarifications will be without legal effect. It is the BIDDER’s

responsibility to become informed of any addenda that have been issued and to include all such information in its Bid.

5.3.2 Price Proposal

5.3.2.1 The Price Proposal shall be submitted separately from the Technical Proposal and shall be received no later than the time and date shown on the cover of this RFP.

Submittal of the Price Proposal after the date stipulated will be cause for rejection of the entire Proposal and disqualification of the Design-Builder for this selection process.

5.3.2.2 The Price Proposal is to be submitted in sealed packages with the following information clearly marked on the outside of each package:

Name of Design-Builder

Project Title

“Price Proposal” Marked “CONFIDENTIAL” (in red)

5.3.2.3 Failure to comply with the requirements of this RFP may result in disqualification.

5.3.2.4 Price Proposals or modifications thereto received subsequent to the hour and date specified on the cover of this RFP will render the Design-Builder’s submittals invalid and will cause their disqualification in the selection process.

5.4 Review of Technical Proposal

5.4.1 Following the receipt of the Technical Proposal, the City anticipates allotting 2 weeks for review of the Technical Proposals.

5.4.2 Subsequent to receipt, the City will provide written notice of the schedule for technical presentations. This schedule will be on a "random draw" basis and has no bearing on the potential for award.

5.5 Technical Presentation

5.5.1 The interview will consist of a (30) minute presentation by the Design-Builder and (30) minutes of questions by the Panel. The presentation shall be presented by the Design-Builder’s key personnel who will be continuously involved on site or in San Diego, in relative proportion to their level of involvement. Based on the Design-Builder's Proposal, interview and the Project’s Evaluation Criteria, the Panel will rank the Design-Builder’s of its qualifications.

5.5.2 The Design-Builders are responsible for bringing any and all equipment and materials that are required for the presentation. The City will not provide any equipment or materials for presentations.

5.6 Final Selection (Adjusted Low Bid)

5.6.1 The ranking of each Design-Builder during the Technical Proposal review and the Interviews will serve as a divisor of the Price Proposal submitted thereby determining weighted price.

5.6.2 Selection will be based on “Adjusted Low Bid”. Following review of the Technical Proposals and the oral presentations/interviews, the resulting

qualitative evaluation scores will be totaled on a scale of 0 to 100, and will be converted to a decimal (e.g., score of 85 is written as 0.85). After the scores have been calculated, each Design-Builder’s price envelope will be opened. The price will be divided by the score (expressed as a decimal) to yield the “Adjusted Low Bid”. The lowest adjusted bid will be recommended for Contract award. The adjustment to the Price Proposal is for selection purposes only. The Price Proposal as submitted is the actual Contract Price.

The following example summarizes and illustrates the process:

Design-Builder	Qualitative Score (100 Maximum)	Price Proposal	Adjusted Price *
A	0.85	\$1,000,000.00	\$1,176,471
B	0.95	\$1,300,000.00	\$1,368,421
C	0.65	\$900,000.00	\$1,384,615
* The adjustment to the Proposal is for selection only. Firm “A” has Adjusted Lowest Bid. The Price Proposal is the actual Contract amount.			

5.6.3 The Design-Builders will be notified in writing of the City’s final decision.

6.0 POLICIES, PROCEDURES AND GUIDELINES

- 6.1** The Program's Selection Process is based on the policies, procedures and guidelines contained in the City Municipal Code Chapter 2, Article 2, Division 33.
- 6.2** A Ranking Panel (Panel) will be established for this project and will include representatives from the City and may include other interested parties (e.g., Participating Agencies, representative from the Community at Large, as required and other agencies e.g., the State Water Resource Control Board, etc.).
- 6.3** The Panel will review all proposals received and when required interview each Design-Builder in accordance with Attachment ‘B’ of this RFP. Based on the Design-Builder's Proposal, interview and the Project’s Evaluation Criteria, the Panel will rank the Design-Builders’ qualifications. The PM will rate the Design-Builder’s by applying the rating criteria to the price proposal in a closed meeting and will forward its ranked listing of Design-Builders to the Mayor or designee. This closed meeting will be held at **2:30 PM at** Public Works Department, 1200 Third Avenue, Suite 200, San Diego, California, 92101 as scheduled in Section 8.
- 6.4** The Mayor or designee will make the final recommendation to City Council concerning the proposed agreement. The City Council has the final authority to approve the Contract.

7.0 EVALUATION CRITERIA

The evaluation criteria and the respective weights that will be given to each criterion are attached as Attachment ‘B’.

8.0 SELECTION AND AWARD SCHEDULE

The City anticipates that the process for selecting a Design-Builder, and awarding the contract, will be according to the following tentative schedule:

8.1	Issue RFP	September 21, 2011
8.2	Pre-Proposal Meeting	October 5, 2011
8.3	Proposal Due Date	October 18, 2011
8.4	Technical Presentations	November 9, 2011
8.5	Closed Ranking Meeting	November 15, 2011
8.6	Selection and Notification	November 16, 2011
8.7	Receipt of Bonds and Insurance Certificates	November 30, 2011
8.8	Notice to Proceed	January 13, 2012

9.0 PRE-PROPOSAL ACTIVITIES

9.1 Questions Concerning RFP

All questions regarding the RFP shall be presented in writing to the PM by the USPS or the e-mail address identified in the Contract Front End Volume 1, Invitation to Bids (see Attachments).

9.2 Pre-Proposal Meeting

A **MANDATORY** Pre-Proposal meeting and representative sites visit will be held as scheduled in Section 8, from 10:00 AM to 12:00 PM, at 1200 Third Avenue, Suite 200, large conference room, San Diego, CA, 92101. All potential responders are required to attend. Any materials distributed at the meeting will be issued to all RFP recipients in the form of an addendum to this RFP. It is not necessary for all members of a Design-Builder's team to be present at the Pre-Proposal Meeting, however, the Design-Builder will be held accountable for receiving and applying all information discussed at the Pre- Proposal Meeting.

Bid shall be considered non-responsive if the Design-Builder fails to attend the Pre-Proposal Meeting as evidenced by the City's meeting sign-in sheet when such a meeting has been specified to be required.

9.3 Revision to the RFP

The City reserves the right to revise the RFP prior to the date that Proposals are due. Revisions to the RFP will be mailed to all RFP holders. The City reserves the right to extend the date by which the Proposals are due.

10.0 SPECIAL CONDITIONS

10.1 Reservations

This RFP does not commit the City to award a contract, to defray any costs incurred in the preparation of a Proposal pursuant to this RFP, or to procure or contract for Work.

10.2 Public Records

After the selection process is complete and a contract is signed between the City and the winning Design-Builder, all Proposals submitted in response to this RFP become the property of the City and are exempted from the public record.

10.3 Right to Cancel

The City reserves the right to cancel, in part or in its entirety, this RFP including but not limited to: selection schedule, submittal date, and submittal requirements. If the City cancels or revises the RFP, all Design-Builders will be notified in writing by the City.

10.4 Additional Information

The City reserves the right to request additional information or clarifications from or interview any or all Design-Builders.

10.5 Public Information

Release of Public Information - Selection announcements, contract awards, data and all documents provided by the City shall be protected from public disclosure in accordance with the provisions of the Water Department Security Upgrades Non-disclosure and Confidentiality Agreement. Design-Builders may not release any information regarding this project.

10.6 Changes to Key Personnel and Substitution of Subcontractors

10.6.1 The Design-Builder shall not change or substitute any individual that is identified as “key personnel” in its SOQ and Proposal without the written consent of the City.

10.6.2 The Design-Builder shall not change or substitute any material, Supplier Subconsultants, or Subcontractor identified in its SOQ and Proposal without written consent of the City.

10.7 Use of Reference Documents and Pre-Design Reports

10.7.1 The City has made available As-Built Plans and Reference Documents related to the Project. Use of these reports shall be for general project background information only, and shall be used at the Design-Builder’s risk. No responsibility is assumed by the City for the completeness or accuracy of these reports. **All documents provided by the City shall be returned at the time of the Technical Presentation.**

10.7.2 The following documents are included with the Scope of Work (Attachment ‘A’):

- a. Construction Drawings for City Of San Diego Security Upgrades - RFP 1
- b. Exhibit A - List of Project Sites
- c. Exhibit B - Microwave Network Connectivity Diagram
- d. Exhibit C - Link Budgets and Calculations
- e. Exhibit D - Site Security Assessment prepared by AECOM
- f. Exhibit E - Vendor Cut Sheets

10.8 Use of Computer Aided Drafting and Design (CADD)

The Design-Builder shall use CADD. CADD drawings, figures, and other work shall be produced by the Design-Builder using MicroStation software. Conversions of CADD work from any other non-standard CADD format to City standard MicroStation format shall not be acceptable in lieu of this requirement unless specified otherwise in the Contract Documents. Refer to City's CADD Standards for detailed requirements.

10.9 Scheduling and Management Reporting Systems

The Design-Builder will be required to use the latest version of the Primavera Project Management and Scheduling Software or equal.

10.9.1 The City will require the Design-Builder to submit and maintain a task-oriented computerized schedule for completing the Work over the life of the Project.

10.9.2 The Design-Builder shall anticipate that the development of this schedule will require at least 3 steps; (1) development of a work breakdown structure by the Design-Builder and submittal to the City for review; (2) development of interface procedures (and software, if necessary) to communicate from the Design-Builder's computer networking software to the City's networking software (Primavera), and (3) development of an activity network for submittal to the City for review and concurrence.

10.9.3 The Design-Builder will be required to furnish activity status and network updates on disks in a format that will interface with the City's scheduling system. The City will utilize the schedule information supplied by the Design-Builder in to review progress payments and to monitor the progress of the project against the agreed schedule requirements.

10.10 Project Schedule

10.10.1 The City has established the following tentative milestones for the Project:

- | | |
|----------------------------------|--------------|
| a. Design Notice to Proceed | January 2012 |
| b. Begin Construction Operations | April 2012 |
| c. Issue Notice of Completion | April 2013 |

For the Contract Time refer to Contract Front End Volume 1, Invitation to Bids (see Attachments).

10.11 Acknowledgement of Addenda

The Design-Builder shall confirm in its Proposal the receipt of all addenda issued to this RFP. Failure to acknowledge all addenda issued, will result in the Proposal being considered **non-responsive** and ineligible for further consideration.

10.12 The agreement, terms and conditions are included in The City's Front End Contract Documents Volume 1 and 2, The GREENBOOK Part 1, and The WHITEBOOK e.g., the City Supplement.

ATTACHMENT A

BRIDGING DOCUMENTS (PROJECT DESCRIPTION, SCOPE OF WORK, TECHNICAL SPECIFICATIONS, DRAWINGS, AND EXHIBITS)

ATTACHMENT A

BRIDGING DOCUMENTS (PROJECT DESCRIPTION, SCOPE OF WORK, TECHNICAL SPECIFICATIONS, AND DRAWINGS)

ENGINEERING & CAPITAL PROJECTS DEPARTMENT

1.0 PROJECT DESCRIPTION

The City's Public Utilities Department desires to have all remote water facilities including water treatment facilities, reservoirs, standpipes, pumping stations and regulators equipped with physical security systems including CCTV, access control and intrusion detection. Approximately half of these sites have physical security and are presently monitored over AT&T leased lines/circuits at the Security Operations Center (SOC), located at the City's Chollas Facility. A complete list of the existing and new sites to be included in this proposal is found in Exhibit A.

This is a design/build project and the successful BIDDER will be required to provide a complete design for review/approval prior to ordering any equipment.

The existing physical security systems include a Pelco based CCTV system with Pelco 8100 DVR units and a broad assortment of both fixed/PTZ day/night cameras; a Northern NexWatch access control system running WinPak Pro software with HID card readers (MaxiProx and ProxPro II) and ProTech Pyramid 2 motion detection and Extreme CCTV IR illuminators.

The new installations will require newer technology be implemented including CCTV with video analytics/detection; a new access control system that will operate the existing Water Department access control system, the Waste Water department access control system, and the new dual technology card readers using SmartCard technologies for these new sites. The introduction of thermal IR cameras for the reservoir sites is also new for the City.

The City desires to implement a situation management platform that will integrate all these systems under one managed solution. The intent is to bring the new sites into this new platform using the standard situation management templates with the capability to bring the legacy system on-line at a future date and is not considered part of this contract. Therefore, the existing headend system is not to be disturbed as part of this project except to verify operability with any new devices installed at sites having existing security. The City is planning to eventually move the current SOC to a new space to be determined in the future.

The second goal of this project is to migrate all sites (existing and new) off of the leased lines to a new wireless communications network to be installed as part of this project. The sites will be equipped with microwave connectivity using line of sight connecting to a designated High Site which will form the backbone ultimately connecting back to the Chollas SOC. Depending on the final design, it may not be possible to obtain line of sight from every location which may require the continues use of leased lines. However, based on the current configuration it would appear that should not be a problem.

The goals of this project are as follows:

- Provide design, procurement and installation services to construct a wireless communications network from designated remote water sites to the SOC located at the Chollas facility.
- Provide design, procurement and installation services to migrate water sites with existing security monitoring systems over to a new City-owned wireless communications network.
- Provide design, procurement and installation services for new physical security as well as security monitoring equipment at sites that presently do not have any monitoring capability.
- Provide design, procurement and installation services to add new sites currently without security monitoring systems on to the new City-owned wireless communications network.
- Provide design, procurement and installation services for security upgrades to existing sites with security already in place as an option on a per site basis.

Communications Upgrade Project: The City has a number of remote sites that are equipped with security monitoring systems and that information is currently transmitted to the SOC using AT&T Opt-E-Man services or leased T-1 circuits. The City desires to move away from the monthly recurring costs of these services and is requesting that the existing and new security sites incorporate wireless communications technology over licensed/unlicensed spectrum channels as an alternate transmission medium. The plan is for each site to be equipped with a microwave link that connects to a proposed “high level site” for backbone connection back to the Chollas SOC facility.

New Security Installation Requirement: For new sites that do not have any security monitoring systems installed, the sites shall require adequate CCTV surveillance cameras and locally installed video recorders; access control card readers, door contacts, motion detection, perimeter fencing, and gate/door mag-locks. Intrusion detection will incorporate the use of video detection at the camera. Additionally, the use of two-way audio between the SOC and select remote sites is also required.

Security Upgrade Requirements: For sites that have existing security measures installed today, the design and implementation of those installations were not all performed at the same time which implies some locations have different levels of security than others. The recommended upgrades are identified which may include fence line repairs, adding additional cameras, motion detection, infrared illuminators, etc.

This project is structured as a design/build type contract using pre-qualified firms to perform as the General Contractor, designer, installer and integrator of the proposed security and communications systems in order to achieve the goals of this project.

Design Process:

Following the successful award the contractor will conduct a detailed site survey of each facility. Following the survey, the contractor will provide a site visit report to the City outlining any potential issues or concerns that require consideration that would deviate from the current 30% design documents. The intent is not to redesign the solution from the ground up, only to point out where additional security measures may be suggested where a potential cost impact needs to be pointed out. The City desires to minimize Change Order Requests to the extent possible and reasonable.

The contractor will provide three (3) design submittals as part of this effort:

1. 60% Design – Due 60 Days following Contract Award
2. 100% Design – Due 30 Days following 60% Design Review
3. Final Design – Due 30 Days following 100% Design Review

Each deliverable will include CSI Master Format Specifications combined into one Project Manual, design drawings broken down by discipline (Electrical, security, telecom, wireless, etc.). The contractor must provide a cost estimate along with each submittal for City review by site with a master rollup as a coversheet.

Design reviews will occur within 15 Days of receipt of deliverable.

All submittals shall be provided in full sized and half sized hardcopies as well as electronic PDF files. The Final submittal will be provided in both hardcopy and softcopy native and PDF formats on CD/DVD.

Test Plans, Labeling Plans and Commissioning Plans will be provided within 30 Days after Final Submittal Approval for City review/approval.

Contractor is to provide a proposed implementation schedule as part of the Bid Response. This schedule will be updated and resubmitted with each deliverable. The contractor is encouraged to use multiple crews to expedite the installation process.

The City anticipates the contractor will use a subcontractor to perform the wireless design and installation activities. The City requires that the wireless subcontractor to have performed an installation of similar size and scope in order to be considered viable and qualified to perform this effort. The City requests the BIDDER submit the name of the subcontractor for the wireless effort(s) as part of the bid response.

2.0 SCOPE OF WORK

2.1 Security

The City desires to standardize the level/type of security based on a site category such as Reservoirs, Pump Stations and Regulators to the extent possible. This standard would provide for CCTV coverage, access control, and perimeter intrusion detection at all sites. Recommendations for existing security sites are also addressed in specific sections below.

- a. **Reservoirs:** There are two types of reservoirs involved in this project - above ground tanks/standpipes and underground tanks. The requirements vary slightly for each as described below.
 - i. Above Ground Tanks/Standpipes: These reservoirs are smaller and easier to secure the boundary due to the smaller physical area required for these types of reservoirs.
 - ii. Underground Tank:Monitoring these types of reservoirs can be difficult with traditional PTZ Day/Night cameras with limited range motion detection and IR illuminators. These sites have expansive perimeters and by using traditional

intrusion schemes such as buried fiber sensors or microwave sensors they are not as fiscally feasible to implement based on terrain and perimeter distances.

- b. **Pump Stations:** These facilities generally house the controls and physical pumps within a physical structure, building, or underground vault. The pump station sits on a plot of land and is usually fenced in. In some cases, the pump station is within the same perimeter of a reservoir, or in the public right of way.
- c. **Regulators:** These are very small sites, almost invariably installed underground and accessed through a traffic rated manhole or hatch vault.

2.1.1 Security Standard for Above Ground/Underground Tank/Standpipe Reservoirs

- a. **CCTV:** Use of thermal IR cameras is required with video detection to cover the perimeter boundary. Install new video recorder in air-cooled outdoor cabinet if no standalone structure is available to house the equipment. Install one camera at each corner of the property with view angles down the fence lines. Accommodate changes in elevation by adding additional cameras as necessary.
- b. **Access Control:** Provide dual technology proximity card reader on post at main gate. Install automatic gate opener and ground loops at main gate. Provide contact sensors at all doors and hatch door with padlock. Provide proximity card reader at all primary door entrances and add mag-locks. Provide dual technology motion detector inside vaults and structures with detection angle towards doors and windows. Install controllers and interfaces inside security cabinet.
- c. **Intrusion Detection:** Provide video detection to detect human size movement along perimeter fence lines.

2.1.2 Security Standard for Pump Stations

- a. **CCTV:** Use of fixed cameras is required with video detection to cover the perimeter boundary. Install new video recorder in air-cooled outdoor cabinet if no standalone structure is available to house the equipment indoors. Install one camera at each corner of the property with view angles down the fence lines. Install one PTZ camera positioned such to provide a view of the gate entrance when credentials are used at the gate and of the primary door entrance when the card reader is used. If such an angle cannot be accommodated, install additional fixed camera with coverage of primary entrance door. If pump station is underground, install single fixed CCTV camera inside vault with view of entrance.
- b. **Access Control:** Provide dual technology proximity card reader on post at main gate. Install automatic gate opener and ground loops at main gate. Provide contact sensors at all doors and in-ground hatch door with padlock. Provide proximity card reader at all primary door entrance and add mag-lock to primary door. Provide dual technology motion detector inside structures with detection angle towards doors and windows. Install wall mount security cabinet to house UPS, NVR, ACS controllers, communications equipment and interfaces. If pump station is underground install card reader with LED Indicator inside hatchway. Install motion sensor to detect motion inside vault.

- c. Intrusion Detection: Provide video detection to detect human size movement along perimeter fence lines.

2.1.3 Security Standard for Regulators

- a. CCTV: Install PTZ camera on pole with view of entrance manhole cover or vault hatch as default. If regulator is enclosed within new fence PTZ camera will also need to view entrance gate when credentials are used at card reader.
- b. Access Control: Provide dual technology proximity card reader on post at main gate. Provide contact sensors on in-ground hatch door with padlock or manhole cover. If regulator is underground install card reader with LED Indicator inside hatchway or manhole entrance. Install motion sensor to detect motion inside vault. Install wall mount security cabinet to house UPS, NVR, ACS controllers, communications equipment and interfaces. Cabinet may be installed above ground in outdoor rated cabinet.
- c. Intrusion Detection: Provide video detection to detect human size movement along perimeter fence lines.

2.1.4 Security Standard for Fence Lines

- a. Existing Fence Line: Replace/repair existing fencing to ensure all breaches are properly mitigated. Install new fencing only if indicated on drawings. Add barbed wire and outriggers on existing fencing where indicated on drawings. Verify/adjust fence tension to ensure less than 4 inches or less of movement when pushed at the center of a span between posts. Prior to installing new fence, coordinate with City surveyor for accurate property lines.
- b. New Fence Lines: All fence lines are to be constructed with 8 foot, 9 gauge black coated metal mesh with three strands of barbed wire on 18 inch outriggers. All fences shall have tension wire installed at the bottom of the fence and galvanized fence wire attached to posts. Verify/adjust fence tension to ensure less than 4 inches or less of movement when pushed at the center of a span between posts.
- c. Existing Vehicle Gates/Pedestrian Gates: Verify/adjust existing gates to ensure proper alignment between fence posts. Augment to incorporate center drop rod where none exists today. Several gates were found to be out of alignment or in disrepair. Replace where indicated. Ensure gap under fence is 5 inches or less from post to post. If gap exceeds this distance, build up asphalt to form speed hump to close the gap. Install new barbed wire with outriggers above fence (if mesh style gate) or add decorative security wrought iron spikes above wrought iron gates.
- d. New Vehicle Gates/Pedestrian Gates: All new vehicle gates must have an automatic gate opener with ground loops installed. This includes replacement gates where noted. All gates will be topped with three strands of barbed wire.
- e. Ornamental Fencing: Certain locations require wrought iron fencing due to matching existing neighboring fences or extensions of existing fences. All ornamental fencing must have security spikes at the top to attain an overall constructed height of 8 feet.

2.1.5 Security Standard for Security Cabinets

- a. Outdoor Cabinets: All outdoor cabinets will be installed on new concrete pads. All cabinets will be stainless steel NEMA-4 rated with air-cooled unit installed on side. Cabinet will be powered with dedicated 110VAC/20A quad outlet installed inside cabinet.
- b. Indoor Cabinets: All indoor cabinets will be wall mounted swing gate style with louvered front/sides and lockable doors. Size is dependent on site requirement. Cabinet will be powered with dedicated 110VAC/20A Quad outlet installed inside cabinet. No cooling unit required indoors.

2.1.6 Security Standard for CCTV Cameras

- a. New cameras to be provided will include fixed, PTZ and Thermal IR. Cameras intended for perimeter surveillance shall be equipped with video detection for perimeter intrusion. Site coverage to include perimeter, gate entrance, door entrance, vault hatch opening/manhole (for underground vaults only). Fixed are intended for perimeter or static images such as doorways and perimeter fencing; PTZ for gate coverage and general site panning; and thermal for large expanses and long range tracking. The lighting levels vary at all sites so appropriate night lux levels need to be designed.
- b. New cameras will be IP based operating at H.264 compression.
- c. New/Existing Sites: SOC viewing frames per second will be dictated by bandwidth availability and resolution settings. The existing sites communications links are operating at ~2Mb per site. Standard recording will be set to 7.5 fps at 4CIF and will provide recording storage for 30 days. With the implementation of IP based cameras the minimum bandwidth is expected to increase, particularly during events. Limitations will be at the mercy of the wireless communications links.
- d. All cameras will be equipped with appropriate heaters and sunshields if dictated by current climate conditions and locations.
- e. Require total integrated camera solution to include video detection and IR illumination (new cameras only).
- f. New poles will be required to be installed at new security sites. Height will be a minimum of 25 feet. Proper foundation and square pole material with brown finish will be used. Poles/equipment will be mounted a minimum of 36 inches away from any perimeter fence line or structure and no equipment will be allowed to be attached to the fence line itself.
- g. One way audio is required at a number of remote sites. IP based speakers for integrated solution is required where shown on drawings.

2.1.7 Security Standard for Video Recorders

- a. New Video Recorders are required to be networked based and IP ready. All recorders will be installed locally at each site with uplink provided via wireless communications to SOC.

- b. Data storage for 30 days will be required.
- c. Ability to throttle up/down frame rate is required during event alarm. Estimate 7.5 fps at 4CIF for normal viewing and escalate to 15 fps during an event.
- d. Must be backed up via new UPS in rack for 10 minutes with alarm sent to SOC when loss of power detected.

2.1.8 Security Standard for Access Control

- a. All site entrances will require dual technology proximity readers installed on post inside property line against fence line adjacent to gate.
- b. All vehicle gates (at new sites only) will require installation of automatic gate openers at the gate opening with ground loops.
- c. Doors to be equipped with magnetic locks rated at 650lbs.
- d. Request to Exit Sensors are required at all doors with access control card readers.
- e. Dual technology proximity card reader to be installed at one primary door and inside Pump Station/Regulator hatch/manhole vaults if no fence is installed.
- f. Provide LED Red/Green Illuminators at hatch locations adjacent to card readers to provide visual acknowledgement of card access status.
- g. Dual technology motion detection will be installed in all vaults and building structures with sensors pointed towards all doors and windows to facilitate intrusion detection.

2.1.9 Security Standard for Door/Hatch Contacts

- a. Use surface mount sensors at all primary door locations and on hatch door(s) that is equipped with padlock/mechanical lock only. Include sensors at regulator manhole locations.

2.1.10 Wiring Requirements

- a. All sites will require trenching for PVC conduit for both power and communications wiring as dictated by the final design. General contractor must use licensed electrician for all panel and electrical work.
- b. All exposed routes will require EMT from security cabinet to end device location.
- c. No Wiremold is to be used in this project.
- d. Pull boxes are to be installed per TIA guidelines.
- e. All power runs will be on dedicated circuits. No shared circuits with non-security systems are allowed.
- f. All low voltage interior wiring will be Category 6 UTP. All exterior cabling will be Category 6 STP cable.

- g. All communications cabling and power wiring will be rated for installation environment (OSP, etc.).

2.1.11 Security Standard on Signage

- a. Security warning signage is to be posted at main gate and on perimeter fence at a distance of no less than 50 feet apart. For large perimeter sites, spacing every 75 feet is acceptable.
- b. Signage is to indicate area under 24 hour surveillance, no trespassing, and that it is City of San Diego property.
- c. Color printed samples to be provided for review/approval prior to procurement.

2.1.12 Audio Capability

- a. Select locations will require two-way audio capability from the SOC to IP based speaker horns over the communications network.
- b. Placement/quantity of speakers will be provided in construction drawings for City review and approval.

2.1.13 Erosion Control

- a. There are a number of locations where erosion is a factor due to the terrain and composition of the ground causing potential breach points that exist today. Mitigation of these issues will be on a per site basis. Include an allotment of \$5000 to address this issue in the proposal as a separate line item to cover labor and materials to fill/mitigate existing gaps under fence lines where indicated. Should any one site require more than \$1000 of erosion control measures contact the City prior to performing any work for direction.

2.1.14 Foliage Conditions

- a. In many instances there is significant overgrowth along the fence lines and within the property that impedes both the natural surveillance and mechanical surveillance and detection capabilities. At a minimum, the fences must be completely cleared of all foliage including a reasonable clear zone on both sides of the fence. Further, all trees are required to be cut back to facilitate approximately 6 months of growth before the next trimming is to occur. All bushes and trees are to be trimmed such to provide a clear view between 2 feet and 6 feet above the ground, and all branches trimmed back to prevent obstruction of CCTV cameras. The BIDDER is required to provide a lump sum cost to enlist the services of a professional landscaping or maintenance firm to perform this clearing activity at ALL sites included in this RFP.

2.1.15 Maintenance Standards

- a. The BIDDER shall offer optional maintenance contracts to cover both the new security systems and equipment and existing systems offered in their response to this RFP inclusive of the SOC equipment and systems.
- b. The BIDDER shall provide a single maintenance cost for the proposed security monitoring devices and systems for the remote sites with no existing security monitoring presently and any new equipment and systems installed at the SOC. The maintenance contract shall take effect immediately following the expiration of the warranty period, and be renewable on a yearly basis.
- c. The BIDDER will also provide a separate maintenance cost to cover the existing security monitoring equipment at the remote sites and at the SOC. The maintenance contract for the existing systems or devices that are considered part of the security monitoring system shall take effect immediately following contract award. Any device or system not currently operational must be repaired/replaced to become operational within 60 days after contract award. The City shall provide a detailed list of any known devices, systems or other issues not presently operational including cameras, DVR's, display monitors in the SOC, motion sensors, IR illuminators, card readers, mag-locks, door contacts and any other known system issues (video quality, etc.). The Site Survey Report developed by the consultant identifies only those known issues as determined while visiting the site.
- d. This system maintenance contract shall be based on the initial system configuration for equipment. The maintenance contract shall include preventive and demand maintenance for the infrastructure and the repair and/or replacement of defective units. Costs for successive annual renewable contract services to provide (in combination with the warranty) a total of three years of maintenance services shall be considered when determining this cost of coverage.
- e. The approach to maintenance of this system shall be preventive in nature.
- f. In addition to preventive maintenance, it is expected, following cutover to the City, that some system optimization and adjustment will be required. This work shall be coordinated through and with the City's Project Manager or other designated representative.
- g. Equipment shall be maintained in clean condition. Oil, dust and other foreign substances shall be removed on a routine basis.
- h. Equipment and system performance shall be maintained at the level initially described in these equipment and systems specifications. The service organization shall maintain records to confirm that this has been performed.
- i. Records shall be available for City's inspection upon request. Records shall be maintained by the BIDDER'S throughout the initial maintenance and warranty periods (and any subsequent maintenance contract period), and shall revert to the City upon termination of the warranty (or maintenance contract).
- j. Routine maintenance procedures recommended by the equipment manufacturer shall be followed.

- k. The BIDDER shall provide 24/7/365 technical support by only factory trained and authorized maintenance personnel and shall be San Diego based with the ability to provide on-site technical support within two (2) hours as required at no additional cost. The City will allow reasonable access to City locations for the purpose of installing, repairing and removing equipment.
- l. The BIDDER or authorized service organization(s) shall maintain comprehensive installation and instruction manuals for all system equipment. These manuals shall be the property of the City, and shall revert to the City at such time as they assume the maintenance responsibility for the system.

2.1.16 Parts / Spare Parts

- a. A sufficient supply of spare parts shall be readily available to allow immediate restoration of minimal operation of the new security monitoring system on a rolling repair and return basis. Other parts shall be available via emergency request and air freighted within twenty-four hours of the equipment failure.
- b. The BIDDER shall provide the cost of recommended critical spare parts in the Price Proposal.
- c. At the end of the warranty/maintenance period, the full complement of inventoried spares shall be delivered to the City in a new or fully repaired condition.

2.1.17 Training

- a. The BIDDER shall provide training for the City's personnel in the operational, functional, administrative, and maintenance-related aspects of the new security system.
- b. The BIDDER shall describe in detail the training programs to be offered in the Proposal.
- c. The BIDDER shall provide all materials, manuals, schematics, and other documentation required in the training.

2.2 Wireless Communications Scope of Work

2.2.1 General Connectivity Requirements

- a. The connectivity network shall be designed to support the security monitoring systems at each site. The connectivity network shall provide connectivity to the SOC at the Chollas facility for centralized monitoring / control / management. Each location requires a minimum sustained 2 Mbps symmetrical bandwidth, scalable to 8 Mbps with Ethernet interfaces.
- b. Newly developed intermediate sites should only be considered if none of the existing locations are tenable. Should a site not be tenable, coordinate with the City to ascertain alternative sites or to determine if a leased circuit is the best method to provide connectivity.

- c. Provide a robust backbone provisioning that considers both the reliability and the cost effectiveness of existing connectivity networks and any newly planned methods of site connectivity. The new connectivity network will contain segments, systems, links and/or rings using City of San Diego communication sites as shown in Exhibit B at the end of this attachment and in Exhibit A Site Distances table. The proposed connectivity network architecture shall be capable of supporting the data rates indicated in the Connectivity Network Diagram and IP-based data transmission. The connectivity network shall provide a per hop two-way availability of 99.999% at a maximum BER of 1E-7. The maximum one way latency shall be 50 milliseconds from any site to the Chollas SOC. The T1 clocking shall be Stratum 1 or better. Network jitter shall not exceed 5 microseconds.
- d. All high level sites must adhere to established Motorola R56 grounding standards and guidelines for communication sites.
- e. The BIDDER must describe in detail the following standard offerings (no additional cost):
 - a. Standard installation including typical time to install.
 - b. Technical support including Network Operations, Service Orders, Trouble Ticket Process, Availability / Usage reports.
 - c. Performance guarantees with credit for loss of connectivity.
- f. Preliminary Link Budget Figures and Calculations were compiled and are provided for review in Exhibit C. The calculations assume an antenna height of 50 feet AGL for most links. The BIDDER must verify these links by performing a terrain walk which will likely reveal some limitations that apply to antenna heights for some of the links.

2.2.2 Interfaces to Chollas SOC

- a. The Chollas SOC has an existing IP router based network. The PROPOSER is responsible to interface with the existing IP network. Interfaces may include but are not limited to:
 - RJ-45 connectors
 - SC fiber connectors
- b. The Contractor shall identify the demarcation point at its equipment. The City shall make the connection to the Ethernet demarcation point at the Chollas SOC and at the Connectivity Network Equipment located at each site. The Contractor shall be responsible for necessary cross-connections.

2.2.3 DHCP and Compatibility with IPv6

- a. The BIDDER shall describe its approach to compatibility with IPv6. This will include a migration road map for network addressing, routing, etc. from current IPv4 to IPv6.
- b. The BIDDER must coordinate the IP configuration and port assignments with the City of San Diego IP System administrators and must provide DHCP hardware and software services to interface with the existing IP network addressing scheme.
- c. The BIDDER, in conjunction with the City, shall develop an IP addressing plan that is compatible and collision inhibitive throughout the proposed and existing networks.

2.2.4 Microwave Telecommunications System

2.2.4.1 System Configuration

- a. The microwave system shall provide digital connectivity between the Water site physical locations as shown in Exhibit A. Access to the sites must be coordinated with the City of San Diego Communication Division for the communication only sites and with the City of San Diego Water Department for the Water Department sites.
- b. There is an existing link from Chollas SOC to the Catalina Standpipe that is used for Public Safety. The proposed design shown in Exhibit B does not use this link, but adds a new link from Chollas SOC to Catalina PS / Point Loma Res. If the link to Catalina Standpipe is used, BIDDER must coordinate with the City of San Diego Communication Division to ensure there is adequate bandwidth and that the existing equipment is compatible with the BIDDER's system design.
- c. Interfacing with the existing link from Chollas SOC to Lyons Peak is an Aviat (Harris) Truepoint 5000 MHSB. This link is used for other critical public safety communications. This link does not have the required 134 Mbps required for the system design shown in Exhibit B. The link from Lyons Peak to San Ysidro can possibly be used to meet the hot standby needs of the Chollas to Lyons peak link. Details of this configuration will be discussed with the BIDDER during the DDR.
- d. The BIDDER may suggest alternative microwave system configurations designed to enhance system performance or in the event that the microwave path surveys determine that the proposed link is not viable.
- e. Microwave radios shall be Public Safety grade and should meet the specifications for "Backbone" and "Spur" sites as indicated in the enclosed representative vendor products. These product sheets are provided as a guideline and similar products from other vendors are acceptable provided they meet the specifications indicated in this RFP,
 - "Backbone" representative product – Aviat Eclipse or IRU6000.
 - "Spur" representative product – Firetide Hotport 7020.
- f. All spurs and backbone links from/to the high level sites must use a licensed frequency and if the radio is mounted with the antenna, the height of the antenna/radio must be accessible with a bucket truck and these heights must be coordinated with the City.

2.2.4.2 Microwave Frequency Bands

- a. The microwave contractor shall attempt to use unlicensed 5.8 GHz were possible without outside or self induced interference. Licensed frequencies in the 6.2, 6.7, 11.2 or 18 GHz fixed service bands must be used wherever designated and where unlicensed frequencies are not practicable. The microwave network can use the unlicensed band at the water sites, but the PROPOSER must discuss these options with the City.
- b. All links into high level sites (Black Mountain, Mount Woodson, Cowles Mountain, Chollas SOC, Lyons Peak, Encanto, and San Ysidro) and back bone sites will use licensed frequencies, which are indicated in Exhibit A and Exhibit B.
- c. The Contractor shall prepare license applications and modifications necessary to accommodate the system design, including the following:
 - Prior Coordination Notices
 - FCC forms
 - FAA forms
 - Waiver requests
- d. The Contractor shall submit this documentation to the FCC within 60 days after final detailed design and shall pay all coordination and licensing fees.

2.2.4.3 Microwave System Performance

- a. Each microwave path shall be designed to provide a minimum two-way path availability of 99.999% with a BER threshold of $1E-7$. The microwave system shall be designed to provide no packet loss end-to-end including any combination of contiguous microwave hops. Jitter shall be less than 5 microseconds.
- a. The BIDDER shall state performance guarantees for the following:
 - Network Latency
 - Blackhaul
 - Last Mile
 - Packet Loss
 - Jitter
 - Network Availability
- b. Microwave path propagation predictions and designs shall be based on line-of-sight conditions conforming to the following obstruction clearance criteria:
 - $0.6 F1 + 10$ feet at $K = 1.0$
 - $0.3 F1$ at $K = 2/3$
 - $F1$ at $K = 4/3$

2.2.4.4 Equipment Requirements

- a. The microwave system shall include all equipment required for a complete operational system. Accessories shall include specialized test fixtures, test cords, and

adapters. All equipment shall be completely factory tested and documented in the final configuration.

- b. The equipment shall be completely solid-state, employing the latest technology. All necessary standby switching, alarm sensing, and control shall ensure fully automatic operation. Equipment shall have remote alarm/control capability for any equipment failure.

2.2.4.5 Digital Microwave Radio

- a. RF terminal equipment shall meet the following requirements:

Primary Power Input	110 VAC to the IDU at water sites 48 VDC at the high level sites
Maximum Receiver BER	1E-10
Capacity	Backbone rings and links, up to 124 Mbps. Spurs up to 20 Mbps, no less than 2 Mbps sustained per site.

2.2.4.6 Digital Microwave Redundancy

- a. The microwave equipment shall utilize redundancy against failure. The IDU and/or IP switch must be capable of routing the locally dropped and through Ethernet traffic to avoid packet loss.
- b. All active circuits shall be automatically protected using BER sensing, Packet loss detection, circuit-switched, and/or IP circuitry.
- c. The microwave equipment shall have fault-sensing circuitry that will detect transmitter and receiver failures, packet loss and bit error rate degradation.
- d. The equipment shall provide alarm outputs to the alarm system and network management system. The equipment shall provide status indications for local observation. All available alarm points in the equipment and all external control inputs, which may be utilized for remote equipment control functions, shall be described in the Proposal.

2.2.4.7 Mesh-Configured Microwave Equipment

- a. In a Mesh configuration, the microwave equipment shall be fully protected with OSI Layer 3 or 4 redundancy. The Contractor will provide test data on the reroute switching time from current to alternate route that demonstrates the total traffic outage time in milliseconds and loss of packets. This will be demonstrated with an forced equipment outage and path fade BER threshold switch.

2.2.4.8 Non-Ring Configured Microwave Equipment

- a. Spur links of more than 2 hops shall be fully protected with monitored hot-standby (MHSB) transmitters and receivers. The MHSB transmitters shall be switched to provide proper termination and isolation to the standby transmitter. Either the primary or secondary transmitter may be active.

2.2.4.9 Node Interface

- a. The digital microwave radio shall be capable of interfacing with the current City microwave links. These interfaces may include but are not limited to RJ45 Ethernet connectors and fiber connectors.

2.2.4.10 Test Points and Metering

- a. Built-in metering or a RS-232C port shall provide convenient monitoring of all major operating conditions. Test points and facilities shall enable alignment and testing of RF signal levels, including to and from the antenna, modulation levels, BER levels, frequency and all interface signals, all with no interruption of service.
- b. Local equipment provisioning and performance access ports must be provided and all microwave terminals shall be accessible from any single terminal location within contiguous links of same vendor microwave equipment. This connectivity shall be via the vendor's microwave equipment signal overhead.
- c. The minimum requirements for test points and built-in metering are:
 - TX oscillator, power and frequency.
 - RX LO and frequency
 - RX signal level
 - RX BER

2.2.4.11 Digital Microwave Routing / Switching Equipment

- a. A native IP based end to end network is required with 100 baseT Ethernet connectivity. The design may incorporate layer 2 routing and/or layer 3 edge routers, MPLS, IP over ATM, etc.
- b. The equipment shall be complete. Accessories shall include specialized test fixtures, test cords, and adapters. All equipment shall be completely factory tested and documented in the final configuration.
- c. The equipment shall be completely solid-state and employing the latest technology. All necessary standby switching, alarm sensing, and control shall ensure fully automatic operation, and it shall have remote alarm/control capability for any equipment failure.
- d. Clocking should incorporate some combination of the following:
 - Receive side recovered clocking
 - Transmit master clocking
 - External clocking: GPS, Stratum and Telco reference
- e. They shall have local and remote provisioning access, be capable of performing loop back functions and testing and have full diagnostic capabilities. There shall be two clock sources that cannot be located in the same facility.

2.2.4.12 Microwave Power Supplies

- a. All proposed microwave and multiplex equipment shall be powered from a nominal 110 VAC supply at the water sites and 48 VDC at the high level sites. Wherever possible, the microwave and router/switching equipment shall use the same common power voltages as the existing site equipment that will be utilized in the new connectivity network.
- b. The new equipment must interface with the CITY equipment at the communication only sites.
- c. All high level sites should be powered from a 48 VDC rectifier and batter plant to improve reliability/availability. The BIDDER shall provide Power Consumption, BTU, and wattage calculations for the equipment at the high level sites with their Detailed Design.

2.2.4.13 Microwave Antenna Systems

- a. The antennas, radomes, waveguide and associated mounting hardware at the **communication only sites** shall be rated to withstand 100 mph winds and conditions common to the City of San Diego. It is envisioned that most antennas will be panel, minimal sized antennas. The antennas, transmission lines, equipment and facilities shall all be installed in accordance with the National Electric Code and manufacturer recommended grounding and surge protection.
- b. The antennas and associated mounting hardware at the water security sites shall not exceed 24" x 24" and be mounted in a location that minimizes the aesthetic conditions at each site and at a height that is accessible with a bucket truck. In many cases the water sites are located in residential neighborhoods and every attempt should be made to minimize the visual profile at each site.

2.2.4.14 Microwave Antenna Mounting

- a. At the reservoir, regulator and pumping station locations the antennas will be mounted on existing shelter roofs or monopoles and must be coordinated with the City of San Diego.
- b. At the communication only sites the mounting of antennas must be coordinated with the City of San Diego and will use existing towers and/or be mounted to existing buildings / shelters located at the site.
- c. All antennas 6 ft or greater in diameter shall be secured to the tower with a minimum of two side-braces. Standard 4.5-inch diameter pipe mountings shall be utilized to support the microwave antennas.

2.2.4.15 Microwave Transmission Lines

- a. From the IDU to the ODU, Ethernet cable should be used in lieu of elliptical waveguide. The ODU should be powered via the Ethernet cable from the IDU. Exhibit A provides guidelines on the links that should use an indoor (waveguide) versus an outdoor (antenna/radio combination) for each location.

2.2.4.16 Dehydrator/Pressurization System

- a. If required, the Contractor shall furnish equipment for pressurization of microwave antenna feeds and elliptical waveguide. The pressurization equipment shall maintain at least 3 psig of positive pressure in the elliptical waveguide and antenna feed horn. The Contractor shall include all required fittings, regulators and pressurization lines, gauges, distribution manifolds, and installation hardware. Separate pressure metering shall be provided for each waveguide pressurized. Alarm outputs for low pressure, high pressure, high humidity, and excessive compressor run time shall be provided and connected to the network monitoring and control system.
- b. All installed antenna/transmission lines shall be purged, pressure tested, and tested for low VSWR using return loss measurements over the specified frequency band.

2.2.4.17 Microwave System Testing

- a. The microwave subsystem shall be tested both at the factory prior to shipment, and in the field upon completion of installation and alignment. The purpose of these tests is to verify that the subsystem meets the performance objectives and requirements specified herein and also meets the Contractor's proposed system and equipment specifications.
- b. All tests and results shall be documented and certified by the Contractor and signed off by City. Standard factory test procedures are acceptable so long as the City approves them in advance and they adequately represent the simulated field conditions. A detailed test plan including test procedures shall be submitted as part of the ATP (as described in this section of this RFP).

2.2.4.18 Microwave Factory or Staging Tests

- a. The microwave system shall be assembled in the factory or at a staging area so that all sites are interconnected by RF transmission lines and attenuators to simulate the exact system configuration and predicted RF net path losses. This shall include all RF racks, orderwire, remote alarm/control, and intermediate circuit multiplexers.
- b. The simulated system shall then be tested and results recorded for all pertinent unit, equipment, subsystem, rack, RF path, and end-to-end system parameters.
- c. Careful testing shall be performed to ensure that the RF path performance and end-to-end voice/data circuit performance requirements are measured and documented. The end-to-end performance tests shall specifically include BER tests at the levels of all circuits provided in normal and protected configurations.
- d. These factory or staging area tests shall become the baseline for tests and measurements performed after field installation, to allow item-by-item comparisons.
- e. The following are minimum tests and measurements required for the staging test plan:

System

- Latency measurement and demonstration
- Network node switching and recovery time for hard and soft failures
- Network node BER switch threshold

Radio Equipment

- Operating voltages
- TX modulator performance
- TX local oscillator frequency
- TX output power and frequency
- TX alarms and control
- RX local oscillator frequency
- RX signal level and frequency
- RX local oscillator frequency
- RX BER sensitivity
- RX attenuated fade margin
- RX alarms and control
- TX/RX automatic protection and switching
- Built-in metering

Routing / Switching Equipment

- Operating voltages
- Alarms and control
- Built-in metering
- Packet Loss
- Loop-back tests
- Automatic protection switching/routing

Orderwire (OW)

- Operating voltages
 - OW signaling
 - OW loudspeaker and handset checks
 - OW external telephone interface
- f. Representatives of the City shall be afforded the opportunity to witness the microwave factory staging tests. The Contractor shall notify the City of microwave factory staging tests at least 30 days prior to the scheduled test date. The Contractor shall provide the City a draft of the factory test plans and procedures at least 15 days prior to the beginning of staging. The City reserves the option to modify or request additional tests that demonstrate compliance with the equipment and/or system specifications.

2.2.4.21 Site Tests

- a. Upon completion of installation and final alignment, the Contractor shall perform and record data in accordance with the collection/reduction process agreed to in the ATP for the same type equipment tests as were made in the factory, so long as they are not exclusive factory type tests.
- b. All equipment and equipment components, both main and standby, shall be exercised during the course of the site tests.

2.2.4.22 Microwave Path Tests

- a. Microwave path tests shall include:
 - On-site transmitter power measurement.
 - Remote on-site nominal receive signal level (RSL) measurements.
 - The difference between the above two measurements is the net path loss (NPL). This NPL shall meet or exceed the calculated NPL within a field tolerance of 2 dB.
 - Receive fade margin tests will be conducted on each hop with variable attenuators at the transmit end of the hop. Receive threshold sensitivity shall be the RSL in dBm based on a BER of 1E-6 or initial packet loss.

2.2.4.23 Microwave System End-to-End Verification Tests

- a. End-to-end circuit verification tests shall be performed on each hop in the microwave system.
 - End-to-end BER test on primary direction or (A-side) Transmitter/Receiver unit (A1 radio) for a 12-hour period for each link in the system. BER shall not exceed the test objective of $N \times 1E-10$ one-way, where N = the number of microwave hops.
 - End-to-end Ethernet throughput rate verification tests
 - Switch to secondary direction or protection unit. End-to-end BER test on secondary radios for 12 hours. Test requirements will be finalized based on design configuration.
 - End-to-end orderwire tests

2.2.4.24 Maintenance Standards

- a. The BIDDER shall offer an optional maintenance contract for the system equipment in their Proposal. The maintenance contract shall take effect immediately following the expiration of the warranty period, and be renewable on a yearly basis. This system maintenance contract shall be based on the initial system configuration for equipment. The maintenance contract shall include preventive and demand maintenance for the infrastructure and the repair and/or replacement of defective units. Costs for successive annual renewable contract services to provide (in combination with the warranty) a total of three years of maintenance services shall be provided.
- b. The approach to maintenance of this system shall be preventive in nature.
- c. In addition to preventive maintenance, it is expected, following cutover to the City, that some system optimization and adjustment will be required. This work shall be coordinated through and with the City's Project Manager or other designated representative.
- d. Equipment shall be maintained in clean condition. Oil, dust and other foreign substances shall be removed on a routine basis.
- e. Equipment and system performance shall be maintained at the level initially described in these equipment and systems specifications. The service organization shall maintain records to confirm that this has been performed.

- f. Records shall be available for City's inspection upon request. Records shall be maintained by the BIDDER'S radio maintenance shop throughout the initial maintenance and warranty periods (and any subsequent maintenance contract period), and shall revert to the City upon termination of the warranty (or maintenance contract).
- g. Routine maintenance procedures recommended by the equipment manufacturer shall be followed.
- h. The BIDDER shall provide 24/7/365 network monitoring and technical support by only factory trained and authorized maintenance personnel and Network operations shall be San Diego based with the ability to provide on-site technical support within two (2) hours as required at no additional cost. The City will allow reasonable access to City locations for the purpose of installing, repairing and removing equipment.
- i. The BIDDER or authorized service organization(s) shall maintain comprehensive installation and instruction manuals for all system equipment. These manuals shall be the property of the City, and shall revert to the City at such time as they assume the maintenance responsibility for the system.

2.2.4.25 Parts / Spare Parts

- a. A sufficient supply of spare parts shall be readily available to allow immediate restoration of minimal operation of the Connectivity Network on a rolling repair and return basis. Other parts shall be available via emergency request and air freighted within twenty-four hours of the equipment failure.
- b. The BIDDER shall provide the cost of recommended critical spare parts in the Price Proposal. The BIDDER shall provide a detailed list of critical spare parts at the DDR.
- c. At the end of the warranty/maintenance period, the full complement of spares shall be delivered to the City in a new or fully repaired condition.
- d. The Connectivity Network Contractor shall supply the recommended types and numbers of spares deemed necessary by the Connectivity Network Contractor for all Contractor-provided equipment such as terminal nodes, multiplexors, routers, etc.

2.2.4.26 Network Management System

- a. The BIDDER shall provide an HP Openview network management system to monitor the Connectivity Network for catastrophic and non-catastrophic failures, status changes, and perform provisioning of nodes/terminals. The system shall be continuously and automatically monitored for failure of any key component. To this end, any failure of a key component shall be automatically indicated at the designated alarm monitoring points. The network management system shall provide provisioning access of all nodes, multiplexors, microwave terminals and fiber optic terminals from any site located within the network.
- b. The BIDDER will be responsible for building the initial HP Openview database and with assisting City personnel with interfacing the new information with the existing HP Openview network management system.

2.2.6 Leased Connectivity

2.2.6.1 Leased Connectivity System Requirements

- a. For those Water Department Sites that cannot be connected via microwave or via the OTN, the Connectivity Network Contractor shall make recommendations for alternative methods of connecting those sites, including the use of Leased Circuits.
- b. The CITY shall be responsible for engineering and coordination of leased circuit orders in the event they are needed.

2.2.7 Training

- a. The BIDDER shall provide training for the City's personnel in the operational, functional, administrative, and maintenance-related aspects of the communication system.
- b. The following types of training shall be provided. Each type of training shall be quoted as a separate line item:
 - System administration and support training
 - Maintenance training
- c. The BIDDER shall describe in detail the training programs to be offered in the Proposal.
- d. The BIDDER shall provide all materials, manuals, schematics, and other documentation required in the training.
- e. System Administration and Support Training is for engineers, administrators, and supervisors involved in system administration and control.
- f. The System Administration and Support Training are intended to provide a hands-on working knowledge of system administration, support equipment, and support functions. Included in this training are items such as, but not limited to, data base management, system programming, and system management functions.
- g. Maintenance training is for maintenance personnel and supervisors.
- h. The Maintenance Training is anticipated to be a combination of on-the-job training, on-site formal training, and factory training.
- i. Sufficient training to enable maintenance of the equipment and system to the LRU level (Line Replaceable Unit), or card level shall be offered.

3.0 TECHNICAL SPECIFICATIONS

The security equipment listed below is provided as a baseline for performance based purposes only. The BIDDER shall propose their own recommended solution understanding that the specific manufacturers and part numbers are subject to being equal to that shown below or approved equal.

3.1 Situation Management (Add/Alternate)

- a. The Situation Management System (SMS) shall provide the infrastructure and tools for the management of video surveillance systems, access control systems, intrusion detection systems, and audio control for the new sites only. The BIDDER will provide a breakdown of the specific Gateways, Licenses, supporting network and server hardware/software, and programming labor (using the pre-set templates provided with the base system software) to form a complete system. The SMS will be displayed at the SOC console. The BIDDER shall provide the NICE Situator solution or approved equal as an Add/Alternate cost.

3.2 SOC Upgrades (Add/Alternate)

- a. The SOC will require new operator consoles equipped for two operators, each equipped identically with storage drawers, task lighting, phone handset for pre-programmed numbers (police, etc.), power receptacle for cell phone charger and radio charger, 6-24 in. monitors (dual stack of 3), PTZ control unit, PC for system client security software (and latest Microsoft OS and Office Suite), optical mouse, keyboard, keyboard monitor switch, (to switch between Pelco System and new CCTV system), microphone/speaker for audio system, and heavy use 24/7 ergonomic chair. The console shall be Sit/Stand type console by Evans, Uptime, Wrightline or approved equal. This cost will be included as an Add/Alternate in the Bid Response.

3.3 DVMS

- a. The Digital Video Management System (DVMS) shall provide the infrastructure and tools for the management of video surveillance systems, including the recording, transmission, viewing, analytics and event management of video, audio and other data.
- b. The DVMS shall seamlessly support audio and video inputs from Digital Video Recorders (DVR), Networked Video Recorders (NVR) or both.
- c. The DVMS shall have a central database (AMS) for consistent configuration of site equipment and user data. The centralized management shall be available from remote locations over the network.
- d. The DVMS shall provide virtual matrix (VMX) features and capabilities allowing full switching and control of the DVMS inputs via a GUI and/or CCTV keyboard.
- e. The DVMS shall allow the user to select the streaming method to workstation running the DVMS application. The user shall have the ability to select RTP/UDP, TCP or multicast protocol.
- f. The DVMS shall be NiceVision or approved equal.

3.4 Cameras

3.4.1 IP cameras

- a. The Fixed Position Digital Day/Night Camera shall be Bosch NWD-495 series or approved equal. (See attached vendor spec. sheet).

- b. The PTZ Digital Day/Night Camera shall be Pelco Spectra IV or approved equal. (See attached vendor spec. sheet).
- c. The Thermal Camera shall be Axis Q1921E or approved equal. (See attached vendor spec sheet).

3.5 Video Management Capabilities

3.5.1 General Capabilities

- a. The DVMS application suite shall include applications for viewing and investigation of video, user policy setup, site setup and configurations, and an application for monitoring and providing alarms of failure or errors of any of the DVMS components.
- b. The DVMS real time application shall be NiceVision Control Center or approved equal. (See attached vendor spec. sheet).
- c. The DVMS Application Suite shall be capable of running on Windows XP Pro SP2 or Microsoft Vista SP1 Ultimate edition or Microsoft Vista SP1 Business edition Operating Systems.
- d. The DVMS Application Suite shall allow authorized users to monitor and playback video from cameras connected to the DVMS, on local workstation and/or external monitors (analog and digital).
- e. The DVMS Application Suite shall allow authorized users to monitor, record and playback audio from audio sources connected to the DVMS.
- f. The DVMS Application Suite shall allow authorized users to acknowledge/ reject/reset alarms.
- g. The DVMS Application Suite shall provide dual monitor support.
 - 1. Channels, Groups, Alarm, Tours, Salvos and Maps shall be displayed on monitor one
 - 2. Video layout pages shall be displayed on monitor two
- h. The DVMS Application Suite shall graphically display camera states on the hierarchical list, the states shown shall include indication of:
 - 1. Loss of the video signal
 - 2. Trigger activated
 - 3. User event activated
 - 4. Association with audio channel
 - 5. Recording status (recording or not recording)
 - 6. Content analytics application associated with the camera

- i. The DVMS Application Suite shall allow the user to monitor and playback video on a full screen or a camera layout page displaying 1, 4, 7, 8, 9, 10, 13, 16 or 25 cameras.
- j. The user shall have the ability to monitor and playback video on a full screen, or on a camera layout page displaying a map, and up to additional 6 cameras.
- k. The DVMS shall support digital zoom on the workstation or external monitors (analog or digital). The user shall be able to perform the zoom magnification up to 20 times.
 - 1. The zoom feature shall be available on monitor and playback modes.
 - 2. The zoom feature shall provide Digital PTZ functionality, allowing the user to Pan and Tilt within the zoomed image.
- l. The DVMS shall allow the user the ability to define a homepage to be displayed in the local workstation. The homepage shall include a specific layout of video panes and pre-selected cameras either in live or playback modes.
- m. The DVMS shall allow the viewing of a video in live and playback modes and of alarm information on PDA using Windows CE.
- n. The DVMS shall enable the user to select to switch to previously displayed views, where a view contains both the layout and the channels selected with that layout

3.5.2 Playback Functionality

- a. The DVMS shall allow the user to perform any of the following actions on played back video:
 - 1. Start and Stop, Pause and Resume, Fast Forward/Fast Reverse (this feature shall allow the user to playback up to 1024 times faster than the recorded speed), Frame by frame advance or rewind and Loop Replay.
- b. The DVMS shall provide the user a Jog shuttle video playback experience by providing a slide bar allowing the user to perform fast forward/fast reverse in a speed of up to 1024 times faster by dragging a slide bar. Upon releasing of the slide bar the video shall pause.
- c. Instant Reverse Playback.
 - 1. The user shall have the ability to change from a real time monitoring to a reverse playback. The user will indicate when to stop the reverse playback and start forward playback.
 - 2. The user shall have the ability to resume real time monitoring at any time.
- d. Synchronized Playback – The DVMS shall allow the user to play up to 16 synchronized video channels or up to three video channels and one audio channel synchronized.

3.5.3 Web Browser Viewing

- a. The DVMS shall enable using a browser (i.e. Microsoft Internet Explorer) over a VPN connection.
- b. The DVMS Web interface shall allow authorized users to monitor, record, and play back video and audio from input channels.
- c. The DVMS Web interface will support viewing at layouts which are Single screen, 2x2 screen, and Full screen.
- d. The DVMS shall enable distribution and maintenance of updates by the web server so.
- e. clients will be able to install the applications and receive updates automatically from the web server.

3.5.4 Level of Service (LoS)

- a. The DVMS will implement a LoS mechanism to accommodate communication between the remote sites and the Head End.
- b. The DVMS shall provide LoS support in MJPEG monitoring by using frame dilution. Therefore, whenever the LoS mechanism is turned on, it will drop MJPEG frames until the desired performance is reached.
- c. The DVMS shall provide LoS support in MPEG4 for monitoring, for dual coding devices. Therefore, whenever the LoS mechanism is turned on, it will switch to the most appropriate stream from the IP edge device in accordance with the workstations/decoder performance.
- d. The viewing application shall provide the capability to manage CPU resources and bandwidth utilization on the user's network. The following options shall be independently configured for each workstation:
 1. Best Available – Provides the user with the highest resolution, bit-rate and frame-rate possible based on the available network bandwidth.
 2. Pre-defined Bandwidth Limits – Provides the user with pre-defined bandwidth limits from 28.8 Kbps to 4 Mbps.
 3. User-defined Bandwidth Limits – Allows the user to manually set the maximum bandwidth the Control Application can use between 28.8Kbps to 4Mbps.
- e. The DVMS shall enable the restriction of certain users from using the system. This will allow compensating for performance at times the network is overloaded.
 1. User restriction shall be available manually upon a user selection.
 2. User restriction shall be available automatically upon an alarm.
 3. User restriction shall be available automatically upon TTL.

- f. Upon user restriction all the viewing application of non-authorized users shall be closed automatically.
- g. The restriction may be set to a predefined time or until manual clear shall be done by the restricting user.
- h. Authorized user shall be able to cancel the user restriction and resume a normal operation mode.

3.5.5 PTZ Control

- a. The viewing application workstation shall provide support for PTZ Keyboards to allow authorized users to control PTZ cameras. **Provide a quantity of two PTZ Control units.**
- b. PTZ Presets:
 - 1. The viewing application shall allow authorized users to create new PTZ presets.
 - 2. The viewing application shall allow authorized users to call up PTZ presets (via GUI and/or CCTV keyboard).
 - 3. The DVMS shall allow authorized users to predefine a home-preset to each camera and a predefined timeout after which a PTZ camera, if was not handled by any user, will return to the home preset.
- c. PTZ Priorities:
 - 1. Each user shall be assigned a priority for controlling PTZ cameras.
 - 2. 1000 PTZ priorities shall be available in the DVMS.
 - 3. Users with a higher priority shall have precedence over lower priority users.
 - 4. Lower priority users shall receive a pop-up message notifying them that a higher priority user has taken control over the PTZ camera.
- d. Users shall be able to lock PTZ camera and thus prevent lower priority users to gain control of the camera. Lock operation shall be available via GUI and/or CCTV keyboard.
- e. PTZ lock operation shall have a predefined timeout for an automatic lock release. The timeout parameter shall be programmable by the system administrator.

3.5.6 Digital Presets

- a. The DVMS shall allow the user to save and call digital presets on any camera, fixed or a PTZ one.

3.5.7 Maps

- a. The DVMS shall allow the user to open a layout that includes a map as well as several other video windows.

- b. The DVMS shall allow the user to click on a Home Map icon and switch immediately to a Home Map page.
- c. The DVMS shall display a list of maps allowing easy navigation through all available maps.
- d. The DVMS shall allow the user to click on an Interest Zone and drill down to additional linked maps. As an alternative the user can select the linked maps from a drop-down list.
- e. The DVMS shall allow the user to zoom into the map and also to select a “fit to screen” option which will stretch the current map onto the available map space on the current layout.
- f. The DVMS shall allow the user to “drag & drop” a camera from the map area to a video window or to right-click on a camera to start viewing it.
- g. The DVMS shall provide the user with an alarm information, when a camera is "Triggered" the user will see the alarm on the map.
- h. The map formats supported will be: BMP, GIF, JPG and WMF.
- i. The DVMS shall allow the user to place the following components on maps: cameras (including indication of their angle), audio channels, triggers, linked map and pages.
- j. The DVMS shall enable an automatic pop-up of a map upon events.

3.5.8 Tours

- a. The DVMS viewing application shall support a Tour feature; this allows the user to monitor several video input channels, analog or digital, in a single window in a cyclic succession.
- b. The user shall have the ability to configure from one to 16 windows in which to display a sequence of touring cameras.
- c. The DVMS viewing application shall have a tab containing all preconfigured-tours.
- d. The user shall have the ability to select a dwell time to each camera/each preset.
- e. The user shall have the ability to set a preset to each PTZ camera in the tour.
- f. The user shall have the ability to progress to the Next camera in the tour or go to Previous camera in the tour, regardless of the predefined dwell time.
- g. The user shall be able to pause the tour and afterwards resume it.
- h. The user shall be able to view On Screen Display (OSD) indicating TOUR is running.
- i. The user shall have the ability to call up a tour to a local or an external monitor (analog or digital) via GUI and/or CCTV keyboard.

3.5.9 Salvos

- a. The viewing application shall support a Salvo feature; this allows the user to call up multiple cameras and/or tours to be display on contiguous external monitors and/or contiguous video windows within the viewing application.
- b. The viewing application shall have a tab containing all pre-configured salvos.
- c. The user shall have the ability to select for Salvos cameras, tours or combination of the both.
- d. The user shall have the ability to select a loop mode to each camera which is set to a playback mode in a Salvo.
- e. The user shall have the ability to set a preset to each PTZ camera in the salvo.
- f. The user shall have the ability to call up a Salvo to local or external monitors (analog or digital) via GUI and/or CCTV keyboard.

3.5.10 Pages

- a. The DVMS shall support a Page feature; this allows the user to save any of the available video layouts while assigning specific cameras to each video tile in the layout. The user can later, from the viewing application, call up the page manually or upon alarm.
- b. Tour of pages – the viewing application shall allow the user to group several pages into one group, and run a tour of all the pages in the group according to a predefined dwell time.

3.5.11 External Monitors / Video Wall Management

- a. Authorized users shall have the ability to call up cameras/tours/salvos on external monitors, analog or digital, connected to the DVMS decoders.
 1. An authorized user shall have the ability to drag a camera/tour/salvo to a monitor using the GUI.
 2. An authorized user shall have the ability to call up camera/tour/salvo on external monitors using CCTV keyboard (each camera/ tour/ salvo shall be assigned with a shortcut for this purpose).
 3. An authorized user shall have the ability to double-click a camera/tour/ salvo in order to display it on an external monitor.
- b. An authorized user shall have the ability to play back video on external monitors.
 1. The following operations shall be available for played back video: Start, Stop, Pause, Fast forward/reverse (up to 1024 times faster than the recorded speed), Slow forward/reverses (x1/2, x1/4, 1/8 times slower than the recorded speed), Frame by frame, Play from Time (last 30 sec, 1 min, 5 min, 10 min or user defined).

- c. The viewing application shall enable authorized users to switch to an external monitor view mode.
 - 1. The DVMS shall enable the user to select a specific control room to be displayed in the external monitor view mode.
 - 2. The DVMS shall enable the user to select a specific monitor layout GUI representing the actual monitor layout.
 - 3. The DVMS shall display only monitors the user is authorized to view and manage.
- d. The DVMS shall enable the user to assign a shortcut to each external monitor.
 - 1. The user shall have the ability to select a monitor by selecting its shortcut from the GUI and/or CCTV keyboard.
- e. The DVMS shall enable the user to assign a shortcut to different display entities like cameras, tours and salvos, so that the user can call up any of these entities on any monitor (local/remote, analog/digital) via the GUI and/or the keyboard.
- f. The DVMS shall enable the user to select a certain video entry in a split screen mode, via the GUI and/or CCTV keyboard. The user can then call up a live or playback camera on that entry perform digital zoom and start a tour or a salvo.
- g. The DVMS shall enable the user to ARM or DISARM external monitors for an alarm-pop up display.

3.5.12 Alarm Management

- a. The DVMS shall support management of alarms based on VMD, Content Analytics Application, 3rd party input via API and TTL.
- b. Alarm Queue.
 - 1. The DVMS shall list all alarms the user is authorized to view.
 - 2. The user shall have the ability to sort the alarm queue according to the alarm type, priority or status (active/inactive).
 - 3. Each alarm shall have an icon indicating its type (security alarm vs. maintenance alarms) and status (active/inactive).
 - 4. Each alarm shall have the capability to be assigned to individual users or to user groups (profiles).
 - 5. The user shall have the ability to filter the type of alarm displayed in the alarm list (according to the alarm type and/or severity.)
 - 6. The user shall have the ability to set the minimum priority for an alarm they want to be displayed in the alarm list (only for the alarms the user is authorized to view).
- c. Alarm Notification.

1. The DVMS shall support the following methods of notifying users that a video alarm has occurred:
 - (a) Display the alarm in the main alarm list, along with a non-maintenance alarm security.
 - (b) A pop-up window for the notification of an alarm occurrence.
 - (c) Alarm video pop-up on local or external monitors.
 - (d) Email (supports email distribution lists).
 - (e) API – Notifies a third party security system that a video alarm has occurred.
 - (f) TTL/Relay – Activates a TTL/Relay to drive an external alarm device.
 2. The DVMS shall support the following methods of notifying users that a maintenance alarm has occurred.
 - (a) Display the alarm in the main alarm list, along with a non-maintenance alarm security.
 - (b) A pop-up window for the notification of a maintenance alarm occurrence.
 - (c) Display the alarm in a dedicated application monitoring all DVMS components.
 - (d) Email – Supports email distribution lists.
 - (e) SNMP.
- d. Alarm Display on Local Workstation (Pages).
1. The user shall have the ability to associate each video alarm with a pre-defined alarm page which contains a video pane layout and pre-configured cameras in live or playback mode.
 2. The user shall have the ability to configure a different alarm page for each alarm in the system.
 3. The user shall have the ability to monitor and playback up to 16 cameras per an alarm page.
 4. If an alarm has not been associated with an alarm page, the default alarm page will be displayed.
 5. The user shall have the ability to arm the workstation to enable the automatic display of an alarm page on the workstation.
 6. The user shall have the ability to view any alarm video by selecting it from the list (the alarm page will then be displayed).
 7. The workstation shall have two arming modes:

- (a) Mode 1: The workstation remains engaged regardless the display of alarm pages.
 - (b) Mode 2: The workstation disengages after the display of an alarm page. The user shall have the ability to manually re-arm the workstation again.
- e. Alarm Display on Virtual Matrix (Alarm Pop-Up).
 - 1. The user shall be able to associate alarms with a pre-defined salvo to be automatically displayed on one or more external monitors upon an alarm.
 - 2. The user shall be able to choose to ARM the virtual matrix to display the automatic salvo.
 - 3. The user shall be able to choose to DISARM the virtual matrix, hence automatic salvos, even if associated with an alarm, shall not be displayed.
- f. Alarm Macro.
 - 1. The user shall have the ability to define macros to be automatically executed upon alarm
 - 2. Alarm macros may contain the following actions: Reset API alarm, Restrict users, Cancel user restrictions, Play Salvo, Play Tour, Shutdown recorders, Enable/Disable services, Activate / Deactivate output signal
- g. Alarm Workflow.
 - 1. The user shall have the ability to define a workflow for each alarm.
 - (a) The user shall have the ability to define a To-Do List instructing the operator what actions to take when an alarm occurs.
 - (b) The user shall have the ability to check off each instruction as it is completed.
 - 2. The user shall have the ability to acknowledge, reject or reset each alarm – after the alarm has been acknowledged all authorized users shall see the alarm status change on their respective workstations.
 - 3. The system administrator shall have the ability to audit user alarm actions (acknowledge /reject/reset).
 - 4. The user shall have the option to clear an alarm from an alarm list
 - 5. The user shall have the option to clear all handled alarms from the alarm list.
 - 6. All alarm actions (acknowledge/reject/reset/) shall be available via GUI and/or CCTV keyboard.
- h. Alarm Escalation
 - 1. The user shall have the ability to define escalation profiles.

2. Alarm which was not handled by its originally assigned user will be escalated to other user profiles after predefined time.
- i. PTZ Alarm Presets.
 1. The user shall have the ability to define a set of presets for each PTZ camera.
 2. Each of these presets may be associated with an alarm.
 3. Upon an alarm the associated PTZ camera(s) will automatically move to the specified preset.
 - j. One-click-alarm-reconstruction.
 1. The user shall have the option to reconstruct an alarm display on a workstation by a single click on the alarm list.
 2. The user shall have the ability to reconstruct an alarm display on external monitors (virtual matrix) by a single click on the alarm list.
 - k. Smart Alarms.
 1. The user shall have the capability to associate a logic condition for each alarm.
 2. The user shall have the capability to define Boolean expressions using triggers from any recorder in the system.
 3. The associated alarm will not trigger until all conditions of the Boolean expression are met.

3.5.13 Video Investigation and Event Query

- a. The DVMS shall provide a user with a search tool that enables authorized users to quickly locate video and audio events regardless of the location of the recording channel.
- b. The Query results shall be presented in a simple database view.
- c. The Query function shall allow the user to lock a video event. Locked events shall have a graphical representation indicating the event is locked.
- d. The Query function shall enable the user to playback video events directly from the query results list.
- e. The Query function shall allow the user to transfer events to the Central Storage Server (CSS).
- f. The Query function shall include an offline VMD. This feature shall allow the user to search for previously recorded video, by file or channel. Specifying areas of interest in the video and searching for motion in the selected area, or specifying directional from/to areas in the video, and searching for motion moving in the specified direction. The results are displayed via thumbnails using the first frame in the video segment. The search can be defined by date and time, or last minute(s), hour(s) or day(s).

- g. Graphical timeline. The user shall be able to request a graphical timeline for displaying query results.

3.5.14 Audit

- a. The DVMS shall provide a detailed Audit Reports.
- b. The user shall have the capability to generate, view, print and export the following reports: Login Report, Logout Report, Login Failure Report, Export Data Report, Channel Event Report, Recorder Event Report, Output Signal Event Report, Trigger Event Report, Output Signal Event Report, Trigger Event Report, PTZ Event Report, Camera Selection Report, Salvo Report and Tour Report.

3.6 Video Content Analytics

3.6.1 Overview

- a. The proposed system shall be ready to implement video content analytics once the City will decide to deploy such a system.
- b. The video content analysis sub-system of the DVMS is intended to apply automatic, persistent artificial intelligence to video signals in an effort to improve the efficiency of operators by directing them immediately to events that need attention and provide them an easy way to make a determination on the appropriate action.

3.6.2 Detection applications

- a. The DVMS shall allow detection of incidents using video content analytics. The four main applications shall be:
 - 1. Intruder Detection
 - 2. Vehicle Detection
 - 3. Unattended Baggage
 - 4. People Counting
- b. The DVMS shall provide capability to alert upon an intruder entering a restricted area or moving from one defined area to a second defined area.
- c. The DVMS shall be able to detect if a vehicle remains in a specific area for more than a predetermined period of time.
- d. The DVMS shall be able to detect if a person or object moves in an unauthorized direction through a given area, even when a large number of people or objects are also moving in the same area in an authorized direction.
- e. The DVMS shall detect crowding in a specific zone and will generate an alert upon detection of a crowd larger than the threshold set for the system.

- f. The DVMS shall detect unattended baggage in a specific zone and will generate an alert upon detection of an object which meets the characteristics set for the system (object size, time left unattended, etc.)
- g. The DVMS shall be able to alert upon a queue of people extending beyond a designated length.
- h. The DVMS shall be able to count people entering or exiting a specific area with output of the count as an on-screen display and over configurable time periods in a reporting application.

3.6.3 Video Content Analysis Performance

- a. The DVMS shall highlight in the video display window objects that are being tracked and alarmed.
 - 1. Objects that are alarming shall be a different color from objects that are not under alarm.
 - 2. The oldest alarming object shall be displayed in a different color from all subsequent alarms in the same view.
 - 3. Alarm objects that have been acknowledged shall be displayed differently from those that have not been acknowledged.
 - 4. The user shall have the option of turning off the highlights for either unalarmed objects or all objects.
- b. The DVMS views shall apply seamlessly to either indoor or outdoor scenes.
 - 1. In outdoor scenes, the system shall dynamically and automatically adapt to changing environments without user intervention. This includes reacting to lighting changes caused by day, night, cloud cover, and video stationary motion created by events such as blowing leaves or waves.
 - 2. In outdoor scenes, the system shall provide filters to compensate for snow and clouds.
 - 3. The system shall provide software stabilization to compensate for shaking cameras.

3.6.4 Scenario Reconstruction

- a. The DVMS shall provide the capability to reconstruct a scenario once an event has been detected.
- b. Specifically, the DVMS shall provide the ability for the user to select an alarm from the active video and through a single click start playback at the time in the video at which the alerting object was first detected. No other search operations are required to achieve the above.

3.6.5 Edge and Server Analytics

- a. The DVMS shall perform analytics on a video smart encoder for analog cameras. The smart encoder shall be NICE NVE1002CA or approved equal. (See attached vendor spec. sheet).
- b. The DVMS shall perform analytics on a Smart NVR for IP cameras. The Smart NVR shall be NICE Smart NVR 9200 or approved equal. (See attached vendor spec. sheet).

3.7 Application Management Server (AMS)

- a. The DVMS shall utilize a middle tier server for data consistency and integrity, time synchronization of all the DVMS components and optimal network utilization (by smart routing managed by the middle tier). It shall be NiceVision AMS or approved equal.
- b. The AMS shall run SQL Server 2005 Standard Edition
- c. The AMS shall provide time synchronization for all NVRs
- d. The AMS shall be deployed at each physical site/station to allow autonomous operation of the station even if the communication to the Head-End is interrupted.

3.8 Maintenance Alarms

- a. A special technical supervisory application shall be available to the system technical supervisor, providing him with indications on the system's components viability.
 1. Each of the supervised units shall be listed with the following:
 - (a) Indication that the supervised unit is working properly.
 - (b) Number of alarms.
 - (c) Date and time of latest alarm.
 2. When one of the DVMS elements fails, a pop-up alarm shall appear as the top window on the DVMS Supervisor's workstation with a PC speaker alarm tone. A recommend response shall be displayed to the user. Authorized user shall also have the ability to select and display a Maintenance alarm on the main viewing application.
- b. The DVMS supervisory application shall have the capability to receive Built-In-Test (BIT) reports from the different DVMS components, including video validation alarms.
- c. Maintenance alarms may initiate the transmission email and/or SNMP Trap.

3.9 Resiliency

3.9.1 Monitoring/ Playback and Recording Continuous Operations

- a. In case of AMS failure the existing monitor and playback operations shall continue without an interruption.

- b. In case of network disconnection between the workstation or decoder and the recording devices, the workstation or decoder shall continue requesting the monitored stream until the network is recovered.
- c. In case of AMS failure the recording of the channels on the NVR shall continue without an interruption.

3.9.2 Redundant Application Management Server (AMS)

- a. The DVMS shall support an active-standby configuration of the AMS.
- b. The DVMS shall include two separate application servers, in active (Master) – standby (Slave) configuration.
 - 1. In case of failure in the Master application server, the Slave application server shall take over all the existing functionalities.
 - 2. Failover time shall not exceed 5 minutes.
 - 3. Failover shall be fully automatic and without user intervention.
- c. Maintenance notifications and alerts:
 - 1. The DVMS shall display an alert message with the relevant failure details
 - 2. Upon recovery (once the Master server has been repaired) the DVMS shall provide a notification with the relevant details

3.10 Security

3.10.1 Data Accessibility

- a. The DVMS shall enable the system administrator to define user profiles with different user security access privileges.
- b. Each user group shall be able to have access privileges to specific video or audio resources and to specific system operations, such as video monitoring, playback and channel setup.
- c. To ensure secured access to the DVMS System, the DVMS user management application shall be used by the DVMS System Administrator to centrally set-up and maintain user profiles. A user may be associated with multiple user profiles.
- d. The DVMS shall allow the following user management settings:
 - 1. User creation
 - 2. User import from Microsoft Active Directory
 - (a) The system administrator shall be able to import existing users from an Active Directory repository and assign to them profiles.
 - (b) The authentication of an imported user shall be done against Active Directory.

- (c) The DVMS shall support Windows Active Directory integration, to enable authenticating users against the Active Directory central user repository.

3. User Profiles

- (a) A profile shall be used as a privileges template. Unlimited number of profiled may be created.
- (b) A user may be assigned with one or more profile(s).

3.11 Video & Audio Streaming and Recording

3.11.1 Overview

- a. Video and audio shall be recorded on NVRs.
- b. To prevent overload of the network, all NVRs shall record locally at each physical site and stream video to the center upon demand.
- c. The Network Video Recording System (NVR) shall be used to record IP video from video encoders or IP cameras. The NVR shall be NiceVision NVR 9200 or approved equal.
- d. The NVR shall be capable of supporting Mega-Pixel cameras: 1.3MP, 2MP, 3MP and 5MP.
- e. The NVR and DVR shall be based upon a fully modular architecture, which allows for upgrades for additional recording capacity in the future.
- f. The system shall simultaneously display live, playback and record video while continuously recording onto the system's Hard-Drive(s) and archiving to remote storage server.
- g. The NVR shall support Real Time Streaming Protocol (RTSP) signaling to communicate with edge devices that support RTSP protocol.
- h. The NVR shall support HTTP/TCP signaling to communicate with edge devices that support HTTP protocol.

3.11.2 Networking Capabilities

- a. The NVR shall support 2 separate network interface cards (NICs).
- b. The NVR shall include support for the following network segments:
 - 1. Video collection network – the network in which video is collected, encoded and transported over an IP enabled network to the NVR.
 - 2. Video viewing network – the network in which video is transmitted across an IP enabled network, to remote or local decoding devices, which display it on analog or digital displays.
- c. Network segment assignment options:

1. The NVR shall be able to define different network segment assignments for each of the NICs.
2. The NVR shall be able to define different network segment assignments on the same NIC.

3.11.3 Video Stream Monitoring

- a. The DVMS shall support video streaming from the NVR or directly from the encoding devices.
- b. When streaming directly from the edge devices the workstation will receive a multicast stream directly from the encoding device for monitoring purposes. The NVR will register to the same multicast group for recording.
- c. The DVMS shall support multicast at SSM mode (source specific multicast).
- d. The DVMS shall support the following monitoring protocols:
- e. RTP/TCP – unicast support only.
- f. RTP/UDP – unicast and multicast support.

3.11.4 Video Stream Playback

- a. The DVMS shall support the RTP/TCP protocol (unicast support only) for playback purposes.

3.11.5 Automatic Streaming

- a. The DVMS shall be able to provide a multicast stream for remote 3rd party decoding devices (e.g. BARCO) over an IP network.
- b. The DVMS shall be able to configure different multicast addresses per recording channels.

3.12 Access Control

Migrate the existing Water Department and Waste Water Department systems onto the new ACS platform.

3.12.1 ACS System Upgrades (Add/Alternate)

- a. The access control software shall be Software House C-Cure 800/8000 or approved equivalent. Provide manufacturer recommended server and suitable UPS in existing SOC network cabinets. System shall be C-Cure 800/8000 or approved equal.
- b. Provide new badging software for minimum 1,500 users. This includes server for software and image retainage. System database must be backed up minimum every 30 days to City owned server. Software shall be C-Cure ID Badging software or approved equivalent.
- c. Badge design to be coordinated with City to include color background, employee name and photo.

- d. Badge printer shall be FargoDTC400E or approved equal.
- e. Badge cards shall be employ SmartCard technology providing proximity reader capability with future application of biometrics storage on board card. Provide 1,000 cards as part of this procurement.

3.12.2 Control Panel

- a. The access control panel shall be Software House iStar rack mount controllers or approved equal.

3.12.3 Card Reader

- a. The card reader shall be a dual technology capable HID Reader, or approved equal.

3.12.4 Magnetic Locks

- a. The magnetic door lock shall be Dortronic Systems Inc. 1600 Magnetic Lock or approved equal.

3.12.5 Indicator Lights

- a. The security system on/off indicator lights shall be Dortronics 7201 Series Hi Intensity LED's or approved equal. (See attached vendor spec. sheets).

3.13 UPS

- a. The digital Uninterrupted Power Supply (UPS) shall be provided for all system components, 4 hour minimum, and be Tripp-lite SU1000RTXL2UA, or approved equal.

3.14 Motion Detector

3.14.1 Interior Motion Detector

- a. The interior motion detector shall be Bosch DS860 or approved equal. (See attached vendor spec. sheets).

3.14.2 Request-to-Exit Detector

- a. The request-to-exit detector shall be Bosch DS150i series or approved equal. (See attached vendor spec. sheets).

3.15 Door / Hatch Contacts

- a. The door / hatch contacts shall be GE-Sentrol 2500 Series or approved equal. (See attached vendor spec. sheets).

3.16 Camera Pole and Foundation

- a. Camera Pole and Foundation shall be Valmont DS330 Pole or equal. (See attached vendor spec. sheets). For estimating purposes, plan for a pole height of 25 feet.

3.17 Perimeter Fencing

- a. The perimeter fencing shall be a minimum of 8 foot high chain link, galvanized and black vinyl coated with 3-strand barbed wire per San Diego Regional Standard Drawings SDM-112, SDM-114, and M-20.

3.18 Audio System

- a. The audio system to be provided to select sites will be the Valcom VIP-801TS Networked Page Zone Extender or approved equal.
- b. Speaker Horns will be Valcom VIP 480L IP speakers or approved equal.

4.0 Quantities

The following preliminary quantities and descriptions for each location are being provided to the Design-Builder to establish the minimum work required at each location. Quantities may vary at no cost increase to the City.

65th and Herrick Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	3	EA
Wireless "Spur" Type Radio	3	EA
Exterior Motion Sensor	4	EA
Exterior IR Illuminator	4	EA
Request to Exit Sensor		EA
Gate - Card Reader/Mounting Post	1	EA
Gate - Magnetic Lock	1	EA
IP Speakerhorn	2	EA
Ornamental Wrought Iron Fencing	35	LF
Electrical/Data Conduit/Wiring	50	FT
Electrical/Data Conduit/Wiring,Trenching	25	FT
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA
Demolish Costs for Site (Includes Removal)	1	LS

Bayview Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	2	EA
Wireless "Spur" Type Radio	2	EA
Electrical/Data Conduit/Wiring,Trenching	25	FT
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA

Bayview Reservoir		
Description	Quantity	Unit
Thermal CCTV Outdoor Camera	6	EA
Security Mounting Pole (25')	4	EA
Security Mounting Pole Foundation	4	EA
Electrical/Data Conduit/Wiring,Trenching	1500	FT
Grounding Kits	1	EA

Bernardo Heights Pump Station		
Description	Quantity	Unit
Door Magenetic Lock	1	EA
Card Reader - Door/Hatch	1	EA
Miscellaneous Other Site Improvements	1	LS

Black Moutain Pump Station (Lower)		
Description	Quantity	Unit
IP Speakerhorn	1	EA
Miscellaneous Other Site Improvements	1	LS

Black Moutain Reservoir		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	1	EA
Wireless "Spur" Type Radio	1	EA
Thermal CCTV Outdoor Camera	4	EA
Security Mounting Pole (25')	4	EA
Security Mounting Pole Foundation	4	EA
IP Speakerhorn	4	EA
Electrical/Data Conduit/Wiring,Trenching	1600	FT
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA
Miscellaneous Other Site Improvements	1	LS

Cabrillo Palisades Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	2	EA
Wireless "Spur" Type Radio	1	EA
Wireless "Backbone" Outdoor Type Radio	1	EA
Access Control Panel	1	EA
Door/Hatch Contacts	1	EA
Door Magenetic Lock	1	EA
Card Reader - Door/Hatch	1	EA
Interior Motion Detector	1	EA
Request to Exit Sensor	1	EA
Gate - Card Reader/Mounting Post	1	EA
Outdoor Security Cabinet (NEMA-4)	1	EA
Fixed CCTV Day/Night Outdoor Camera	4	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Security Mounting Pole (25')	4	EA
Security Mounting Pole Foundation	4	EA

IP Speakerhorn	1	EA
Digital Video Recorder with UPS	1	EA
8 ft Mesh Fence with 18" Outrigger/Barbed Wire	500	FT
Vehicle Gates (Dual Swing) with Gate Opener/Loops	1	EA
Electrical/Data Conduit/Wiring	25	FT
Electrical/Data Conduit/Wiring,Trenching	200	FT
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA
Demolition Costs for Site (Includes Removal)	1	LS
Miscellaneous Other Site Improvements	1	LS

Carmel Mountain High Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	1	EA
Wireless "Spur" Type Radio	1	EA
Exterior Motion Sensor	1	EA
Exterior IR Illuminator	1	EA
Fixed CCTV Day/Night Outdoor Camera	1	EA
Electrical/Data Conduit/Wiring,Trenching	25	FT
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA

Carmel Mountain High Reservoir		
Description	Quantity	Unit
Backbone Indoor Microwave System Antenna	1	EA
Wireless Antenna (Outdoor)	2	EA
Wireless "Spur" Type Radio	1	EA
Wireless "Backbone" Indoor Type Radio	1	EA
Wireless "Backbone" Outdoor Type Radio	1	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
IP Speakerhorn	1	EA
Electrical/Data Conduit/Wiring,Trenching	25	FT
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA

Carmel Mountain Industrial Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	1	EA
Wireless "Spur" Type Radio	1	EA

Door/Hatch Contacts	1	EA
Door Magenetic Lock	1	EA
Card Reader - Door/Hatch	1	EA
Fixed CCTV Day/Night Outdoor Camera	1	EA
IP Speakerhorn	1	EA
Digital Video Recorder with UPS	1	EA
Electrical/Data Conduit/Wiring	25	FT
Electrical/Data Conduit/Wiring,Trenching	25	FT
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA
Miscellaneous Other Site Improvements	1	LS

Carmel Mountain Mall Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	2	EA
Wireless "Spur" Type Radio	2	EA
Fixed CCTV Day/Night Outdoor Camera	2	EA
Security Mounting Pole (25')	1	EA
Security Mounting Pole Foundation	1	EA
IP Speakerhorn	1	EA
Electrical/Data Conduit/Wiring,Trenching	50	FT
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA
Miscellaneous Other Site Improvements	1	LS

Catalina Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	2	EA
Wireless "Spur" Type Radio	2	EA
Electrical/Data Conduit/Wiring,Trenching	25	FT
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA

Security Operations Center (SOC)		
Description	Quantity	Unit
Backbone Indoor Microwave System Antenna	2	EA
Wireless Antenna (Outdoor)	4	EA
Wireless "Spur" Type Radio	4	EA
Wireless "Backbone" Indoor Type Radio	2	EA

8 ft Mesh Fence with 18" Outrigger/Barbed Wire	2000	FT
Vehicle Gates (Dual Swing) with Gate Opener/Loops	1	EA
Electrical/Data Conduit/Wiring,Trenching	200	FT
Grounding Kits	1	EA
Demolition Costs for Site (Includes Removal)	1	LS
Miscellaneous Other Site Improvements	1	LS
Video Management System - SOC (Server, Software, & Controller)	2	LS
Operator Workstation w/VMS Client Software	2	LS
IP Networked Page Zone Extender	1	LS
Situation Management Platform/Gateways/Licences	1	LS

Chollas Heights Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	2	EA
Wireless "Spur" Type Radio	2	EA
Access Control Panel	1	EA
Door/Hatch Contacts	1	EA
Door Magenetic Lock	1	EA
Card Reader - Door/Hatch	1	EA
Interior Motion Detector	1	EA
Request to Exit Sensor	1	EA
Gate - Card Reader/Mounting Post	1	EA
Indoor Security Cabinet (Swing Gate)	1	EA
Fixed CCTV Day/Night Outdoor Camera	1	EA
PTZ CCTV Day/Night Outdoor Camera	4	EA
Security Mounting Pole (25')	4	EA
Security Mounting Pole Foundation	4	EA
Digital Video Recorder with UPS	1	EA
8 ft Mesh Fence with 18" Outrigger/Barbed Wire	120	FT
Vehicle Gates (Dual Swing) with Gate Opener/Loops	1	EA
Electrical/Data Conduit/Wiring	50	FT
Electrical/Data Conduit/Wiring,Trenching	100	FT
Grounding Kits	2	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA
Demolition Costs for Site (Includes Removal)	1	LS

Cielo and Woodman Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	2	EA
Wireless "Spur" Type Radio	2	EA
Access Control Panel	1	EA
Door/Hatch Contacts	1	EA
Card Reader - Door/Hatch	1	EA
LED Indicator - Inside Hatch (Connects to reader)	1	EA
Interior Motion Detector	1	EA
Gate - Card Reader/Mounting Post	1	EA
Outdoor Security Cabinet (NEMA-4)	1	EA
Fixed CCTV Day/Night Outdoor Camera	4	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Security Mounting Pole (25')	4	EA
Security Mounting Pole Foundation	4	EA
IP Speakerhorn	1	EA
Digital Video Recorder with UPS	1	EA
8 ft Mesh Fence with 18" Outrigger/Barbed Wire	560	FT
Vehicle Gates (Dual Swing) with Gate Opener/Loops	2	EA
Electrical/Data Conduit/Wiring	100	FT
Electrical/Data Conduit/Wiring,Trenching	500	FT
Grounding Kits	2	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA
Miscellaneous Other Site Improvements	1	LS

Climax Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	1	EA
Wireless "Spur" Type Radio	1	EA
Access Control Panel	1	EA
Door/Hatch Contacts	2	EA
Card Reader - Door/Hatch	1	EA
LED Indicator - Inside Hatch (Connects to reader)	1	EA
Interior Motion Detector	1	EA
Outdoor Security Cabinet (NEMA-4)	1	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Security Mounting Pole (25')	1	EA
Security Mounting Pole Foundation	1	EA
Digital Video Recorder with UPS	1	EA
Electrical/Data Conduit/Wiring	50	FT

Electrical/Data Conduit/Wiring, Trenching	50	FT
Grounding Kits	2	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA
Deerfield Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	1	EA
Wireless "Spur" Type Radio	1	EA
Door/Hatch Contacts	1	EA
Door Magentic Lock	1	EA
Card Reader - Door/Hatch	1	EA
Exterior Motion Sensor	4	EA
Exterior IR Illuminator	4	EA
Request to Exit Sensor	1	EA
Gate - Card Reader/Mounting Post	1	EA
Gate - Magnetic Lock	1	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
IP Speakerhorn	1	EA
Electrical/Data Conduit/Wiring	100	FT
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA
Miscellaneous Other Site Improvements	1	LS
Del Cerro Highland Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	2	EA
Wireless "Spur" Type Radio	2	EA
Access Control Panel	1	EA
Door/Hatch Contacts	1	EA
Card Reader - Door/Hatch	1	EA
LED Indicator - Inside Hatch (Connects to reader)	1	EA
Interior Motion Detector	2	EA
Indoor Security Cabinet (Swing Gate)	1	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Security Mounting Pole (25')	1	EA
Security Mounting Pole Foundation	1	EA
Digital Video Recorder with UPS	1	EA
Electrical/Data Conduit/Wiring	100	FT
Electrical/Data Conduit/Wiring, Trenching	50	FT
Grounding Kits	2	EA
Network Switch (Includes cabling/jumpers)	1	EA

Network Router (Includes cabling/jumpers)	1	EA
Del Cerro Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	2	EA
Wireless "Spur" Type Radio	2	EA
Door/Hatch Contacts	1	EA
Door Magnetic Lock	1	EA
Card Reader - Door/Hatch	1	EA
Request to Exit Sensor	1	EA
Gate - Card Reader/Mounting Post	1	EA
Fixed CCTV Day/Night Outdoor Camera	1	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Electrical/Data Conduit/Wiring	50	FT
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA
Del Cerro Reservoir		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	1	EA
Wireless "Spur" Type Radio	1	EA
Thermal CCTV Outdoor Camera	4	EA
IP Speakerhorn	2	EA
Electrical/Data Conduit/Wiring	100	FT
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA
Eagle Ridge Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	1	EA
Wireless "Spur" Type Radio	1	EA
Door/Hatch Contacts	1	EA
Fixed CCTV Day/Night Outdoor Camera	2	EA
Digital Video Recorder with UPS	1	EA
Electrical/Data Conduit/Wiring	50	FT
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA

East Gate Mall Regulator		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	1	EA
Wireless "Spur" Type Radio	1	EA
Access Control Panel	1	EA
Door/Hatch Contacts	1	EA
Card Reader - Door/Hatch	1	EA
LED Indicator - Inside Hatch (Connects to reader)	1	EA
Interior Motion Detector	1	EA
Gate - Card Reader/Mounting Post	1	EA
Outdoor Security Cabinet (NEMA-4)	1	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Security Mounting Pole (25')	1	EA
Security Mounting Pole Foundation	1	EA
Digital Video Recorder with UPS	1	EA
8 ft Mesh Fence with 18" Outrigger/Barbed Wire	150	FT
Vehicle Gates (Dual Swing) with Gate Opener/Loops	1	EA
Electrical/Data Conduit/Wiring	50	FT
Electrical/Data Conduit/Wiring,Trenching	50	FT
Grounding Kits	2	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA
Miscellaneous Other Site Improvements	1	LS

Elliot Pipeline Regulator		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	2	EA
Wireless "Spur" Type Radio	2	EA
Access Control Panel	1	EA
Door/Hatch Contacts	1	EA
Card Reader - Door/Hatch	1	EA
LED Indicator - Inside Hatch (Connects to reader)	1	EA
Interior Motion Detector	1	EA
Gate - Card Reader/Mounting Post	1	EA
Outdoor Security Cabinet (NEMA-4)	1	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Security Mounting Pole (25')	1	EA
Security Mounting Pole Foundation	1	EA
Digital Video Recorder with UPS	1	EA
8 ft Mesh Fence with 18" Outrigger/Barbed Wire	100	FT

Vehicle Gates (Dual Swing) with Gate Opener/Loops	1	EA
Electrical/Data Conduit/Wiring	25	FT
Electrical/Data Conduit/Wiring, Trenching	50	FT
Grounding Kits	2	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA

Friars Road Regulator		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	2	EA
Wireless "Spur" Type Radio	2	EA
Access Control Panel	1	EA
Gate - Card Reader/Mounting Post	1	EA
Outdoor Security Cabinet (NEMA-4)	1	EA
Fixed CCTV Day/Night Outdoor Camera	4	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Security Mounting Pole (25')	2	EA
Security Mounting Pole Foundation	2	EA
IP Speakerhorn	1	EA
Digital Video Recorder with UPS	1	EA
8 ft Mesh Fence with 18" Outrigger/Barbed Wire	100	FT
Vehicle Gates (Dual Swing) with Gate Opener/Loops	1	EA
Electrical/Data Conduit/Wiring	50	FT
Grounding Kits	2	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA
Demolition Costs for Site (Includes Removal)	1	LS

La Jolla View Standpipe		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	4	EA
Wireless "Spur" Type Radio	4	EA
Access Control Panel	1	EA
Gate - Card Reader/Mounting Post	1	EA
Outdoor Security Cabinet (NEMA-4)	1	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Thermal CCTV Outdoor Camera	4	EA
Security Mounting Pole (25')	4	EA
Security Mounting Pole Foundation	4	EA
IP Speakerhorn	2	EA
Digital Video Recorder with UPS	1	EA

6 ft Mesh Fence with 18" Outrigger/Barbed Wire	500	FT
Vehicle Gates (Dual Swing) with Gate Opener/Loops	1	EA
Electrical/Data Conduit/Wiring, Trenching	200	FT
Grounding Kits	2	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA
Demolition Costs for Site (Includes Removal)	1	LS

Los Penasquitos Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	2	EA
Wireless "Spur" Type Radio	2	EA
Indoor Security Cabinet (Swing Gate)	1	EA
Fixed CCTV Day/Night Outdoor Camera	1	EA
Digital Video Recorder with UPS	1	EA
Electrical/Data Conduit/Wiring	25	FT
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA

Los Penasquitos Reservoir		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	3	EA
Wireless "Spur" Type Radio	1	EA
Wireless "Backbone" Outdoor Type Radio	2	EA
IP Speakerhorn	2	EA
Electrical/Data Conduit/Wiring, Trenching	100	FT
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA

Mercy Mira Mesa High Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	1	EA
Wireless "Spur" Type Radio	1	EA
Electrical/Data Conduit/Wiring, Trenching	25	FT
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA

Miramar Ranch North Reservoir		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	1	EA
Wireless "Spur" Type Radio	1	EA
Gate - Card Reader/Mounting Post	1	EA
Gate - Magnetic Lock	1	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Security Mounting Pole (25')	1	EA
Security Mounting Pole Foundation	1	EA
IP Speakerhorn	2	EA
8 ft Mesh Fence with 18" Outrigger/Barbed Wire	40	FT
Electrical/Data Conduit/Wiring,Trenching	150	FT
Grounding Kits	1	EA
Miscellaneous Other Site Improvements	1	LS

Montezuma Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	2	EA
Wireless "Spur" Type Radio	2	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Electrical/Data Conduit/Wiring	25	FT
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA

Muirlands Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	1	EA
Wireless "Spur" Type Radio	1	EA
Access Control Panel	1	EA
Door/Hatch Contacts	1	EA
Door Magnetic Lock	1	EA
Card Reader - Door/Hatch	1	EA
Interior Motion Detector	1	EA
Request to Exit Sensor	1	EA
Gate - Card Reader/Mounting Post	1	EA
Outdoor Security Cabinet (NEMA-4)	1	EA
Fixed CCTV Day/Night Outdoor Camera	4	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Security Mounting Pole (25')	4	EA

Security Mounting Pole Foundation	4	EA
IP Speakerhorn	1	EA
Digital Video Recorder with UPS	1	EA
8 ft Mesh Fence with 18" Outrigger/Barbed Wire	1050	FT
Vehicle Gates (Dual Swing) with Gate Opener/Loops	1	EA
Electrical/Data Conduit/Wiring, Trenching	100	FT
Grounding Kits	2	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA
Demolition Costs for Site (Includes Removal)	1	LS

Ocean View Hills Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	1	EA
Wireless "Spur" Type Radio	1	EA
Access Control Panel	1	EA
Door/Hatch Contacts	4	EA
Door Magnetic Lock	1	EA
Card Reader - Door/Hatch	1	EA
Interior Motion Detector	2	EA
Request to Exit Sensor	1	EA
Gate - Card Reader/Mounting Post	1	EA
Indoor Security Cabinet (Swing Gate)	1	EA
Fixed CCTV Day/Night Outdoor Camera	4	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Security Mounting Pole (25')	4	EA
Security Mounting Pole Foundation	4	EA
IP Speakerhorn	1	EA
Digital Video Recorder with UPS	1	EA
Ornamental Wrought Iron Fencing	350	FT
Vehicle Gates (Dual Swing) with Gate Opener/Loops	1	EA
Electrical/Data Conduit/Wiring	100	FT
Electrical/Data Conduit/Wiring, Trenching	200	FT
Grounding Kits	2	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA
Demolition Costs for Site (Includes Removal)	1	LS

Otay Mesa Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	1	EA

Wireless "Spur" Type Radio	1	EA
Access Control Panel	1	EA
Door/Hatch Contacts	1	EA
Door Magnetic Lock	1	EA
Card Reader - Door/Hatch	1	EA
Interior Motion Detector	1	EA
Request to Exit Sensor	1	EA
Gate - Card Reader/Mounting Post	1	EA
Outdoor Security Cabinet (NEMA-4)	1	EA
Fixed CCTV Day/Night Outdoor Camera	4	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Security Mounting Pole (25')	4	EA
Security Mounting Pole Foundation	4	EA
IP Speakerhorn	2	EA
Digital Video Recorder with UPS	1	EA
8 ft Mesh Fence with 18" Outrigger/Barbed Wire	400	FT
Vehicle Gates (Dual Swing) with Gate Opener/Loops	1	EA
Electrical/Data Conduit/Wiring	50	FT
Electrical/Data Conduit/Wiring,Trenching	200	FT
Grounding Kits	2	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA
Demolition Costs for Site (Includes Removal)	1	LS
Miscellaneous Other Site Improvements	1	LS

Paradise Mesa #1 Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	1	EA
Wireless "Spur" Type Radio	1	EA
Access Control Panel	1	EA
Door/Hatch Contacts	1	EA
Door Magenetic Lock	1	EA
Card Reader - Door/Hatch	1	EA
Interior Motion Detector	1	EA
Request to Exit Sensor	1	EA
Gate - Card Reader/Mounting Post	1	EA
Outdoor Security Cabinet (NEMA-4)	1	EA
Fixed CCTV Day/Night Outdoor Camera	4	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Security Mounting Pole (25')	4	EA
Security Mounting Pole Foundation	4	EA

IP Speakerhorn	1	EA
Digital Video Recorder with UPS	1	EA
8 ft Mesh Fence with 18" Outrigger/Barbed Wire	220	FT
Vehicle Gates (Dual Swing) with Gate Opener/Loops	1	EA
Electrical/Data Conduit/Wiring	50	FT
Electrical/Data Conduit/Wiring,Trenching	200	FT
Grounding Kits	2	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA
Demolition Costs for Site (Includes Removal)	1	LS

Paradise Mesa #2 Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	1	EA
Wireless "Spur" Type Radio	1	EA
Access Control Panel	1	EA
Door/Hatch Contacts	1	EA
Card Reader - Door/Hatch	1	EA
LED Indicator - Inside Hatch (Connects to reader)	1	EA
Interior Motion Detector	1	EA
Gate - Card Reader/Mounting Post	1	EA
Outdoor Security Cabinet (NEMA-4)	1	EA
Fixed CCTV Day/Night Outdoor Camera	4	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Security Mounting Pole (25')	4	EA
Security Mounting Pole Foundation	4	EA
IP Speakerhorn	1	EA
Digital Video Recorder with UPS	1	EA
8 ft Mesh Fence with 18" Outrigger/Barbed Wire	300	FT
Vehicle Gates (Dual Swing) with Gate Opener/Loops	1	EA
Electrical/Data Conduit/Wiring	50	FT
Electrical/Data Conduit/Wiring,Trenching	200	FT
Grounding Kits	2	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA

Paradise Mesa Hills #2 Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	4	EA
Wireless "Spur" Type Radio	2	EA
Wireless "Backbone" Outdoor Type Radio	2	EA

Access Control Panel	1	EA
Gate - Card Reader/Mounting Post	1	EA
Outdoor Security Cabinet (NEMA-4)	1	EA
Fixed CCTV Day/Night Outdoor Camera	4	EA
PTZ CCTV Day/Night Outdoor Camera	2	EA
Security Mounting Pole (25')	4	EA
Security Mounting Pole Foundation	4	EA
IP Speakerhorn	1	EA
Digital Video Recorder with UPS	1	EA
Electrical/Data Conduit/Wiring,Trenching	200	FT
Grounding Kits	2	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA
Miscellaneous Other Site Improvements	1	LS

Paradise Mesa Standpipe		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	2	EA
Wireless "Backbone" Outdoor Type Radio	2	EA
Door Magnetic Lock	1	EA
Card Reader - Door/Hatch	1	EA
Exterior Motion Sensor	5	EA
Exterior IR Illuminator	5	EA
Outdoor Security Cabinet (NEMA-4)	1	EA
PTZ CCTV Day/Night Outdoor Camera	5	EA
Security Mounting Pole (25')	3	EA
Security Mounting Pole Foundation	3	EA
IP Speakerhorn	2	EA
8 ft Mesh Fence with 18" Outrigger/Barbed Wire	450	EA
Vehicle Gates (Dual Swing) with Gate Opener/Loops	1	EA
Demolition Costs for Site (Includes Removal)	1	LS

Penasquitos Bluffs #8 Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	1	EA
Wireless "Spur" Type Radio	1	EA
Electrical/Data Conduit/Wiring,Trenching	25	FT
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA

Point Loma Reservoir

Description	Quantity	Unit
Gate - Card Reader/Mounting Post	1	EA
Gate - Magnetic Lock	1	EA
Thermal CCTV Outdoor Camera	4	EA
Security Mounting Pole (25')	1	EA
Security Mounting Pole Foundation	1	EA
IP Speakerhorn	2	EA
Electrical/Data Conduit/Wiring, Trenching	300	FT
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA
Demolition Costs for Site (Includes Removal)	1	LS

Pomerado Park Reservoir		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	2	EA
Wireless "Backbone" Outdoor Type Radio	2	EA
Exterior IR Illuminator	1	EA
IP Speakerhorn	2	EA
Electrical/Data Conduit/Wiring	100	FT
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA

Pomerado Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	3	EA
Wireless "Spur" Type Radio	3	EA
Access Control Panel	1	EA
Door/Hatch Contacts	4	EA
Door Magnetic Lock	1	EA
Card Reader - Door/Hatch	1	EA
Interior Motion Detector	2	EA
Request to Exit Sensor	1	EA
Gate - Card Reader/Mounting Post	1	EA
Indoor Security Cabinet (Swing Gate)	1	EA
Fixed CCTV Day/Night Outdoor Camera	4	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Security Mounting Pole (25')	4	EA
Security Mounting Pole Foundation	4	EA
IP Speakerhorn	2	EA
Digital Video Recorder with UPS	1	EA

8 ft Mesh Fence with 18" Outrigger/Barbed Wire	400	FT
Vehicle Gates (Dual Swing) with Gate Opener/Loops	1	EA
Electrical/Data Conduit/Wiring	100	FT
Electrical/Data Conduit/Wiring,Trenching	300	FT
Grounding Kits	2	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA

Princess Park Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	1	EA
Wireless "Spur" Type Radio	1	EA
Access Control Panel	1	EA
Door/Hatch Contacts	4	EA
Door Magnetic Lock	1	EA
Card Reader - Door/Hatch	1	EA
Interior Motion Detector	2	EA
Request to Exit Sensor	1	EA
Gate - Card Reader/Mounting Post	1	EA
Indoor Security Cabinet (Swing Gate)	1	EA
Fixed CCTV Day/Night Outdoor Camera	4	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Security Mounting Pole (25')	4	EA
Security Mounting Pole Foundation	4	EA
IP Speakerhorn	2	EA
Digital Video Recorder with UPS	1	EA
Electrical/Data Conduit/Wiring	100	FT
Electrical/Data Conduit/Wiring,Trenching	150	FT
Grounding Kits	2	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA
Miscellaneous Other Site Improvements	1	LS

Rancho Bernardo Industrial Pump Station		
Description	Quantity	Unit
Exterior IR Illuminator	4	EA
Gate - Card Reader/Mounting Post	1	EA
Gate - Magnetic Lock	1	EA
Fixed CCTV Day/Night Outdoor Camera	4	EA
IP Speakerhorn	1	EA
Vehicle Gates (Dual Swing) with Gate Opener/Loops	1	EA
Electrical/Data Conduit/Wiring	80	FT

Grounding Kits	1	EA
Miscellaneous Other Site Improvements	1	LS

Rancho Bernardo Reservoir		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	2	EA
Wireless "Spur" Type Radio	1	EA
Wireless "Backbone" Outdoor Type Radio	1	EA
Thermal CCTV Outdoor Camera	6	EA
Security Mounting Pole (25')	4	EA
Security Mounting Pole Foundation	4	EA
IP Speakerhorn	2	EA
Electrical/Data Conduit/Wiring,Trenching	500	FT
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA
Demolition Costs for Site (Includes Removal)	1	LS
Miscellaneous Other Site Improvements	1	LS

Rancho Penasquitos Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	1	EA
Wireless "Spur" Type Radio	1	EA
Electrical/Data Conduit/Wiring,Trenching	25	FT
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA

Redwood Village Standpipe		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	2	EA
Wireless "Spur" Type Radio	2	EA
Access Control Panel	1	EA
Gate - Card Reader/Mounting Post	1	EA
Gate - Magnetic Lock	1	EA
Outdoor Security Cabinet (NEMA-4)	1	EA
Fixed CCTV Day/Night Outdoor Camera	4	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Security Mounting Pole (25')	4	EA
Security Mounting Pole Foundation	4	EA
IP Speakerhorn	2	EA
Digital Video Recorder with UPS	1	EA

8 ft Mesh Fence with 18" Outrigger/Barbed Wire	500	FT
Vehicle Gates (Dual Swing) with Gate Opener/Loops	1	EA
Electrical/Data Conduit/Wiring	50	FT
Electrical/Data Conduit/Wiring,Trenching	300	FT
Grounding Kits	2	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA
Demolition Costs for Site (Includes Removal)	1	LS

San Andreas Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	3	EA
Wireless "Spur" Type Radio	3	EA
Access Control Panel	1	EA
Door/Hatch Contacts	4	EA
Door Magenetic Lock	1	EA
Card Reader - Door/Hatch	1	EA
Interior Motion Detector	1	EA
Request to Exit Sensor	1	EA
Gate - Card Reader/Mounting Post	1	EA
Outdoor Security Cabinet (NEMA-4)	1	EA
Fixed CCTV Day/Night Outdoor Camera	1	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Digital Video Recorder with UPS	1	EA
Ornamental Wrought Iron Fencing	60	LF
Electrical/Data Conduit/Wiring	50	FT
Electrical/Data Conduit/Wiring,Trenching	100	FT
Grounding Kits	2	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA

San Carlos Reservoir		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	2	EA
Wireless "Spur" Type Radio	2	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Security Mounting Pole (25')	1	EA
Security Mounting Pole Foundation	1	EA
IP Speakerhorn	2	EA
Electrical/Data Conduit/Wiring,Trenching	100	FT
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA

Network Router (Includes cabling/jumpers)	1	EA
Miscellaneous Other Site Improvements	1	LS

Scripps Ranch Reservoir		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	3	EA
Wireless "Spur" Type Radio	3	EA
IP Speakerhorn	2	EA
Electrical/Data Conduit/Wiring,Trenching	200	FT
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA

Scripps Woods #2 Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	1	EA
Wireless "Spur" Type Radio	1	EA
Access Control Panel	1	EA
Door/Hatch Contacts	4	EA
Door Magenetic Lock	1	EA
Card Reader - Door/Hatch	1	EA
Interior Motion Detector	2	EA
Request to Exit Sensor	1	EA
Gate - Card Reader/Mounting Post	1	EA
Indoor Security Cabinet (Swing Gate)	1	EA
Fixed CCTV Day/Night Outdoor Camera	4	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Security Mounting Pole (25')	4	EA
Security Mounting Pole Foundation	4	EA
IP Speakerhorn	1	EA
Digital Video Recorder with UPS	1	EA
8 ft Mesh Fence with 18" Outrigger/Barbed Wire	400	FT
Vehicle Gates (Dual Swing) with Gate Opener/Loops	1	EA
Electrical/Data Conduit/Wiring	100	FT
Electrical/Data Conduit/Wiring,Trenching	100	FT
Grounding Kits	2	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA

Soledad Reservoir		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	1	EA

Wireless "Spur" Type Radio	1	EA
IP Speakerhorn	2	EA
8 ft Mesh Fence with 18" Outrigger/Barbed Wire	30	FT
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA
Miscellaneous Other Site Improvements	1	LS

South Creek Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	3	EA
Wireless "Spur" Type Radio	3	EA
Access Control Panel	1	EA
Door/Hatch Contacts	4	EA
Door Magnetic Lock	1	EA
Card Reader - Door/Hatch	1	EA
Interior Motion Detector	2	EA
Request to Exit Sensor	1	EA
Gate - Card Reader/Mounting Post	1	EA
Indoor Security Cabinet (Swing Gate)	1	EA
Fixed CCTV Day/Night Outdoor Camera	4	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Security Mounting Pole (25')	4	EA
Security Mounting Pole Foundation	4	EA
Digital Video Recorder with UPS	1	EA
Electrical/Data Conduit/Wiring	100	FT
Electrical/Data Conduit/Wiring,Trenching	200	FT
Grounding Kits	2	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA

South San Diego Reservoir		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	1	EA
Wireless "Spur" Type Radio	1	EA
Gate - Card Reader/Mounting Post	1	EA
Gate - Magnetic Lock	1	EA
Thermal CCTV Outdoor Camera	4	EA
IP Speakerhorn	4	EA
Electrical/Data Conduit/Wiring,Trenching	400	FT
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA

Network Router (Includes cabling/jumpers)	1	EA
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Stonebridge Pump Station #1		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	1	EA
Wireless "Spur" Type Radio	1	EA
Access Control Panel	1	EA
Door/Hatch Contacts	4	EA
Door Magenetic Lock	1	EA
Card Reader - Door/Hatch	1	EA
Interior Motion Detector	2	EA
Request to Exit Sensor	1	EA
Gate - Card Reader/Mounting Post	1	EA
Indoor Security Cabinet (Swing Gate)	1	EA
Fixed CCTV Day/Night Outdoor Camera	4	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Security Mounting Pole (25')	4	EA
Security Mounting Pole Foundation	4	EA
IP Speakerhorn	1	EA
Digital Video Recorder with UPS	1	EA
Ornamental Wrought Iron Fencing	400	LF
Electrical/Data Conduit/Wiring	50	FT
Electrical/Data Conduit/Wiring, Trenching	150	FT
Grounding Kits	2	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA
Miscellaneous Other Site Improvements	1	LS

Stonebridge Pump Station #2		
Description	Quantity	Unit
Backbone Indoor Microwave System Antenna	2	EA
Wireless Antenna (Outdoor)	1	EA
Wireless "Spur" Type Radio	1	EA
Wireless "Backbone" Indoor Type Radio	2	EA
Access Control Panel	1	EA
Door/Hatch Contacts	4	EA
Door Magenetic Lock	1	EA
Card Reader - Door/Hatch	1	EA
Interior Motion Detector	2	EA
Request to Exit Sensor	1	EA
Gate - Card Reader/Mounting Post	1	EA
Indoor Security Cabinet (Swing Gate)	1	EA

PTZ CCTV Day/Night Outdoor Camera	1	EA
Thermal CCTV Outdoor Camera	4	EA
Security Mounting Pole (25')	4	EA
Security Mounting Pole Foundation	4	EA
IP Speakerhorn	2	EA
Digital Video Recorder with UPS	1	EA
Ornamental Wrought Iron Fencing	800	FT
Electrical/Data Conduit/Wiring	75	FT
Electrical/Data Conduit/Wiring, Trenching	300	FT
Grounding Kits	2	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA

Texas Street Regulator		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	1	EA
Wireless "Spur" Type Radio	1	EA
Access Control Panel	1	EA
Door/Hatch Contacts	1	EA
Interior Motion Detector	1	EA
Gate - Card Reader/Mounting Post	1	EA
Outdoor Security Cabinet (NEMA-4)	1	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Security Mounting Pole (25')	1	EA
Security Mounting Pole Foundation	1	EA
Digital Video Recorder with UPS	1	EA
8 ft Mesh Fence with 18" Outrigger/Barbed Wire	160	FT
Vehicle Gates (Dual Swing) with Gate Opener/Loops	1	EA
Electrical/Data Conduit/Wiring, Trenching	25	FT
Grounding Kits	2	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA
Miscellaneous Other Site Improvements	1	LS

Thorn Street Regulator		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	1	EA
Wireless "Spur" Type Radio	1	EA
Access Control Panel	1	EA
Door/Hatch Contacts	1	EA
Card Reader - Door/Hatch	1	EA

LED Indicator - Inside Hatch (Connects to reader)	1	EA
Interior Motion Detector	1	EA
Outdoor Security Cabinet (NEMA-4)	1	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Security Mounting Pole (25')	1	EA
Security Mounting Pole Foundation	1	EA
Digital Video Recorder with UPS	1	EA
Electrical/Data Conduit/Wiring	50	FT
Grounding Kits	2	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA
Miscellaneous Other Site Improvements	1	LS

University Heights Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	1	EA
Wireless "Spur" Type Radio	1	EA
Exterior Motion Sensor	6	EA
Exterior IR Illuminator	6	EA
Fixed CCTV Day/Night Outdoor Camera	6	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Security Mounting Pole (25')	6	EA
Security Mounting Pole Foundation	6	EA
IP Speakerhorn	2	EA
Electrical/Data Conduit/Wiring	75	FT
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA
Miscellaneous Other Site Improvements	1	LS

Waring Road Pump Station		
Description	Quantity	Unit
Wireless Antenna (Outdoor)	1	EA
Wireless "Spur" Type Radio	1	EA
IP Speakerhorn	2	EA
Electrical/Data Conduit/Wiring	75	FT
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA
Miscellaneous Other Site Improvements	1	LS

Black Mountain High Level Site		
Description	Quantity	Unit
Backbone Interior Wireless System Antenna	2	EA
Wireless Antenna (Outdoor)	9	EA
Wireless "Spur" Type Radio	8	EA
Wireless "Backbone" Indoor Type Radio	1	EA
Wireless "Backbone" Outdoor Type Radio	1	EA
Exterior Motion Sensor	1	EA
Exterior IR Illuminator	1	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Security Mounting Pole (25')	1	EA
Security Mounting Pole Foundation	1	EA
IP Speakerhorn	1	EA
Digital Video Recorder with UPS	1	EA
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA

Cowles Mountain High Level Site		
Description	Quantity	Unit
Backbone Interior Wireless System Antenna	3	EA
Wireless Antenna (Outdoor)	5	EA
Wireless "Spur" Type Radio	5	EA
Wireless "Backbone" Indoor Type Radio	3	EA
Exterior Motion Sensor	1	EA
Exterior IR Illuminator	1	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Security Mounting Pole (25')	1	EA
Security Mounting Pole Foundation	1	EA
IP Speakerhorn	1	EA
Digital Video Recorder with UPS	1	EA
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA

Encanto High Level Site		
Description	Quantity	Unit
Backbone Interior Wireless System Antenna	1	EA
Wireless Antenna (Outdoor)	2	EA
Wireless "Spur" Type Radio	1	EA
Wireless "Backbone" Indoor Type Radio	1	EA

Wireless "Backbone" Outdoor Type Radio	1	EA
Exterior Motion Sensor	1	EA
Exterior IR Illuminator	1	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Security Mounting Pole (25')	1	EA
Security Mounting Pole Foundation	1	EA
IP Speakerhorn	1	EA
Digital Video Recorder with UPS	1	EA
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA

Lyons Peak High Level Site		
Description	Quantity	Unit
Backbone Interior Wireless System Antenna	3	EA
Wireless Antenna (Outdoor)	3	EA
Wireless "Spur" Type Radio	3	EA
Wireless "Backbone" Indoor Type Radio	3	EA
Exterior Motion Sensor	1	EA
Exterior IR Illuminator	1	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Security Mounting Pole (25')	1	EA
Security Mounting Pole Foundation	1	EA
IP Speakerhorn	1	EA
Digital Video Recorder with UPS	1	EA
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA

Mount Woodson High Level Site		
Description	Quantity	Unit
Backbone Interior Wireless System Antenna	2	EA
Wireless "Backbone" Indoor Type Radio	2	EA
Exterior Motion Sensor	1	EA
Exterior IR Illuminator	1	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Security Mounting Pole (25')	1	EA
Security Mounting Pole Foundation	1	EA
IP Speakerhorn	1	EA
Digital Video Recorder with UPS	1	EA
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA

Network Router (Includes cabling/jumpers)	1	EA
San Ysidro High Level Site		
Description	Quantity	Unit
Backbone Interior Wireless System Antenna	2	EA
Wireless "Backbone" Indoor Type Radio	2	EA
Exterior Motion Sensor	1	EA
Exterior IR Illuminator	1	EA
PTZ CCTV Day/Night Outdoor Camera	1	EA
Security Mounting Pole (25')	1	EA
Security Mounting Pole Foundation	1	EA
IP Speakerhorn	1	EA
Digital Video Recorder with UPS	1	EA
Grounding Kits	1	EA
Network Switch (Includes cabling/jumpers)	1	EA
Network Router (Includes cabling/jumpers)	1	EA

5.0 Reference Standards:

1. STANDARD SPECIFICATIONS

Document No.	Filed	Description
PITS0504090	05-04-09	Standard Specifications for Public Works Construction (The GREENBOOK), 2009 Edition
PITS09011001	09-01-10	City of San Diego Standard Specifications for Public Works Construction (The WHITEBOOK), 2010 Update *
AEC1231064	12-31-06	California Department of Transportation, Manual of Uniform Traffic Control Devices (MUTCD 2006)
769023	09-11-84	Standard Federal Equal Employment Opportunity Construction Contract Specifications and the Equal Opportunity Clause

NOTE: The City of San Diego Supplement, 2010 Update now consolidates various City Public Works Construction Standard Specifications which in the past were included in the Supplementary Special Provisions. The Bidders' attention is directed to this edition of the City Supplement for a close review to ensure no important information is missed for the preparation of the Bids.

2. STANDARD DRAWINGS

Document No.	Filed	Description
PITS09011002	09-01-10	City of San Diego Standard Drawings *
N/A	Varies	City Standard Drawings - Updates Approved For Use (when specified)*
AEC0925061	09-25-06	Caltrans 2006 U.S. Customary Unit Standard Plans

NOTE: * Available online under Engineering Documents and References at: <http://www.sandiego.gov/engineering-cip>

**ATTACHMENT A
EXHIBIT A – LIST OF PROJECT SITES**

Water Site Locations

Sites without Existing Security Equipment and with No Connectivity								
Site #	Site Name	Address	City	Zip	Lat	Long	Site Type	Existing Connectivity
1	Cabrillo Palisades PS	3190 Health Center Dr	San Diego	92123	32.80169	117.15269	PS	nothing
2	Chollas Heights PS	3303 60th St	San Diego	92105	32.74105	117.06663	PS	nothing
3	Cielo & Woodman PS	6599 Cielo Dr.	San Diego	92114	32.7037	117.05495	PS	nothing
4	East Gate Mall Regulator	5302 Eastgate Mall	San Diego	92121	32.88054	117.18913	Regulator	nothing
5	Elliot Pipeline Regulator	5592 Clairemont Mesa Blvd	San Diego	92117	32.83425	117.17223	Regulator	nothing
6	Friars Rd Regulator	2275 Rio Bonito Way	San Diego	92108	32.77794	117.13535	Regulator	nothing
7	La Jolla View Standpipe	Brodiaea Way & Encelia Drive	San Diego	92037	32.84209	117.26151	Standpipe	nothing
8	Muirlands PS	7480 Country Club Dr	San Diego	92037	32.84188	117.26339	PS	nothing
9	Ocean View Hills PS	4951 Ocean View Hills Pkwy	San Diego	92154	32.5818	117.0254	PS	nothing
10	Otay Mesa PS	5350 Otay Valley Rd	San Diego	92154	32.58505	117.01183	PS	nothing
11	Paradise Hills #2 PS	1930 Sea Star Lane	San Diego	92139	32.68428	117.05555	PS	nothing
12	Paradise Mesa #1 PS	1695 Plaza Crest Ridge Rd	San Diego	92114	37.69135	117.05228	PS	nothing
13	Paradise Mesa #2 PS	2599 Alta View Dr.	San Diego	92139	32.67845	117.04575	PS	nothing
14	Paradise Mesa Standpipe	1513 Statton Ct.	San Diego	92114	32.69322	117.04622	Standpipe	nothing
15	Pomerado PS	10455 Pomerado Rd	San Diego	92131	32.89857	117.10039	PS	nothing
16	Princess Park PS	1740 Masterson Ln	San Diego	92154	32.5656	117.03983	PS	nothing
17	San Andreas PS	3042 Tercer Cerde	Del Mar	92014	32.98533	117.24517	PS	nothing
18	Scripps Woods #2 PS	12344 Semillon Blvd	San Diego	92131	32.91116	117.06514	PS	nothing
19	South Creek PS	12330 Springhurst Dr.	San Diego	92128	32.94236	117.07611	PS	nothing
20	Stonebridge PS #1	14079 Stonebridge Pkwy	San Diego	92131	32.92278	117.03413	PS	nothing
21	Stonebridge PS #2	14800 Stonebridge Pkwy	San Diego	92131	32.92673	117.00764	PS	nothing
22	Texas St. Regulator	2915 Camino Del Rio South	San Diego	92108	32.77073	117.13166	Regulator	nothing
23	Thorn St Regulator	3005 Thorn St	San Diego	92104	32.73931	117.12917	Regulator	nothing
24	Red Wood Villiage Standpipe	6056 Hughes St.	San Diego	92115	32.74848	117.06703	Standpipe	nothing
25	Black Mtn				32.98139	117.1165	HLS	nothing
26	Cowles Mtn				32.8135	117.0322	HLS	nothing
27	Encanto				32.70461	117.0525	HLS	nothing
29	Lyons Peak				32.70104	116.76563	HLS	nothing
28	Mt Woodson				33.00903	116.97354	HLS	nothing
30	San Ysidro				32.56166	117.0352	HLS	nothing

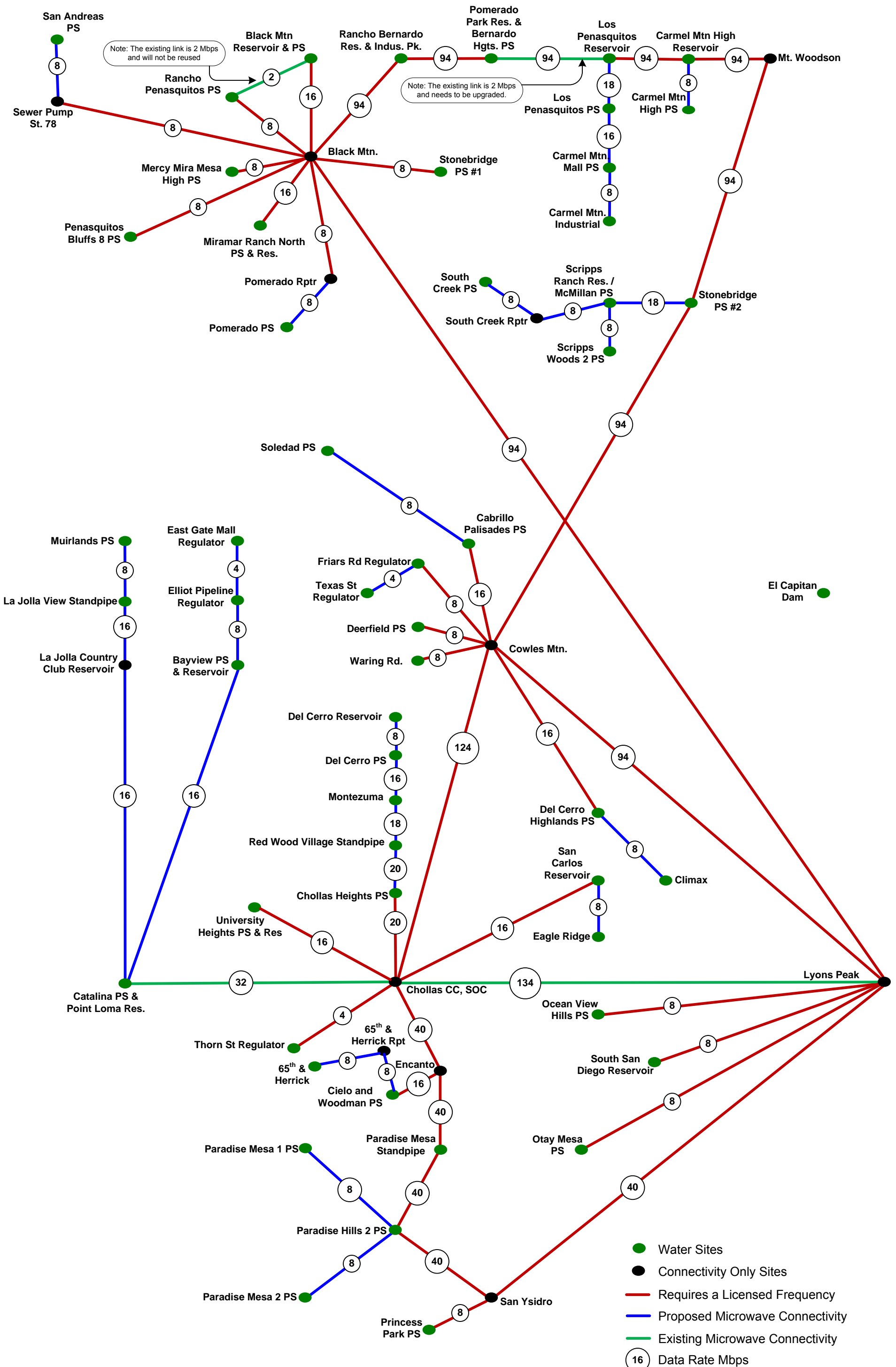
Sites with Existing Security Equipment and Connectivity								
Site #	Site Name	Address	City	Zip	Lat	Long	Site Type	Existing Connectivity
31	65th and Herrick	6501 Herrick St	San Diego	92114	32.71111	117.05785	PS	Leased DSL VPN Circuit
32	Bayview Reservoir	5400 Thunderbird Lane	San Diego	92037	32.81812	117.23959	Res	(uses Bayview PS T1 line)
32	Bayview PS	2000 Parkview Terrace	San Diego	92037	32.81812	117.23959	PS	Leased T1 - Co-located with Bayview Res
33	Black Mtn Reservoir	14600 Black Mtn. Road (approx.)	San Diego	92129	32.98568	117.12824	Res	(uses the wireless at the Black Mtn PS)
33	Black Mtn PS	14600 Black Mtn. Road (approx.)	San Diego	92129	32.98568	117.12824	PS	Wireless to Rancho Penasquitos PS - Co-Located with PS
34	Carmel Mtn High Reservoir	13642 Shoal Summit Dr	San Diego	92128	32.96542	117.07719	Res	Leased T1
35	Carmel Mtn High PS	11600 Shoal Creek Dr	San Diego	92128	32.96618	117.08033	PS	Leased T1
36	Carmel Mtn Industrial	11403 Rancho Carmel Dr.	San Diego	92128	32.98564	117.08197	PS	Leased T1
37	Carmel Mtn Mall PS	11202 Rancho Carmel Dr.	San Diego	92128	32.98206	117.08338	PS	Leased T1
38	Climax	7084 Coleshill Dr.	San Diego	92119	32.81095	117.01841	PS	Leased Opteman
39	Deerfield PS	8002 Mision Gorge Rd.	San Diego	92120	32.81629	117.06245	PS	Leased T1
40	Del Cerro Highlands PS	6097 Madra Ave	San Diego	92120	32.78906	117.05562	PS	Leased Opteman
41	Del Cerro PS	5700 Marne Ave	San Diego	92120	32.78238	117.06158	PS	Leased T1
42	Del Cerro Reservoir	5880 Rockhurst Ct.	San Diego	92120	32.78696	117.06046	Res	Leased Opteman
43	Eagle Ridge	7822 Wing Flight Ct.	San Diego	92119	32.8053	117.02766	PS	Leased Opteman
44	Los Penasquitos PS	15265 Andorra Way	San Diego	92129	32.99137	117.08451	PS	Leased Opteman
45	Los Penasquitos Reservoir	Penasquitos Dr. & Avenida Maria	San Diego	92129	32.98583	117.09238	Res	wireless to Pomerado Park
46	Mercy Mira Mesa High	9525 Babauta rd.	San Diego	92129	32.93642	117.12301	PS	Leased Opteman
47	Miramar Ranch North Res	11496 Weatherhill Way	San Diego	92131	32.93642	117.12301	Res	(uses Miramar Ranch North PS leased Line)
47	Miramar Ranch North PS	11497 Weatherhill Way	San Diego	92131	32.92791	117.10117	PS	Leased Opteman - Co-located with Miramar Ranch North Res
48	Montezuma	4998 Catocin Dr.	San Diego	92115	32.76881	117.05854	PS	Leased Opteman
49	Penasquitos Bluffs #8 PS	9198 Oviedo St	San Diego	92129	32.96843	117.12959	PS	Leased T1
50a	Point Loma Res	1061 Catalina blvd.	San Diego	92106	32.72498	117.24424	Res	(uses Ctalina PS leased line)
50b	Catalina PS	4062 Varona St.	San Diego	92106	32.72563	117.24396	PS	Leased Opteman - Co-located with Point Loma Reservoir
51a	Pomerado Park Reservoir	16126 Avenida Venusto	San Diego	92128	33.00475	117.07508	Res	(uses Bernardo Heights PS T-1 line)
51b	Bernardo Heights PS	16126 Avenida Venusto	San Diego	92128	33.00475	117.07508	PS	Leased T1 - Co-located with Pomerado Park Res
52	Rancho Bernardo Reservoir	16059 Big Springs Way	San Diego	92127	33.00751	117.08435	Res	(uses Rancho Bernardo Industrial PS leased line)
52	Rancho Bernardo Industrial PS	16055 big Springs Way	San Diego	92127	33.00751	117.08435	PS	Leased Opteman - Co-located with Rancho Bernardo Res
53	Rancho Penasquitos PS	8888 Sparren Way	San Diego	92129	32.97303	117.13501	PS	Leased Opteman
54	San Carlos Reservoir	7944 Wingspan Dr (Tommy Dr.)	San Diego	92119	32.80774	117.02797	Res	Leased Opteman
55	Scripps Ranch Reservoir	12225 Spring Canyon rd.	San Diego	92131	32.92199	117.06693	Res	(uses Scripps McMillan PS leased line)
55	Scripps McMillan PS	12225 Spring Canyon rd.	San Diego	92131	32.92199	117.06693	PS	Leased Opteman - Co-located with Scripps Ranch Res
56	Security Operations Center (SOC)	2794 Caminito Chollas	San Diego	92105	32.73479	117.07166	Control Center	Fiber
57	Soledad Reservoir	6751 La Jolla Scenic Dr	La Jolla	92037	32.83774	117.24859	Res	Leased T1
57	Soledad PS	6751 La Jolla Scenic Dr	La Jolla	92037	32.83774	117.24859	Res	Leased T1
58	South San Diego Reservoir	1998 Magdalena Avenue	Chula Vista		32.6011	116.9753	Res	Leased T1
59	University Heights Reservoir	4220 Idaho St	San Diego	92105	32.75428	117.13406	PS	Leased T1
59	University Heights PS	4220 Idaho St	San Diego	92105	32.75428	117.13406	PS	Leased T1
60	Waring Road PS	4850 Waring Rd.	San Diego	92120	32.78313	117.08751	PS	Leased Opteman
Communication Only Sites - To be used to build out backbone and connect other sites								
Site #	Site Name	Address	City	Zip	Lat	Long	Site Type	Existing Connectivity
7	La Jolla Country Club Reservoir	7269 Encelia Dr.	San Diego	92037	32.84147	117.25769	Res	Communication Only Site
19	South Creek Repeater				32.93551	117.06874	Rptr	Communication Only Site
31	65th and Herrick Repeater				32.71078	117.05479	Rptr	Communication Only Site
17	Sewer Pump Station 78				32.96293	117.255595	Sewer PS	Communication Only Site
15	Pomerado PS Repeater				32.894154	117.110642	Rptr	Communication Only Site

Site Distances

Site A	Site B	Distance (miles)	Data Rate (Mbps)	Licensed / Unlicensed	Indoor / Outdoor Transceiver	Estimate Antenna Size
65th and Herrick	65th and Herrick Rptr	0.18	8	Unlicensed	Outdoor	2' Panel
Bayview Res	Elliot Pipeline Reg	4.08	8	Unlicensed	Outdoor	2' Panel
Black Mtn	Black Mtn Res	0.75	16	Licensed	Outdoor	2' Panel
Black Mtn	Lyons Peak	28.1	94	Licensed	Indoor	6' Parabolic
Black Mtn	Mercy Mira Mesa High PS	3.13	8	Licensed	Outdoor	2' Panel
Black Mtn	Miramar Ranch North PS	3.8	16	Licensed	Outdoor	2' Panel
Black Mtn	Penasquitos Bluffs 8 PS	1.19	8	Licensed	Outdoor	2' Panel
Black Mtn	Pomerado PS Rptr	6.02	8	Licensed	Outdoor	2' Panel
Black Mtn	Rancho Bernardo Res	2.58	94	Licensed	Outdoor	2' Panel
Black Mtn	Rancho Penasquitos PS	1.22	8	Licensed	Outdoor	2' Panel
Black Mtn	Sewer Pump Station 78	8.19	8	Licensed	Outdoor	2' Panel
Black Mtn	Stonebridge PS 1	6.26	8	Licensed	Outdoor	2' Panel
Cabrillo Palisades PS	Soledad PS	6.11	8	Unlicensed	Outdoor	2' Panel
Carmel Mtn High Res	Carmel Mtn High PS	0.18	8	Unlicensed	Outdoor	2' Panel
Carmel Mtn High Res	Los Penasquitos Res	1.65	94	Licensed	Outdoor	2' Panel
Carmel Mtn High Res	Mt Woodson	6.73	94	Licensed	Indoor	2' Panel
Carmel Mtn Mall PS	Carmel Mtn Indus PS	0.26	8	Unlicensed	Outdoor	2' Panel
Catalina PS	Bayview Res	6.38	16	Unlicensed	Outdoor	2' Panel
Catalina PS	La Jolla Country Club Res	8.02	16	Unlicensed	Outdoor	2' Panel
Chollas Heights PS	Redwood Villiage Standpipe	0.52	20	Unlicensed	Outdoor	2' Panel
Chollas SOC	Chollas Heights PS	0.53	20	Licensed	Outdoor	2' Panel
Chollas SOC	Encanto	2.35	40	Licensed	Indoor	2' Panel
Chollas SOC	San Carlos Res	5.64	16	Licensed	Outdoor	2' Panel
Chollas SOC	Thorn St Reg	3.36	4	Licensed	Outdoor	2' Panel
Chollas SOC	University Heights PS / Res	3.87	16	Licensed	Outdoor	2' Panel
Cielo and Woodman PS	65th and Herrick Rptr	0.49	8	Unlicensed	Outdoor	2' Panel
Cowles Mtn	Cabrillo Palisades PS	7.06	16	Licensed	Outdoor	2' Panel
Cowles Mtn	Chollas SOC	5.9	124	Licensed	Indoor	2' Panel
Cowles Mtn	Deerfield PS	1.77	8	Licensed	Outdoor	2' Panel
Cowles Mtn	Del Cerro Highland PS	2.16	16	Licensed	Outdoor	2' Panel
Cowles Mtn	Friars Rd Reg	6.48	8	Licensed	Outdoor	2' Panel
Cowles Mtn	Lyons Peak	17.35	94	Licensed	Indoor	4' Parabolic
Cowles Mtn	Stonebridge PS 2	7.92	94	Licensed	Indoor	2' Panel
Cowles Mtn	Waring Rd PS	3.84	8	Licensed	Outdoor	2' Panel
Del Cerro Highlands PS	Climax	2.62	8	Unlicensed	Outdoor	2' Panel
Del Cerro PS	Del Cerro Res	0.31	8	Unlicensed	Outdoor	2' Panel
Elliot Pipeline Reg	Eastgate Mall Reg	3.35	4	Unlicensed	Outdoor	2' Panel
Encanto	Cielo and Woodman PS	0.16	16	Licensed	Outdoor	2' Panel
Encanto	Paradise Mesa Standpipe	0.87	40	Licensed	Outdoor	2' Panel
Friars Rd Reg	Texas St Reg	0.54	4	Unlicensed	Outdoor	2' Panel
La Jolla Country Club Res	La Jolla View Standpipe	0.22	16	Unlicensed	Outdoor	2' Panel
La Jolla View Standpipe	Muirlands PS	0.11	8	Unlicensed	Outdoor	2' Panel
Los Penasquitos PS	Carmel Mtn Mall PS	0.65	16	Unlicensed	Outdoor	2' Panel
Los Penasquitos Res	Los Penasquitos PS	0.6	16	Unlicensed	Outdoor	2' Panel
Los Penasquitos Res	Pomerado Park Res	1.65	94	Licensed	Outdoor	2' Panel
Lyons Peak	Ocean Veiw Hills PS	17.22	8	Licensed	Outdoor	3' Parabolic
Lyons Peak	Otay Mesa PS	16.43	8	Licensed	Outdoor	3' Parabolic
Lyons Peak	San Ysidro	18.42	40	Licensed	Indoor	3' Parabolic
Lyons Peak	South San Diego Res	14.02	8	Licensed	Outdoor	3' Parabolic
Montezuma	Del Cerro PS	0.95	16	Unlicensed	Outdoor	2' Panel
Mt Woodson	Stonebridge PS 2	6.02	94	Licensed	Indoor	2' Panel
Paradise Hills 2 PS	Paradise Mesa 1 PS	0.53	8	Unlicensed	Outdoor	2' Panel
Paradise Hills 2 PS	Paradise Mesa 2 PS	0.7	8	Unlicensed	Outdoor	2' Panel
Paradise Hills 2 PS	Paradise Mesa Standpipe	0.84	40	Licensed	Outdoor	2' Panel
Pomerado Park Res	Rancho Bernardo Res	0.58	94	Licensed	Outdoor	2' Panel
Pomerado PS	Pomerado PS Rptr	0.67	8	Unlicensed	Outdoor	2' Panel
Redwood Village Standpipe	Montezuma	1.48	18	Unlicensed	Outdoor	2' Panel
San Carlos Res	Eagle Ridge PS	0.17	8	Unlicensed	Outdoor	2' Panel
San Ysidro	Paradise Hills 2 PS	8.52	40	Licensed	Outdoor	2' Panel
San Ysidro	Princess Park PS	0.37	8	Licensed	Outdoor	2' Panel
Scripps Ranch Res	Scripps Woods PS 2	0.81	8	Unlicensed	Outdoor	2' Panel
Scripps Ranch Res	South Creek Rptr	0.94	8	Unlicensed	Outdoor	2' Panel
Sewer Pump Station 78	San Andreas PS	1.65	8	Unlicensed	Outdoor	2' Panel
SouthCreek PS	South Creek Rptr	0.64	8	Unlicensed	Outdoor	2' Panel
Stonebridge PS 2	Scripps Ranch Res	3.45	18	Unlicensed	Outdoor	2' Panel

ATTACHMENT A
EXHIBIT B – MICROWAVE NETWORK CONNECTIVITY DIAGRAM

City of San Diego Water Security Connectivity Network



ATTACHMENT A
EXHIBIT C – LINK BUDGETS AND CALCULATIONS

Table E-1
Bayview Reservoir to Elliot Pipeline Regulator

Site	BAYVIEW RESERVOIR	ELLIOT PIPELINE REGULATOR
Latitude	32 49 5.02 N	32 50 3.01 N
Lat (Dec Degrees)	32.81806	32.83417
Longitude	117 14 22.99 W	117 10 19.99 W
Lon (Dec Degrees)	-117.23972	-117.17222
Site Elevation	456.04 ft	381.48 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	74.2	254.23
Antenna Orientation	74.2	254.24
Path Angle	-0.2	0.2
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna	FP2-5-28 Vpol	FP2-5-28 Vpol
(Ant File/ID)	AMXS0005 X000500017	AMXS0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.41 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	74.2	254.23
Distance	4.08 mi	4.08 mi
Absorption Loss		0.03 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		124.08 dB
Total Gains dBm		81.8
Total Loss dB		127.11
Received Signal Level dBm		-45.32
Unfaded Fade Margin dB		27.68
Digital DFM		46
Composite Fade Margin		27.62
Terrain Factor (a)	0.472	
Climate Factor (b)	0.325	
Undp (TFM)		2.58E-07
Reliability (%)		99.99997423
Outage (sec/yr)		8



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Figure C-1

Bayview Reservoir to Elliot Pipeline Regulator

BAYVIEW RESERVOIR

32 49 5.02 N
117 14 22.99 W
NAD 83:
Elev: 456.04 ft MSL

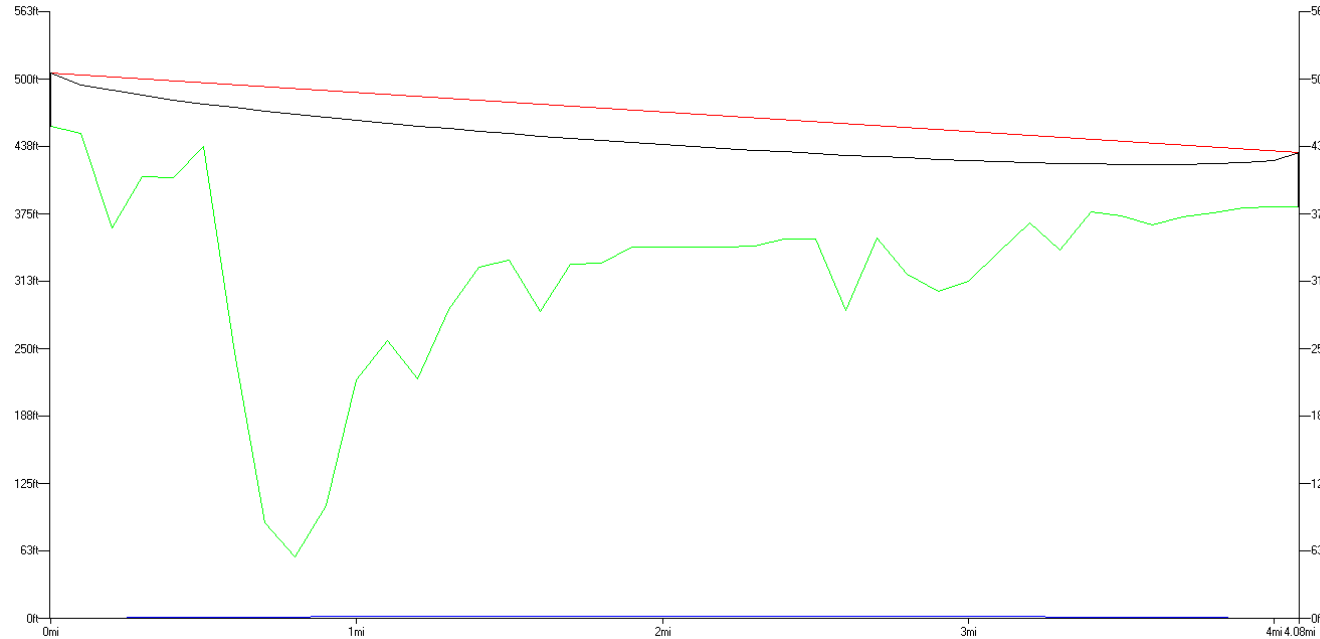
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 74.20

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 74.20

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



ELLIOT PIPELINE
REGULATOR

32 50 3.01 N
117 10 19.99 W
NAD 83:
Elev: 381.48 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 254.24

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 254.24

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 74.20°T Reverse 254.23°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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Table C-2
Black Mountain to Black Mountain Reservoir

Site	BLACK MTN	BLACK MTN RESERVOIR
Latitude	32 58 53.00 N	32 59 8.02 N
Lat (Dec Degrees)	32.98139	32.98556
Longitude	117 06 59.00 W	117 07 41.99 W
Lon (Dec Degrees)	-117.11639	-117.12833
Site Elevation	1561.02 ft	779.04 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	292.51	112.51
Antenna Orientation	292.51	112.48
Path Angle	-11.16	11.16
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna	FP2-5-28 Vpol	FP2-5-28 Vpol
(Ant File/ID)	AM SX0005 X000500017	AM SX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.38 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	292.51	112.51
Distance	0.75 mi	0.75 mi
Absorption Loss		0.01 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		109.38 dB
Total Gains dBm		81.76
Total Loss dB		112.39
Received Signal Level dBm		-30.62
Unfaded Fade Margin dB		42.38
Digital DFM		46
Composite Fade Margin		40.81
Terrain Factor (a)	0.5	
Climate Factor (b)	0.325	
Undp (TFM)		5.77E-11
Reliability (%)		99.99999999
Outage (sec/yr)		0



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Figure C-2

Black Mountain to Black Mountain Reservoir

BLACK MTN

32 58 53.00 N
117 06 59.00 W
NAD 83:
Elev: 1561.02 ft MSL

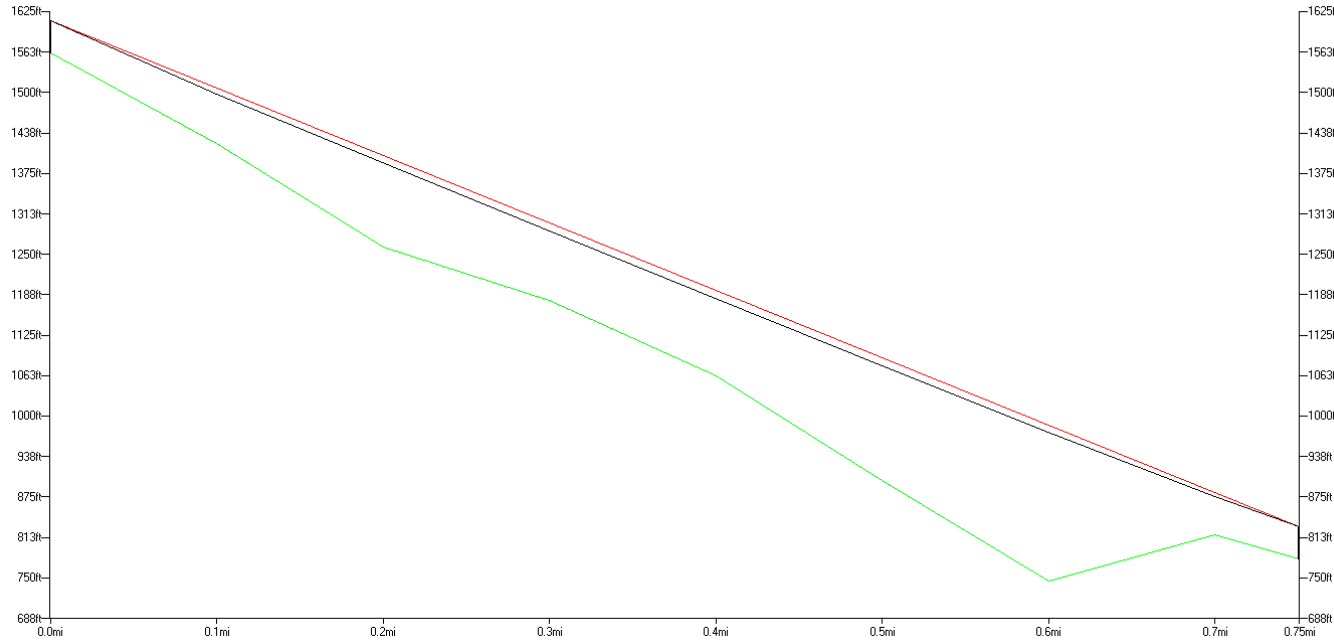
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 292.51

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 292.51

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



BLACK MTN RESERVOIR

32 59 8.02 N
117 07 41.99 W
NAD 83:
Elev: 779.04 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 112.48

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 112.48

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 292.51°T Reverse 112.51°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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**Table C-3
Black Mountain to Lyons Peak**

Site	BLACK MTN	LYONS PEAK
Latitude	32 58 53.00 N	32 42 3.38 N
Lat (Dec Degrees)	32.98139	32.70094
Longitude	117 06 59.00 W	116 45 56.56 W
Lon (Dec Degrees)	-117.11639	-116.76571
Site Elevation	1561.02 ft	3690.24 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	133.36	313.55
Antenna Orientation	133.36	313.55
Path Angle	0.82	-0.82
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	30.000 dBm	
RX Threshold		-73.000 dBm
Antenna	SDF 6 - 52A	SDF 6 - 52A
(Ant File/ID)	AMSX0005 X000500005	AMSX0005 X000500005
Ant Gain (Major Lobe)	37.40 dBi	37.40 dBi
Ant Gain (Along Path)	37.39 dBi	37.39 dBi
Line 1	Andrew EWP52 Elliptical Waveguide_ 5.6	Andrew EWP52 Elliptical Waveguide_ 5.6
(Line1 File/ID)	LmsAND00 0120000013	LmsAND00 0120000013
Line1 Length	80.00 ft	80.00 ft
Line1 Loss	0.98 dB	0.98 dB
Circulator Loss	0.50 dB	0.50 dB
Connector Loss	0.25 dB	0.25 dB
Jumper Loss	0.50 dB	0.50 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	133.36	313.55
Distance	28.10 mi	28.10 mi
Absorption Loss		0.19 dB
Rain Loss CRANE:		0.07 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		140.84 dB
Total Gains dBm		104.79
Total Loss dB		146.56
Received Signal Level dBm		-41.77
Unfaded Fade Margin dB		31.23
Digital DFM		46
Composite Fade Margin		31.08
Terrain Factor (a)	0.021	
Climate Factor (b)	0.325	
Undp (TFM)		1.66E-06
Reliability (%)		99.99983441
Outage (sec/yr)		52



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Figure C-3 Black Mountain to Lyons Peak

BLACK MTN

32 58 53.00 N
117 06 59.00 W
NAD 83:
Elev: 1561.02 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 62.52 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: SDF 6 - 52A
GAIN: 37.40 dBi
ORIENT: 133.36

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: SDF 6 - 52A
GAIN: 37.40 dBi
ORIENT: 133.36

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



LYONS PEAK

32 42 3.38 N
116 45 56.56 W
NAD 83:
Elev: 3690.24 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 62.52 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: SDF 6 - 52A
GAIN: 37.40 dBi
ORIENT: 313.55

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: SDF 6 - 52A
GAIN: 37.40 dBi
ORIENT: 313.55

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 133.36°T Reverse 313.55°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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Table C-4
Black Mountain to Mercy Mira Mesa High

Site	BLACK MTN	MERCY MIRA MESA HIGH
Latitude	32 58 53.00 N	32 56 11.00 N
Lat (Dec Degrees)	32.98139	32.93639
Longitude	117 06 59.00 W	117 07 23.02 W
Lon (Dec Degrees)	-117.11639	-117.12306
Site Elevation	1561.02 ft	496.22 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	187.12	7.12
Antenna Orientation	187.12	7.12
Path Angle	-3.69	3.69
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.40 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	187.12	7.12
Distance	3.13 mi	3.13 mi
Absorption Loss		0.02 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		121.77 dB
Total Gains dBm		81.79
Total Loss dB		124.79
Received Signal Level dBm		-43
Unfaded Fade Margin dB		30
Digital DFM		46
Composite Fade Margin		29.89
Terrain Factor (a)	0.503	
Climate Factor (b)	0.325	
Undp (TFM)		7.24E-08
Reliability (%)		99.99999276
Outage (sec/yr)		2



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Figure C-4

Black Mountain to Mercy Mira Mesa High

BLACK MTN

32 58 53.00 N
117 06 59.00 W
NAD 83:
Elev: 1561.02 ft MSL

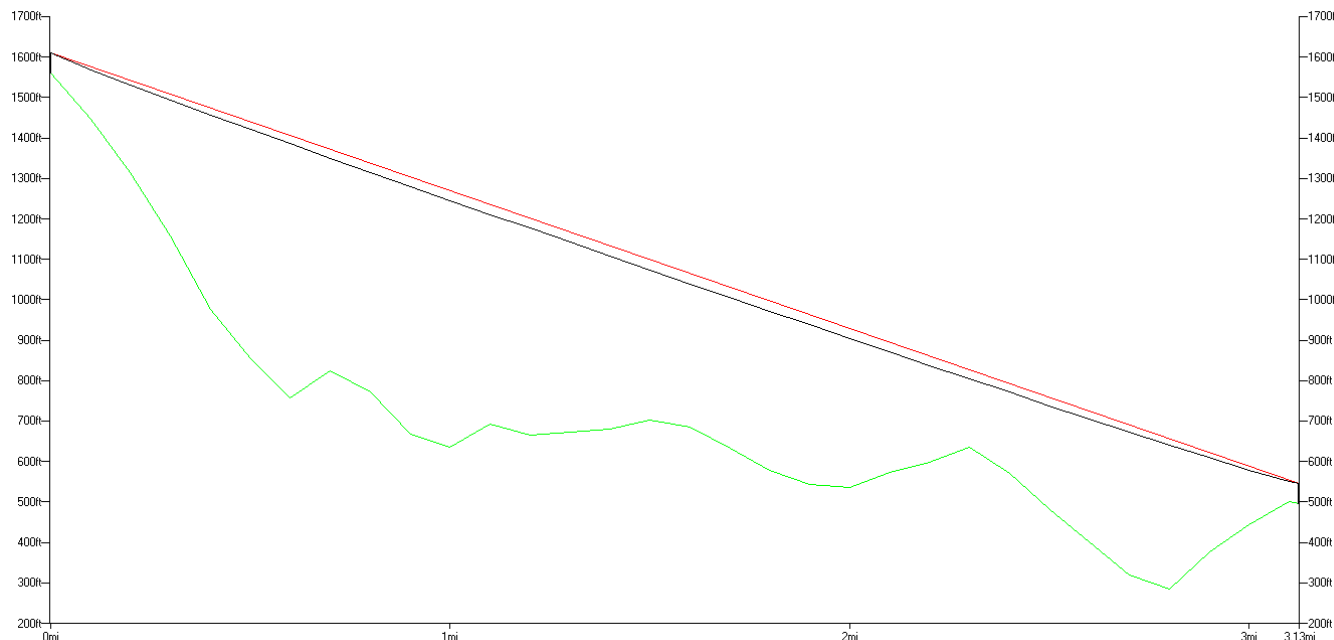
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 187.12

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 187.12

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



MERCY MIRA MESA HIGH

32 56 11.00 N
117 07 23.02 W
NAD 83:
Elev: 496.22 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 7.12

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 7.12

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 187.12°T Reverse 7.12°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)

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Table C-5
Black Mountain to Miramar Ranch North PS

Site	BLACK MTN	MIRAMAR RANCH NORTH PS
Latitude	32 58 53.00 N	32 55 40.01 N
Lat (Dec Degrees)	32.98139	32.92778
Longitude	117 06 59.00 W	117 06 4.00 W
Lon (Dec Degrees)	-117.11639	-117.10111
Site Elevation	1561.02 ft	1002.62 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	166.48	346.49
Antenna Orientation	166.48	346.49
Path Angle	-1.59	1.59
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.40 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	166.48	346.49
Distance	3.80 mi	3.80 mi
Absorption Loss		0.03 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		123.46 dB
Total Gains dBm		81.78
Total Loss dB		126.49
Received Signal Level dBm		-44.71
Unfaded Fade Margin dB		28.29
Digital EIFM		0
Digital AIFM		0
Digital DFM		46
Composite Fade Margin		28.22
Terrain Factor (a)	0.146	
Climate Factor (b)	0.325	
Undp (TFM)		5.59E-08
Reliability (%)		99.99999441
Outage (sec/yr)		2



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Figure C-5 Black Mountain to Miramar Ranch North PS

BLACK MTN

32 58 53.00 N
117 06 59.00 W
NAD 83:
Elev: 1561.02 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 166.48

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 166.48

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



MIRAMAR RANCH NORTH PS

32 55 40.01 N
117 06 4.00 W
NAD 83:
Elev: 1002.62 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 346.49

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 346.49

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 166.48°T Reverse 346.49°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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Table C-6
Black Mountain to Pomerado PS Repeater

Site	BLACK MTN	POMERADO PS RPTR
Latitude	32 58 53.00 N	32 53 38.94 N
Lat (Dec Degrees)	32.98139	32.89415
Longitude	117 06 59.00 W	117 06 38.30 W
Lon (Dec Degrees)	-117.11639	-117.11064
Site Elevation	1561.02 ft	488.94 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	176.82	356.82
Antenna Orientation	176.82	356.82
Path Angle	-1.93	1.93
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna	SPF 3 - 52 B	SPF 3 - 52 B
(Ant File/ID)	AMSX0005 X000500006	AMSX0005 X000500006
Ant Gain (Major Lobe)	32.00 dBi	32.00 dBi
Ant Gain (Along Path)	32.00 dBi	32.00 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	176.82	356.82
Distance	6.02 mi	6.02 mi
Absorption Loss		0.04 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		127.46 dB
Total Gains dBm		90.99
Total Loss dB		130.5
Received Signal Level dBm		-39.51
Unfaded Fade Margin dB		33.49
Digital EIFM		0
Digital AIFM		0
Digital DFM		46
Composite Fade Margin		33.25
Terrain Factor (a)	0.615	
Climate Factor (b)	0.325	
Undp (TFM)		2.84E-07
Reliability (%)		99.99997165
Outage (sec/yr)		9



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Figure C-6 Black Mountain to Pomerado PS Repeater

BLACK MTN

32 58 53.00 N
117 06 59.00 W
NAD 83:
Elev: 1561.02 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 55.34 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: SPF 3 - 52 B
GAIN: 32.00 dBi
ORIENT: 176.82

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: SPF 3 - 52 B
GAIN: 32.00 dBi
ORIENT: 176.82

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



POMERADO PS RPTR

32 53 38.94 N
117 06 38.30 W
NAD 83:
Elev: 488.94 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 55.34 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: SPF 3 - 52 B
GAIN: 32.00 dBi
ORIENT: 356.82

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: SPF 3 - 52 B
GAIN: 32.00 dBi
ORIENT: 356.82

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 176.82°T Reverse 356.82°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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Table C-7
Black Mountain to Penasquitos Bluffs 8 PS

Site	BLACK MTN	PENASQUITOS BLUFFS 8 PS
Latitude	32 58 53.00 N	32 58 5.99 N
Lat (Dec Degrees)	32.98139	32.96833
Longitude	117 06 59.00 W	117 07 46.99 W
Lon (Dec Degrees)	-117.11639	-117.12972
Site Elevation	1561.02 ft	530.76 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	220.71	40.7
Antenna Orientation	220.71	40.71
Path Angle	-9.33	9.33
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.41 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	220.71	40.7
Distance	1.19 mi	1.19 mi
Absorption Loss		0.01 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		113.36 dB
Total Gains dBm		81.8
Total Loss dB		116.37
Received Signal Level dBm		-34.57
Unfaded Fade Margin dB		38.43
Digital DFM		46
Composite Fade Margin		37.73
Terrain Factor (a)	0.5	
Climate Factor (b)	0.325	
Undp (TFM)		5.66E-10
Reliability (%)		99.99999994
Outage (sec/yr)		0



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Figure C-7

Black Mountain to Penasquitos Bluffs 8 PS

BLACK MTN

32 58 53.00 N
117 06 59.00 W
NAD 83:
Elev: 1561.02 ft MSL

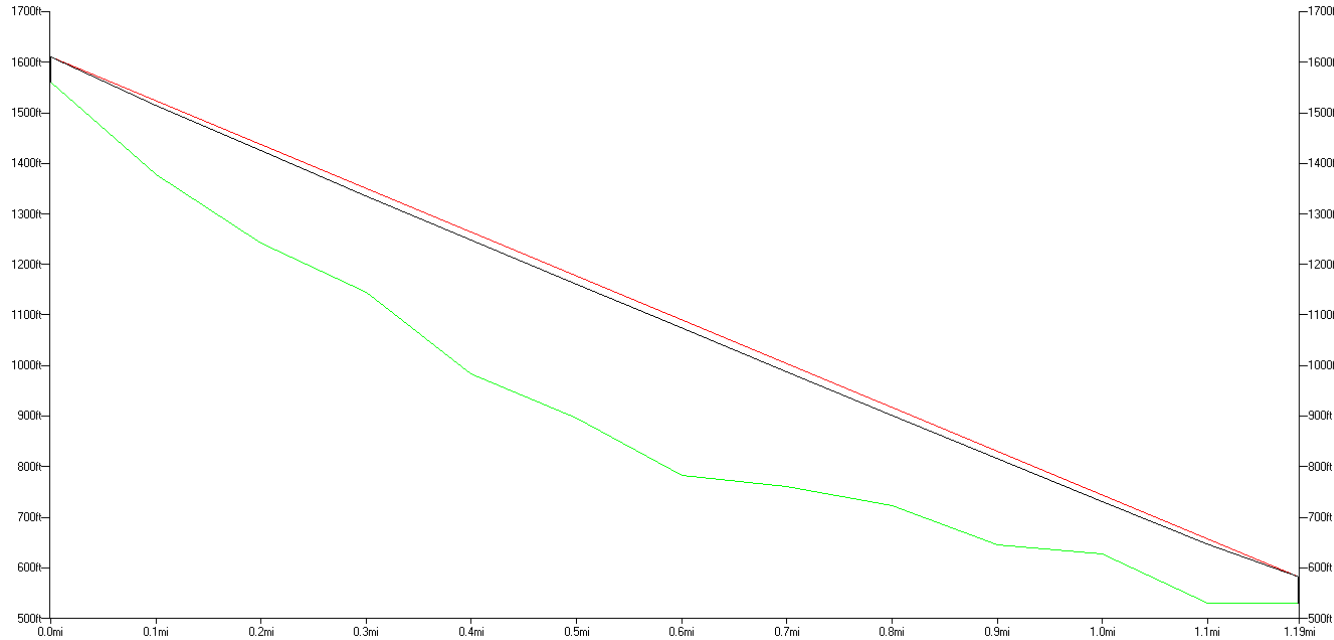
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 220.71

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 220.71

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 220.71°T Reverse 40.70°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)

PENASQUITOS BLUFFS 8
PS

32 58 5.99 N
117 07 46.99 W
NAD 83:
Elev: 530.76 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 40.71

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 40.71

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



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**Table C-8
Black Mountain to Rancho Penasquitos PS**

Site	BLACK MTN	RANCHO PENASQUITOS PS
Latitude	32 58 53.00 N	32 58 23.02 N
Lat (Dec Degrees)	32.98139	32.97306
Longitude	117 06 59.00 W	117 08 6.00 W
Lon (Dec Degrees)	-117.11639	-117.135
Site Elevation	1561.02 ft	440.78 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	242.03	62.02
Antenna Orientation	242.03	62.01
Path Angle	-9.83	9.83
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.39 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	242.03	62.02
Distance	1.22 mi	1.22 mi
Absorption Loss		0.01 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		113.62 dB
Total Gains dBm		81.77
Total Loss dB		116.63
Received Signal Level dBm		-34.86
Unfaded Fade Margin dB		38.14
Digital DFM		46
Composite Fade Margin		37.48
Terrain Factor (a)	0.5	
Climate Factor (b)	0.325	
Undp (TFM)		6.63E-10
Reliability (%)		99.99999993
Outage (sec/yr)		0



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Figure C-8

Black Mountain to Rancho Penasquitos PS

BLACK MTN

32 58 53.00 N
 117 06 59.00 W
 NAD 83:
 Elev: 1561.02 ft MSL

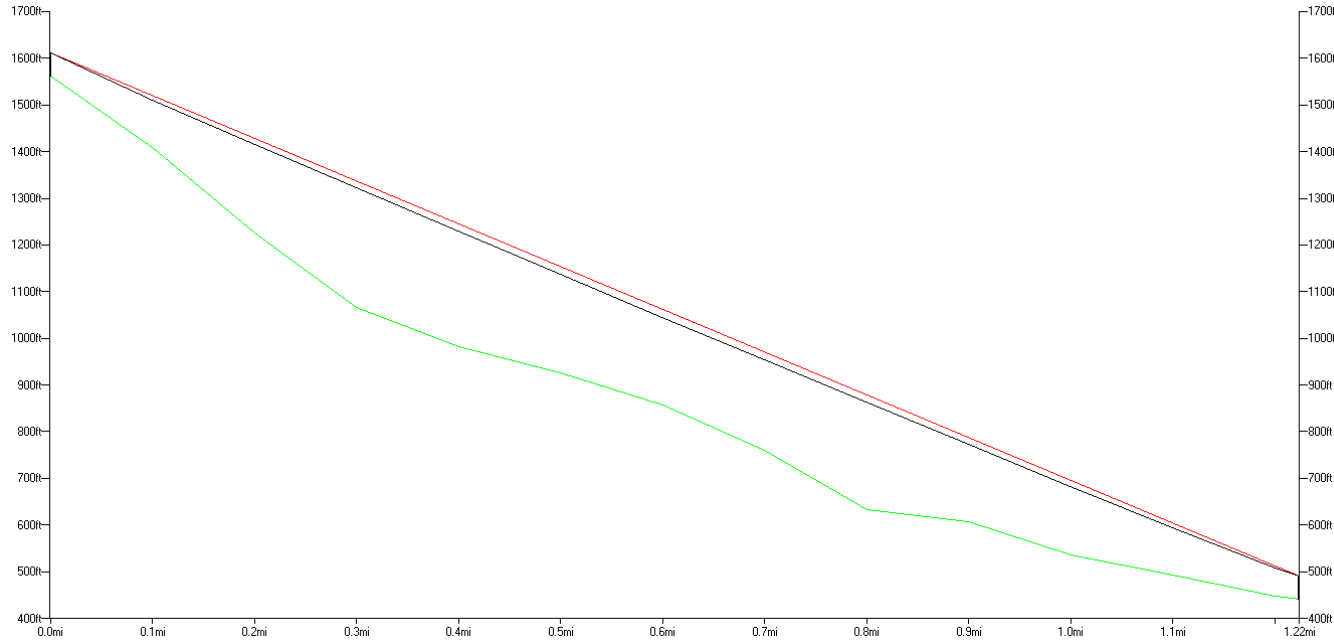
TRANSMITTER:
 FREQ: 5800.00 MHz
 ERP: 51.54 dBm

TX Antenna:
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 242.03

RX Antenna (Primary):
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 242.03

RECEIVER:
 FREQ: 5800.00 MHz
 SENS: -73.00 dBm
 (50.00 Ohms)

DIGITAL SPECS:
 DFM: 46.00



RANCHO PENASQUITOS
 PS

32 58 23.02 N
 117 08 06.00 W
 NAD 83:
 Elev: 440.78 ft MSL

TRANSMITTER:
 FREQ: 5800.00 MHz
 ERP: 51.54 dBm

TX Antenna:
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 62.01

RX Antenna (Primary):
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 62.01

RECEIVER:
 FREQ: 5800.00 MHz
 SENS: -73.00 dBm
 (50.00 Ohms)

DIGITAL SPECS:
 DFM: 46.00

Effective Earth Curvature:
 1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 242.03°T Reverse 62.02°T

Topo Data Step: 0.10
 mi

Topo Data Types:
 30m; 30s; VMB; DTED; BIL;
 HGT

Land Use Data:
 TIA TR8 (May 20
 1997)

Topo Data Interp:
 FCC Interpolation (4
 points)



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Table C-9
Black Mountain to Sewer Pump Station 78

Site	BLACK MTN	SEWER PUMP STATION 78
Latitude	32 58 53.00 N	32 57 46.55 N
Lat (Dec Degrees)	32.98139	32.96293
Longitude	117 06 59.00 W	117 15 20.16 W
Lon (Dec Degrees)	-117.11639	-117.2556
Site Elevation	1561.02 ft	27.91 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	261.1	81.02
Antenna Orientation	261.1	81.02
Path Angle	-2.03	2.03
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.40 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	261.1	81.02
Distance	8.19 mi	8.19 mi
Absorption Loss		0.05 dB
Rain Loss CRANE:		0.01 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		130.13 dB
Total Gains dBm		81.79
Total Loss dB		133.19
Received Signal Level dBm		-51.4
Unfaded Fade Margin dB		21.6
Digital DFM		46
Composite Fade Margin		21.59
Terrain Factor (a)	0.119	
Climate Factor (b)	0.325	
Undp (TFM)		2.13E-06
Reliability (%)		99.99978726
Outage (sec/yr)		67



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Figure C-9 Black Mountain to Sewer PS 78

BLACK MTN

SEWER PUMP STATION 78

32 58 53.00 N
117 06 59.00 W
NAD 83:
Elev: 1561.02 ft MSL

32 57 46.55 N
117 15 20.16 W
NAD 83:
Elev: 27.91 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 261.10

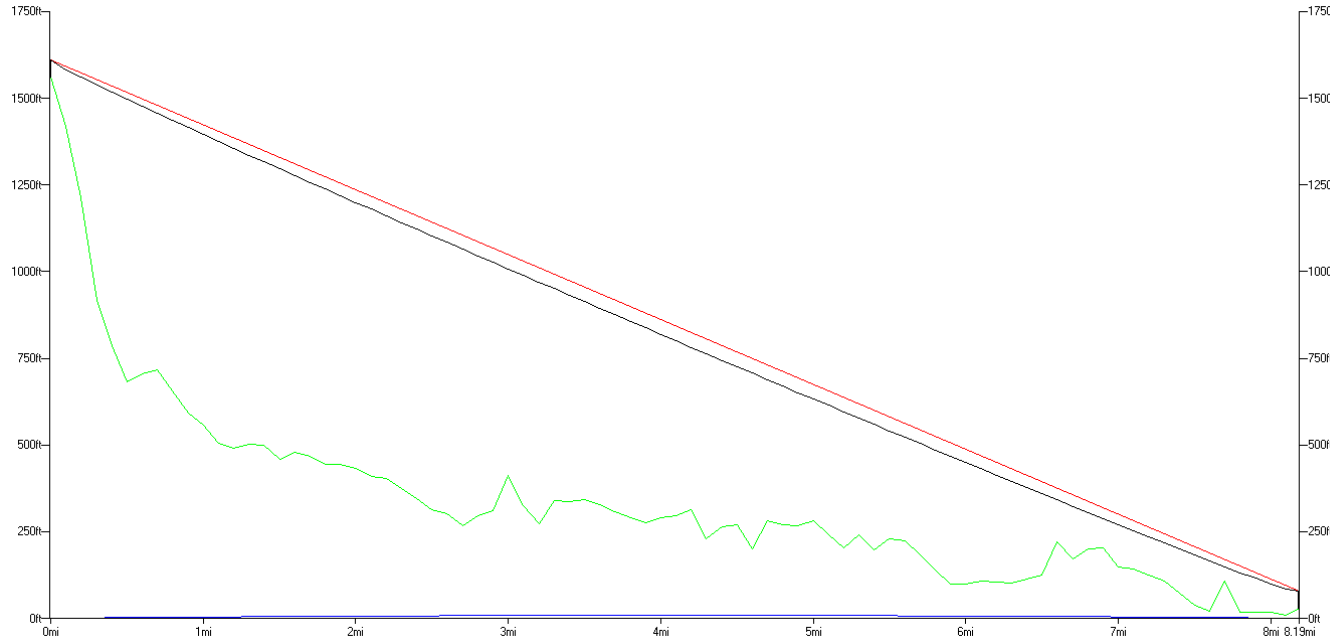
TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 81.02

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 261.10

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 81.02

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)



DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 261.10°T Reverse 81.02°T

DIGITAL SPECS:
DFM: 46.00

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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Table C-10
Black Mountain to Stonebridge PS 1

Site	BLACK MTN	STONEBRIDGE PS 1
Latitude	32 58 53.00 N	32 55 22.01 N
Lat (Dec Degrees)	32.98139	32.92278
Longitude	117 06 59.00 W	117 02 3.01 W
Lon (Dec Degrees)	-117.11639	-117.03417
Site Elevation	1561.02 ft	696.52 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	130.19	310.24
Antenna Orientation	130.19	310.24
Path Angle	-1.5	1.5
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.40 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	130.19	310.24
Distance	6.26 mi	6.26 mi
Absorption Loss		0.04 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		127.79 dB
Total Gains dBm		81.79
Total Loss dB		130.83
Received Signal Level dBm		-49.04
Unfaded Fade Margin dB		23.96
Digital DFM		46
Composite Fade Margin		23.93
Terrain Factor (a)	0.138	
Climate Factor (b)	0.325	
Undp (TFM)		6.40E-07
Reliability (%)		99.999936
Outage (sec/yr)		20



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Figure C-10

Black Mountain to Stonebridge PS 1

BLACK MTN

32 58 53.00 N
117 06 59.00 W
NAD 83:
Elev: 1561.02 ft MSL

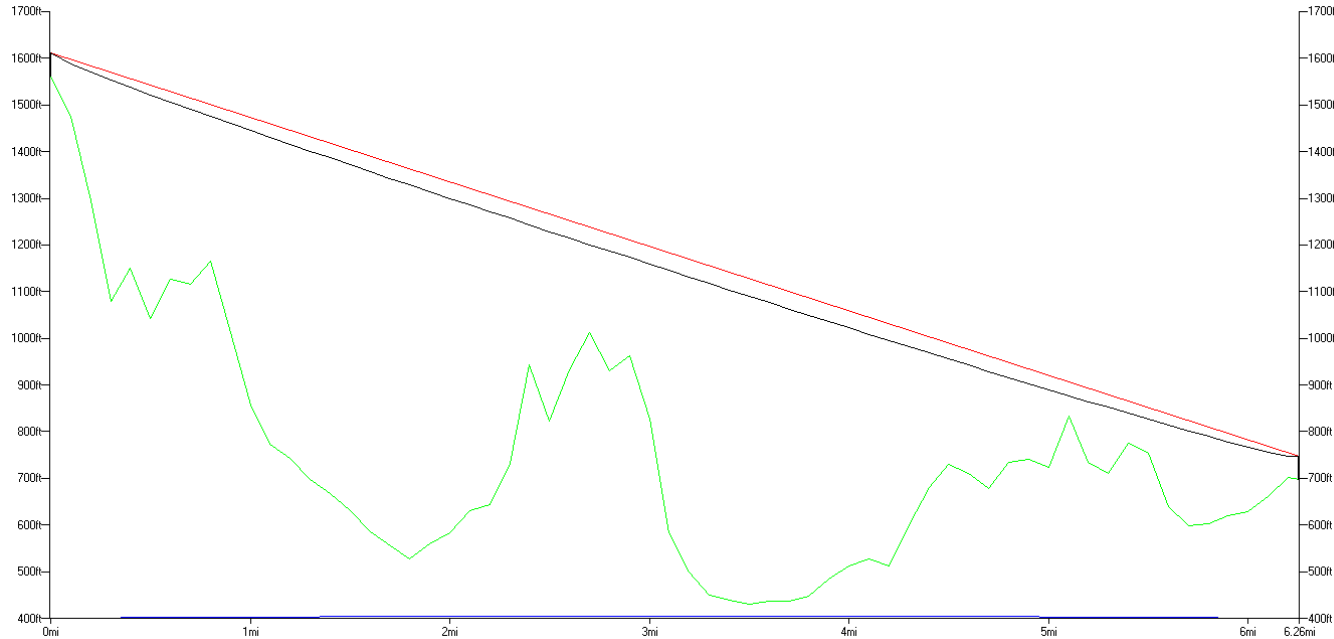
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 130.19

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 130.19

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



STONEBRIDGE PS 1

32 55 22.01 N
117 02 3.01 W
NAD 83:
Elev: 696.52 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 310.24

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 310.24

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 130.19°T Reverse 310.24°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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**Table C-11
Cabrillo Palisades PS to Soledad Reservoir**

Site	CABRILLO PALISADES PS	SOLEDAD RESERVOIR
Latitude	32 48 6.01 N	32 50 16.01 N
Lat (Dec Degrees)	32.80167	32.83778
Longitude	117 09 10.01 W	117 14 55.00 W
Lon (Dec Degrees)	-117.15278	-117.24861
Site Elevation	446.19 ft	711.45 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	294.08	114.02
Antenna Orientation	294.08	114.02
Path Angle	0.47	-0.47
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.41 dBi	27.40 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	294.08	114.02
Distance	6.11 mi	6.11 mi
Absorption Loss		0.04 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		127.58 dB
Total Gains dBm		81.79
Total Loss dB		130.62
Received Signal Level dBm		-48.83
Unfaded Fade Margin dB		24.17
Digital DFM		46
Composite Fade Margin		24.14
Terrain Factor (a)	0.223	
Climate Factor (b)	0.325	
Undp (TFM)		9.16E-07
Reliability (%)		99.99990837
Outage (sec/yr)		29



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Figure C-11

Cabrillo Palisades PS to Soledad Reservoir

CABRILLO PALISADES PS

32 48 6.01 N
117 09 10.01 W
NAD 83:
Elev: 446.19 ft MSL

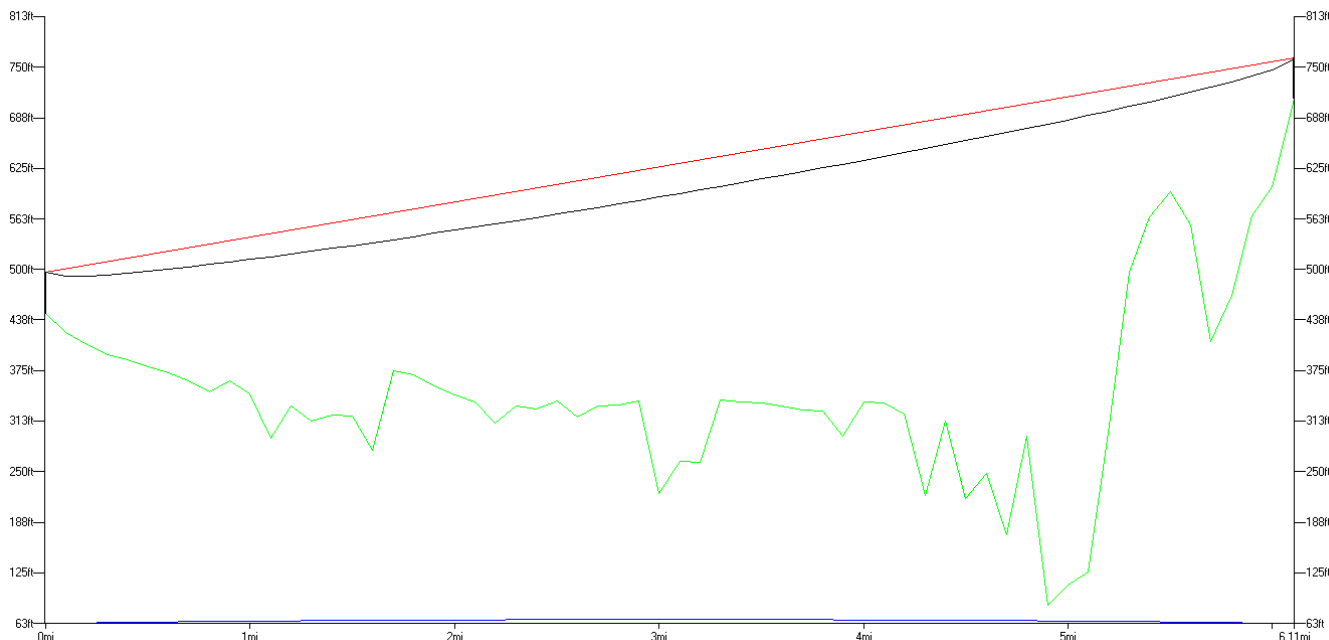
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 294.08

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 294.08

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



SOLEDAD RESERVOIR

32 50 16.01 N
117 14 55.00 W
NAD 83:
Elev: 711.45 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 114.02

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 114.02

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 294.08°T Reverse 114.02°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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Table C-12
Carmel Mountain High Reservoir to Carmel Mountain High PS

Site	CARMEL MTN HIGH RESERVOIR	CARMEL MTN HIGH PS
Latitude	32 57 56.02 N	32 57 58.00 N
Lat (Dec Degrees)	32.96556	32.96611
Longitude	117 04 37.99 W	117 04 49.01 W
Lon (Dec Degrees)	-117.07722	-117.08028
Site Elevation	952.76 ft	792.16 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	282.04	102.04
Antenna Orientation	282.04	102.04
Path Angle	-9.5	9.5
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.41 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	282.04	102.04
Distance	0.18 mi	0.18 mi
Absorption Loss		0.00 dB
Rain Loss		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		97.06 dB
Total Gains dBm		81.8
Total Loss dB		100.06
Received Signal Level dBm		-18.26
Unfaded Fade Margin dB		54.74
Digital DFM		46
Composite Fade Margin		45.46
Terrain Factor (a)	0.5	
Climate Factor (b)	0.325	
Undp (TFM)		4.75E-14
Reliability (%)		100
Outage (sec/yr)		0



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Figure C-12

Carmel Mountain High Reservoir to Carmel Mountain High PS

CARMEL MTN HIGH
RESERVOIR

32 57 56.02 N
117 04 37.99 W
NAD 83:
Elev: 952.76 ft MSL

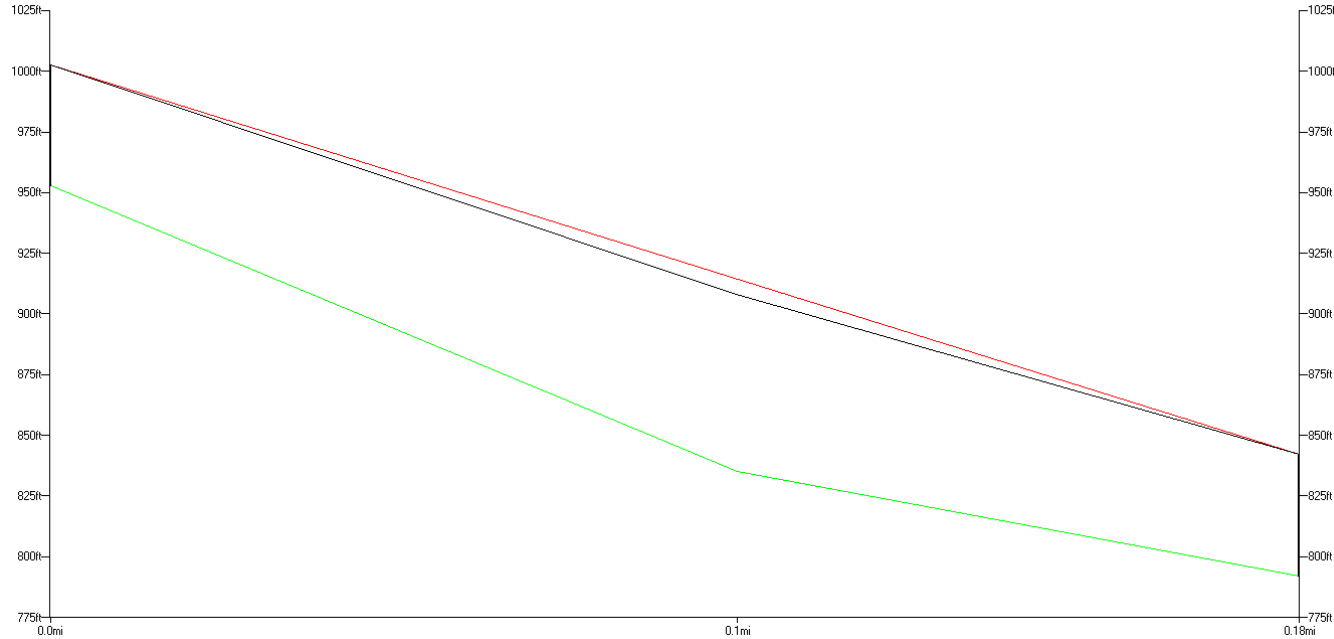
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 282.04

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 282.04

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



CARMEL MTN HIGH PS

32 57 58.00 N
117 04 49.01 W
NAD 83:
Elev: 792.16 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 102.04

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 102.04

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 282.04°T Reverse 102.04°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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**Table C-13
Carmel Mountain Reservoir to Los Penasquitos Reservoir**

Site	CARMEL MTN HIGH RESERVOIR	LOS PENASQUITOS RESERVOIR
Latitude	32 57 56.02 N	32 59 8.99 N
Lat (Dec Degrees)	32.96556	32.98583
Longitude	117 04 37.99 W	117 05 33.00 W
Lon (Dec Degrees)	-117.07722	-117.0925
Site Elevation	952.76 ft	888.29 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	327.57	147.56
Antenna Orientation	327.57	147.56
Path Angle	-0.42	0.42
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.40 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	327.57	147.56
Distance	1.65 mi	1.65 mi
Absorption Loss		0.01 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		116.24 dB
Total Gains dBm		81.78
Total Loss dB		117.25
Received Signal Level dBm		-35.47
Unfaded Fade Margin dB		37.53
Digital DFM		46
Composite Fade Margin		36.95
Terrain Factor (a)	0.5	
Climate Factor (b)	0.325	
Undp (TFM)		1.89E-09
Reliability (%)		99.99999981
Outage (sec/yr)		0



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Figure C-13

Carmel Mountain High Reservoir to Los Penasquitos Reservoir

CARMEL MTN HIGH
RESERVOIR

32 57 56.02 N
117 04 37.99 W
NAD 83:
Elev: 952.76 ft MSL

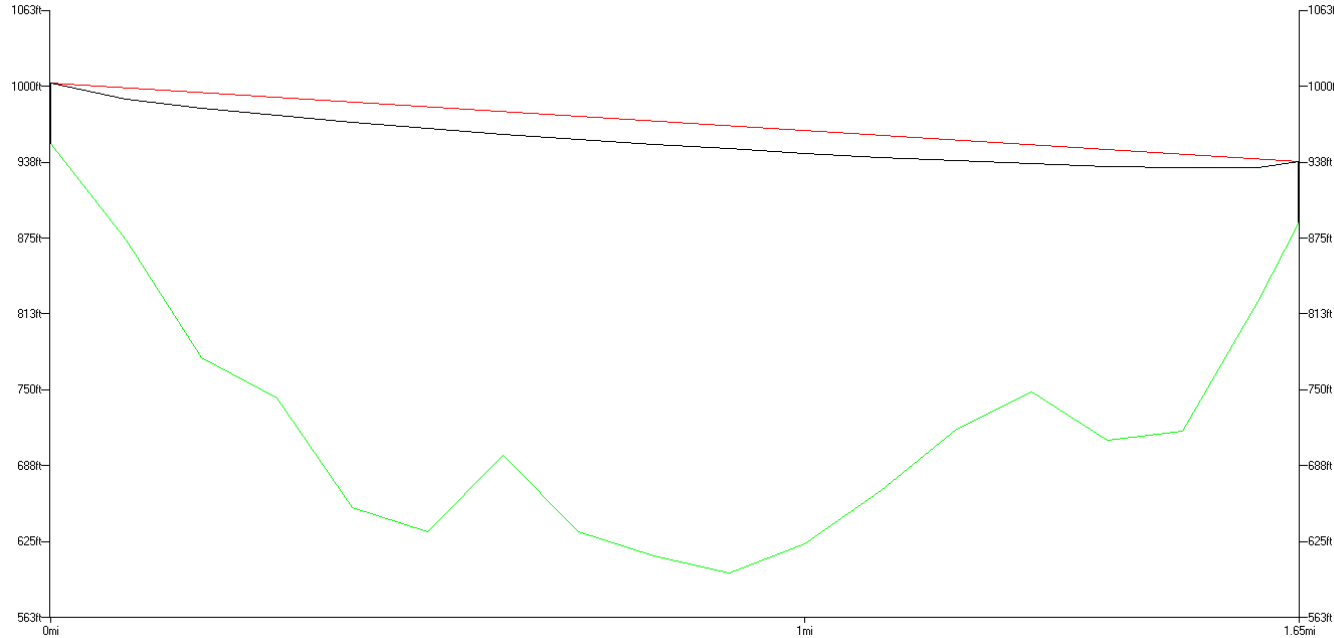
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 52.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 327.57

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 327.57

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



LOS PENASQUITOS
RESERVOIR

32 59 8.99 N
117 05 33.00 W
NAD 83:
Elev: 888.29 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 52.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 147.56

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 147.56

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 327.57°T Reverse 147.56°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)

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Table C-14
Carmel Mountain High Reservoir to Mount Woodson

Site	CARMEL MTN HIGH RESERVOIR	MT WOODSON
Latitude	32 57 56.02 N	33 00 33.01 N
Lat (Dec Degrees)	32.96556	33.00917
Longitude	117 04 37.99 W	116 58 25.00 W
Lon (Dec Degrees)	-117.07722	-116.97361
Site Elevation	952.76 ft	2778.87 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	63.43	243.49
Antenna Orientation	63.43	243.49
Path Angle	2.94	-2.94
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.40 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	63.43	243.49
Distance	6.73 mi	6.73 mi
Absorption Loss		0.05 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		128.42 dB
Total Gains dBm		81.79
Total Loss dB		129.47
Received Signal Level dBm		-47.69
Unfaded Fade Margin dB		25.31
Digital DFM		46
Composite Fade Margin		25.28
Terrain Factor (a)	0.055	
Climate Factor (b)	0.325	
Undp (TFM)		2.32E-07
Reliability (%)		99.9999768
Outage (sec/yr)		7



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Figure C-14

Carmel Mountain High Reservoir to Mount Woodson

CARMEL MTN HIGH
RESERVOIR

32 57 56.02 N
117 04 37.99 W
NAD 83:
Elev: 952.76 ft MSL

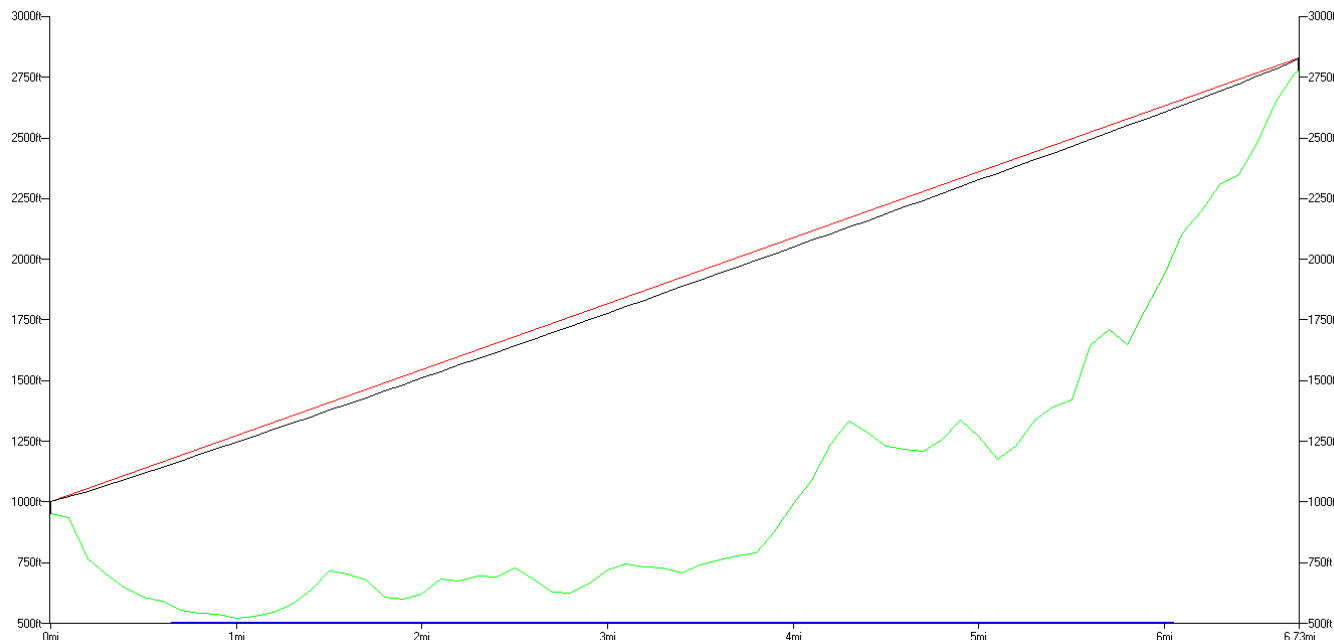
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 52.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 63.43

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 63.43

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



MT WOODSON

33 00 33.01 N
116 58 25.00 W
NAD 83:
Elev: 2778.87 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 52.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 243.49

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 243.49

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00000MHz

Azimuth 63.43°T Reverse 243.49°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)

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Table C-15

Carmel Mountain Mall PS to Carmel Mountain Industrial

Site	CARMEL MTN MALL PS	CARMEL MTN INDUSTRIAL
Latitude	32 58 54.98 N	32 59 8.02 N
Lat (Dec Degrees)	32.98194	32.98556
Longitude	117 04 59.99 W	117 04 54.98 W
Lon (Dec Degrees)	-117.08333	-117.08194
Site Elevation	635.75 ft	700.95 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	17.93	197.93
Antenna Orientation	17.93	197.9
Path Angle	2.7	-2.7
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.37 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	17.93	197.93
Distance	0.26 mi	0.26 mi
Absorption Loss		0.00 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		100.24 dB
Total Gains dBm		81.76
Total Loss dB		103.24
Received Signal Level dBm		-21.48
Unfaded Fade Margin dB		51.52
Digital DFM		46
Composite Fade Margin		44.93
Terrain Factor (a)	0.5	
Climate Factor (b)	0.325	
Undp (TFM)		3.00E-13
Reliability (%)		100
Outage (sec/yr)		0



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Figure C-15

Carmel Mountain Mall PS to Carmel Mountain Industrial

CARMEL MTN MALL PS

32 58 54.98 N
117 04 59.99 W
NAD 83:
Elev: 635.75 ft MSL

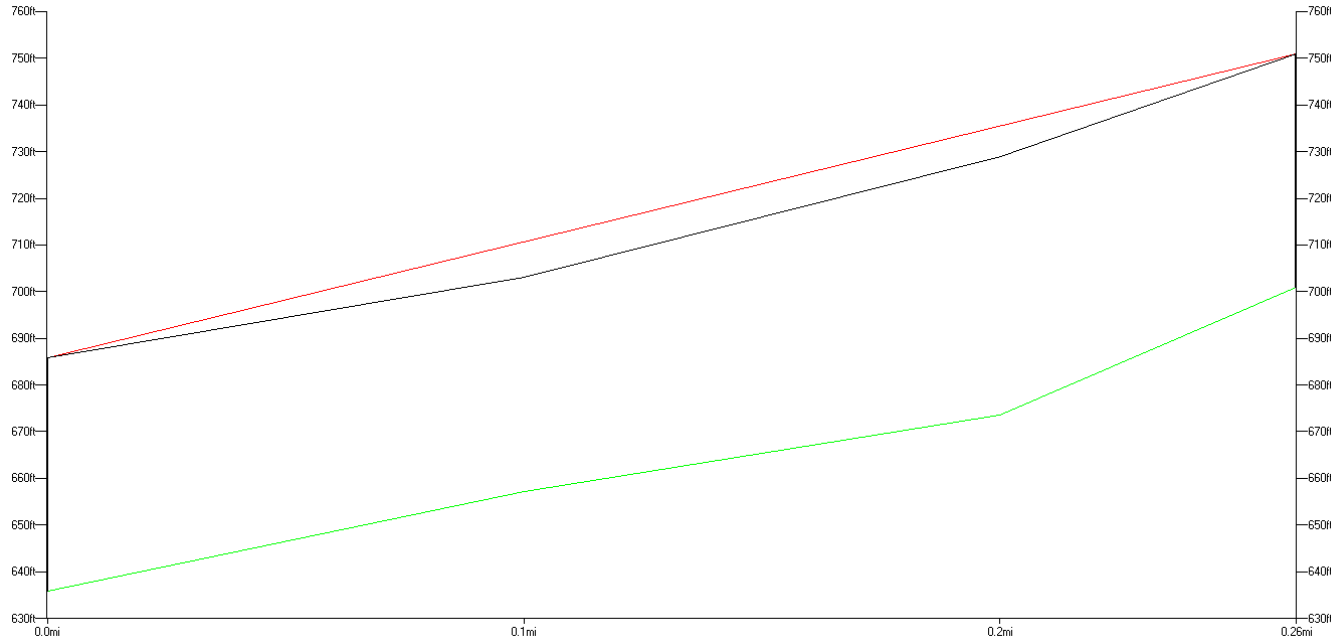
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 17.93

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 17.93

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



CARMEL MTN INDUSTRIAL

32 59 8.02 N
117 04 54.98 W
NAD 83:
Elev: 700.95 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 197.9

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 197.9

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 17.93°T Reverse 197.93°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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Table C-16
Catalina PS to Bayview Reservoir

Site	CATALINA PS	BAYVIEW RESERVOIR
Latitude	32 43 32.02 N	32 49 5.02 N
Lat (Dec Degrees)	32.72556	32.81806
Longitude	117 14 38.00 W	117 14 22.99 W
Lon (Dec Degrees)	-117.24389	-117.23972
Site Elevation	223.84 ft	456.04 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	2.18	182.18
Antenna Orientation	2.18	182.18
Path Angle	0.4	-0.4
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.40 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	2.18	182.18
Distance	6.38 mi	6.38 mi
Absorption Loss		0.04 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		127.96 dB
Total Gains dBm		81.79
Total Loss dB		131
Received Signal Level dBm		-49.22
Unfaded Fade Margin dB		23.78
Digital DFM		46
Composite Fade Margin		23.76
Terrain Factor (a)	0.281	
Climate Factor (b)	0.325	
Undp (TFM)		1.44E-06
Reliability (%)		99.99985621
Outage (sec/yr)		45



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Figure C-16 Catalina PS to Bayview Reservoir

CATALINA PS

32 43 32.02 N
117 14 38.00 W
NAD 83:
Elev: 223.84 ft MSL

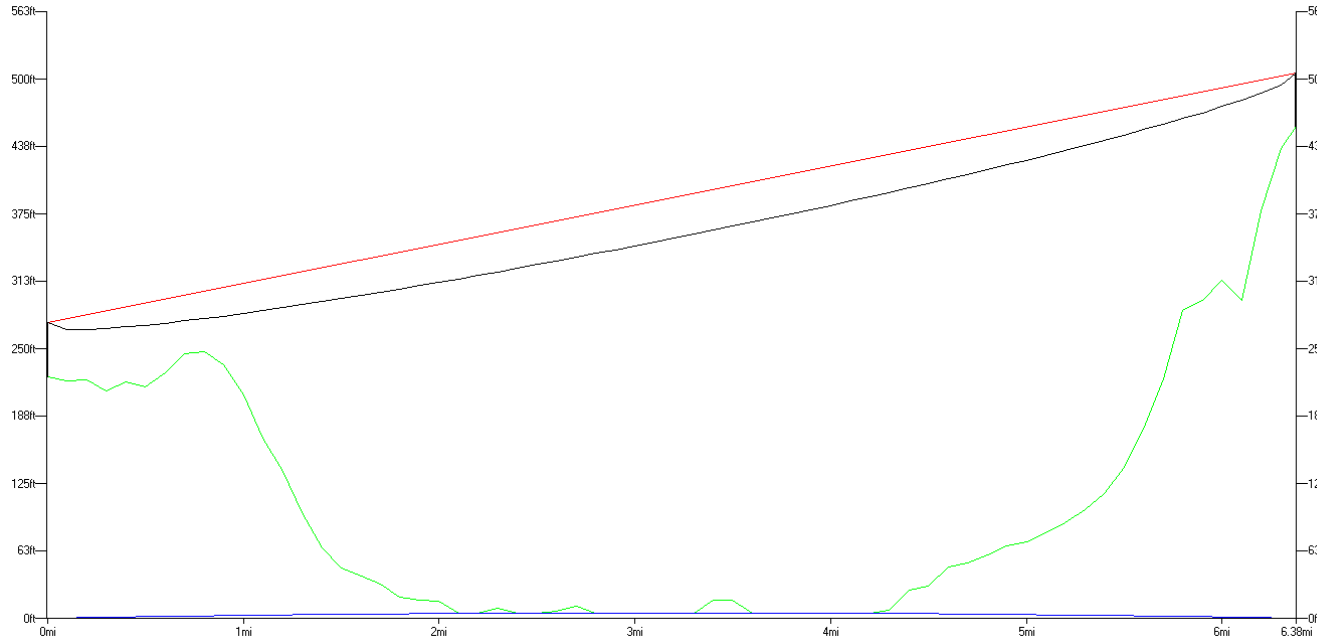
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 2.18

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 2.18

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



BAYVIEW RESERVOIR

32 49 5.02 N
117 14 22.99 W
NAD 83:
Elev: 456.04 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 182.18

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 182.18

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 2.18°T Reverse 182.18°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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Table C-17
Catalina PS to La Jolla Country Club Reservoir

Site	CATALINA PS	LA JOLLA COUNTRY CLUB RESERVOIR
Latitude	32 43 32.02 N	32 50 29.00 N
Lat (Dec Degrees)	32.72556	32.84139
Longitude	117 14 38.00 W	117 15 28.01 W
Lon (Dec Degrees)	-117.24389	-117.25778
Site Elevation	223.84 ft	719.32 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	354.22	174.21
Antenna Orientation	354.22	174.21
Path Angle	0.67	-0.67
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.40 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	354.22	174.21
Distance	8.02 mi	8.02 mi
Absorption Loss		0.05 dB
Rain Loss CRANE:		0.01 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		129.96 dB
Total Gains dBm		81.79
Total Loss dB		133.02
Received Signal Level dBm		-51.23
Unfaded Fade Margin dB		21.77
Digital DFM		46
Composite Fade Margin		21.76
Terrain Factor (a)	0.086	
Climate Factor (b)	0.325	
Undp (TFM)		1.39E-06
Reliability (%)		99.99986089
Outage (sec/yr)		44



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Figure C-17

Catalina PS to La Jolla Country Club Reservoir

CATALINA PS

32 43 32.02 N
117 14 38.00 W
NAD 83:
Elev: 223.84 ft MSL

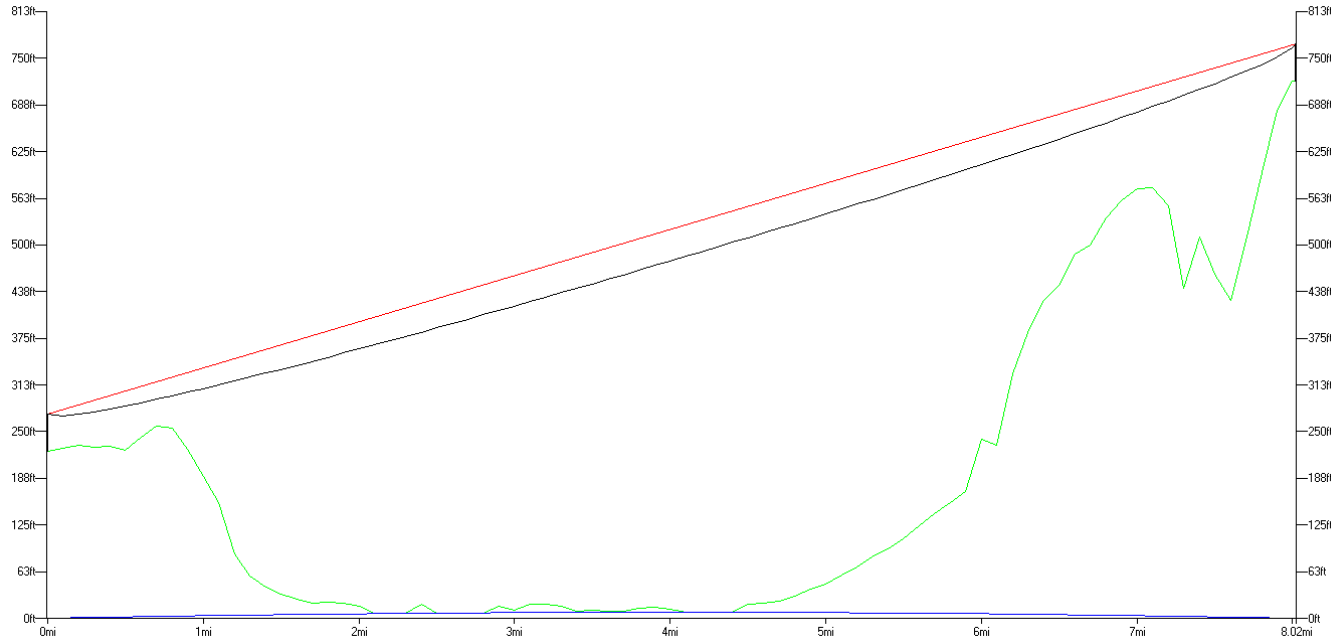
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 354.22

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 354.22

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



LA JOLLA COUNTRY CLUB
RESERVOIR

32 50 29.00 N
117 15 28.01 W
NAD 83:
Elev: 719.32 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 174.21

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 174.21

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 354.22°T Reverse 174.21°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)

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Table C-18

Chollas Heights PS to Red Wood Village Standpipe

Site	CHOLLAS HEIGHTS PS	RED WOOD VILLAGE STANDPIPE
Latitude	32 44 28.00 N	32 44 55.00 N
Lat (Dec Degrees)	32.74111	32.74861
Longitude	117 04 0.01 W	117 04 0.98 W
Lon (Dec Degrees)	-117.06667	-117.06694
Site Elevation	455.54 ft	461.78 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	358.26	178.26
Antenna Orientation	358.26	178.23
Path Angle	0.13	-0.13
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.37 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	358.26	178.26
Distance	0.52 mi	0.52 mi
Absorption Loss		0.00 dB
Rain Loss		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		106.14 dB
Total Gains dBm		81.77
Total Loss dB		109.14
Received Signal Level dBm		-27.37
Unfaded Fade Margin dB		45.63
Digital DFM		46
Composite Fade Margin		42.8
Terrain Factor (a)	0.5	
Climate Factor (b)	0.325	
Undp (TFM)		8.91E-12
Reliability (%)		100
Outage (sec/yr)		0



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Figure C-18

Chollas Heights PS to Red Wood Village Standpipe

CHOLLAS HEIGHTS PS

32 44 28.00 N
117 04 0.01 W
NAD 83:
Elev: 455.54 ft MSL

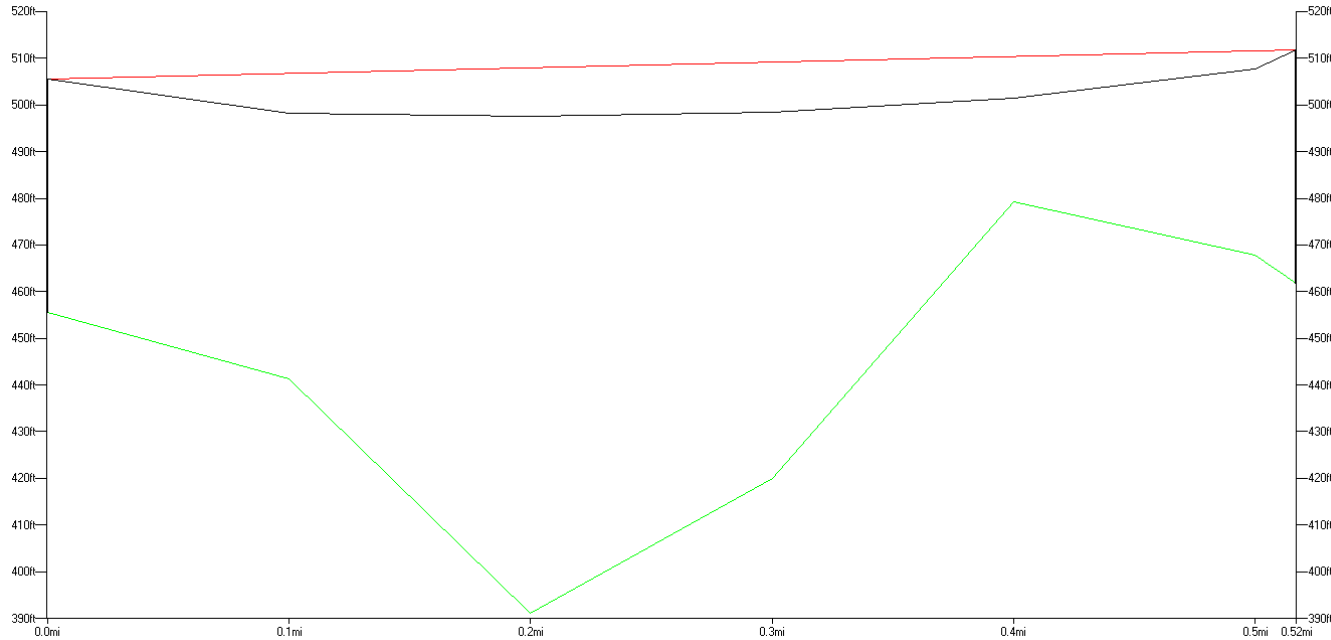
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 358.26

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 358.26

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



RED WOOD VILLAGE
STANDPIPE

32 44 55.00 N
117 04 0.98 W
NAD 83:
Elev: 461.78 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 178.23

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 178.23

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 358.26°T Reverse 178.26°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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**Table C-19
Cowles Mountain to Cabrillo Palisades PS**

Site	COWLES MTN	CABRILLO PALISADES PS
Latitude	32 48 49.00 N	32 48 6.01 N
Lat (Dec Degrees)	32.81361	32.80167
Longitude	117 01 55.99 W	117 09 10.01 W
Lon (Dec Degrees)	-117.03222	-117.15278
Site Elevation	1513.86 ft	446.19 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	263.34	83.28
Antenna Orientation	263.34	83.28
Path Angle	-1.64	1.64
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.40 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	263.34	83.28
Distance	7.06 mi	7.06 mi
Absorption Loss		0.05 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		128.85 dB
Total Gains dBm		81.79
Total Loss dB		131.9
Received Signal Level dBm		-50.11
Unfaded Fade Margin dB		22.89
Digital DFM		46
Composite Fade Margin		22.87
Terrain Factor (a)	0.187	
Climate Factor (b)	0.325	
Undp (TFM)		1.60E-06
Reliability (%)		99.99984026
Outage (sec/yr)		50



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Figure C-19

Cowles Mountain to Cabrillo Palisades PS

COWLES MTN

32 48 49.00 N
117 01 55.99 W
NAD 83:
Elev: 1513.86 ft MSL

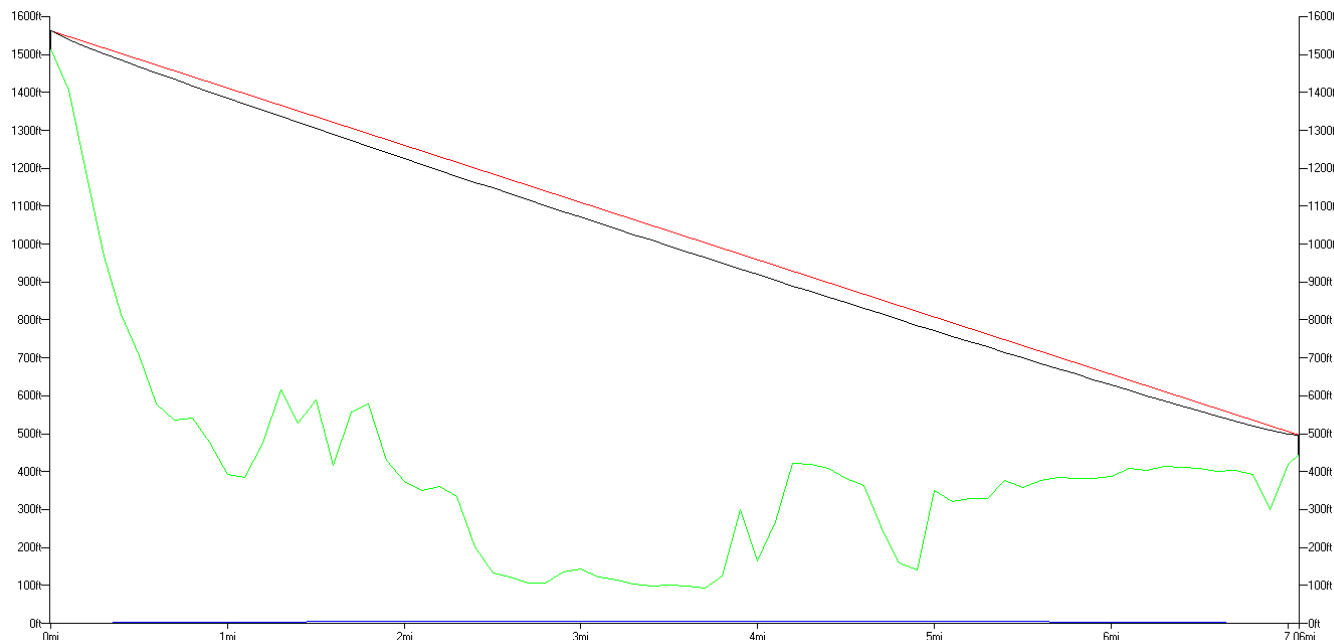
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 263.34

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 263.34

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



CABRILLO PALISADES PS

32 48 6.01 N
117 09 10.01 W
NAD 83:
Elev: 446.19 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 83.28

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 83.28

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 263.34°T Reverse 83.28°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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**Table C-20
Cowles Mountain to Deerfield PS**

Site	COWLES MTN	DEERFIELD PS
Latitude	32 48 49.00 N	32 48 59.00 N
Lat (Dec Degrees)	32.81361	32.81639
Longitude	117 01 55.99 W	117 03 45.00 W
Lon (Dec Degrees)	-117.03222	-117.0625
Site Elevation	1513.86 ft	317.75 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	276.21	96.2
Antenna Orientation	276.21	96.19
Path Angle	-7.28	7.28
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.39 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	276.21	96.2
Distance	1.77 mi	1.77 mi
Absorption Loss		0.01 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		116.84 dB
Total Gains dBm		81.78
Total Loss dB		119.85
Received Signal Level dBm		-38.07
Unfaded Fade Margin dB		34.93
Digital DFM		46
Composite Fade Margin		34.6
Terrain Factor (a)	0.5	
Climate Factor (b)	0.325	
Undp (TFM)		4.22E-09
Reliability (%)		99.99999958
Outage (sec/yr)		0



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Figure C-20 Cowles Mountain to Deerfield PS

COWLES MTN

32 48 49.00 N
117 01 55.99 W
NAD 83:
Elev: 1513.86 ft MSL

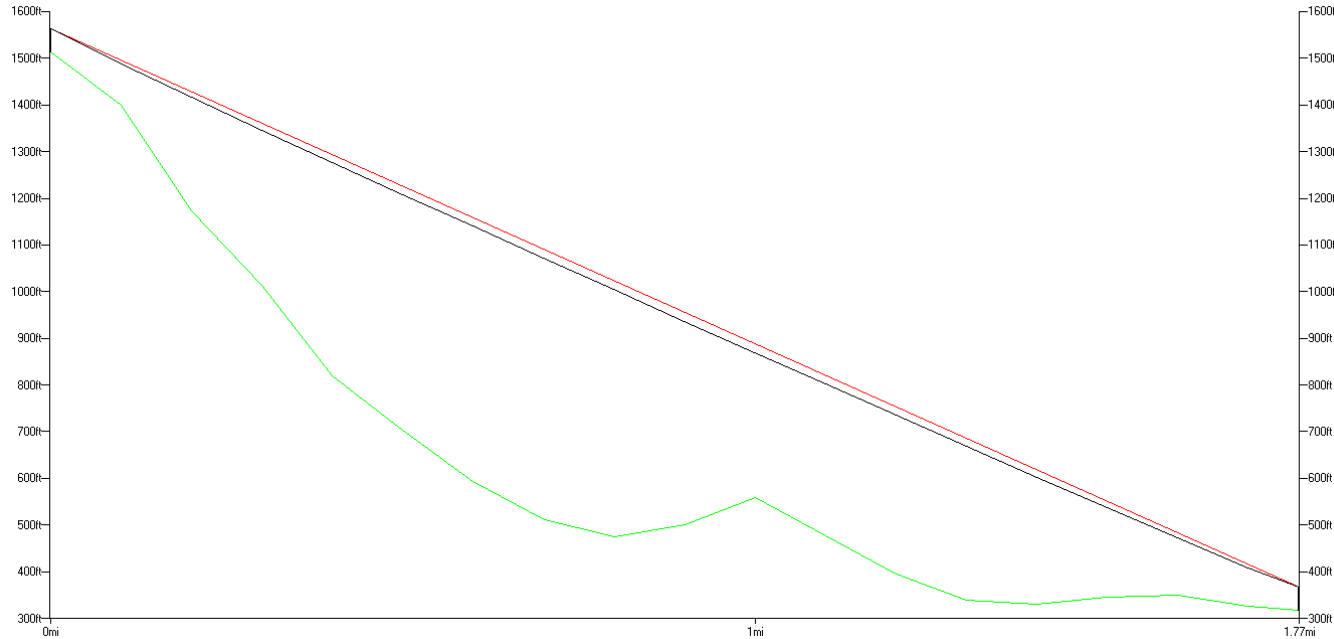
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 276.21

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 276.21

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



DEERFIELD PS

32 48 59.00 N
117 03 45.00 W
NAD 83:
Elev: 317.75 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 96.19

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 96.19

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 276.21°T Reverse 96.20°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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**Table C-21
Cowles Mountain to Del Cerro Highland PS**

Site	COWLES MTN	DEL CERRO HIGHLANDS PS
Latitude	32 48 49.00 N	32 47 21.01 N
Lat (Dec Degrees)	32.81361	32.78917
Longitude	117 01 55.99 W	117 03 20.02 W
Lon (Dec Degrees)	-117.03222	-117.05556
Site Elevation	1513.86 ft	758.45 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	218.89	38.88
Antenna Orientation	218.89	38.88
Path Angle	-3.78	3.78
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.40 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	218.89	38.88
Distance	2.16 mi	2.16 mi
Absorption Loss		0.01 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		118.57 dB
Total Gains dBm		81.78
Total Loss dB		121.58
Received Signal Level dBm		-39.8
Unfaded Fade Margin dB		33.2
Digital DFM		46
Composite Fade Margin		32.98
Terrain Factor (a)	4	
Climate Factor (b)	0.325	
Undp (TFM)		9.13E-08
Reliability (%)		99.99999087
Outage (sec/yr)		3



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Figure C-21

Cowles Mountain to Del Cerro Highlands PS

COWLES MTN

32 48 49.00 N
 117 01 55.99 W
 NAD 83:
 Elev: 1513.86 ft MSL

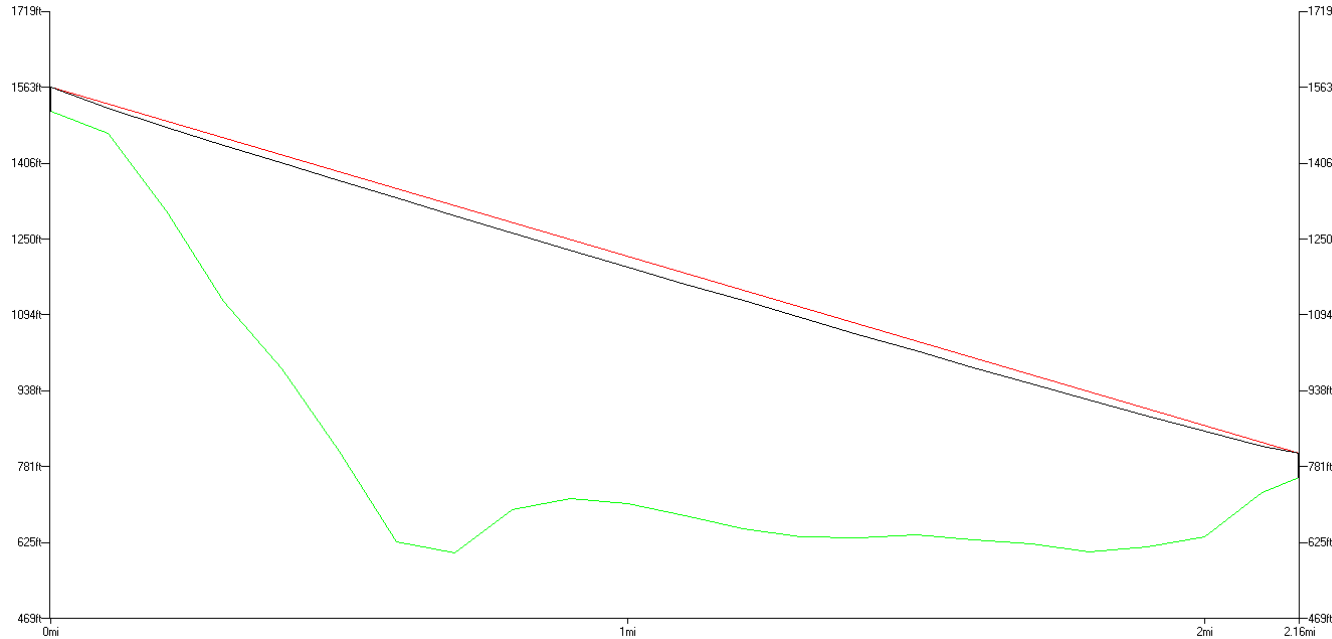
TRANSMITTER:
 FREQ: 5800.00 MHz
 ERP: 51.54 dBm

TX Antenna:
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 218.89

RX Antenna (Primary):
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 218.89

RECEIVER:
 FREQ: 5800.00 MHz
 SENS: -73.00 dBm
 (50.00 Ohms)

DIGITAL SPECS:
 DFM: 46.00



DEL CERRO HIGHLANDS PS

32 47 21.01 N
 117 03 20.02 W
 NAD 83:
 Elev: 758.45 ft MSL

TRANSMITTER:
 FREQ: 5800.00 MHz
 ERP: 51.54 dBm

TX Antenna:
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 38.88

RX Antenna (Primary):
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 38.88

RECEIVER:
 FREQ: 5800.00 MHz
 SENS: -73.00 dBm
 (50.00 Ohms)

DIGITAL SPECS:
 DFM: 46.00

Effective Earth Curvature:
 1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 218.89°T Reverse 38.88°T

Topo Data Step: 0.10
 mi

Topo Data Types:
 30m; 30s; VMB; DTED; BIL;
 HGT

Land Use Data:
 TIA TR8 (May 20
 1997)

Topo Data Interp:
 FCC Interpolation (4
 points)



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**Table C-22
Cowles Mountain to Friars Road Regulator**

Site	COWLES MTN	FRIARS RD REGULATOR
Latitude	32 48 49.00 N	32 46 41.02 N
Lat (Dec Degrees)	32.81361	32.77806
Longitude	117 01 55.99 W	117 08 7.01 W
Lon (Dec Degrees)	-117.03222	-117.13528
Site Elevation	1513.86 ft	94.24 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	247.81	67.76
Antenna Orientation	247.81	67.75
Path Angle	-2.38	2.38
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.39 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	247.81	67.76
Distance	6.48 mi	6.48 mi
Absorption Loss		0.04 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		128.10 dB
Total Gains dBm		81.78
Total Loss dB		131.14
Received Signal Level dBm		-49.36
Unfaded Fade Margin dB		23.64
Digital DFM		46
Composite Fade Margin		23.62
Terrain Factor (a)	0.126	
Climate Factor (b)	0.325	
Undp (TFM)		6.98E-07
Reliability (%)		99.99993018
Outage (sec/yr)		22



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Figure C-22

Cowles Mountain to Friars Road Regulator

COWLES MTN

32 48 49.00 N
117 01 55.99 W
NAD 83:
Elev: 1513.86 ft MSL

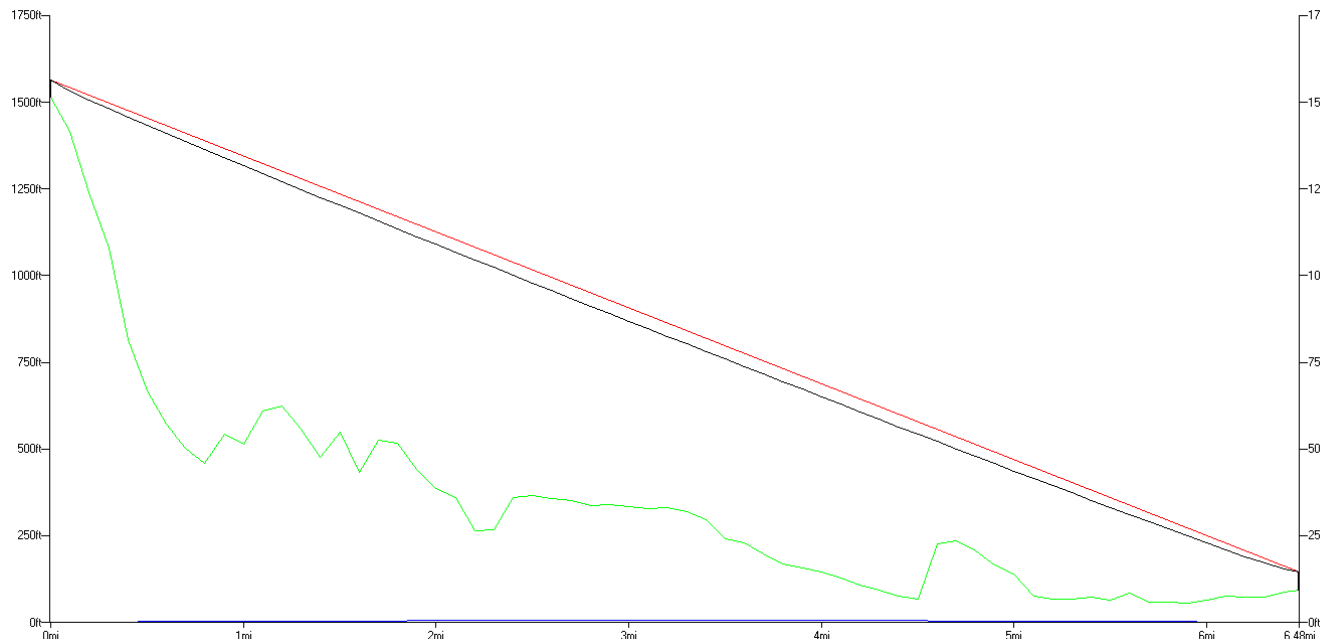
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 247.81

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 247.81

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



FRIARS RD REGULATOR

32 46 41.02 N
117 08 7.01 W
NAD 83:
Elev: 94.24 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 67.75

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 67.75

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 247.81°T Reverse 67.76°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)

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Table C-23 Cowles Mountain to Lyons Peak

Site	COWLES MTN	LYONS PEAK
Latitude	32 48 49.00 N	32 42 3.38 N
Lat (Dec Degrees)	32.81361	32.70094
Longitude	117 01 55.99 W	116 45 56.56 W
Lon (Dec Degrees)	-117.03222	-116.76571
Site Elevation	1513.86 ft	3690.24 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	116.51	296.65
Antenna Orientation	116.51	296.65
Path Angle	1.36	-1.36
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	30.000 dBm	
RX Threshold		-73.000 dBm
Antenna	SDF 4 - 52A	SDF 4 - 52A
(Ant File/ID)	AMSX0005 X000500004	AMSX0005 X000500004
Ant Gain (Major Lobe)	33.90 dBi	33.90 dBi
Ant Gain (Along Path)	33.90 dBi	33.90 dBi
Line 1	Andrew EWP52 Elliptical Waveguide_ 5.6	Andrew EWP52 Elliptical Waveguide_ 5.6
(Line1 File/ID)	LmsAND00 0120000013	LmsAND00 0120000013
Line1 Length	80.00 ft	80.00 ft
Line1 Loss	0.98 dB	0.98 dB
Circulator Loss	0.50 dB	0.50 dB
Connector Loss	0.25 dB	0.25 dB
Jumper Loss	0.50 dB	0.50 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	116.51	296.65
Distance	17.35 mi	17.35 mi
Absorption Loss		0.12 dB
Rain Loss CRANE:		0.04 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		136.66 dB
Total Gains dBm		97.8
Total Loss dB		142.28
Received Signal Level dBm		-44.48
Unfaded Fade Margin dB		28.52
Digital DFM		46
Composite Fade Margin		28.44
Terrain Factor (a)	0.025	
Climate Factor (b)	0.325	
Undp (TFM)		8.65E-07
Reliability (%)		99.99991349
Outage (sec/yr)		27



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Figure C-23 Cowles Mountain to Lyons Peak

COWLES MTN

32 48 49.00 N
117 01 55.99 W
NAD 83:
Elev: 1513.86 ft MSL

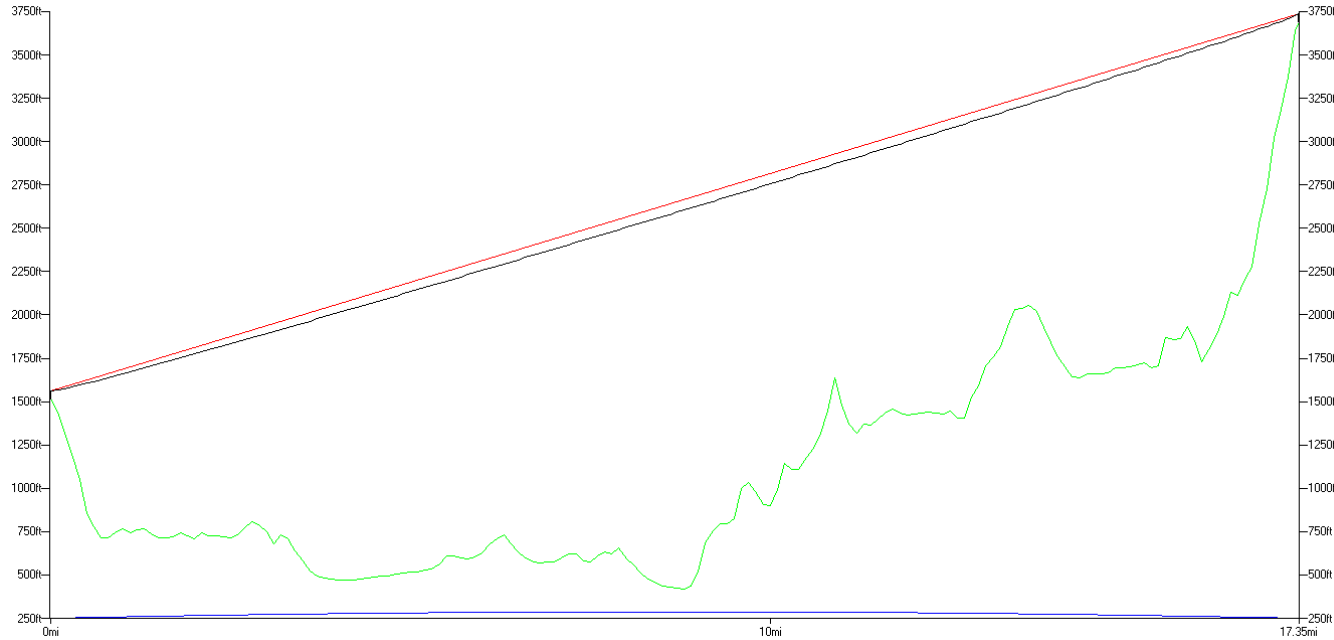
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 59.02 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: SDF 4 - 52A
GAIN: 33.90 dBi
ORIENT: 116.51

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: SDF 4 - 52A
GAIN: 33.90 dBi
ORIENT: 116.51

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



LYONS PEAK

32 42 3.38 N
116 45 56.56 W
NAD 83:
Elev: 3690.24 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 59.02 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: SDF 4 - 52A
GAIN: 33.90 dBi
ORIENT: 296.65

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: SDF 4 - 52A
GAIN: 33.90 dBi
ORIENT: 296.65

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 116.51°T Reverse 296.65°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)

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**Table C-24
Cowles Mountain to Security Operations Center (SOC)**

Site	COWLES MTN	SECURITY OPERATIONS CENTER (SOC)
Latitude	32 48 49.00 N	32 44 4.99 N
Lat (Dec Degrees)	32.81361	32.73472
Longitude	117 01 55.99 W	117 04 18.01 W
Lon (Dec Degrees)	-117.03222	-117.07167
Site Elevation	1513.86 ft	423.56 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	202.91	22.89
Antenna Orientation	202.91	22.89
Path Angle	-2	2
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMXS0005 X000500017	FP2-5-28 Vpol AMXS0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.40 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	202.91	22.89
Distance	5.90 mi	5.90 mi
Absorption Loss		0.04 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		127.29 dB
Total Gains dBm		81.79
Total Loss dB		130.33
Received Signal Level dBm		-48.54
Unfaded Fade Margin dB		24.46
Digital DFM		46
Composite Fade Margin		24.43
Terrain Factor (a)	0.271	
Climate Factor (b)	0.325	
Undp (TFM)		9.40E-07
Reliability (%)		99.99990596
Outage (sec/yr)		30



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Figure C-24

Cowles Mountain to Security Operations Center (SOC)

COWLES MTN

32 48 49.00 N
 117 01 55.99 W
 NAD 83:
 Elev: 1513.86 ft MSL

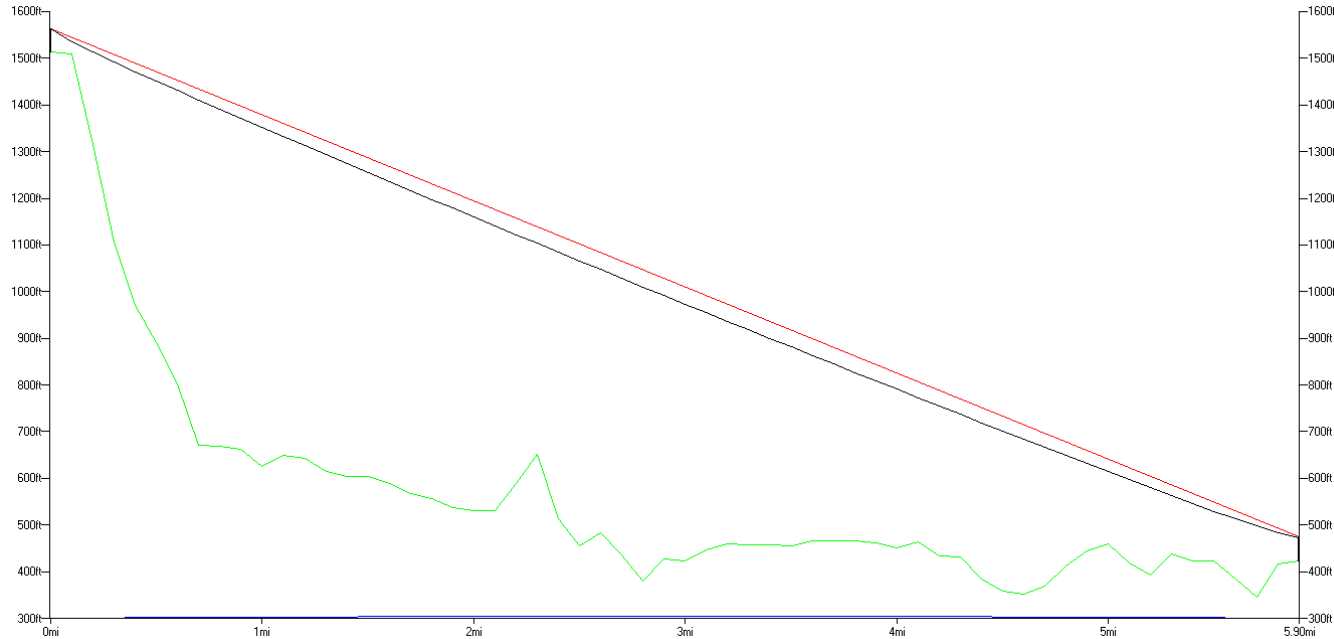
TRANSMITTER:
 FREQ: 5800.00 MHz
 ERP: 51.54 dBm

TX Antenna:
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 202.91

RX Antenna (Primary):
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 202.91

RECEIVER:
 FREQ: 5800.00 MHz
 SENS: -73.00 dBm
 (50.00 Ohms)

DIGITAL SPECS:
 DFM: 46.00



SECURITY OPERATIONS
 CENTER (SOC)

32 44 4.99 N
 117 04 18.01 W
 NAD 83:
 Elev: 423.56 ft MSL

TRANSMITTER:
 FREQ: 5800.00 MHz
 ERP: 51.54 dBm

TX Antenna:
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 22.89

RX Antenna (Primary):
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 22.89

RECEIVER:
 FREQ: 5800.00 MHz
 SENS: -73.00 dBm
 (50.00 Ohms)

DIGITAL SPECS:
 DFM: 46.00

Effective Earth Curvature:
 1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 202.91°T Reverse 22.89°T

Topo Data Step: 0.10
 mi

Topo Data Types:
 30m; 30s; VMB; DTED; BIL;
 HGT

Land Use Data:
 TIA TR8 (May 20
 1997)

Topo Data Interp:
 FCC Interpolation (4
 points)



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**Table C-25
Cowles Mountain to Waring Road PS**

Site	COWLES MTN	WARING RD PS
Latitude	32 48 49.00 N	32 46 59.02 N
Lat (Dec Degrees)	32.81361	32.78306
Longitude	117 01 55.99 W	117 05 15.00 W
Lon (Dec Degrees)	-117.03222	-117.0875
Site Elevation	1513.86 ft	120.98 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	236.82	56.79
Antenna Orientation	236.82	56.78
Path Angle	-3.92	3.92
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.39 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	236.82	56.79
Distance	3.84 mi	3.84 mi
Absorption Loss		0.03 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		123.57 dB
Total Gains dBm		81.79
Total Loss dB		126.6
Received Signal Level dBm		-44.81
Unfaded Fade Margin dB		28.19
Digital DFM		46
Composite Fade Margin		28.12
Terrain Factor (a)	6.046	
Climate Factor (b)	0.325	
Undp (TFM)		2.46E-06
Reliability (%)		99.99975435
Outage (sec/yr)		77



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Figure C-25

Cowles Mountain to Waring Road PS

COWLES MTN

32 48 49.00 N
117 01 55.99 W
NAD 83:
Elev: 1513.86 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 236.82

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 236.82

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



WARING RD PS

32 46 59.02 N
117 05 15.00 W
NAD 83:
Elev: 120.98 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 56.78

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 56.78

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 236.82°T Reverse 56.79°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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**Table C-26
Del Cerro Highlands PS to Climax**

Site	DEL CERRO HIGHLANDS PS	CLIMAX
Latitude	32 47 21.01 N	32 48 38.99 N
Lat (Dec Degrees)	32.78917	32.81083
Longitude	117 03 20.02 W	117 01 7.00 W
Lon (Dec Degrees)	-117.05556	-117.01861
Site Elevation	758.45 ft	742.62 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	55.23	235.25
Antenna Orientation	55.23	235.25
Path Angle	-0.07	0.07
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.40 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	55.23	235.25
Distance	2.62 mi	2.62 mi
Absorption Loss		0.02 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		120.23 dB
Total Gains dBm		81.8
Total Loss dB		123.25
Received Signal Level dBm		-41.45
Unfaded Fade Margin dB		31.55
Digital DFM		46
Composite Fade Margin		31.4
Terrain Factor (a)	4	
Climate Factor (b)	0.325	
Undp (TFM)		2.37E-07
Reliability (%)		99.99997634
Outage (sec/yr)		7



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Figure C-26 Del Cerro Highlands PS to Climax

DEL CERRO HIGHLANDS PS

32 47 21.01 N
117 03 20.02 W
NAD 83:
Elev: 758.45 ft MSL

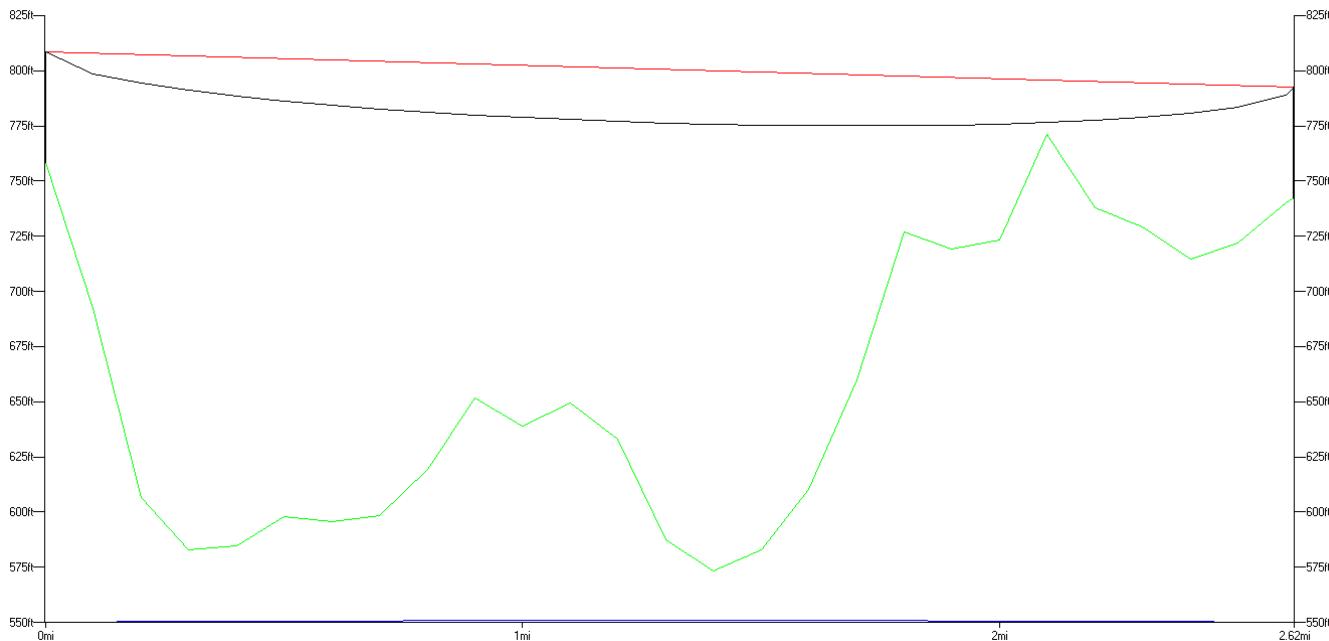
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 55.23

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 55.23

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



CLIMAX

32 48 38.99 N
117 01 7.00 W
NAD 83:
Elev: 742.62 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 235.25

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 235.25

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 55.23°T Reverse 235.25°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)

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Table C-27
Del Cerro PS to Del Cel Reservoir

Site	DEL CERRO PS	DEL CERRO RESERVOIR
Latitude	32 46 57.00 N	32 47 12.98 N
Lat (Dec Degrees)	32.7825	32.78694
Longitude	117 03 42.01 W	117 03 38.02 W
Lon (Dec Degrees)	-117.06167	-117.06056
Site Elevation	453.17 ft	673.56 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	11.92	191.92
Antenna Orientation	11.92	191.96
Path Angle	7.6	-7.6
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.44 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	11.92	191.92
Distance	0.31 mi	0.31 mi
Absorption Loss		0.00 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		101.77 dB
Total Gains dBm		81.82
Total Loss dB		104.77
Received Signal Level dBm		-22.95
Unfaded Fade Margin dB		50.05
Digital DFM		46
Composite Fade Margin		44.56
Terrain Factor (a)	0.5	
Climate Factor (b)	0.325	
Undp (TFM)		7.12E-13
Reliability (%)		100
Outage (sec/yr)		0



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Figure C-27

Del Cerro PS to Del Cerro Reservoir

DEL CERRO PS

32 46 57.00 N
 117 03 42.01 W
 NAD 83:
 Elev: 453.17 ft MSL

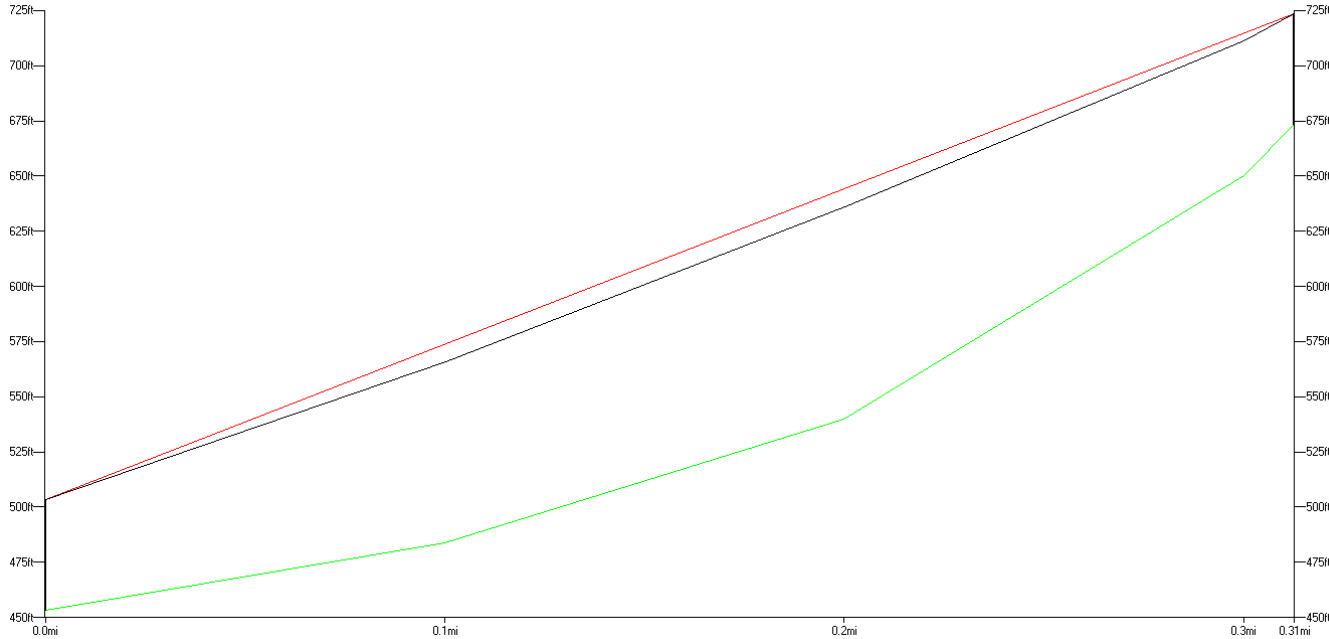
TRANSMITTER:
 FREQ: 5800.00 MHz
 ERP: 51.54 dBm

TX Antenna:
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 11.92

RX Antenna (Primary):
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 11.92

RECEIVER:
 FREQ: 5800.00 MHz
 SENS: -73.00 dBm
 (50.00 Ohms)

DIGITAL SPECS:
 DFM: 46.00



DEL CERRO RESERVOIR

32 47 12.98 N
 117 03 38.02 W
 NAD 83:
 Elev: 673.56 ft MSL

TRANSMITTER:
 FREQ: 5800.00 MHz
 ERP: 51.54 dBm

TX Antenna:
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 191.96

RX Antenna (Primary):
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 191.96

RECEIVER:
 FREQ: 5800.00 MHz
 SENS: -73.00 dBm
 (50.00 Ohms)

DIGITAL SPECS:
 DFM: 46.00

Effective Earth Curvature:
 1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 11.92°T Reverse 191.92°T

Topo Data Step: 0.10
 mi

Topo Data Types:
 30m; 30s; VMB; DTED; BIL;
 HGT

Land Use Data:
 TIA TR8 (May 20
 1997)

Topo Data Interp:
 FCC Interpolation (4
 points)



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Table C-28

Elliot Pipeline Regulator to East Gate Mall Regulator

Site	ELLIOT PIPELINE REGULATOR	EAST GATE MALL REGULATOR
Latitude	32 50 3.01 N	32 52 50.02 N
Lat (Dec Degrees)	32.83417	32.88056
Longitude	117 10 19.99 W	117 11 21.01 W
Lon (Dec Degrees)	-117.17222	-117.18917
Site Elevation	381.48 ft	388.53 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	342.87	162.86
Antenna Orientation	342.87	162.86
Path Angle	0.02	-0.02
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.41 dBi	27.40 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	342.87	162.86
Distance	3.35 mi	3.35 mi
Absorption Loss		0.02 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		122.36 dB
Total Gains dBm		81.8
Total Loss dB		125.38
Received Signal Level dBm		-43.58
Unfaded Fade Margin dB		29.42
Digital DFM		46
Composite Fade Margin		29.33
Terrain Factor (a)	0.509	
Climate Factor (b)	0.325	
Undp (TFM)		1.03E-07
Reliability (%)		99.99998974
Outage (sec/yr)		3

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Figure C-28

Elliot Pipeline Regulator to East Gate Mall Regulator

ELLIOT PIPELINE REGULATOR

32 50 3.01 N
117 10 19.99 W
NAD 83:
Elev: 381.48 ft MSL

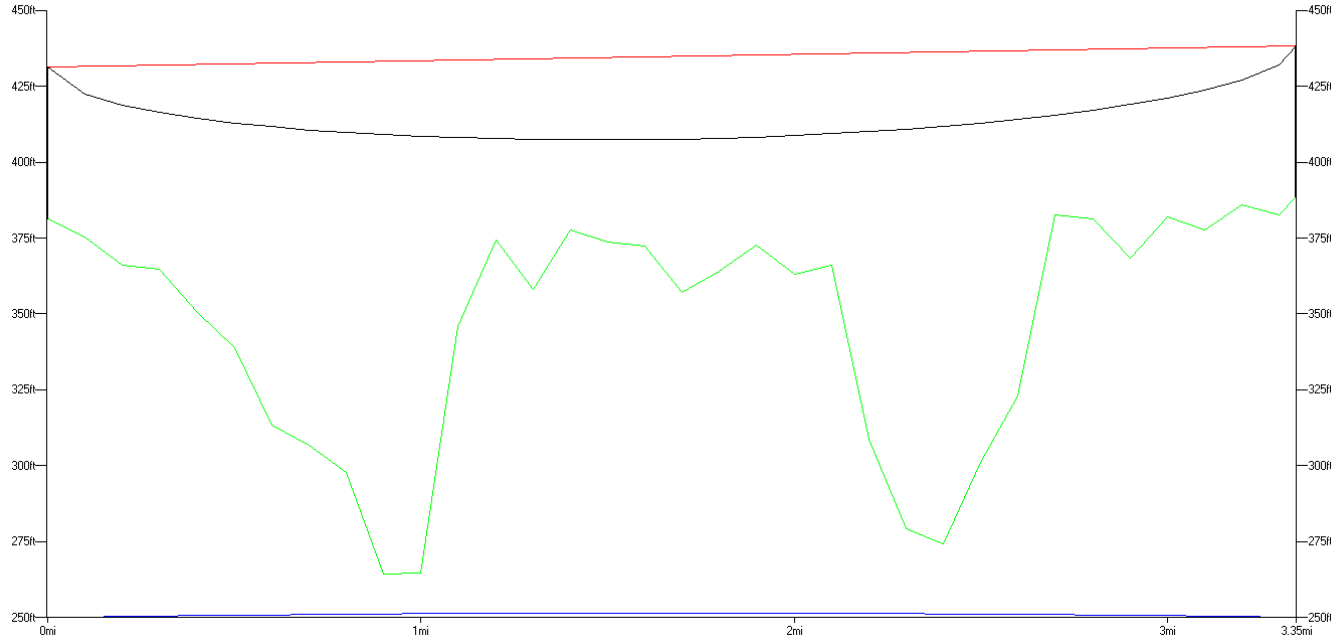
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 342.87

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 342.87

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



EAST GATE MALL
REGULATOR

32 52 50.02 N
117 11 21.01 W
NAD 83:
Elev: 388.53 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 162.86

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 162.86

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 342.87°T Reverse 162.86°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)

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**Table C-29
Encanto to Cielo and Woodman PS**

Site	ENCANTO	CIELO AND WOODMAN PS
Latitude	32 42 16.99 N	32 42 13.00 N
Lat (Dec Degrees)	32.70472	32.70361
Longitude	117 03 9.00 W	117 03 18.00 W
Lon (Dec Degrees)	-117.0525	-117.055
Site Elevation	483.27 ft	399.36 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	242.29	62.29
Antenna Orientation	242.29	62.32
Path Angle	-5.52	5.52
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.43 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	242.29	62.29
Distance	0.16 mi	0.16 mi
Absorption Loss		0.00 dB
Rain Loss		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		96.19 dB
Total Gains dBm		81.81
Total Loss dB		99.19
Received Signal Level dBm		-17.38
Unfaded Fade Margin dB		55.62
Digital DFM		46
Composite Fade Margin		45.55
Terrain Factor (a)	0.5	
Climate Factor (b)	0.325	
Undp (TFM)		2.88E-14
Reliability (%)		100
Outage (sec/yr)		0



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Figure C-29

Encanto to Cielo and Woodman PS

ENCANTO

32 42 16.99 N
117 03 9.00 W
NAD 83:
Elev: 483.27 ft MSL

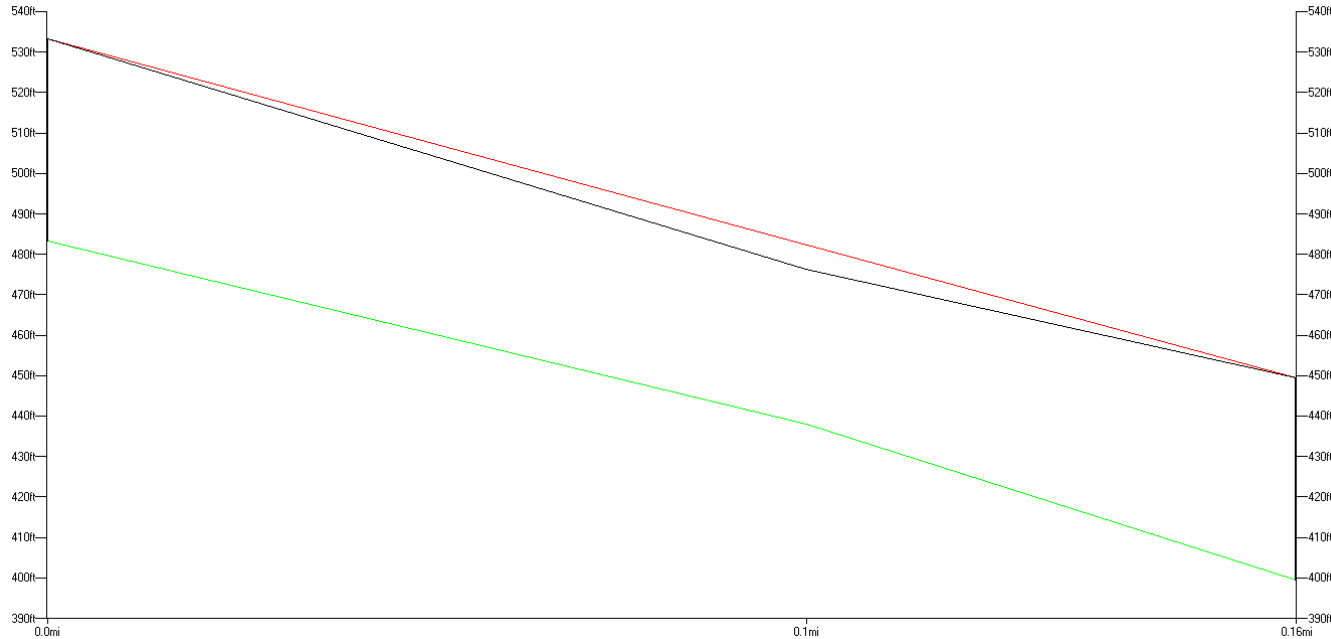
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 242.29

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 242.29

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



CIELO AND WOODMAN PS

32 42 13.00 N
117 03 18.00 W
NAD 83:
Elev: 399.36 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 62.32

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 62.32

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 242.29°T Reverse 62.29°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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Table C-30
Encanto to Paradise Mesa Standpipe

Site	ENCANTO	PARADISE MESA STANDPIPE
Latitude	32 42 16.99 N	32 41 35.99 N
Lat (Dec Degrees)	32.70472	32.69333
Longitude	117 03 9.00 W	117 02 46.00 W
Lon (Dec Degrees)	-117.0525	-117.04611
Site Elevation	483.27 ft	480.72 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	154.62	334.62
Antenna Orientation	154.62	334.62
Path Angle	-0.03	0.03
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.40 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	154.62	334.62
Distance	0.87 mi	0.87 mi
Absorption Loss		0.01 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		110.65 dB
Total Gains dBm		81.79
Total Loss dB		113.66
Received Signal Level dBm		-31.87
Unfaded Fade Margin dB		41.13
Digital DFM		46
Composite Fade Margin		39.91
Terrain Factor (a)	0.5	
Climate Factor (b)	0.325	
Undp (TFM)		1.19E-10
Reliability (%)		99.99999999
Outage (sec/yr)		0



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Figure C-30

Encanto to Paradise Mesa Standpipe

ENCANTO

32 42 16.99 N
117 03 9.00 W
NAD 83:
Elev: 483.27 ft MSL

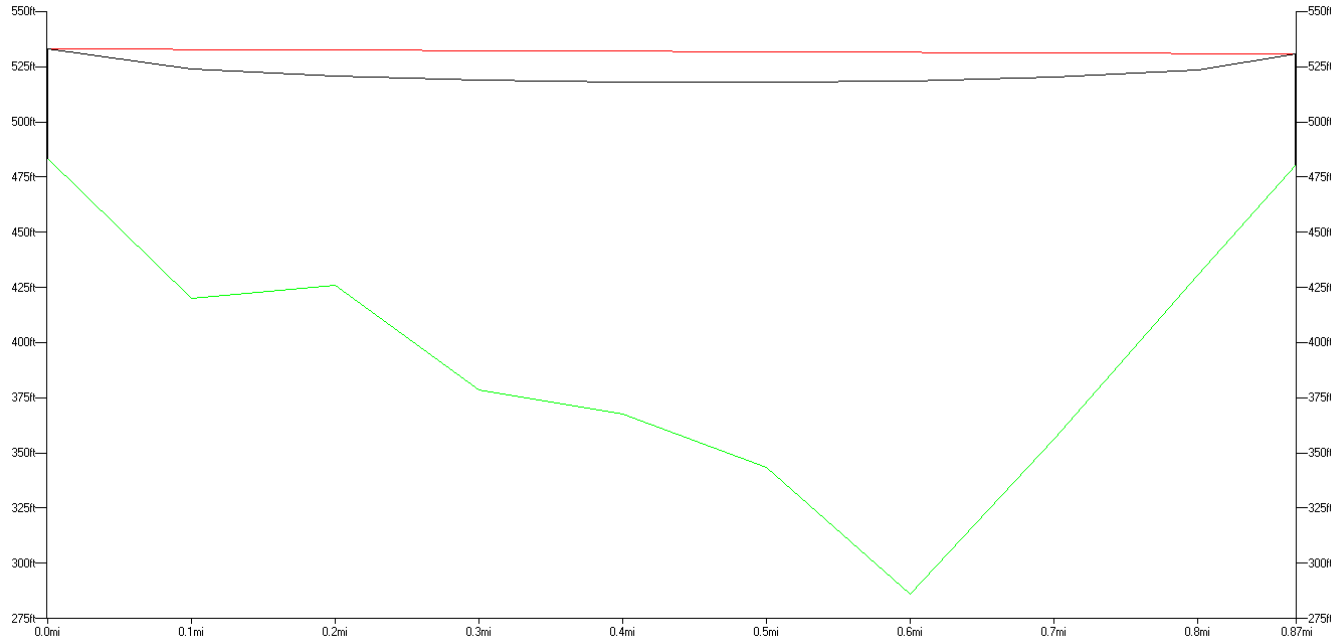
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 154.62

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 154.62

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



PARADISE MESA
STANDPIPE

32 41 35.99 N
117 02 46.00 W
NAD 83:
Elev: 480.72 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 334.62

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 334.62

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 154.62°T Reverse 334.62°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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Table C-31
Friars Road Regulator to Texas Street Regulator

Site	FRIARS RD REGULATOR	TEXAS ST REGULATOR
Latitude	32 46 41.02 N	32 46 14.99 N
Lat (Dec Degrees)	32.77806	32.77083
Longitude	117 08 7.01 W	117 07 54.01 W
Lon (Dec Degrees)	-117.13528	-117.13167
Site Elevation	94.24 ft	66.35 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	157.13	337.13
Antenna Orientation	157.13	337.1
Path Angle	-0.56	0.56
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.37 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	157.13	337.13
Distance	0.54 mi	0.54 mi
Absorption Loss		0.00 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		106.53 dB
Total Gains dBm		81.76
Total Loss dB		109.53
Received Signal Level dBm		-27.76
Unfaded Fade Margin dB		45.24
Digital DFM		46
Composite Fade Margin		42.59
Terrain Factor (a)	0.5	
Climate Factor (b)	0.325	
Undp (TFM)		1.12E-11
Reliability (%)		100
Outage (sec/yr)		0



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Figure C-31

Friars Road Regulator to Texas Street Regulator

FRIARS RD REGULATOR

32 46 41.02 N
117 08 7.01 W
NAD 83:
Elev: 94.24 ft MSL

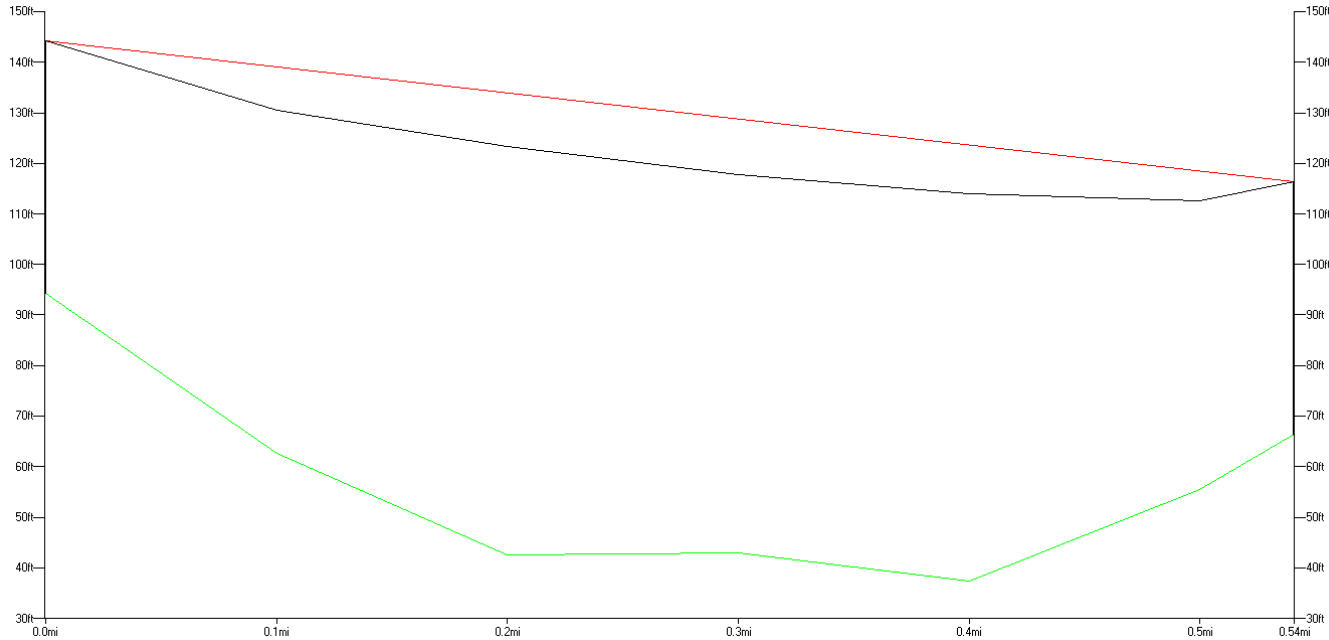
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 157.13

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 157.13

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



TEXAS ST REGULATOR

32 46 14.99 N
117 07 54.01 W
NAD 83:
Elev: 66.35 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 337.1

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 337.1

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 157.13°T Reverse 337.13°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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Table C-32 La Jolla Country Club Reservoir to La Jolla View Standpipe

Site	LA JOLLA COUNTRY CLUB RESERVOIR	LA JOLLA VIEW STANDPIPE
Latitude	32 50 29.00 N	32 50 31.99 N
Lat (Dec Degrees)	32.84139	32.84222
Longitude	117 15 28.01 W	117 15 41.00 W
Lon (Dec Degrees)	-117.25778	-117.26139
Site Elevation	719.32 ft	526.25 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	285.24	105.23
Antenna Orientation	285.24	105.28
Path Angle	-9.54	9.54
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.45 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	285.24	105.23
Distance	0.22 mi	0.22 mi
Absorption Loss		0.00 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		98.62 dB
Total Gains dBm		81.84
Total Loss dB		101.62
Received Signal Level dBm		-19.78
Unfaded Fade Margin dB		53.22
Digital DFM		46
Composite Fade Margin		45.25
Terrain Factor (a)	0.5	
Climate Factor (b)	0.325	
Undp (TFM)		1.16E-13
Reliability (%)		100
Outage (sec/yr)		0



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Figure C-32

La Jolla Country Club Reservoir to La Jolla View Standpipe

LA JOLLA COUNTRY CLUB
RESERVOIR

32 50 29.00 N
117 15 28.01 W
NAD 83:
Elev: 719.32 ft MSL

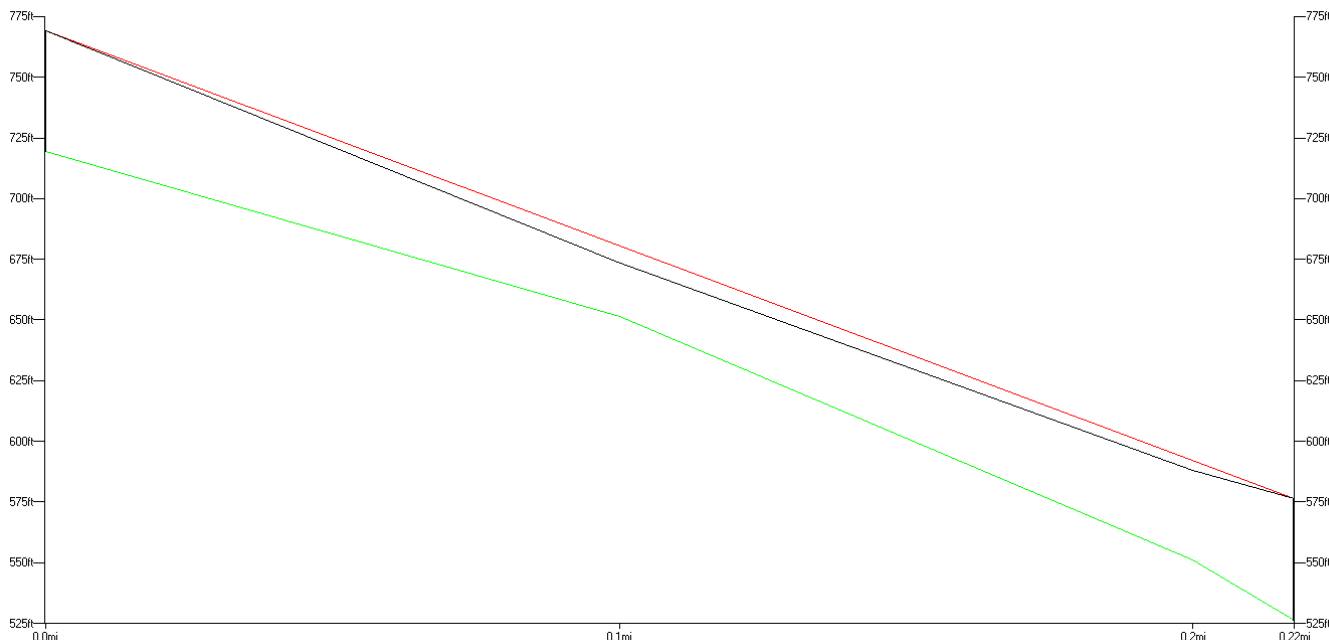
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 285.24

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 285.24

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



LA JOLLA VIEW
STANDPIPE

32 50 31.99 N
117 15 41.00 W
NAD 83:
Elev: 526.25 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 105.28

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 105.28

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 285.24°T Reverse 105.23°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)

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Table C-33
La Jolla View Standpipe to Muirlands PS

Site	LA JOLLA VIEW STANDPIPE	MUIRLANDS PS
Latitude	32 50 31.99 N	32 50 30.98 N
Lat (Dec Degrees)	32.84222	32.84194
Longitude	117 15 41.00 W	117 15 47.99 W
Lon (Dec Degrees)	-117.26139	-117.26333
Site Elevation	526.25 ft	389.35 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	260.3	80.3
Antenna Orientation	260.3	80.3
Path Angle	-12.76	12.76
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.40 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	260.3	80.3
Distance	0.11 mi	0.11 mi
Absorption Loss		0.00 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		93.04 dB
Total Gains dBm		81.79
Total Loss dB		96.04
Received Signal Level dBm		-14.25
Unfaded Fade Margin dB		58.75
Digital DFM		46
Composite Fade Margin		45.78
Terrain Factor (a)	0.5	
Climate Factor (b)	0.325	
Undp (TFM)		4.72E-15
Reliability (%)		100
Outage (sec/yr)		0



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Figure C-33

La Jolla View Standpipe to Muirlands PS

LA JOLLA VIEW STANDPIPE

32 50 31.99 N
117 15 41.00 W
NAD 83:
Elev: 526.25 ft MSL

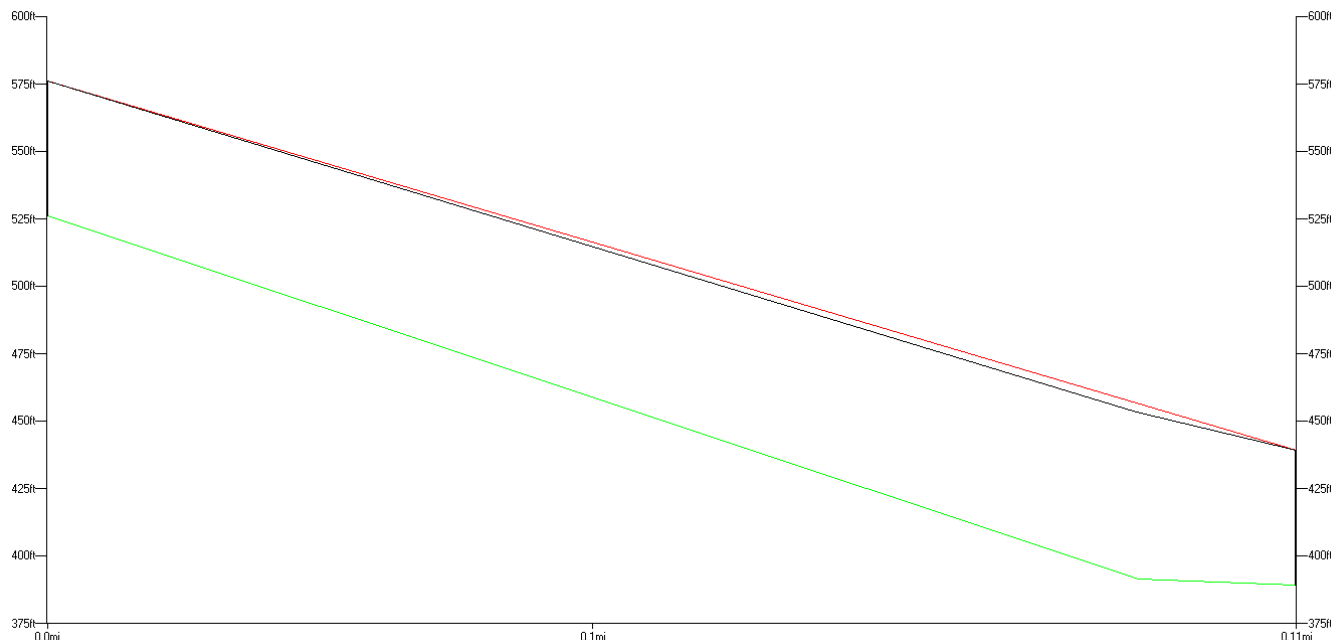
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 260.3

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 260.3

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



MUIRLANDS PS

32 50 30.98 N
117 15 47.99 W
NAD 83:
Elev: 389.35 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 80.30

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 80.30

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 260.30°T Reverse 80.30°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)

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Table C-34
Los Penasquitos PS to Carmel Mountain Mall PS

Site	LOS PENASQUITOS PS	CARMEL MTN MALL PS
Latitude	32 59 29.00 N	32 58 54.98 N
Lat (Dec Degrees)	32.99139	32.98194
Longitude	117 05 3.98 W	117 04 59.99 W
Lon (Dec Degrees)	-117.08444	-117.08333
Site Elevation	765.99 ft	635.75 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	174.35	354.35
Antenna Orientation	174.35	354.36
Path Angle	-2.16	2.16
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.41 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	174.35	354.35
Distance	0.65 mi	0.65 mi
Absorption Loss		0.00 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		108.19 dB
Total Gains dBm		81.81
Total Loss dB		111.19
Received Signal Level dBm		-29.38
Unfaded Fade Margin dB		43.62
Digital DFM		46
Composite Fade Margin		41.64
Terrain Factor (a)	0.5	
Climate Factor (b)	0.325	
Undp (TFM)		2.87E-11
Reliability (%)		100
Outage (sec/yr)		0



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Figure C-34

Los Penasquitos PS to Carmel Mountain Mall PS

LOS PENASQUITOS PS

32 59 29.00 N
117 05 3.98 W
NAD 83:
Elev: 765.99 ft MSL

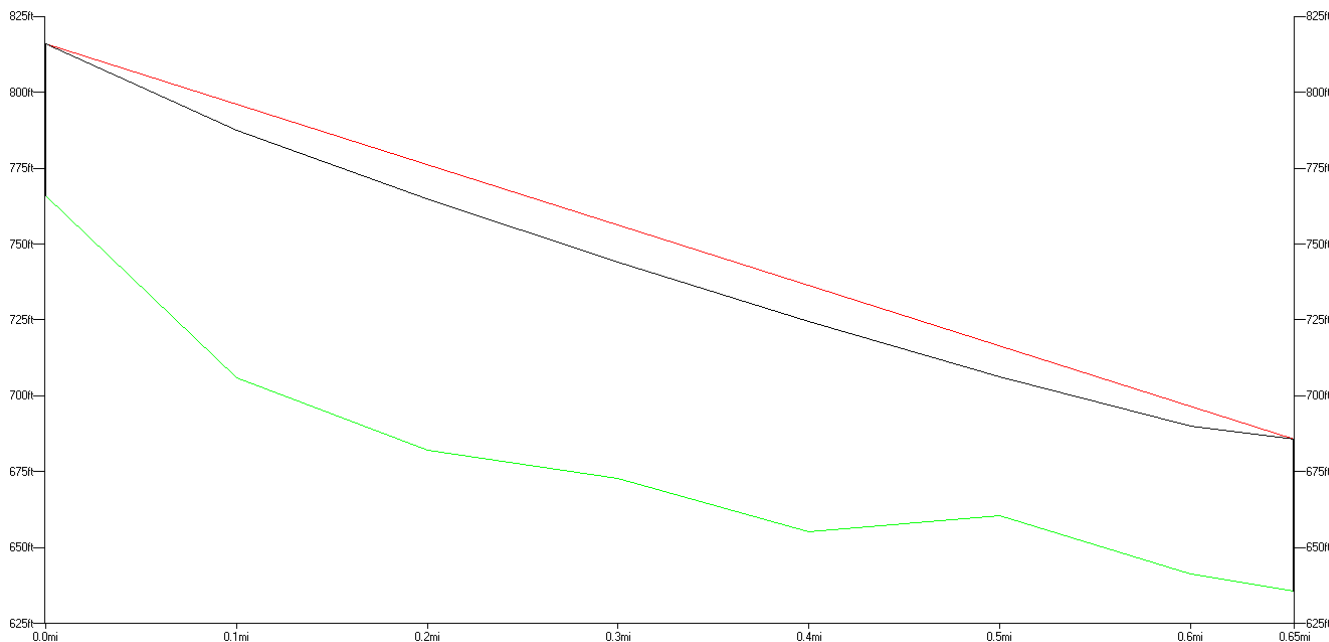
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 174.35

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 174.35

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



CARMEL MTN MALL PS

32 58 54.98 N
117 04 59.99 W
NAD 83:
Elev: 635.75 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 354.36

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 354.36

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 174.35°T Reverse 354.35°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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Table C-35
Los Penasquitos Reservoir to Los Penasquitos PS

Site	LOS PENASQUITOS RESERVOIR	LOS PENASQUITOS PS
Latitude	32 59 8.99 N	32 59 29.00 N
Lat (Dec Degrees)	32.98583	32.99139
Longitude	117 05 33.00 W	117 05 3.98 W
Lon (Dec Degrees)	-117.0925	-117.08444
Site Elevation	888.29 ft	765.99 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	50.7	230.7
Antenna Orientation	50.7	230.69
Path Angle	-2.19	2.19
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.39 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	50.7	230.7
Distance	0.60 mi	0.60 mi
Absorption Loss		0.00 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		107.50 dB
Total Gains dBm		81.78
Total Loss dB		110.5
Received Signal Level dBm		-28.72
Unfaded Fade Margin dB		44.28
Digital DFM		46
Composite Fade Margin		42.05
Terrain Factor (a)	0.5	
Climate Factor (b)	0.325	
Undp (TFM)		1.95E-11
Reliability (%)		100
Outage (sec/yr)		0



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Figure C-35

Los Penasquitos Reservoir to Los Penasquitos PS

LOS PENASQUITOS
RESERVOIR

32 59 8.99 N
117 05 33.00 W
NAD 83:
Elev: 888.29 ft MSL

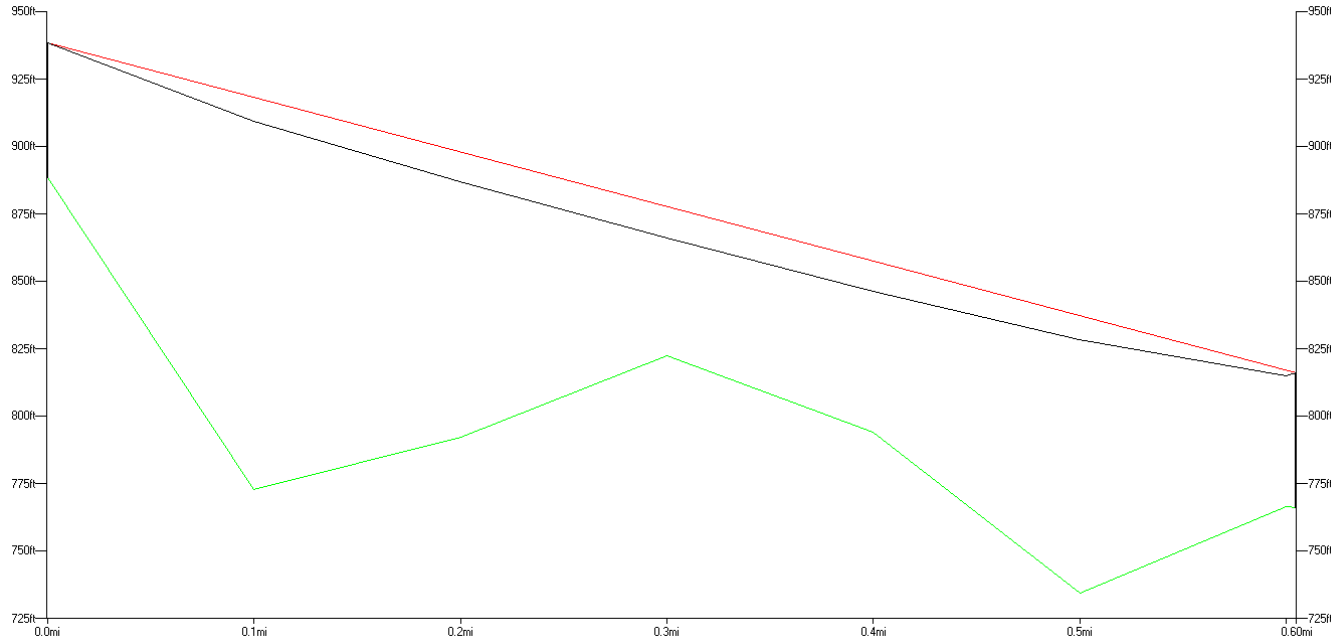
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 50.70

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 50.70

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



LOS PENASQUITOS PS

32 59 29.00 N
117 05 3.98 W
NAD 83:
Elev: 765.99 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 230.69

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 230.69

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 50.70°T Reverse 230.70°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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Table C-36
Los Penasquitos Reservoir to Pomerado Park Reservoir

Site	LOS PENASQUITOS RESERVOIR	POMERADO PARK RESERVOIR
Latitude	32 59 8.99 N	33 00 16.99 N
Lat (Dec Degrees)	32.98583	33.00472
Longitude	117 05 33.00 W	117 04 30.00 W
Lon (Dec Degrees)	-117.0925	-117.075
Site Elevation	888.29 ft	829.40 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	37.97	217.98
Antenna Orientation	37.97	217.98
Path Angle	-0.39	0.39
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna	FP2-5-28 Vpol	FP2-5-28 Vpol
(Ant File/ID)	AMSX0005 X000500017	AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.40 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	37.97	217.98
Distance	1.65 mi	1.65 mi
Absorption Loss		0.01 dB
Rain Loss		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		116.23 dB
Total Gains dBm		81.78
Total Loss dB		119.24
Received Signal Level dBm		-37.45
Unfaded Fade Margin dB		35.55
Digital DFM		46
Composite Fade Margin		35.17
Terrain Factor (a)	0.5	
Climate Factor (b)	0.325	
Undp (TFM)		2.96E-09
Reliability (%)		99.9999997
Outage (sec/yr)		0



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Figure C-36

Los Penasquitos Reservoir to Pomerado Park Reservoir

LOS PENASQUITOS
RESERVOIR

32 59 8.99 N
117 05 33.00 W
NAD 83:
Elev: 888.29 ft MSL

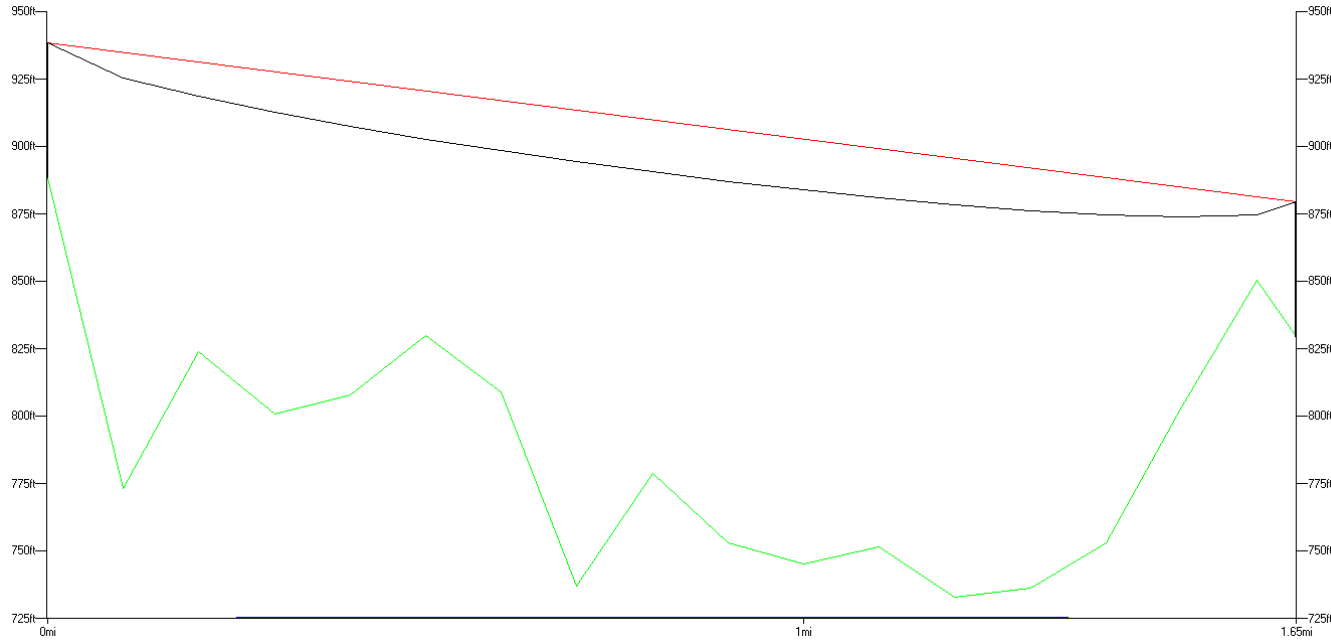
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 37.97

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 37.97

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



POMERADO PARK
RESERVOIR

33 00 16.99 N
117 04 30.00 W
NAD 83:
Elev: 829.40 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 217.98

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 217.98

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 37.97°T Reverse 217.98°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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Table C-37
Lyons Peak to Ocean View Hills PS

Site	LYONS PEAK	OCEAN VIEW HILLS PS
Latitude	32 42 3.38 N	32 34 54.01 N
Lat (Dec Degrees)	32.70094	32.58167
Longitude	116 45 56.56 W	117 01 31.01 W
Lon (Dec Degrees)	-116.76571	-117.02528
Site Elevation	3690.24 ft	365.32 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	241.56	61.42
Antenna Orientation	241.56	61.42
Path Angle	-2.09	2.09
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	30.000 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	SPF 3 - 52 B AMSX0005 X000500006	SPF 3 - 52 B AMSX0005 X000500006
Ant Gain (Major Lobe)	32.00 dBi	32.00 dBi
Ant Gain (Along Path)	32.00 dBi	32.00 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Gain1		dB
Gain2		dB
Bearing (T)	241.56	61.42
Distance	17.22 mi	17.22 mi
Absorption Loss		0.12 dB
Rain Loss CRANE:		0.04 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		136.59 dB
Total Gains dBm		94
Total Loss dB		139.75
Received Signal Level dBm		-45.75
Unfaded Fade Margin dB		27.25
Digital DFM		46
Composite Fade Margin		27.19
Terrain Factor (a)	0.022	
Climate Factor (b)	0.325	
Undp (TFM)		9.98E-07
Reliability (%)		99.99990018
Outage (sec/yr)		31



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Figure C-37

Lyons Peak to Ocean View Hills PS

LYONS PEAK

32 42 3.38 N
 116 45 56.56 W
 NAD 83:
 Elev: 3690.24 ft MSL

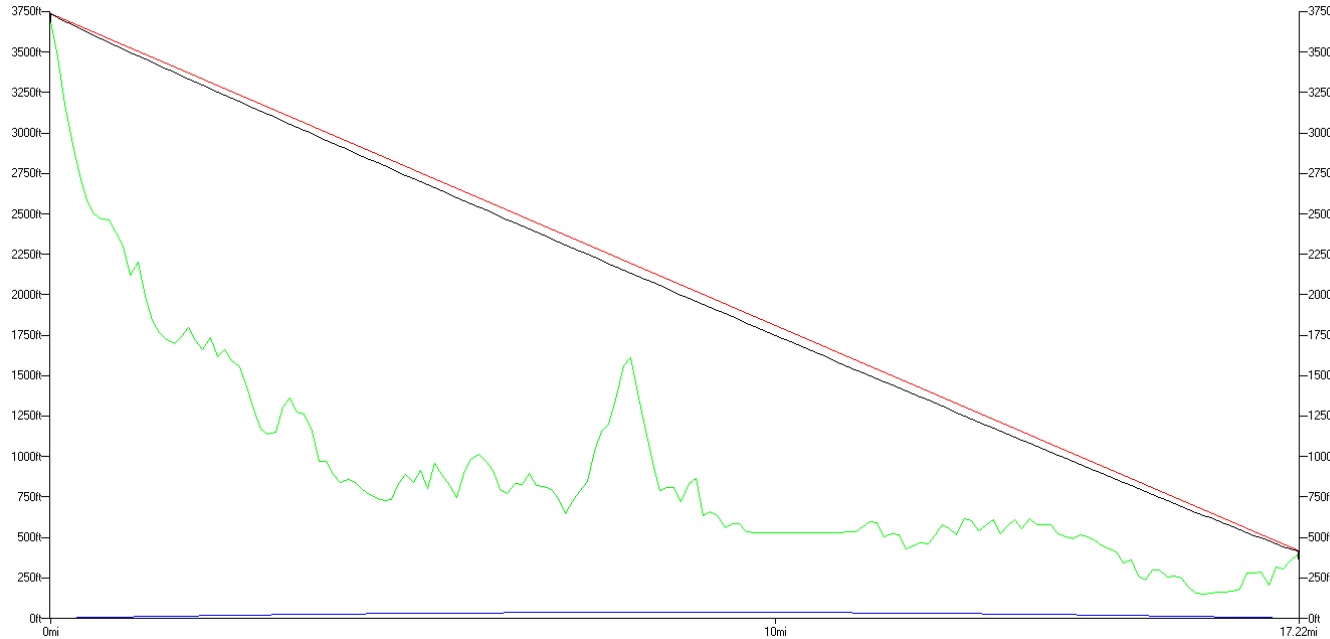
TRANSMITTER:
 FREQ: 5800.00 MHz
 ERP: 58.35 dBm

TX Antenna:
 ANT HGT: 50.00 ft AGL
 DESC: SPF 3 - 52 B
 GAIN: 32.00 dBi
 ORIENT: 241.56

RX Antenna (Primary):
 ANT HGT: 50.00 ft AGL
 DESC: SPF 3 - 52 B
 GAIN: 32.00 dBi
 ORIENT: 241.56

RECEIVER:
 FREQ: 5800.00 MHz
 SENS: -73.00 dBm
 (50.00 Ohms)

DIGITAL SPECS:
 DFM: 46.00



OCEAN VIEW HILLS PS

32 34 54.01 N
 117 01 31.01 W
 NAD 83:
 Elev: 365.32 ft MSL

TRANSMITTER:
 FREQ: 5800.00 MHz
 ERP: 58.35 dBm

TX Antenna:
 ANT HGT: 50.00 ft AGL
 DESC: SPF 3 - 52 B
 GAIN: 32.00 dBi
 ORIENT: 61.42

RX Antenna (Primary):
 ANT HGT: 50.00 ft AGL
 DESC: SPF 3 - 52 B
 GAIN: 32.00 dBi
 ORIENT: 61.42

RECEIVER:
 FREQ: 5800.00 MHz
 SENS: -73.00 dBm
 (50.00 Ohms)

DIGITAL SPECS:
 DFM: 46.00

Effective Earth Curvature:
 1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 241.56°T Reverse 61.42°T

Topo Data Step: 0.10
 mi

Topo Data Types:
 30m; 30s; VMB; DTED; BIL;
 HGT

Land Use Data:
 TIA TR8 (May 20
 1997)

Topo Data Interp:
 FCC Interpolation (4
 points)



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Table C-38
Lyons Peak to Otay Mesa PS

Site	LYONS PEAK	OTAY MESA PS
Latitude	32 42 3.38 N	32 35 6.00 N
Lat (Dec Degrees)	32.70094	32.585
Longitude	116 45 56.56 W	117 00 42.98 W
Lon (Dec Degrees)	-116.76571	-117.01194
Site Elevation	3690.24 ft	275.18 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	240.97	60.84
Antenna Orientation	240.97	60.84
Path Angle	-2.25	2.25
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	30.000 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	SPF 3 - 52 B AMSX0005 X000500006	SPF 3 - 52 B AMSX0005 X000500006
Ant Gain (Major Lobe)	32.00 dBi	32.00 dBi
Ant Gain (Along Path)	32.00 dBi	32.00 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	240.97	60.84
Distance	16.43 mi	16.43 mi
Absorption Loss		0.11 dB
Rain Loss CRANE:		0.03 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		136.18 dB
Total Gains dBm		94
Total Loss dB		139.32
Received Signal Level dBm		-45.32
Unfaded Fade Margin dB		27.68
Digital DFM		46
Composite Fade Margin		27.61
Terrain Factor (a)	0.023	
Climate Factor (b)	0.325	
Undp (TFM)		8.20E-07
Reliability (%)		99.99991796
Outage (sec/yr)		26



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Figure C-38

Lyons Peak to Otay Mesa PS

LYONS PEAK

32 42 3.38 N
 116 45 56.56 W
 NAD 83:
 Elev: 3690.24 ft MSL

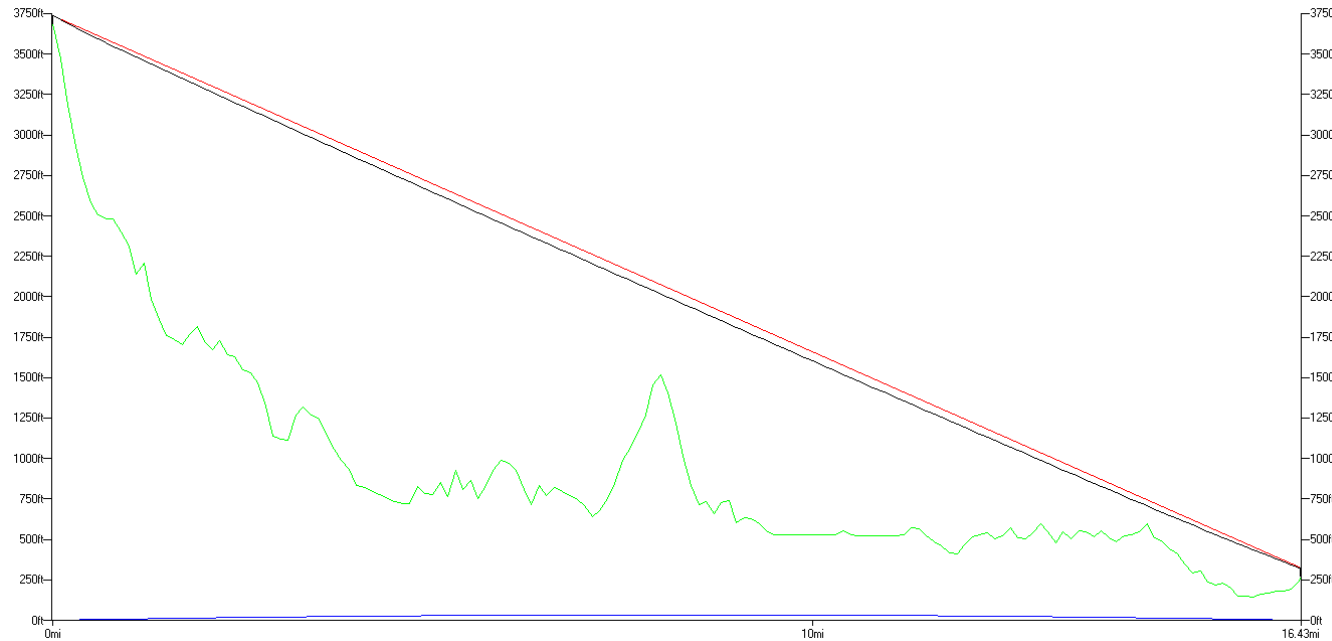
TRANSMITTER:
 FREQ: 5800.00 MHz
 ERP: 58.35 dBm

TX Antenna:
 ANT HGT: 50.00 ft AGL
 DESC: SPF 3 - 52 B
 GAIN: 32.00 dBi
 ORIENT: 240.97

RX Antenna (Primary):
 ANT HGT: 50.00 ft AGL
 DESC: SPF 3 - 52 B
 GAIN: 32.00 dBi
 ORIENT: 240.97

RECEIVER:
 FREQ: 5800.00 MHz
 SENS: -73.00 dBm
 (50.00 Ohms)

DIGITAL SPECS:
 DFM: 46.00



OTAY MESA PS

32 35 6.00 N
 117 00 42.98 W
 NAD 83:
 Elev: 275.18 ft MSL

TRANSMITTER:
 FREQ: 5800.00 MHz
 ERP: 58.35 dBm

TX Antenna:
 ANT HGT: 50.00 ft AGL
 DESC: SPF 3 - 52 B
 GAIN: 32.00 dBi
 ORIENT: 60.84

RX Antenna (Primary):
 ANT HGT: 50.00 ft AGL
 DESC: SPF 3 - 52 B
 GAIN: 32.00 dBi
 ORIENT: 60.84

RECEIVER:
 FREQ: 5800.00 MHz
 SENS: -73.00 dBm
 (50.00 Ohms)

DIGITAL SPECS:
 DFM: 46.00

Effective Earth Curvature:
 1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 240.97°T Reverse 60.84°T

Topo Data Step: 0.10
 mi

Topo Data Types:
 30m; 30s; VMB; DTED; BIL;
 HGT

Land Use Data:
 TIA TR8 (May 20
 1997)

Topo Data Interp:
 FCC Interpolation (4
 points)



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**Table C-39
Lyons Peak to San Ysidro**

Site	LYONS PEAK	SAN YSIDRO
Latitude	32 42 3.38 N	32 33 42.01 N
Lat (Dec Degrees)	32.70094	32.56167
Longitude	116 45 56.56 W	117 02 7.01 W
Lon (Dec Degrees)	-116.76571	-117.03528
Site Elevation	3690.24 ft	468.18 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	238.67	58.52
Antenna Orientation	238.67	58.52
Path Angle	-1.9	1.9
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	30.000 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	SPF 3 - 52 B AMSX0005 X000500006	SPF 3 - 52 B AMSX0005 X000500006
Ant Gain (Major Lobe)	32.00 dBi	32.00 dBi
Ant Gain (Along Path)	32.00 dBi	32.00 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	238.67	58.52
Distance	18.42 mi	18.42 mi
Absorption Loss		0.12 dB
Rain Loss CRANE:		0.04 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		137.17 dB
Total Gains dBm		94
Total Loss dB		140.33
Received Signal Level dBm		-46.33
Unfaded Fade Margin dB		26.67
Digital DFM		46
Composite Fade Margin		26.62
Terrain Factor (a)	0.023	
Climate Factor (b)	0.325	
Undp (TFM)		1.46E-06
Reliability (%)		99.9998541
Outage (sec/yr)		46



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Figure C-39 Lyons Peak to San Ysidro

LYONS PEAK

32 42 3.38 N
116 45 56.56 W
NAD 83:
Elev: 3690.24 ft MSL

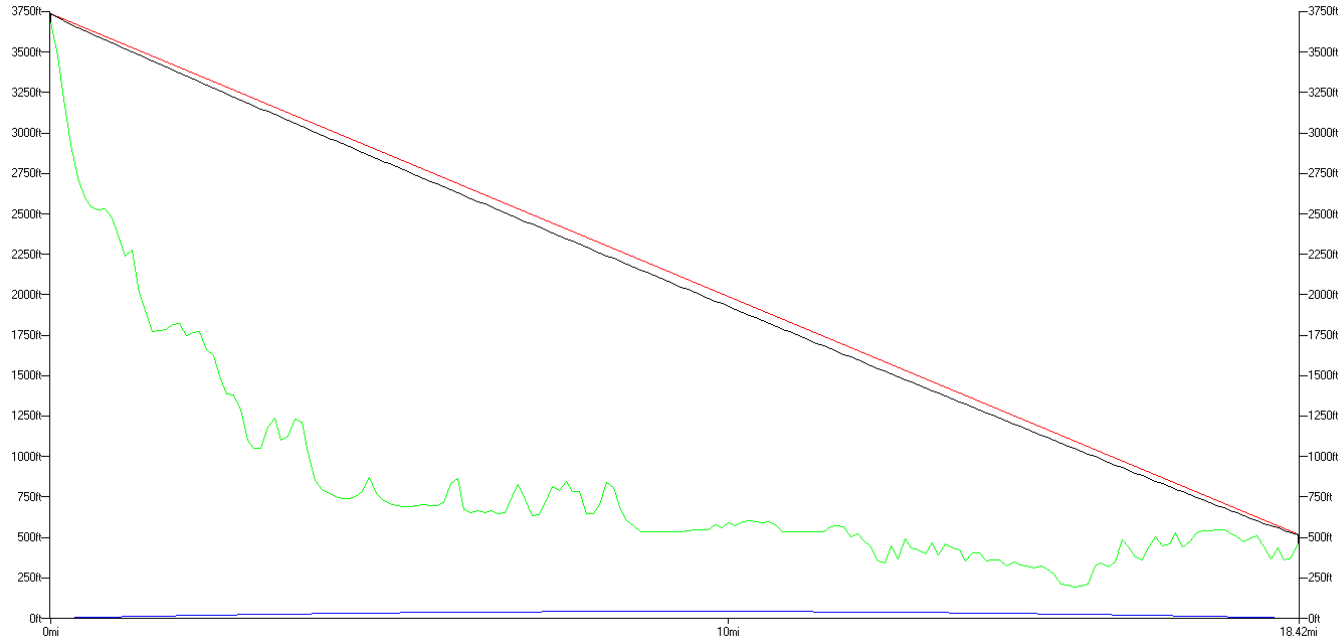
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 58.35 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: SPF 3 - 52 B
GAIN: 32.00 dBi
ORIENT: 238.67

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: SPF 3 - 52 B
GAIN: 32.00 dBi
ORIENT: 238.67

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



SAN YSIDRO

32 33 42.01 N
117 02 7.01 W
NAD 83:
Elev: 468.18 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 58.35 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: SPF 3 - 52 B
GAIN: 32.00 dBi
ORIENT: 58.52

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: SPF 3 - 52 B
GAIN: 32.00 dBi
ORIENT: 58.52

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 238.67°T Reverse 58.52°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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**Table C-40
Lyons Peak to South San Diego Reservoir**

Site	LYONS PEAK	SOUTH SAN DIEGO RESERVOIR
Latitude	32 42 3.38 N	32 36 4.00 N
Lat (Dec Degrees)	32.70094	32.60111
Longitude	116 45 56.56 W	116 58 31.01 W
Lon (Dec Degrees)	-116.76571	-116.97528
Site Elevation	3690.24 ft	463.34 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	240.67	60.56
Antenna Orientation	240.67	60.56
Path Angle	-2.5	2.5
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	30.000 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	SPF 3 - 52 B AMSX0005 X000500006	SPF 3 - 52 B AMSX0005 X000500006
Ant Gain (Major Lobe)	32.00 dBi	32.00 dBi
Ant Gain (Along Path)	32.00 dBi	32.00 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	240.67	60.56
Distance	14.02 mi	14.02 mi
Absorption Loss		0.09 dB
Rain Loss CRANE:		0.03 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		134.80 dB
Total Gains dBm		94
Total Loss dB		137.92
Received Signal Level dBm		-43.93
Unfaded Fade Margin dB		29.07
Digital DFM		46
Composite Fade Margin		28.99
Terrain Factor (a)	0.023	
Climate Factor (b)	0.325	
Undp (TFM)		3.70E-07
Reliability (%)		99.99996303
Outage (sec/yr)		12



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Figure C-40

Lyons Peak to South San Diego Reservoir

LYONS PEAK

32 42 3.38 N
 116 45 56.56 W
 NAD 83:
 Elev: 3690.24 ft MSL

TRANSMITTER:
 FREQ: 5800.00 MHz
 ERP: 58.35 dBm

TX Antenna:
 ANT HGT: 50.00 ft AGL
 DESC: SPF 3 - 52 B
 GAIN: 32.00 dBi
 ORIENT: 240.67

RX Antenna (Primary):
 ANT HGT: 50.00 ft AGL
 DESC: SPF 3 - 52 B
 GAIN: 32.00 dBi
 ORIENT: 240.67

RECEIVER:
 FREQ: 5800.00 MHz
 SENS: -73.00 dBm
 (50.00 Ohms)

DIGITAL SPECS:
 DFM: 46.00



SOUTH SAN DIEGO
 RESERVOIR

32 36 4.00 N
 116 58 31.01 W
 NAD 83:
 Elev: 463.34 ft MSL

TRANSMITTER:
 FREQ: 5800.00 MHz
 ERP: 58.35 dBm

TX Antenna:
 ANT HGT: 50.00 ft AGL
 DESC: SPF 3 - 52 B
 GAIN: 32.00 dBi
 ORIENT: 60.56

RX Antenna (Primary):
 ANT HGT: 50.00 ft AGL
 DESC: SPF 3 - 52 B
 GAIN: 32.00 dBi
 ORIENT: 60.56

RECEIVER:
 FREQ: 5800.00 MHz
 SENS: -73.00 dBm
 (50.00 Ohms)

DIGITAL SPECS:
 DFM: 46.00

Effective Earth Curvature:
 1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 240.67°T Reverse 60.56°T

Topo Data Step: 0.10
 mi

Topo Data Types:
 30m; 30s; VMB; DTED; BIL;
 HGT

Land Use Data:
 TIA TR8 (May 20
 1997)

Topo Data Interp:
 FCC Interpolation (4
 points)



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Table C-41
Montezuma to Del Cerro PS

Site	MONTEZUMA	DEL CERRO PS
Latitude	32 46 8.00 N	32 46 57.00 N
Lat (Dec Degrees)	32.76889	32.7825
Longitude	117 03 31.00 W	117 03 42.01 W
Lon (Dec Degrees)	-117.05861	-117.06167
Site Elevation	454.07 ft	453.17 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	349.25	169.24
Antenna Orientation	349.25	169.26
Path Angle	-0.01	0.01
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.42 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	349.25	169.24
Distance	0.95 mi	0.95 mi
Absorption Loss		0.01 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		111.47 dB
Total Gains dBm		81.81
Total Loss dB		114.48
Received Signal Level dBm		-32.66
Unfaded Fade Margin dB		40.34
Digital DFM		46
Composite Fade Margin		39.29
Terrain Factor (a)	0.5	
Climate Factor (b)	0.325	
Undp (TFM)		1.90E-10
Reliability (%)		99.99999998
Outage (sec/yr)		0



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Figure C-41

Montezuma to Del Cerro PS

MONTEZUMA

32 46 8.00 N
 117 03 31.00 W
 NAD 83:
 Elev: 454.07 ft MSL

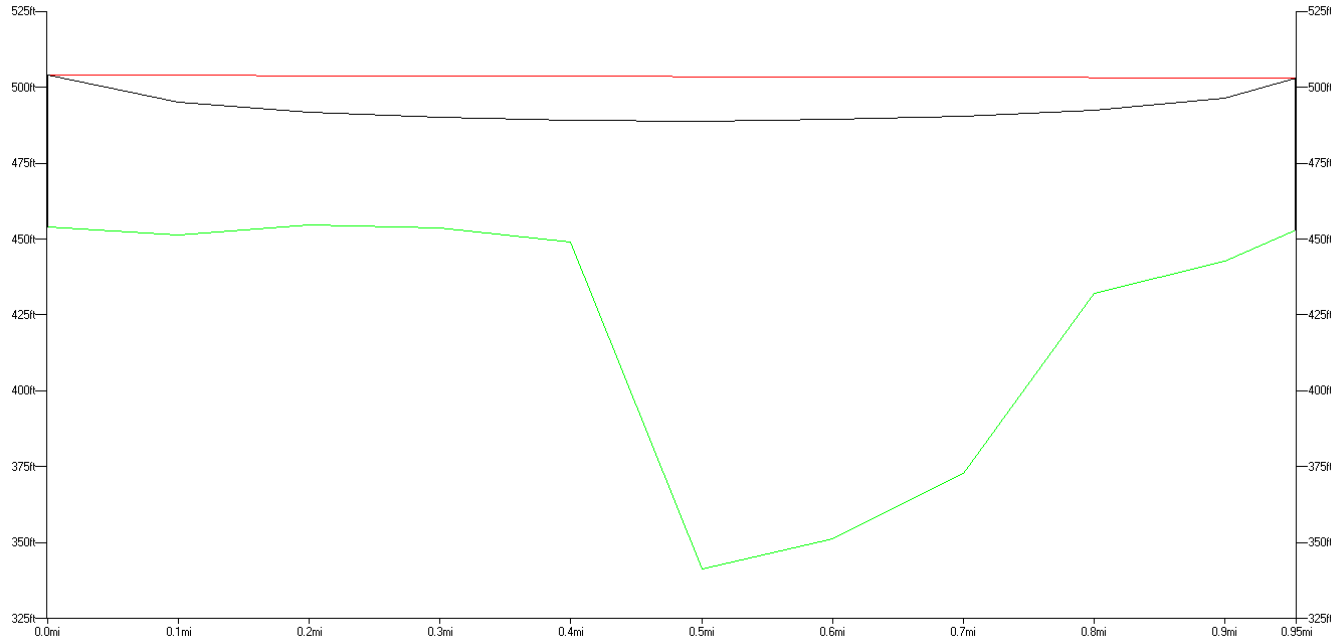
TRANSMITTER:
 FREQ: 5800.00 MHz
 ERP: 51.54 dBm

TX Antenna:
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 349.25

RX Antenna (Primary):
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 349.25

RECEIVER:
 FREQ: 5800.00 MHz
 SENS: -73.00 dBm
 (50.00 Ohms)

DIGITAL SPECS:
 DFM: 46.00



DEL CERRO PS

32 46 57.00 N
 117 03 42.01 W
 NAD 83:
 Elev: 453.17 ft MSL

TRANSMITTER:
 FREQ: 5800.00 MHz
 ERP: 51.54 dBm

TX Antenna:
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 169.26

RX Antenna (Primary):
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 169.26

RECEIVER:
 FREQ: 5800.00 MHz
 SENS: -73.00 dBm
 (50.00 Ohms)

DIGITAL SPECS:
 DFM: 46.00

Effective Earth Curvature:
 1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 349.25°T Reverse 169.24°T

Topo Data Step: 0.10
 mi

Topo Data Types:
 30m; 30s; VMB; DTED; BIL;
 HGT

Land Use Data:
 TIA TR8 (May 20
 1997)

Topo Data Interp:
 FCC Interpolation (4
 points)



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Table C-42
Mount Woodson to Stonebridge PS 2

Site	MT WOODSON	STONEBRIDGE PS 2
Latitude	33 00 33.01 N	32 55 36.01 N
Lat (Dec Degrees)	33.00917	32.92667
Longitude	116 58 25.00 W	117 00 28.01 W
Lon (Dec Degrees)	-116.97361	-117.00778
Site Elevation	2778.87 ft	1106.79 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	199.26	19.24
Antenna Orientation	199.26	19.23
Path Angle	-3.01	3.01
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.41 dBi	27.39 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	199.26	19.24
Distance	6.02 mi	6.02 mi
Absorption Loss		0.04 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		127.46 dB
Total Gains dBm		81.79
Total Loss dB		130.5
Received Signal Level dBm		-48.71
Unfaded Fade Margin dB		24.29
Digital DFM		46
Composite Fade Margin		24.26
Terrain Factor (a)	0.05	
Climate Factor (b)	0.325	
Undp (TFM)		1.92E-07
Reliability (%)		99.99998082
Outage (sec/yr)		6



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Figure C-42

Mount Woodson to Stonebridge PS 2

MT WOODSON

33 00 33.01 N
116 58 25.00 W
NAD 83:
Elev: 2778.87 ft MSL

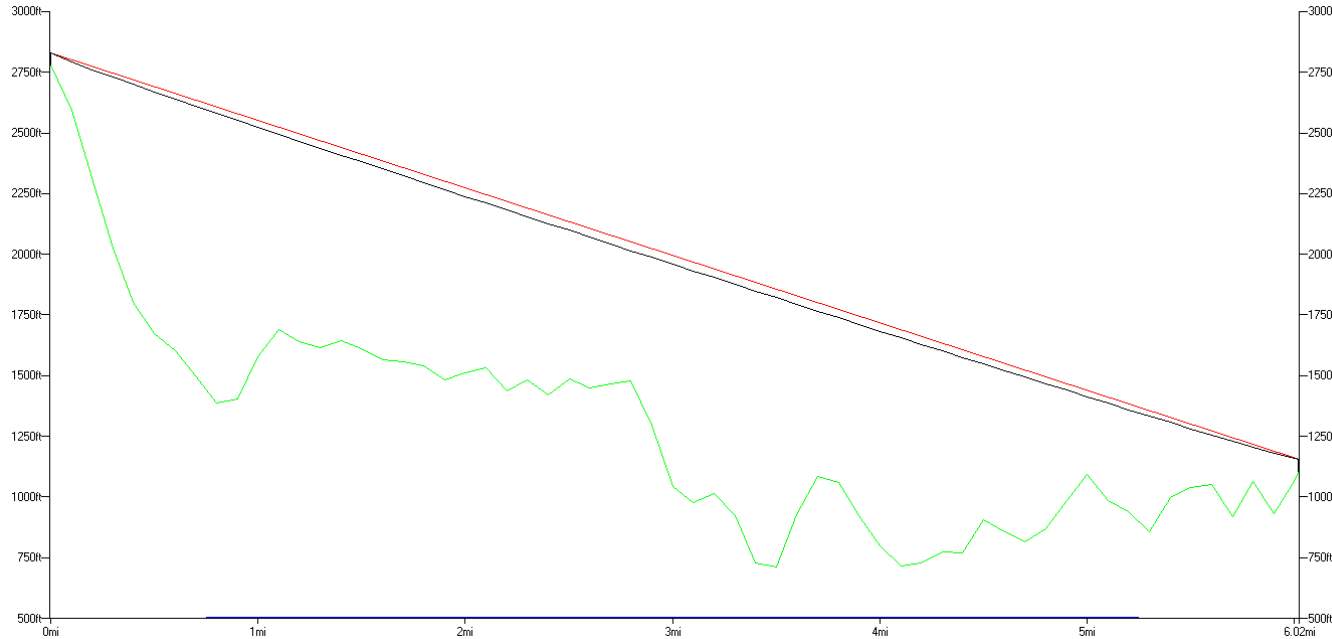
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 199.26

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 199.26

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



STONEBRIDGE PS 2

32 55 36.01 N
117 00 28.01 W
NAD 83:
Elev: 1106.79 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 19.23

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 19.23

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 199.26°T Reverse 19.24°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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Table C-43
Paradise Hills 2 PS to Paradise Mesa 1 PS

Site	PARADISE HILLS 2 PS	PARADISE MESA 1 PS
Latitude	32 41 3.01 N	32 41 29.00 N
Lat (Dec Degrees)	32.68417	32.69139
Longitude	117 03 20.02 W	117 03 7.99 W
Lon (Dec Degrees)	-117.05556	-117.05222
Site Elevation	404.61 ft	337.35 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	21.36	201.37
Antenna Orientation	21.36	201.36
Path Angle	-1.37	1.37
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.39 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	21.36	201.37
Distance	0.53 mi	0.53 mi
Absorption Loss		0.00 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		106.42 dB
Total Gains dBm		81.78
Total Loss dB		109.42
Received Signal Level dBm		-27.64
Unfaded Fade Margin dB		45.36
Digital DFM		46
Composite Fade Margin		42.66
Terrain Factor (a)	0.5	
Climate Factor (b)	0.325	
Undp (TFM)		1.05E-11
Reliability (%)		100
Outage (sec/yr)		0



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Figure C-43

Paradise Hills 2 PS to Paradise Mesa 1 PS

PARADISE HILLS 2 PS

32 41 3.01 N
117 03 20.02 W
NAD 83:
Elev: 404.61 ft MSL

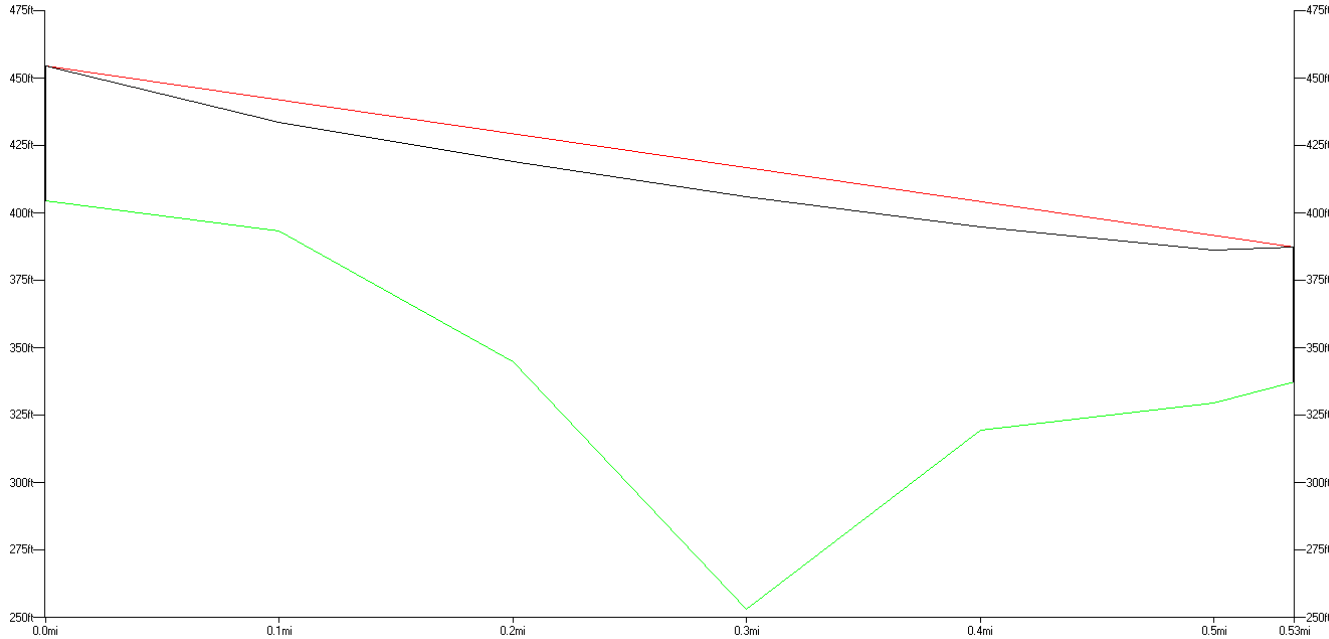
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 21.36

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 21.36

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



PARADISE MESA 1 PS

32 41 29.00 N
117 03 7.99 W
NAD 83:
Elev: 337.35 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 201.36

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 201.36

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 21.36°T Reverse 201.37°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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Table C-44
Paradise Hills 2 PS to Paradise Mesa 2 PS

Site	PARADISE HILLS 2 PS	PARADISE MESA 2 PS
Latitude	32 41 3.01 N	32 40 41.99 N
Lat (Dec Degrees)	32.68417	32.67833
Longitude	117 03 20.02 W	117 02 44.99 W
Lon (Dec Degrees)	-117.05556	-117.04583
Site Elevation	404.61 ft	342.36 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	125.36	305.37
Antenna Orientation	125.36	305.36
Path Angle	-0.97	0.97
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.39 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	125.36	305.37
Distance	0.70 mi	0.70 mi
Absorption Loss		0.00 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		108.71 dB
Total Gains dBm		81.78
Total Loss dB		111.71
Received Signal Level dBm		-29.93
Unfaded Fade Margin dB		43.07
Digital DFM		46
Composite Fade Margin		41.28
Terrain Factor (a)	0.5	
Climate Factor (b)	0.325	
Undp (TFM)		3.91E-11
Reliability (%)		100
Outage (sec/yr)		0



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Figure C-44

Paradise Hills 2 PS to Paradise Mesa 2 PS

PARADISE HILLS 2 PS

32 41 3.01 N
 117 03 20.02 W
 NAD 83:
 Elev: 404.61 ft MSL

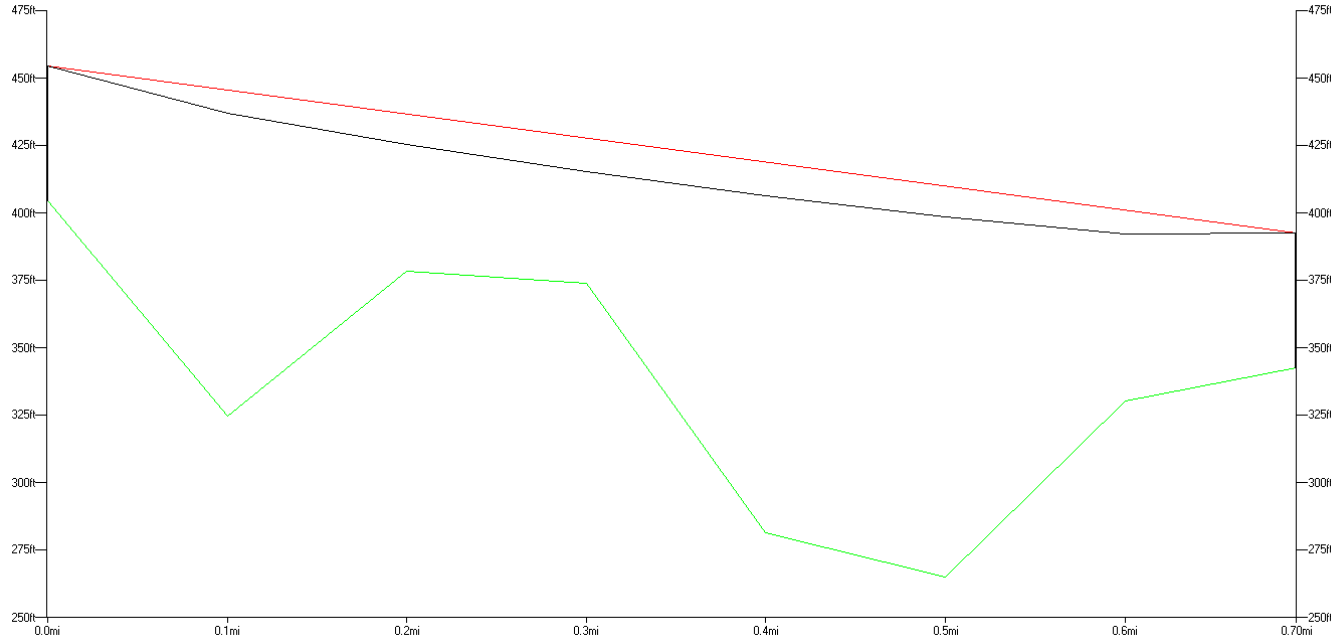
TRANSMITTER:
 FREQ: 5800.00 MHz
 ERP: 51.54 dBm

TX Antenna:
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 125.36

RX Antenna (Primary):
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 125.36

RECEIVER:
 FREQ: 5800.00 MHz
 SENS: -73.00 dBm
 (50.00 Ohms)

DIGITAL SPECS:
 DFM: 46.00



PARADISE MESA 2 PS

32 40 41.99 N
 117 02 44.99 W
 NAD 83:
 Elev: 342.36 ft MSL

TRANSMITTER:
 FREQ: 5800.00 MHz
 ERP: 51.54 dBm

TX Antenna:
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 305.36

RX Antenna (Primary):
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 305.36

RECEIVER:
 FREQ: 5800.00 MHz
 SENS: -73.00 dBm
 (50.00 Ohms)

DIGITAL SPECS:
 DFM: 46.00

Effective Earth Curvature:
 1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 125.36°T Reverse 305.37°T

Topo Data Step: 0.10
 mi

Topo Data Types:
 30m; 30s; VMB; DTED; BIL;
 HGT

Land Use Data:
 TIA TR8 (May 20
 1997)

Topo Data Interp:
 FCC Interpolation (4
 points)



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Table C-45
Paradise Hills 2 PS to Paradise Mesa Standpipe

Site	PARADISE HILLS 2 PS	PARADISE MESA STANDPIPE
Latitude	32 41 3.01 N	32 41 35.99 N
Lat (Dec Degrees)	32.68417	32.69333
Longitude	117 03 20.02 W	117 02 46.00 W
Lon (Dec Degrees)	-117.05556	-117.04611
Site Elevation	404.61 ft	480.72 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	41.1	221.1
Antenna Orientation	41.1	221.09
Path Angle	0.99	-0.99
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.39 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	41.1	221.1
Distance	0.84 mi	0.84 mi
Absorption Loss		0.01 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		110.33 dB
Total Gains dBm		81.78
Total Loss dB		113.34
Received Signal Level dBm		-31.56
Unfaded Fade Margin dB		41.44
Digital DFM		46
Composite Fade Margin		40.14
Terrain Factor (a)	0.5	
Climate Factor (b)	0.325	
Undp (TFM)		9.95E-11
Reliability (%)		99.99999999
Outage (sec/yr)		0



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Figure C-45

Paradise Hills 2 PS to Paradise Mesa Standpipe

PARADISE HILLS 2 PS

32 41 3.01 N
117 03 20.02 W
NAD 83:
Elev: 404.61 ft MSL

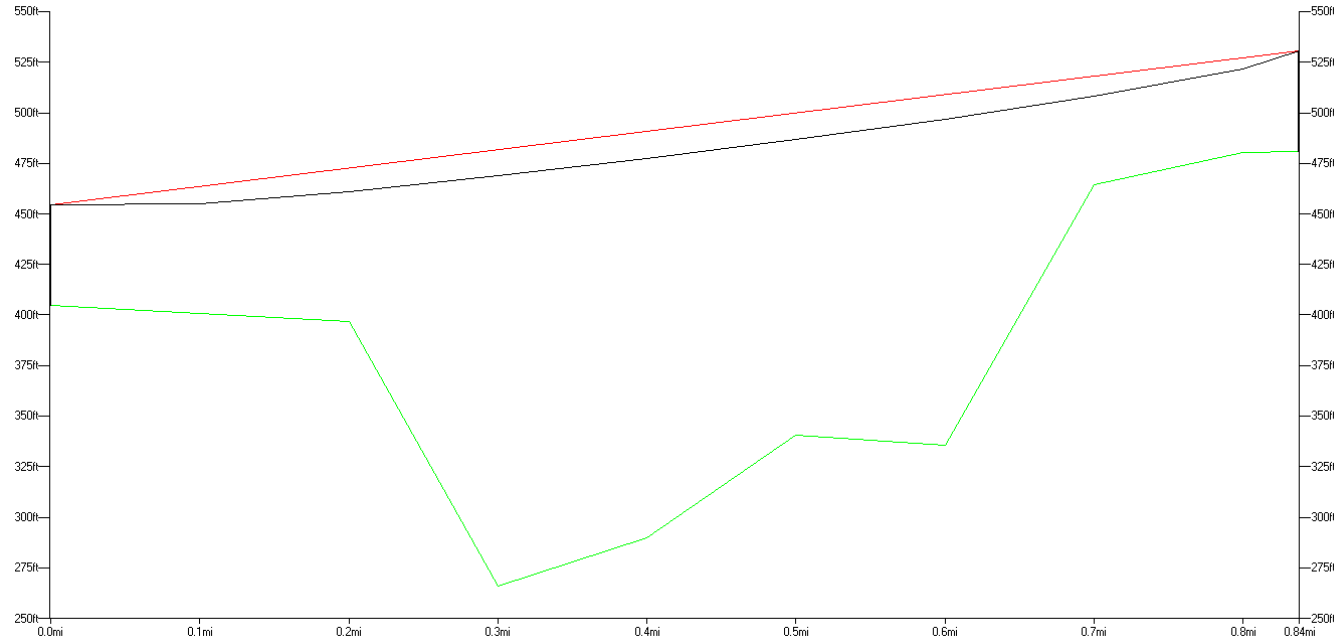
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 41.10

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 41.10

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



PARADISE MESA
STANDPIPE

32 41 35.99 N
117 02 46.00 W
NAD 83:
Elev: 480.72 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 221.09

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 221.09

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 41.10°T Reverse 221.10°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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Table C-46
Pomerado Park Reservoir to Rancho Bernardo Reservoir

Site	POMERADO PARK RESERVOIR	RANCHO BERNARDO RESERVOIR
Latitude	33 00 16.99 N	33 00 27.00 N
Lat (Dec Degrees)	33.00472	33.0075
Longitude	117 04 30.00 W	117 05 3.98 W
Lon (Dec Degrees)	-117.075	-117.08444
Site Elevation	829.40 ft	775.84 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	289.27	109.26
Antenna Orientation	289.27	109.26
Path Angle	-1	1
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.40 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	289.27	109.26
Distance	0.58 mi	0.58 mi
Absorption Loss		0.00 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		107.15 dB
Total Gains dBm		81.79
Total Loss dB		110.15
Received Signal Level dBm		-28.36
Unfaded Fade Margin dB		44.64
Digital DFM		46
Composite Fade Margin		42.26
Terrain Factor (a)	0.5	
Climate Factor (b)	0.325	
Undp (TFM)		1.58E-11
Reliability (%)		100
Outage (sec/yr)		0



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Figure C-46

Pomerado Park Reservoir to Rancho Bernardo Reservoir

POMERADO PARK
RESERVOIR

33 00 16.99 N
117 04 30.00 W
NAD 83:
Elev: 829.40 ft MSL

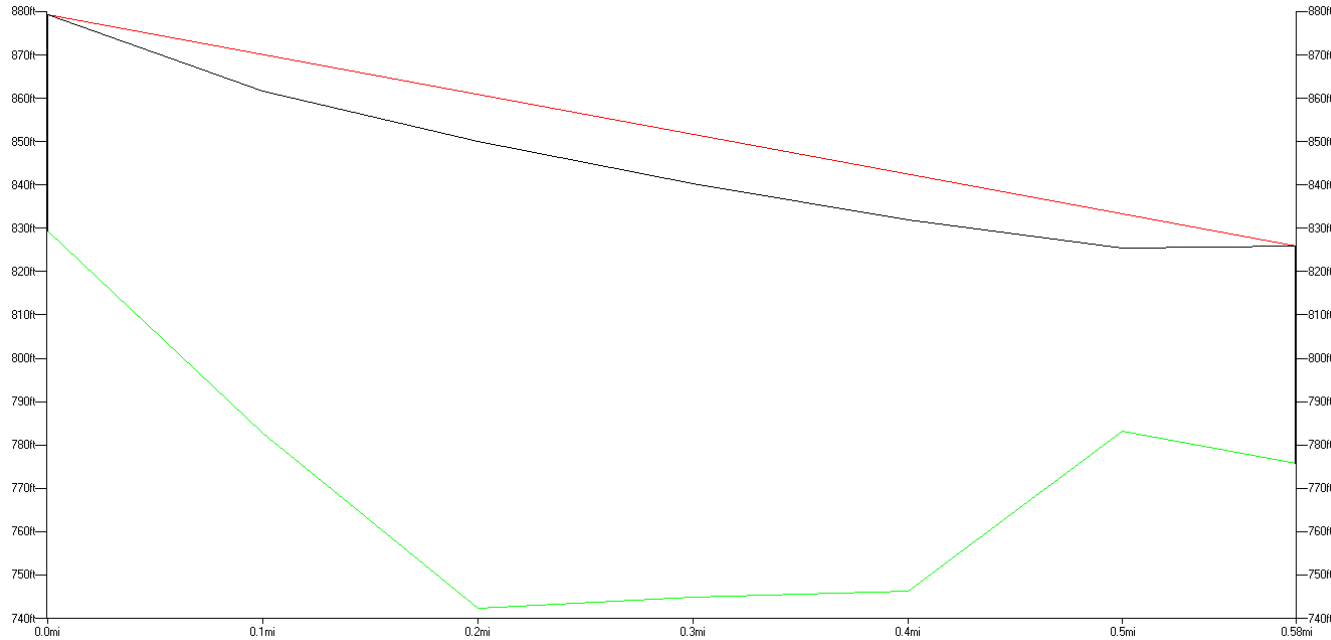
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 289.27

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 289.27

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



RANCHO BERNARDO
RESERVOIR

33 00 27.00 N
117 05 3.98 W
NAD 83:
Elev: 775.84 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 109.26

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 109.26

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 289.27°T Reverse 109.26°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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Table C-47
Rancho Bernardo Reservoir to Black Mountain

Site	RANCHO BERNARDO RESERVOIR	BLACK MTN
Latitude	33 00 27.00 N	32 58 53.00 N
Lat (Dec Degrees)	33.0075	32.98139
Longitude	117 05 3.98 W	117 06 59.00 W
Lon (Dec Degrees)	-117.08444	-117.11639
Site Elevation	775.84 ft	1561.02 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	225.89	45.87
Antenna Orientation	225.89	45.87
Path Angle	3.29	-3.29
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.40 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	225.89	45.87
Distance	2.58 mi	2.58 mi
Absorption Loss		0.02 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		120.12 dB
Total Gains dBm		81.79
Total Loss dB		123.14
Received Signal Level dBm		-41.35
Unfaded Fade Margin dB		31.65
Digital DFM		46
Composite Fade Margin		31.5
Terrain Factor (a)	4	
Climate Factor (b)	0.325	
Undp (TFM)		2.22E-07
Reliability (%)		99.99997777
Outage (sec/yr)		7



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Figure C-47

Rancho Bernardo Reservoir to Black Mountain

**RANCHO BERNARDO
RESERVOIR**

33 00 27.00 N
117 05 3.98 W
NAD 83:
Elev: 775.84 ft MSL

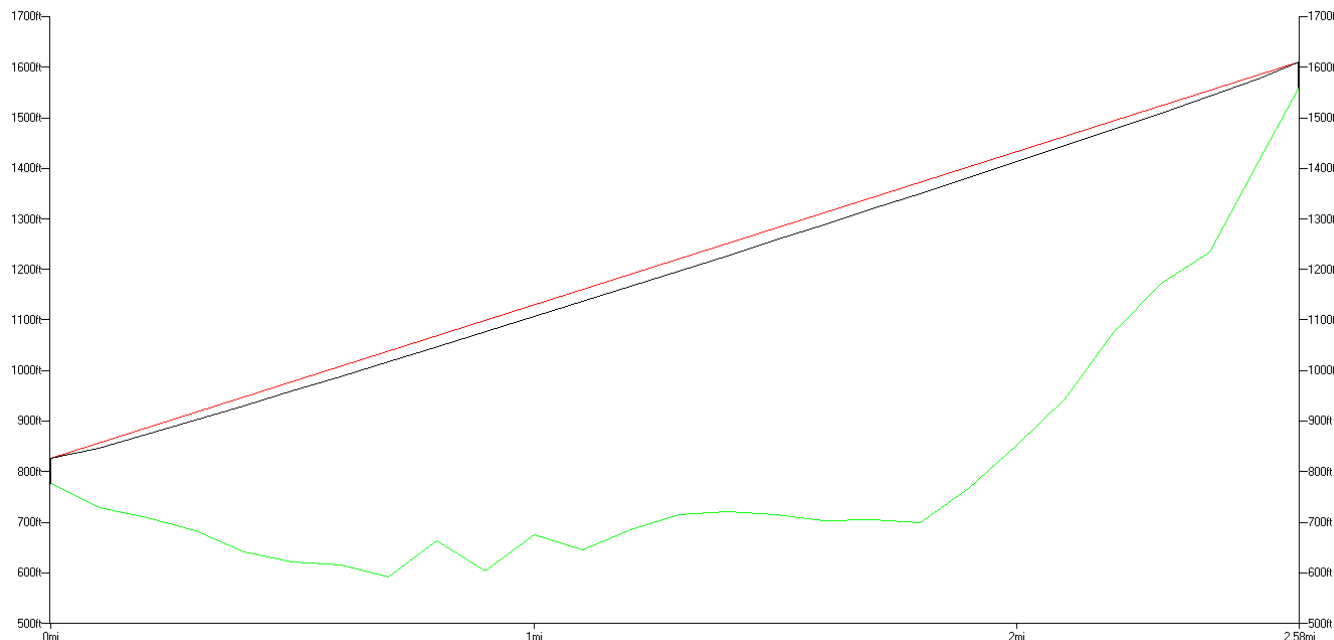
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 225.89

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 225.89

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



BLACK MTN

32 58 53.00 N
117 06 59.00 W
NAD 83:
Elev: 1561.02 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 45.87

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 45.87

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 225.89°T Reverse 45.87°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)

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Table C-48
Red Wood Village Standpipe to Montezuma

Site	RED WOOD VILLAGE STANDPIPE	MONTEZUMA
Latitude	32 44 55.00 N	32 46 8.00 N
Lat (Dec Degrees)	32.74861	32.76889
Longitude	117 04 0.98 W	117 03 31.00 W
Lon (Dec Degrees)	-117.06694	-117.05861
Site Elevation	461.78 ft	454.07 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	19.14	199.14
Antenna Orientation	19.14	199.14
Path Angle	-0.06	0.06
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna	FP2-5-28 Vpol	FP2-5-28 Vpol
(Ant File/ID)	AMSX0005 X000500017	AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.40 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	19.14	199.14
Distance	1.48 mi	1.48 mi
Absorption Loss		0.01 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		115.27 dB
Total Gains dBm		81.79
Total Loss dB		118.28
Received Signal Level dBm		-36.49
Unfaded Fade Margin dB		36.51
Digital DFM		46
Composite Fade Margin		36.05
Terrain Factor (a)	0.5	
Climate Factor (b)	0.325	
Undp (TFM)		1.70E-09
Reliability (%)		99.99999983
Outage (sec/yr)		0



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Figure C-48

Red Wood Village Standpipe to Montezuma

RED WOOD VILLAGE
STANDPIPE

32 44 55.00 N
117 04 0.98 W
NAD 83:
Elev: 461.78 ft MSL

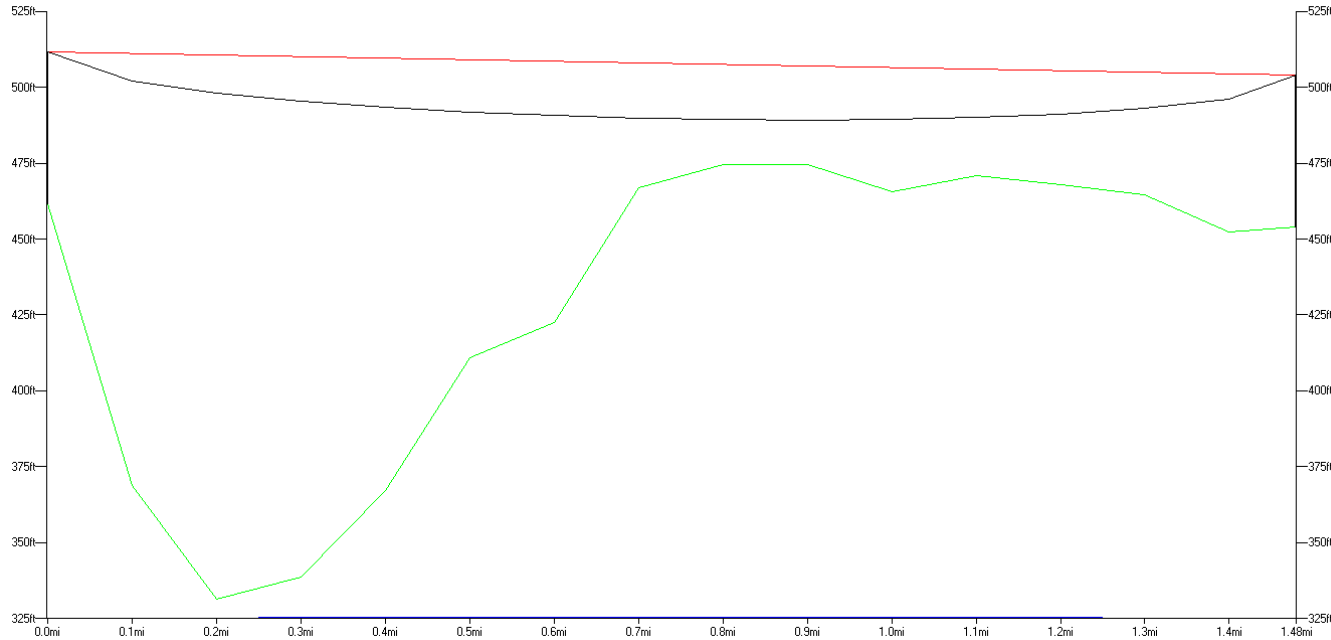
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 19.14

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 19.14

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



MONTEZUMA

32 46 8.00 N
117 03 31.00 W
NAD 83:
Elev: 454.07 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 199.14

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 199.14

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 19.14°T Reverse 199.14°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)

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Table C-49
San Carlos Reservoir to Eagle Ridge

Site	SAN CARLOS RESERVOIR	EAGLE RIDGE
Latitude	32 48 28.01 N	32 48 19.01 N
Lat (Dec Degrees)	32.80778	32.80528
Longitude	117 01 41.02 W	117 01 40.01 W
Lon (Dec Degrees)	-117.02806	-117.02778
Site Elevation	816.03 ft	711.45 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	174.6	354.6
Antenna Orientation	174.6	354.56
Path Angle	-6.53	6.53
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.37 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	174.6	354.6
Distance	0.17 mi	0.17 mi
Absorption Loss		0.00 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		96.63 dB
Total Gains dBm		81.76
Total Loss dB		99.63
Received Signal Level dBm		-17.87
Unfaded Fade Margin dB		55.13
Digital DFM		46
Composite Fade Margin		45.5
Terrain Factor (a)	0.5	
Climate Factor (b)	0.325	
Undp (TFM)		3.75E-14
Reliability (%)		100
Outage (sec/yr)		0



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Figure C-49

San Carlos Reservoir to Eagle Ridge

SAN CARLOS RESERVOIR

32 48 28.01 N
117 01 41.02 W
NAD 83:
Elev: 816.03 ft MSL

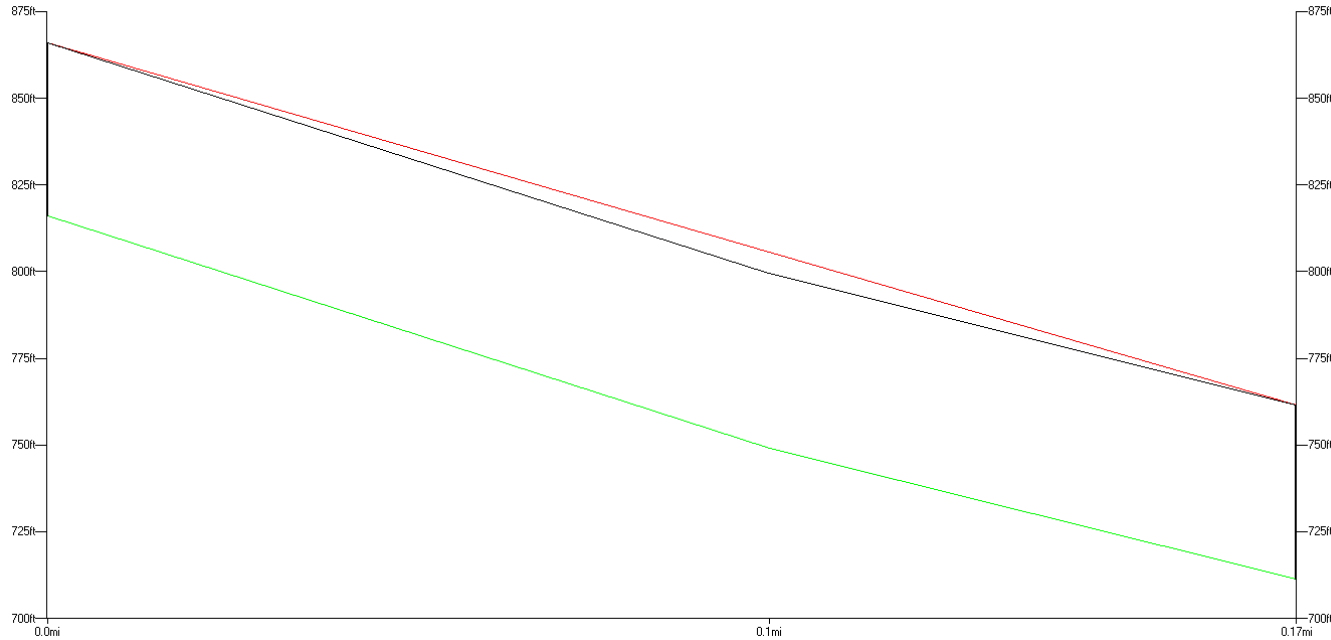
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 174.60

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 174.60

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



EAGLE RIDGE

32 48 19.01 N
117 01 40.01 W
NAD 83:
Elev: 711.45 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 354.56

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 354.56

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 174.60°T Reverse 354.60°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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Table C-50
San Ysidro to Paradise Hills 2 PS

Site	SAN YSIDRO	PARADISE HILLS 2 PS
Latitude	32 33 42.01 N	32 41 3.01 N
Lat (Dec Degrees)	32.56167	32.68417
Longitude	117 02 7.01 W	117 03 20.02 W
Lon (Dec Degrees)	-117.03528	-117.05556
Site Elevation	468.18 ft	404.61 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	352.03	172.02
Antenna Orientation	352.03	172.02
Path Angle	-0.08	0.08
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.40 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	352.03	172.02
Distance	8.52 mi	8.52 mi
Absorption Loss		0.06 dB
Rain Loss CRANE:		0.01 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		130.48 dB
Total Gains dBm		81.79
Total Loss dB		133.55
Received Signal Level dBm		-51.76
Unfaded Fade Margin dB		21.24
Digital DFM		46
Composite Fade Margin		21.22
Terrain Factor (a)	0.335	
Climate Factor (b)	0.325	
Undp (TFM)		7.35E-06
Reliability (%)		99.99926507
Outage (sec/yr)		232



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Figure C-50

San Ysidro to Paradise Hills 2 PS

SAN YSIDRO

32 33 42.01 N
 117 02 7.01 W
 NAD 83:
 Elev: 468.18 ft MSL

TRANSMITTER:
 FREQ: 5800.00 MHz
 ERP: 51.54 dBm

TX Antenna:
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 352.03

RX Antenna (Primary):
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 352.03

RECEIVER:
 FREQ: 5800.00 MHz
 SENS: -73.00 dBm
 (50.00 Ohms)

DIGITAL SPECS:
 DFM: 46.00



PARADISE HILLS 2 PS

32 41 3.01 N
 117 03 20.02 W
 NAD 83:
 Elev: 404.61 ft MSL

TRANSMITTER:
 FREQ: 5800.00 MHz
 ERP: 51.54 dBm

TX Antenna:
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 172.02

RX Antenna (Primary):
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 172.02

RECEIVER:
 FREQ: 5800.00 MHz
 SENS: -73.00 dBm
 (50.00 Ohms)

DIGITAL SPECS:
 DFM: 46.00

Effective Earth Curvature:
 1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 352.03°T Reverse 172.02°T

Topo Data Step: 0.10
 mi

Topo Data Types:
 30m; 30s; VMB; DTED; BIL;
 HGT

Land Use Data:
 TIA TR8 (May 20
 1997)

Topo Data Interp:
 FCC Interpolation (4
 points)



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**Table C-51
San Ysidro to Princess Park PS**

Site	SAN YSIDRO	PRINCESS PARK PS
Latitude	32 33 42.01 N	32 33 56.02 N
Lat (Dec Degrees)	32.56167	32.56556
Longitude	117 02 7.01 W	117 02 22.99 W
Lon (Dec Degrees)	-117.03528	-117.03972
Site Elevation	468.18 ft	258.28 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	315.98	135.97
Antenna Orientation	315.98	135.93
Path Angle	-6.09	6.09
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.41 dBi	27.36 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	315.98	135.97
Distance	0.37 mi	0.37 mi
Absorption Loss		0.00 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		103.30 dB
Total Gains dBm		81.75
Total Loss dB		106.3
Received Signal Level dBm		-24.54
Unfaded Fade Margin dB		48.46
Digital DFM		46
Composite Fade Margin		44.05
Terrain Factor (a)	0.5	
Climate Factor (b)	0.325	
Undp (TFM)		1.74E-12
Reliability (%)		100
Outage (sec/yr)		0



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Figure C-51

San Ysidro to Princess Park PS

SAN YSIDRO

32 33 42.01 N
117 02 7.01 W
NAD 83:
Elev: 468.18 ft MSL

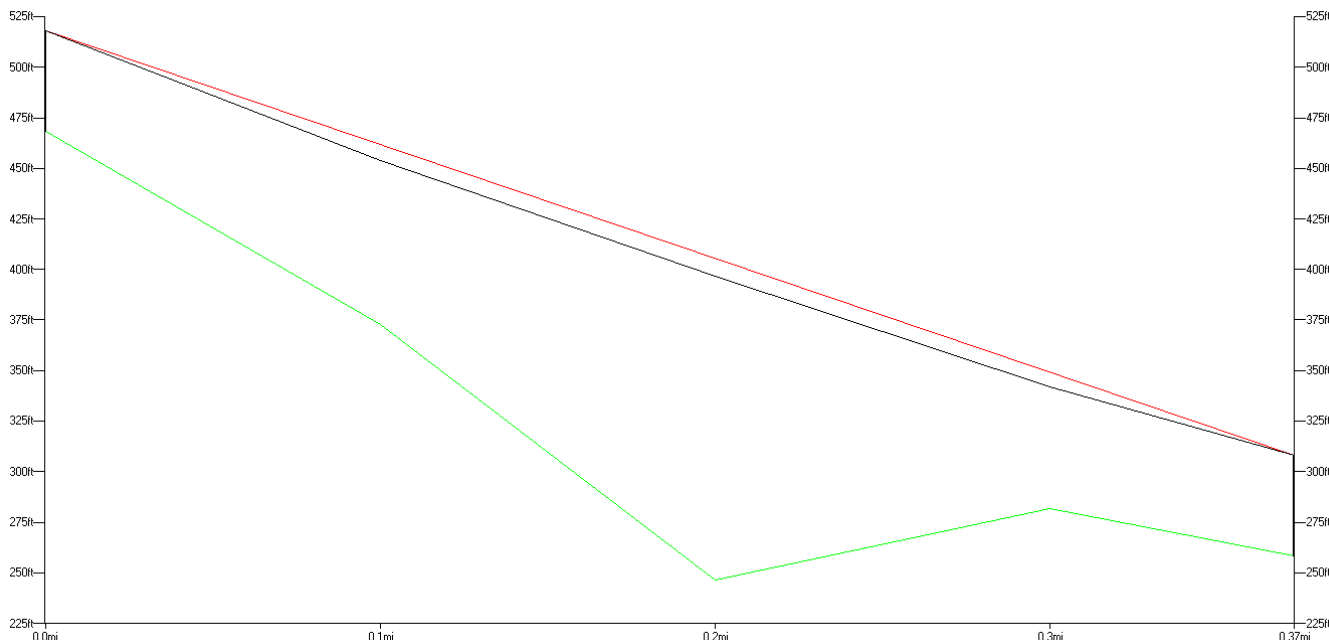
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 315.98

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 315.98

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



PRINCESS PARK PS

32 33 56.02 N
117 02 22.99 W
NAD 83:
Elev: 258.28 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 135.93

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 135.93

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 315.98°T Reverse 135.97°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)

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Table C-52
Scripps Ranch Reservoir to Scripps Woods PS 2

Site	SCRIPPS RANCH RESERVOIR	SCRIPPS WOODS PS 2
Latitude	32 55 18.98 N	32 54 37.01 N
Lat (Dec Degrees)	32.92194	32.91028
Longitude	117 04 0.98 W	117 03 55.01 W
Lon (Dec Degrees)	-117.06694	-117.06528
Site Elevation	994.01 ft	888.45 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	173.15	353.15
Antenna Orientation	173.15	353.15
Path Angle	-1.42	1.42
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.40 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	173.15	353.15
Distance	0.81 mi	0.81 mi
Absorption Loss		0.01 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		110.03 dB
Total Gains dBm		81.78
Total Loss dB		113.04
Received Signal Level dBm		-31.26
Unfaded Fade Margin dB		41.74
Digital DFM		46
Composite Fade Margin		40.36
Terrain Factor (a)	0.5	
Climate Factor (b)	0.325	
Undp (TFM)		8.36E-11
Reliability (%)		99.99999999
Outage (sec/yr)		0



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Figure C-52

Scripps Ranch Reservoir to Scripps Woods PS 2

SCRIPPS RANCH RESERVOIR

32 55 18.98 N
117 04 0.98 W
NAD 83:
Elev: 994.01 ft MSL

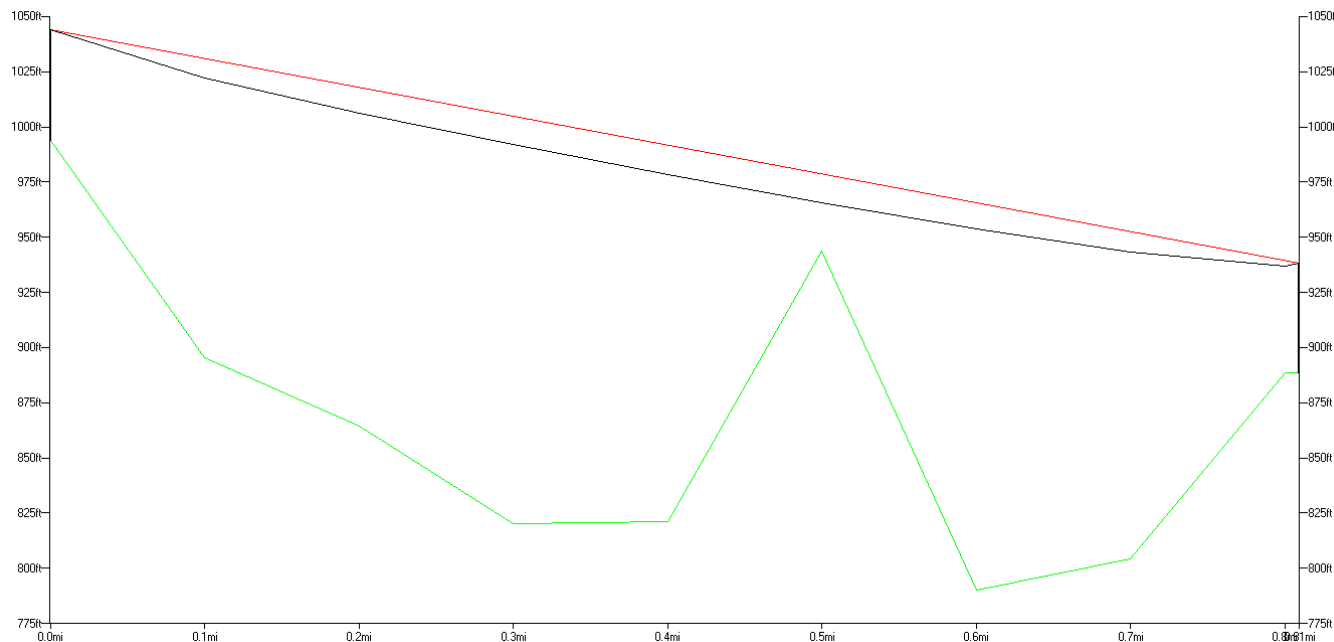
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 173.15

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 173.15

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



SCRIPPS WOODS PS 2

32 54 37.01 N
117 03 55.01 W
NAD 83:
Elev: 888.45 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 353.15

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 353.15

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 173.15°T Reverse 353.15°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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Table C-53
Security Operations Center (SOC) to Chollas Heights PS

Site	SECURITY OPERATIONS CENTER (SOC)	CHOLLAS HEIGHTS PS
Latitude	32 44 4.99 N	32 44 28.00 N
Lat (Dec Degrees)	32.73472	32.74111
Longitude	117 04 18.01 W	117 04 0.01 W
Lon (Dec Degrees)	-117.07167	-117.06667
Site Elevation	423.56 ft	455.54 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	33.48	213.48
Antenna Orientation	33.48	213.49
Path Angle	0.66	-0.66
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMXS0005 X000500017	FP2-5-28 Vpol AMXS0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.41 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	33.48	213.48
Distance	0.53 mi	0.53 mi
Absorption Loss		0.00 dB
Rain Loss		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		106.32 dB
Total Gains dBm		81.81
Total Loss dB		109.32
Received Signal Level dBm		-27.51
Unfaded Fade Margin dB		45.49
Digital DFM		46
Composite Fade Margin		42.73
Terrain Factor (a)	0.798	
Climate Factor (b)	0.325	
Undp (TFM)		1.56E-11
Reliability (%)		100
Outage (sec/yr)		0



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Figure C-53

Security Operations Center (SOC) to Chollas Heights PS

SECURITY OPERATIONS CENTER (SOC)

32 44 4.99 N
117 04 18.01 W
NAD 83:
Elev: 423.56 ft MSL

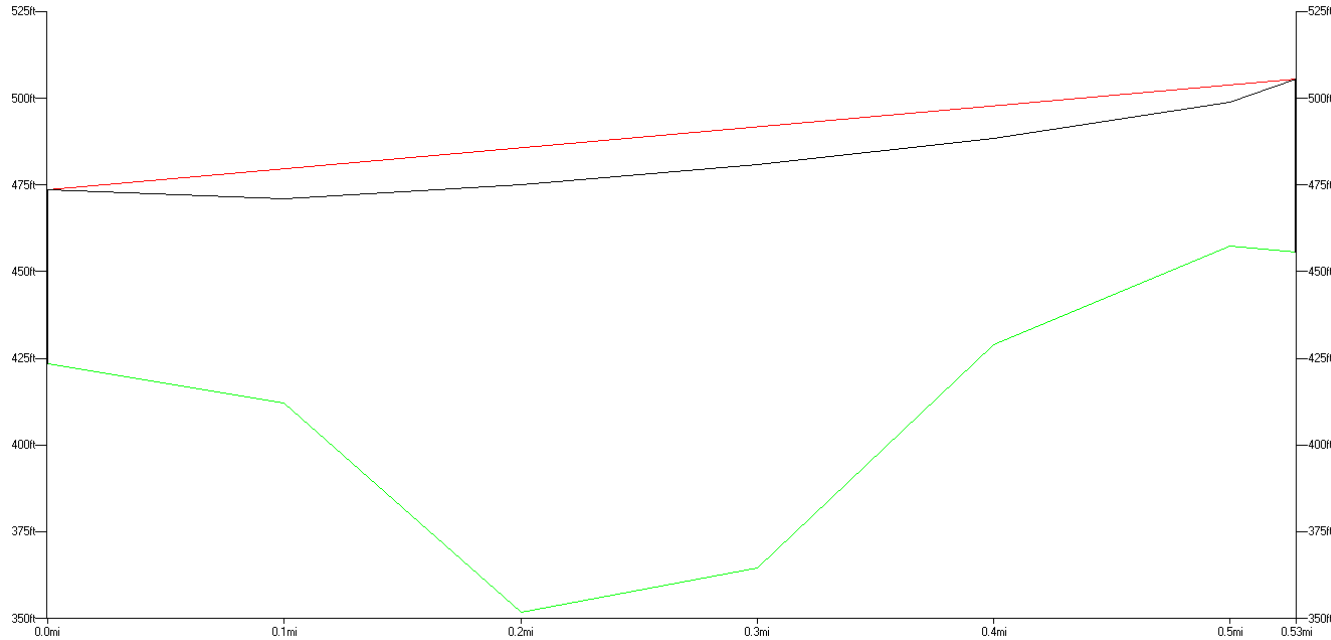
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 33.48

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 33.48

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



CHOLLAS HEIGHTS PS

32 44 28.00 N
117 04 0.01 W
NAD 83:
Elev: 455.54 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 213.49

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 213.49

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 33.48°T Reverse 213.48°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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Table C-54
Security Operations Center (SOC) to Encanto

Site	SECURITY OPERATIONS CENTER (SOC)	ENCANTO
Latitude	32 44 4.99 N	32 42 16.99 N
Lat (Dec Degrees)	32.73472	32.70472
Longitude	117 04 18.01 W	117 03 9.00 W
Lon (Dec Degrees)	-117.07167	-117.0525
Site Elevation	423.56 ft	483.27 ft
Antenna Center	75.00 ft AGL	50.00 ft AGL
Bearing (T)	151.62	331.63
Antenna Orientation	151.62	331.63
Path Angle	0.16	-0.16
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.40 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	151.62	331.63
Distance	2.35 mi	2.35 mi
Absorption Loss		0.02 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		119.29 dB
Total Gains dBm		81.79
Total Loss dB		122.31
Received Signal Level dBm		-40.51
Unfaded Fade Margin dB		32.49
Digital DFM		46
Composite Fade Margin		32.3
Terrain Factor (a)	4	
Climate Factor (b)	0.325	
Undp (TFM)		1.38E-07
Reliability (%)		99.9999862
Outage (sec/yr)		4



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Figure C-54

Security Operations Center (SOC) to Encanto

SECURITY OPERATIONS CENTER (SOC)

32 44 4.99 N
117 04 18.01 W
NAD 83:
Elev: 423.56 ft MSL

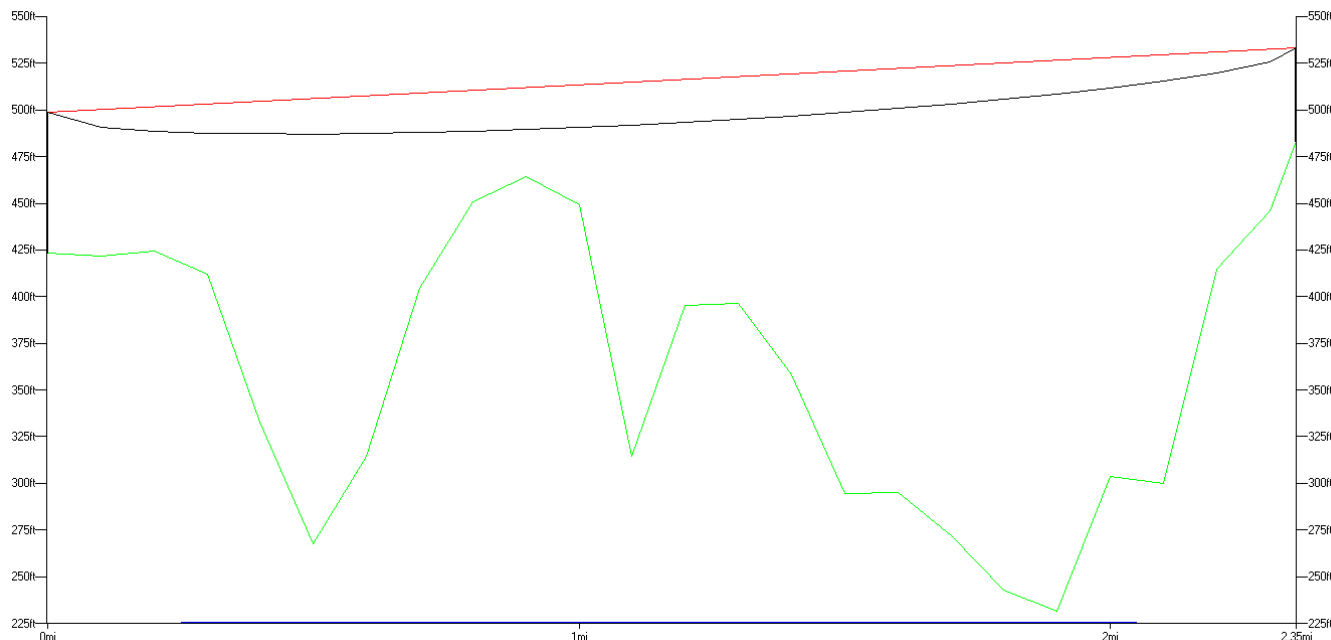
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 75.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 151.62

RX Antenna (Primary):
ANT HGT: 75.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 151.62

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



ENCANTO

32 42 16.99 N
117 03 9.00 W
NAD 83:
Elev: 483.27 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 331.63

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 331.63

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 151.62°T Reverse 331.63°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)

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Table C-55 Security Operations Center (SOC) to San Carlos Reservoir

Site	SECURITY OPERATIONS CENTER (SOC)	SAN CARLOS RESERVOIR
Latitude	32 44 4.99 N	32 48 28.01 N
Lat (Dec Degrees)	32.73472	32.80778
Longitude	117 04 18.01 W	117 01 41.02 W
Lon (Dec Degrees)	-117.07167	-117.02806
Site Elevation	423.56 ft	816.03 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	26.75	206.77
Antenna Orientation	26.75	206.78
Path Angle	0.76	-0.76
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.41 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	26.75	206.77
Distance	5.64 mi	5.64 mi
Absorption Loss		0.04 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		126.89 dB
Total Gains dBm		81.8
Total Loss dB		129.93
Received Signal Level dBm		-48.13
Unfaded Fade Margin dB		24.87
Digital DFM		46
Composite Fade Margin		24.83
Terrain Factor (a)	0.798	
Climate Factor (b)	0.325	
Undp (TFM)		2.20E-06
Reliability (%)		99.99978013
Outage (sec/yr)		69

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Figure C-55

Security Operations Center (SOC) to San Carlos Reservoir

SECURITY OPERATIONS CENTER (SOC)

32 44 4.99 N
117 04 18.01 W
NAD 83:
Elev: 423.56 ft MSL

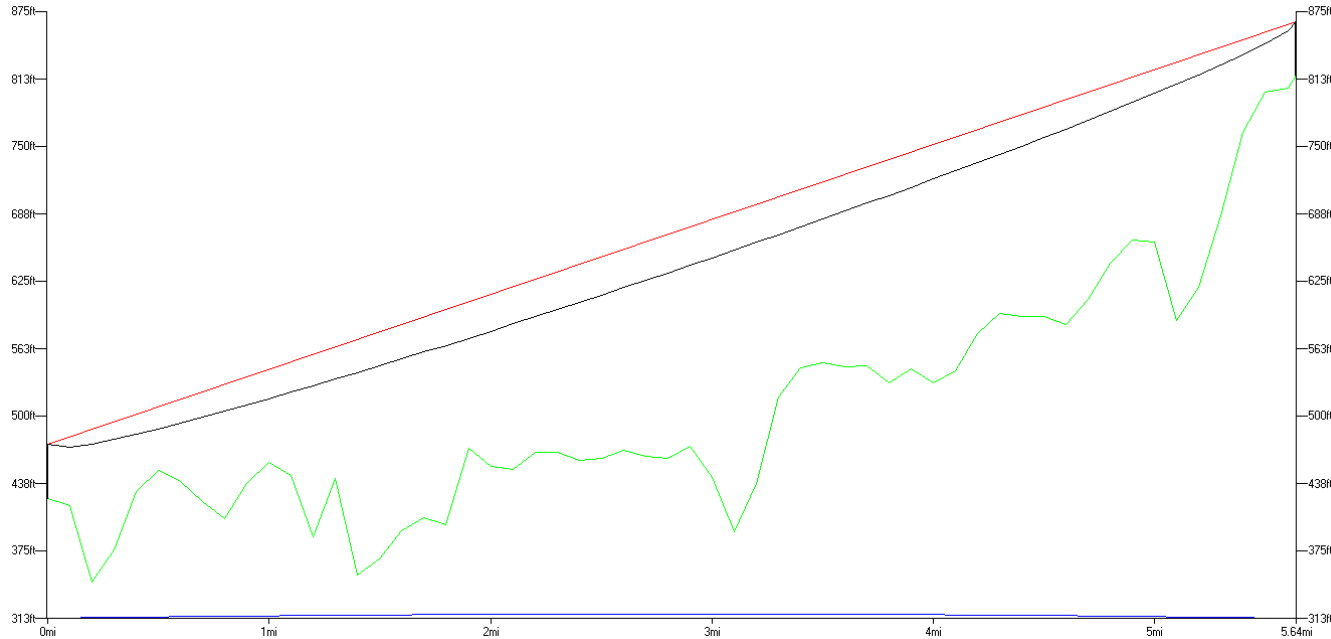
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 26.75

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 26.75

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



SAN CARLOS RESERVOIR

32 48 28.01 N
117 01 41.02 W
NAD 83:
Elev: 816.03 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 206.78

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 206.78

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 26.75°T Reverse 206.77°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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Table C-56
Security Operations Center (SOC) to Thorn Street Regulator

Site	SECURITY OPERATIONS CENTER (SOC)	THORN ST REGULATOR
Latitude	32 44 4.99 N	32 44 21.98 N
Lat (Dec Degrees)	32.73472	32.73944
Longitude	117 04 18.01 W	117 07 45.01 W
Lon (Dec Degrees)	-117.07167	-117.12917
Site Elevation	423.56 ft	330.46 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	275.56	95.53
Antenna Orientation	275.56	95.54
Path Angle	-0.3	0.3
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.41 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	275.56	95.53
Distance	3.36 mi	3.36 mi
Absorption Loss		0.02 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		122.41 dB
Total Gains dBm		81.8
Total Loss dB		125.43
Received Signal Level dBm		-43.63
Unfaded Fade Margin dB		29.37
Digital DFM		46
Composite Fade Margin		29.28
Terrain Factor (a)	4.067	
Climate Factor (b)	0.325	
Undp (TFM)		8.44E-07
Reliability (%)		99.99991558
Outage (sec/yr)		27



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Figure C-56

Security Operations Center (SOC) to Thorn Street Regulator

SECURITY OPERATIONS CENTER (SOC)

32 44 4.99 N
117 04 18.01 W
NAD 83:
Elev: 423.56 ft MSL

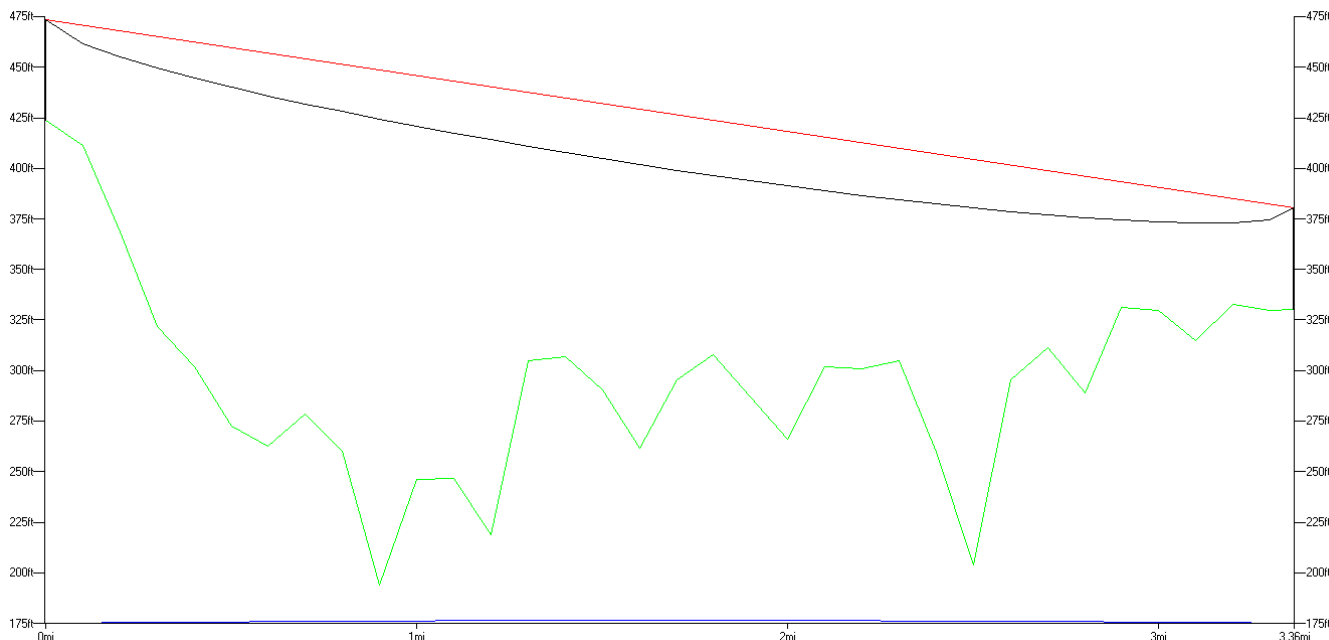
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 275.56

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 275.56

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



THORN ST REGULATOR

32 44 21.98 N
117 07 45.01 W
NAD 83:
Elev: 330.46 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 95.54

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 95.54

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 275.56°T Reverse 95.53°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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Table C-57
Sewer Pump Station 78 to San Andreas PS

Site	SEWER PUMP STATION 78	SAN ANDREAS PS
Latitude	32 57 46.55 N	32 59 7.01 N
Lat (Dec Degrees)	32.96293	32.98528
Longitude	117 15 20.16 W	117 14 43.01 W
Lon (Dec Degrees)	-117.2556	-117.24528
Site Elevation	27.91 ft	121.72 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	21.26	201.27
Antenna Orientation	21.26	201.27
Path Angle	0.62	-0.62
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.40 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	21.26	201.27
Distance	1.65 mi	1.65 mi
Absorption Loss		0.01 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		116.23 dB
Total Gains dBm		81.79
Total Loss dB		119.24
Received Signal Level dBm		-37.45
Unfaded Fade Margin dB		35.55
Digital DFM		46
Composite Fade Margin		35.17
Terrain Factor (a)	0.5	
Climate Factor (b)	0.325	
Undp (TFM)		2.97E-09
Reliability (%)		99.9999997
Outage (sec/yr)		0



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Figure C-57

Sewer Pump Station 78 to San Andreas PS

SEWER PUMP STATION 78

32 57 46.55 N
117 15 20.16 W
NAD 83:
Elev: 27.91 ft MSL

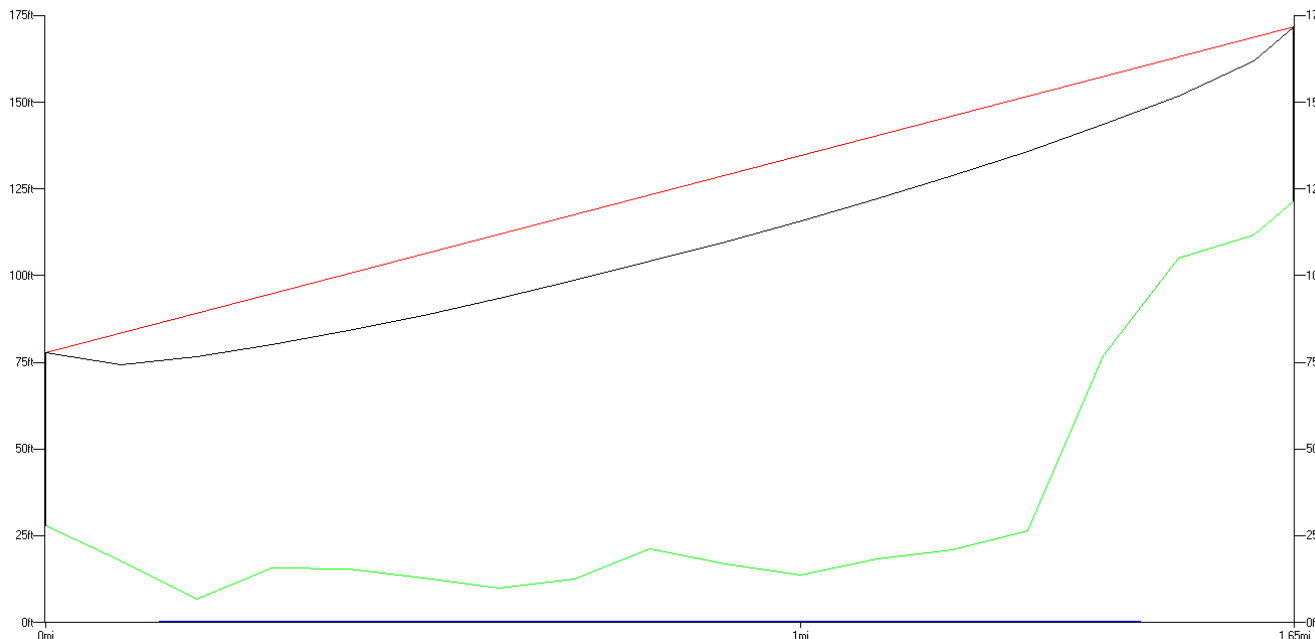
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 21.26

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 21.26

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



SAN ANDREAS PS

32 59 7.01 N
117 14 43.01 W
NAD 83:
Elev: 121.72 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 201.27

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 201.27

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 21.26°T Reverse 201.27°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)

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Table C-58

Stonebridge PS 2 to Cowles Mountain

Site	STONEBRIDGE PS 2	COWLES MTN
Latitude	32 55 36.01 N	32 48 49.00 N
Lat (Dec Degrees)	32.92667	32.81361
Longitude	117 00 28.01 W	117 01 55.99 W
Lon (Dec Degrees)	-117.00778	-117.03222
Site Elevation	1106.79 ft	1513.86 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	190.35	10.33
Antenna Orientation	190.35	10.33
Path Angle	0.56	-0.56
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.41 dBi	27.40 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	190.35	10.33
Distance	7.92 mi	7.92 mi
Absorption Loss		0.05 dB
Rain Loss CRANE:		0.01 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		129.84 dB
Total Gains dBm		81.79
Total Loss dB		132.9
Received Signal Level dBm		-51.11
Unfaded Fade Margin dB		21.89
Digital DFM		46
Composite Fade Margin		21.87
Terrain Factor (a)	0.103	
Climate Factor (b)	0.325	
Undp (TFM)		1.56E-06
Reliability (%)		99.999844
Outage (sec/yr)		49



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Figure C-58

Stonebridge PS 2 to Cowles Mountain

STONEBRIDGE PS 2

32 55 36.01 N
117 00 28.01 W
NAD 83:
Elev: 1106.79 ft MSL

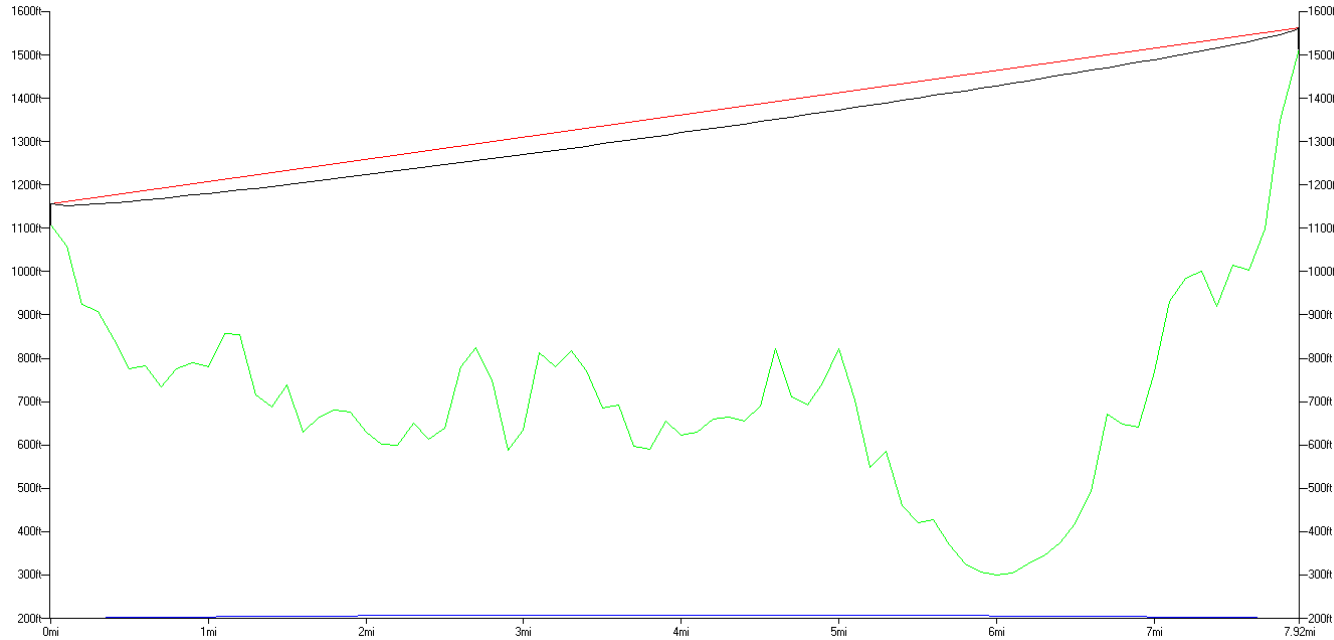
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 190.35

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 190.35

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



COWLES MTN

32 48 49.00 N
117 01 55.99 W
NAD 83:
Elev: 1513.86 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 10.33

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 10.33

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 190.35°T Reverse 10.33°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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Table C-59

Stonebridge PS 2 to Scripps Ranch Reservoir

Site	STONEBRIDGE PS 2	SCRIPPS RANCH RESERVOIR
Latitude	32 55 36.01 N	32 55 18.98 N
Lat (Dec Degrees)	32.92667	32.92194
Longitude	117 00 28.01 W	117 04 0.98 W
Lon (Dec Degrees)	-117.00778	-117.06694
Site Elevation	1106.79 ft	994.01 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	264.6	84.57
Antenna Orientation	264.6	84.57
Path Angle	-0.35	0.35
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500017
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.40 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	264.6	84.57
Distance	3.45 mi	3.45 mi
Absorption Loss		0.02 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		122.63 dB
Total Gains dBm		81.79
Total Loss dB		125.65
Received Signal Level dBm		-43.86
Unfaded Fade Margin dB		29.14
Digital DFM		46
Composite Fade Margin		29.05
Terrain Factor (a)	0.272	
Climate Factor (b)	0.325	
Undp (TFM)		6.44E-08
Reliability (%)		99.99999356
Outage (sec/yr)		2



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Figure C-59

Stonebridge PS 2 to Scripps Ranch Reservoir

STONEBRIDGE PS 2

32 55 36.01 N
117 00 28.01 W
NAD 83:
Elev: 1106.79 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 264.60

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 264.60

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



SCRIPPS RANCH
RESERVOIR

32 55 18.98 N
117 04 0.98 W
NAD 83:
Elev: 994.01 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 84.57

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 84.57

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 264.60°T Reverse 84.57°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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Table C-60

South Creek Pump Station to South Creek Pump Station Repeater

Site	SOUTH CREEK PS	SOUTH CREEK PS RPTR
Latitude	32 56 32.50 N	32 56 7.84 N
Lat (Dec Degrees)	32.94236	32.93551
Longitude	117 04 34.00 W	117 04 7.46 W
Lon (Dec Degrees)	-117.07611	-117.06874
Site Elevation	441.94 ft	723.17 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	137.78	317.79
Antenna Orientation	137.78	317.77
Path Angle	4.78	-4.78
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500020	FP2-5-28 Vpol AMSX0005 X000500020
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.38 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	137.78	317.79
Distance	0.64 mi	0.64 mi
Absorption Loss		0.00 dB
Rain Loss		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		107.96 dB
Total Gains dBm		81.77
Total Loss dB		110.96
Received Signal Level dBm		-29.18
Unfaded Fade Margin dB		43.82
Digital EIFM		0
Digital AIFM		0
Digital DFM		46
Composite Fade Margin		41.76
Terrain Factor (a)	1	
Climate Factor (b)	0.325	
Undp (TFM)		5.07E-11
Reliability (%)		100
Outage (sec/yr)		0



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Figure C-60

South Creek Pump Station to South Creek Pump Station Repeater

SOUTH CREEK PS

32 56 32.50 N
117 04 34.00 W
NAD 83:
Elev: 441.94 ft MSL

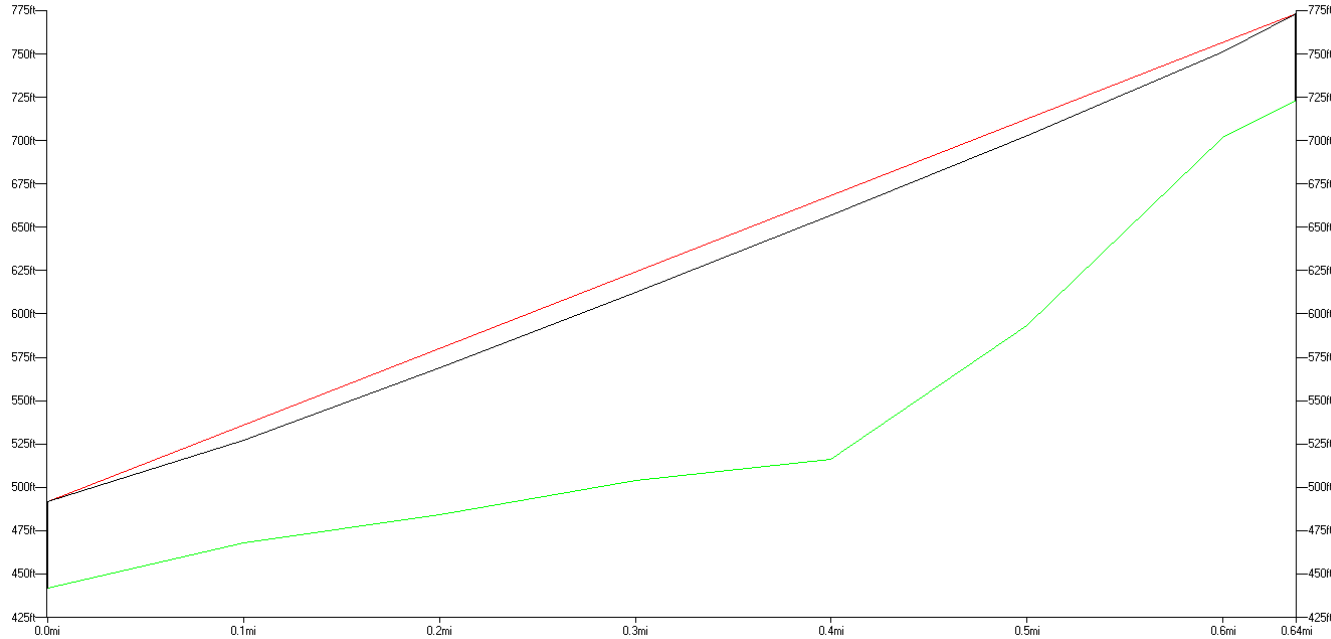
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 137.78

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 137.78

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



SOUTH CREEK PS RPTR

32 56 7.84 N
117 04 7.46 W
NAD 83:
Elev: 723.17 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 317.77

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 317.77

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 137.78°T Reverse 317.79°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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Table C-61
Scripps Ranch Reservoir to South Creek Pump Station Repeater

Site	SCRIPPS RANCH RESERVOIR	SOUTH CREEK PS RPTR
Latitude	32 55 18.98 N	32 56 7.84 N
Lat (Dec Degrees)	32.92194	32.93551
Longitude	117 04 0.98 W	117 04 7.46 W
Lon (Dec Degrees)	-117.06694	-117.06874
Site Elevation	994.01 ft	723.17 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	353.62	173.62
Antenna Orientation	353.62	173.62
Path Angle	-3.12	3.12
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500020
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.40 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	353.62	173.62
Distance	0.94 mi	0.94 mi
Absorption Loss		0.01 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		111.34 dB
Total Gains dBm		81.8
Total Loss dB		114.35
Received Signal Level dBm		-32.55
Unfaded Fade Margin dB		40.45
Digital EIFM		0
Digital AIFM		0
Digital DFM		46
Composite Fade Margin		39.38
Terrain Factor (a)	1	
Climate Factor (b)	0.325	
Undp (TFM)		3.54E-10
Reliability (%)		99.99999997
Outage (sec/yr)		0



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Figure C-61

Scripps Ranch Reservoir to South Creek Pump Station Repeater

SCRIPPS RANCH RESERVOIR

32 55 18.98 N
 117 04 0.98 W
 NAD 83:
 Elev: 994.01 ft MSL

TRANSMITTER:
 FREQ: 5800.00 MHz
 ERP: 51.54 dBm

TX Antenna:
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 353.62

RX Antenna (Primary):
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 353.62

RECEIVER:
 FREQ: 5800.00 MHz
 SENS: -73.00 dBm
 (50.00 Ohms)

DIGITAL SPECS:
 DFM: 46.00



SOUTH CREEK PS RPTR

32 56 7.84 N
 117 04 7.46 W
 NAD 83:
 Elev: 723.17 ft MSL

TRANSMITTER:
 FREQ: 5800.00 MHz
 ERP: 51.54 dBm

TX Antenna:
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 173.62

RX Antenna (Primary):
 ANT HGT: 50.00 ft AGL
 DESC: FP2-5-28 Vpol
 GAIN: 28.20 dBi
 ORIENT: 173.62

RECEIVER:
 FREQ: 5800.00 MHz
 SENS: -73.00 dBm
 (50.00 Ohms)

DIGITAL SPECS:
 DFM: 46.00

Effective Earth Curvature:
 1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 353.62°T Reverse 173.62°T

Topo Data Step: 0.10
 mi

Topo Data Types:
 30m; 30s; VMB; DTED; BIL;
 HGT

Land Use Data:
 TIA TR8 (May 20
 1997)

Topo Data Interp:
 FCC Interpolation (4
 points)



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Table C-62

Pomerado Pump Station to Pomerado Pump Station Repeater

Site	POMERADO PS	POMERADO PS RPTR
Latitude	32 53 54.85 N	32 53 38.94 N
Lat (Dec Degrees)	32.89857	32.89415
Longitude	117 06 1.40 W	117 06 38.30 W
Lon (Dec Degrees)	-117.10039	-117.11064
Site Elevation	551.04 ft	488.94 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	242.93	62.92
Antenna Orientation	242.93	62.95
Path Angle	-1.01	1.01
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500020	FP2-5-28 Vpol AMSX0005 X000500020
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.43 dBi
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	242.93	62.92
Distance	0.67 mi	0.67 mi
Absorption Loss		0.00 dB
Rain Loss		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		108.38 dB
Total Gains dBm		81.82
Total Loss dB		109.38
Received Signal Level dBm		-27.56
Unfaded Fade Margin dB		45.44
Digital EIFM		0
Digital AIFM		0
Digital DFM		46
Composite Fade Margin		42.7
Terrain Factor (a)	0.5	
Climate Factor (b)	0.325	
Undp (TFM)		2.02E-11
Reliability (%)		100
Outage (sec/yr)		0



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Figure C-62

Pomerado Pump Station to Pomerado PS Repeater

POMERADO PS

32 53 54.85 N
117 06 1.40 W
NAD 83:
Elev: 551.04 ft MSL

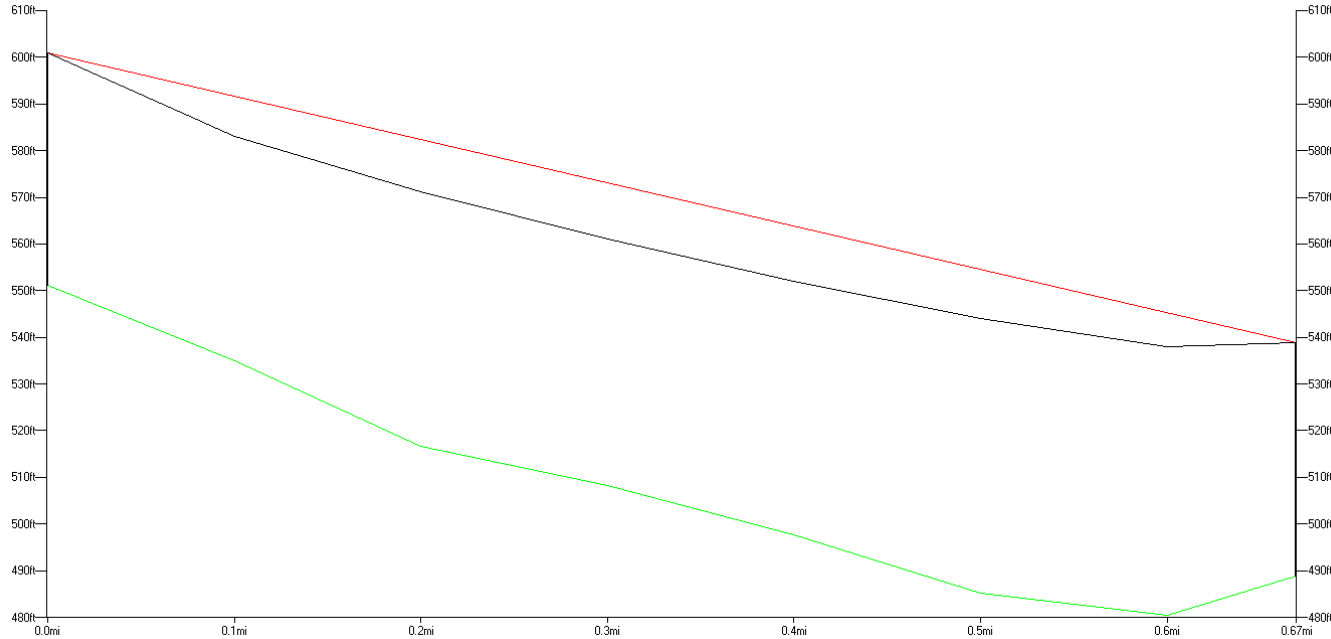
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 52.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 242.93

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 242.93

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



POMERADO PS RPTR

32 53 38.94 N
117 06 38.30 W
NAD 83:
Elev: 488.94 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 52.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 62.95

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 62.95

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 242.93°T Reverse 62.92°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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Table C-63

65th and Herrick to 65th and Herrick Repeater

Site	65TH AND HERRICK	65TH AND HERRICK RPTR
Latitude	32 42 40.00 N	32 42 38.81 N
Lat (Dec Degrees)	32.71111	32.71078
Longitude	117 03 28.26 W	117 03 17.24 W
Lon (Dec Degrees)	-117.05785	-117.05479
Site Elevation	227.31 ft	238.26 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	97.27	277.27
Antenna Orientation	97.27	277.27
Path Angle	0.66	-0.66
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500020	FP2-5-28 Vpol AMSX0005 X000500020
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.40 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	97.27	277.27
Distance	0.18 mi	0.18 mi
Absorption Loss		0.00 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		96.96 dB
Total Gains dBm		81.79
Total Loss dB		99.96
Received Signal Level dBm		-18.17
Unfaded Fade Margin dB		54.83
Digital EIFM		0
Digital AIFM		0
Digital DFM		46
Composite Fade Margin		45.47
Terrain Factor (a)	1	
Climate Factor (b)	0.325	
Undp (TFM)		8.99E-14
Reliability (%)		100
Outage (sec/yr)		0



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Figure C-63

65th and Herrick to 65th and Herrick Repeater

65TH AND HERRICK

32 42 40.00 N
117 03 28.26 W
NAD 83:
Elev: 227.31 ft MSL

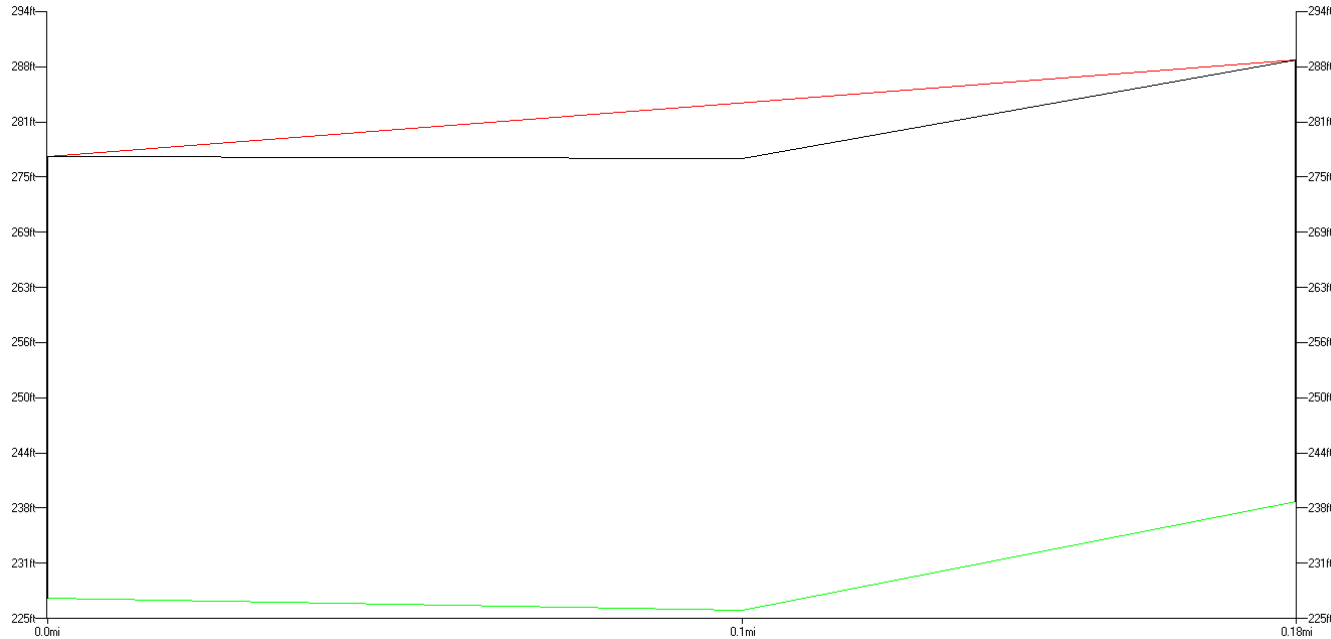
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 97.27

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 97.27

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



65TH AND HERRICK RPTR

32 42 38.81 N
117 03 17.24 W
NAD 83:
Elev: 238.26 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 277.27

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 277.27

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 97.27°T Reverse 277.27°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)

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Table C-64
Cielo and Woodman Pump Station to 65th and Herrick Repeater

Site	CIELO AND WOODMAN PS	65TH AND HERRICK RPTR
Latitude	32 42 13.00 N	32 42 38.81 N
Lat (Dec Degrees)	32.70361	32.71078
Longitude	117 03 18.00 W	117 03 17.24 W
Lon (Dec Degrees)	-117.055	-117.05479
Site Elevation	399.36 ft	238.26 ft
Antenna Center	50.00 ft AGL	50.00 ft AGL
Bearing (T)	1.42	181.42
Antenna Orientation	1.42	181.42
Path Angle	-3.53	3.53
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMSX0005 X000500017	FP2-5-28 Vpol AMSX0005 X000500020
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.40 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Gain1		dB
Gain2		dB
Bearing (T)	1.42	181.42
Distance	0.49 mi	0.49 mi
Absorption Loss		0.00 dB
Rain Loss CRANE:		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		105.75 dB
Total Gains dBm		81.79
Total Loss dB		108.75
Received Signal Level dBm		-26.95
Unfaded Fade Margin dB		46.05
Digital EIFM		0
Digital AIFM		0
Digital DFM		46
Composite Fade Margin		43.01
Terrain Factor (a)	1	
Climate Factor (b)	0.325	
Undp (TFM)		1.41E-11
Reliability (%)		100
Outage (sec/yr)		0



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Figure C-64

Cielo and Woodman Pump Station to 65th and Herrick Repeater

CIELO AND WOODMAN PS

32 42 13.00 N
117 03 18.00 W
NAD 83:
Elev: 399.36 ft MSL

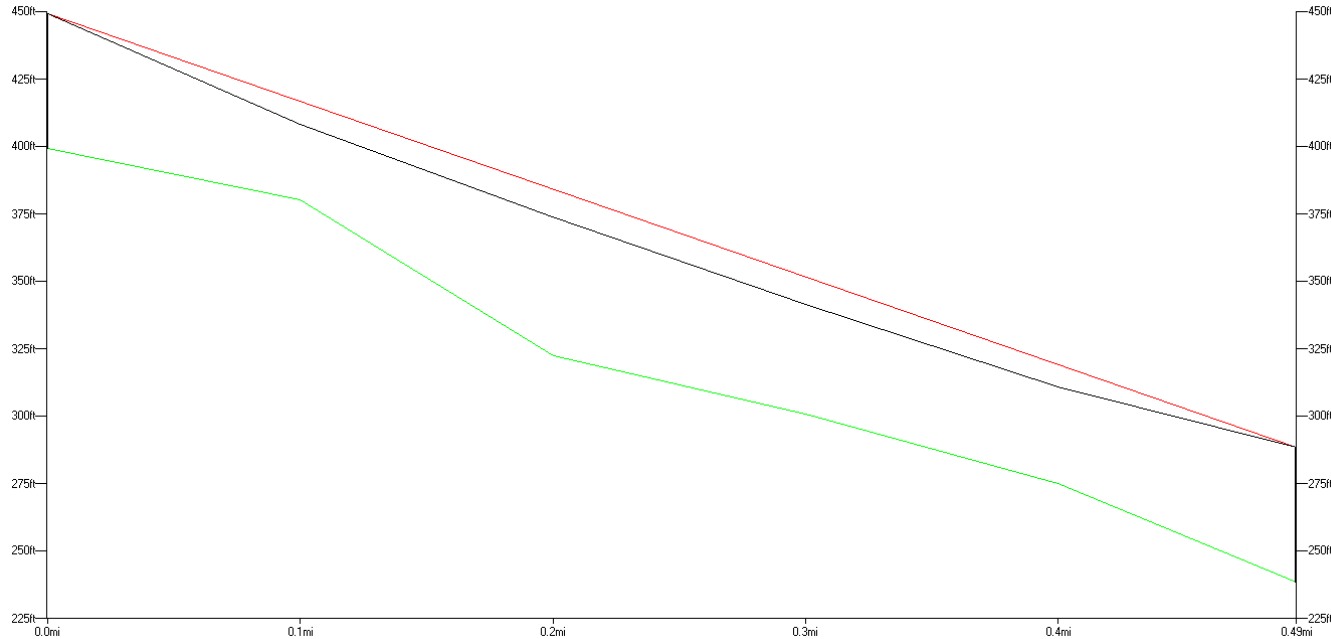
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 1.42

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 1.42

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



65TH AND HERRICK RPTR

32 42 38.81 N
117 03 17.24 W
NAD 83:
Elev: 238.26 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 181.42

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 181.42

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 1.42°T Reverse 181.42°T

Topo Data Step: 0.10
mi

Topo Data Types:
30m; 30s; VMB; DTED; BIL;
HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)



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ATTACHMENT A
EXHIBIT D – SITE SECURITY ASSESSMENT PREPARED BY AECOM



Security Upgrades for the City of San Diego Water Site Security Assessment



Security Upgrades for the City of San Diego Water Site Security Assessment



Prepared By Billy Vanderbur



Prepared By Walter Carrier



Reviewed By Brandon Visser

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1.0 Introduction

The City of San Diego (City) contracted with AECOM Technology Solutions (AECOM) to assess current and future security and communication system needs at water facility reservoirs, pump stations and regulator sites. To gather the data needed, surveys were conducted at each site by Walter “Budge” Currier and Bill Vanderbur of AECOM between February 22 and 25, 2011, with participation from John Stohr and Ryan Kunkle of the City. This report presents the methodology used to conduct the surveys, an overview of the existing security systems found, the minimum security standards acceptable for each different types of water facility site (i.e., reservoir, pump station, or regulator), an overview of the existing communications systems found, and the actual survey completed for each site.

The purpose of the site surveys was to: 1) gather data on the existing security and communication systems currently installed at each site, assess future security and communication system needs and obtain sufficient information to effectively develop the bridging documents required to provide security monitoring for sites not currently equipped; and 2) ascertain the capability of bringing both existing and future remote sites on-line via a wireless communications medium. Each site was inspected to obtain the information shown in **Figure 1**.

Figure 1: Site Survey Data Entry Form

CITY OF SAN DIEGO Water Site Security and Communications Assessment

SITE DATA ENTRY FORM

Site Name: street:
Inspection Date: City: Zipcode:
InspectedBy: Billy Vanderbur and Budge Currier latitude:
Phase Number: SiteType: longitude:

General Security Comments

SiteLighting:
Site Perimeter:
PerimeterCond: PowerAvail:
Number and Type of CCTV Camera Perimeter Gate
Fixed PTZ
Motion_Sensor:
Infrared:
Access_Control:
Gate_Desc:
Intrusion_Det: Description:
FoliageCond:

General Security Observations:

Photo File Name (ex. IMG243.jpg)

Photo Title for Report

Planning Level Opinion of Probable Cost:

Communications:

Recommend:

The data collected was then entered into a Microsoft Access database. The database will be provided to the City and is intended to be used as a “living” document that the City will update and maintain. It will provide the basis for a current catalog of the status of the security systems for each water facility site. It should be noted that all of the associated photos used in the production of this report are contained in a separate electronic file folder. This report, when delivered, will consist of a hardcopy print and electronic copies that include the Microsoft Access database file and the file containing both the low and high resolution photographs. All of this information is to be used at the City’s own discretion.

Note: All information contained in this report is subject to PCII information control and is not to be shared with anyone without City of San Diego approval.

2.0 Security Overview

Pre-existing security monitoring equipment was present on approximately 50 percent of the sites surveyed. Of these sites, most were equipped with either fixed or pan tilt zoom (PTZ) style cameras, Protech Pyramid XL2 motion detection units, Extreme CCTV UF-100 infrared illuminators, proximity style card readers, Sentrol door contact sensors, and dual technology interior motion detection units. Dual technology refers to a detector that combines two different types of detector technology. Often, manufacturers of security detectors will opt to combine the functions of a microwave motion detector with that of an infrared (IR). That way, if one sensor is triggered, the other confirms or ignores the alarm. This function effectively reduces the number of false alarms reported.

At the sites surveyed, existing base of perimeter intrusion detection systems included the Southwest Microwave Intrepid MicroPoint system, and in two locations, Southwest Microwave’s short range microwave sensors. The Intrepid system was not operational at any site, as reported by the Security Operations Center (SOC) operator. This was also found to be the same problem at two treatment plants previously surveyed where the large volume of false alarms rendered the system unusable. The motion detection units on most of the sites would be sufficient to handle intruder alerts, and the Intrepid system is not an appropriate solution for these sites.

An issue observed s at a number of sites is overgrown foliage, which in some cases is severe. Where overgrown foliage is noted in the site survey reports contained herein, trimming should not be considered to be part of the work required by the security contractor. Rather, it is recommended that City Maintenance remove the overgrown foliage as soon as possible. It is a general security mantra to be able to visually surveil the site via a “drive by” by local law enforcement and the overgrowth will not allow the observation of a potential crime in progress.

Most of the sites with existing security systems are operational and the SOC is notified if access is gained. However, a handful of sites were down completely, and the City was aware of most of the

reasons for the non-operational site status. Lack of funding is the primary reason why repairs at these sites have not taken place to date.

The site entrance vehicle gates with security included a card reader adjacent to the gate with maglocks (Magnetic Locks) used at the center of the gate. While this technique can be effective for pedestrian sized gates, it is typically not suited for dual swing gate installations. As demonstrated throughout this survey, it was not difficult to simply push/pull on the gate and have the maglock eventually give way and due to shear physics, the gate opens. This action alone should generate a “forced open” alarm situation similar to when an alarmed door is forced open and the two door contact sensors lose their connection. This is not an ideal solution for securing vehicle gates and recommendations to correct this situation will be included in the bridging documents.

Most of the sites have an adequate fence line in place with mesh fencing capped with outriggers and barbed wire. Others have an ornamental wrought iron security style fence (angled/pointed tips at the top of fence). Most are in decent condition and require perhaps only minor maintenance that would include re-stretching the fabric, restringing the barbed wire, patching breach holes, addressing erosion control issues, etc. A few locations will require comprehensive replacement and even fewer need a fence to be installed where none exists today.

For sites that are not yet equipped with security, the design/build drawings will identify the recommended location and type of equipment to be installed. The recommendations contained in this report include installation of fixed or PTZ style cameras, IR illuminators, and motion detection, plus access control including card readers, motion detection and door contact sensors. The technology to provide high quality images/detection/illumination may require integrated camera solutions that accommodate video, motion detection, and IR illumination in one housing. This will be developed as part of the performance specifications component of the bridging documents. The intention is not to duplicate what is already installed at existing security sites, but to provide a newer solution for the sites that are not yet secure. In regards to the older installations, AECOM does not feel that it is warranted at this time to do wholesale replacement of the security system at all sites. However, at those locations where cameras are no longer operational, or where there is minimal security today, replacement with newer technology will be recommended.

There are several categories of sites that have a direct impact on public water supply. The criticality of these sites should be verified on a site by site basis with Homeland Security assessments that should have been conducted post 9/11. Most cities have a list of critical infrastructure sites with weighted relevance and potential target impacts developed through a detailed assessment using a myriad of algorithms (such as Sandia Laboratories RAM style assessments). Each site is ranked in the level of overall importance/necessity to survival and risk potential if tampered with. Based on other city assessments, reservoirs ranked highest in water distribution categories in terms of impact, then treatment plants, pump stations, then regulators. The security at each type of site should be commensurate with the level of importance and risk. Therefore, in this survey, special attention has been paid to the reservoir sites.

2.1 Reservoir Site Considerations

Introducing anything into the City's water supply would be catastrophic, but at the same time it would take a considerable amount of tainting to be effective from a terrorist perspective due to the sheer volume of water (hundreds of thousands to millions of gallons of water). This type of terrorist attack would take a considerable amount of time, as it requires penetrating the site with a large vehicle, transferring the chemical/biological/radioactive material from the vehicle, and introducing it through locked hatches. Most of these sites are "off the beaten track" which facilitates the "time" issue. Therefore, detection and response will be the key mitigation techniques required, not just at the reservoir sites, but at all locations. The recommendations refer to thermal infrared PTZ cameras equipped with video analytics to act as the detection/alarm/tracking sequence. Views across large bodies of water to view shorelines, or other areas rely heavily on heat signature triggers. What is currently installed today at the reservoir sites is very limited in terms of image quality and detection ability (especially at night) and only offers a symbol of deterrence. Effective security technologies using thermal IR cameras with video analytics has been proven at reservoirs, airports, seaports, the deserts of the Middle East, etc., and it is appropriate to implement this more advanced (and costly) solution at the few reservoir sites included in this assessment.

2.2 Pump Station (PS) Site Considerations

Pump stations maintain water pressure to commercial and residential areas around the City. Should a pump fail, there is typically redundancy built into the system to accommodate the loss of pressure. However, a catastrophic event such as the total destruction of a pump facility may impact a significant number of customers if no redundant station is available. The purpose of security at most pump stations is to detect/alarm the SOC so the site can be viewed, the situation assessed, and appropriate action taken based on the assessment. Most incidents involve trespassers looking for anything loose that they can break/cut and steal to sell. So, the level of security should be consistent with the site and its perceived value to a perpetrator. Perimeter intrusion is the first level of security, and penetrating the pump house is the second.

2.3 Regulator Site Considerations

Similar to pump house security, the regulators are highly vulnerable due to their location in vaults at street corners in residential, or deep within industrial, areas. However, their overall target value is low from a terrorist perspective. They can be very appealing to the transient access into the vault can be accomplished. Having CCTV and IR detection on a nearby pole with a view of the vault/manhole cover helps in the initial detection, but when the vault or manhole is breached, the motion detection inside the space serves as the main trigger with the CCTV simply observing the intrusion.

2.4 Signage

Generally, the existing signage at the sites is limited to the name of the location. As a common deterrent, signage should be posted around the entire perimeter and be prominently displayed at main entrances. The signage should make potential intruders consider the risk prior to entering the

site. Signage that indicates CCTV is present can be very effective and private property signs indicating potential prosecution work as well. A combination sign at main gates is also recommended. Samples are provided below.



3.0 Communications Overview

Longitude and latitude coordinates were collected at each site to be input into a software program that interfaces with topographic information and determines probable line of sight metrics. Potential high elevation sites that will receive wireless transmissions from lower elevation sites are also input into the system and the engineer generates the proposed link data aligning sites with their closest high site. The main challenge is to find a clear “line of sight” between each site in a system configuration that supports redundancy by creating loops within the system. During the site visits, AECOM personnel focused on determining which sites could support multiple antennas and using this information, we developed a reasonable, cost effective solution. Every effort has been made to limit the size and number of microwave antennas potentially located at each site, yet provide sufficient connectivity to support the security needs.

All of the sites visited are currently equipped with SCADA radio antennas. These do not require direct line of site with the receiving antenna, but need to have a strong enough signal to traverse the terrain and be received. The bandwidth requirements in a SCADA system are minimal whereas a wireless system passing video information does require line of sight microwave transmission.

The sites with existing security equipment are connected to the Chollas SOC, either by leased T1 lines, leased Optiman circuits or DSL connections through AT&T. Two sites have existing microwave connections and a majority of the sites have City-owned fiber optic lines installed that are used to carry signals and video feeds from the pump station to the reservoir and back. This communication equipment typically includes a Cisco router and a Cisco switch connected to the DVR and the lease circuit. A router and network distribution center at the SOC interfaces each site with the video displays and other interfaces that the operator uses at the SOC.

Representatives from the City’s Communication Division provided information on the availability of the high level (elevation) communication sites, existing microwave connections, and potential use of the City-owned fiber-optic that runs throughout the City. From this data we will develop a proposed connectivity network that will be included in the bridging documents. Most of the sites will have at

most two 12”X12” panel antennas similar to those used at Black Mountain and Los Penasquitos Reservoir, while the high level sites at Black Mountain, Mt. Woodson, Cowles Mountain, Lyons Peak, San Ysidro, and the Chollas SOC center will have multiple connections. Additional details on the connectivity network will be provided in the bridging documents.

4.0 Site Surveys

The following pages contain the results of each site survey conducted. These yielded good information to use in developing the bridging documents. The assistance provided by the City was invaluable and will assist AECOM in completing the bridging documents project and ultimately providing the City with a more secure infrastructure.

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: 65th and Herrick PS **Street Address:** 6501 Herrick St
Inspection Date: 2/22/2011 **Phase:** 1 **City:** San Diego **Zipcode:** 92114
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.71111 **Longitude:** 117.05785

Site Lighting: On Building Exterior Only
Site Perimeter: 7 foot wrought iron fence
Perimeter Condition: Good
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 5 PTZ: 0 Fixed None
Motion Sensor: None
Infrared: None
Access Control: HID Reader to main door/Sentrol Door Contact
Gate Description: Chain/Lock
Foliage Condition: Minor trimming required



Photo 1 - Building View

General Security Observations:

The site has fixed CCTV cameras covering three of the four sides of the building. There is no CCTV coverage of gate. General lack of motion detection and IR illuminators is a concern. Public art side of building is approachable up to the building exterior where bullet proof glass was installed where a window existed. Evidence of graffiti inside property line indicates breaches have occurred.

Communication Observations:

The site has an existing DSL VPN Circuit with a Cisco 831 Router with open ports. There is 40 Amp commercial power with no open breakers and backup power using portable generator. The existing communication rack is an aluminum rack mounted high on a wall. The DVR is in a separate rack. Conduits run into the shelter. Scada connectivity is provided through scada antenna mounted to the building.



Photo 2 - Exterior - Public Art

Recommendations:

Recommend removing window and filling in with CMU blocks. Consider enclosing public art side out to sidewalk to create separation from public to building. Add IR illuminators and motion detection to site. Add CCTV on public art side to ensure all four sides of building are covered. Add PTZ with IR and MD to provide coverage of main gate. Recommend fencing off public art side of building with matching fence. Add two audio speakers to ward off trespassers (deter tagging).



Photo 3 - Security Cabinet

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Bayview PS

Street Address: 2000 Parkview Terrace

Inspection Date: 2/24/2011

Phase: 1

City: San Diego

Zipcode: 92037

Inspected By: Billy Vanderbur and Budge Currier

Latitude: 32.81812

Longitude: 117.23959

Site Lighting: None

Site Perimeter: 6 foot wrought iron fence

Perimeter Condition: Poor

CCTV Camera Number / Type: Perimeter: Gate:

Fixed: 4 PTZ: 0 N/A N/A

Motion Sensor: Protech Pyramid XL2

Infrared: Extreme CCTV UF-100

Access Control: HID Reader/Sentrol Door Contacts/Interior Moti

Gate Description: Site: HID Reader/Manual Gate

Foliage Condition: Overgrown



Photo 1 - Pump Station Building

General Security Observations:

Shared property with Bayview Reservoir. Pump station secured with fixed CCTV/IR/MD covering all four sides. No issues with this bldg. Overall site has significant foliage overgrowth.



Photo 2 - Pump Station Building Rear

Communication Observations:

The site has an existing AT&T leased T-1 Circuit with a Cisco 2651 switch and a Cisco 2960 Router with 4 open ports. There is commercial power with 3 open breakers and backup power using portable generator. The existing communication rack contains the DVR, UPS and has one open rack space. Conduits run into the shelter. Scada connectivity is provided through 20 foot pole mounted to the building.

Recommendations:

No recommendations required for this building. Refer to Bayview Reservoir for perimeter coverage issues.



Photo 3 - Security Equipment rack

The attached Materials contain Security Sensitive information that is "For Official Use Only" or other types of sensitive but unclassified information requiring protection against unauthorized disclosure. The attached materials will be handled and safeguarded in accordance with City directives governing protection and dissemination of such information.

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Bayview Reservoir Street Address: 5400 Thunderbird Lane
Inspection Date: 2/24/2011 Phase: 1 City: San Diego Zipcode: 92037
Inspected By: Billy Vanderbur and Budge Currier Latitude: 32.81812 Longitude: 117.23959

Site Lighting: None
Site Perimeter: 6 foot wrought iron fence
Perimeter Condition: Poor
CCTV Camera Number / Type: Perimeter: Gate:
Fixed: 0 PTZ: 2 PTZ PTZ
Motion Sensor: Protech Pyramid XL2
Infrared: Extreme CCTV UF-100
Access Control: n/a
Gate Description: HID Reader/Manual Gate
Foliage Condition: Overgrown



Photo 1 - Main Entrance CCTV/Motion Detector



Photo 2 - Perimeter View

General Security Observations:

Large expanse of space with limited/inadequate CCTV coverage. Perimeter access uninhibited except for ornamental fence line along south/east sides. Security equipment for site located in Pump Station building. Neighbor located at Northwest corner concerned about security camera coverage having vantage point of their home/balcony/hot tub. Perimeter grossly overgrown with foliage.

Communication Observations:

The cameras at the reservoir are linked via Ethernet / fiber to the Bayview PS and utilize the communication links at the Pump Station for connectivity.

Recommendations:

Recommend thermal PTZ cameras on each corner of property equipped with video analytics. Clear of fence lines of overgrown vines, trees and bushes.



Photo 3 - View Across Reservoir

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SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Bernardo Heights PS **Street Address:** 16126 Avenida Venusto
Inspection Date: 2/23/2011 **Phase:** 1 **City:** San Diego **Zipcode:** 92128
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 33.00475 **Longitude:** 117.07508

Site Lighting: Floodlights on building
Site Perimeter: 6' Mesh with barbed wire.
Perimeter Condition: Good
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 1 PTZ: 1 PTZ None
Motion Sensor: Protech Pyramid XL2
Infrared: Extreme CCTV UF-100
Access Control: None at building
Gate Description: card reader with maglock, chain/lock
Foliage Condition: No issue.



Photo 1 - CCTV on Pole

General Security Observations:

Site is fenced with mesh and barbed wire. Vehicle gate needs to be readjusted so maglocks will work properly. One camera with IR on pole on property, one off property. Motion sensors on each corner of building. Main gate has card reader and mag lock. Site lighting from floodlights on building - appear broken. Site connects via fiber optics up the hill to Pomerado Park outdoor cabinet.

Communication Observations:

The site has an existing AT&T leased T-1 Circuit with a Cisco 2651 switch and a Cisco 2960 Router with 4 open ports. There is commercial power with 4 open breakers and backup power using portable generator. The existing communication rack contains the DVR, UPS and has one open rack space. Conduits run into the shelter. Scada connectivity is provided through scada antenna mounted to the building. Communication costs included with Bernardo Heights Reservoir



Photo 2 - Typical corner w/ Motion Det.

Recommendations:

Repair exterior lighting with new motion sensed floodlights. Realign vehicle gate. Add card reader to building with door contacts.



Photo 3 - Security Equipment Rack

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SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Black Mtn PS - Bldg 14799A **Street Address:** 14600 Black Mtn Rd
Inspection Date: 2/23/2011 **Phase:** 1 **City:** San Diego **Zipcode:** 92129
Inspected By: Billy Vanderbur & Budge Carrier **Latitude:** 32.98568 **Longitude:** 117.12824

Site Lighting: On Building Only - Motion detection with flood lights
Site Perimeter: 6' chain link mesh with outriggers and barbed wire
Perimeter Condition: Good
CCTV Camera Number / Type: **Perimeter:** **Gate:**
 Fixed: 4 PTZ: 0 Fixed PTZ
Motion Sensor: Protech Pyramid XL2
Infrared: Extreme CCTV UF-100
Access Control: HID Reader/Sentrol Door Contacts/Interior Motion
Gate Description: Site: HID Reader/Auto-Gate/Trigon HF-2 Intercom
Foliage Condition: Overgrown around perimeter



Photo 1 - Main Gate to Site



Photo 2 - Pump Station Building

General Security Observations:

This Pump Station connects to the Upper Pump Station via fiber optics and is on the same property with the Black Mountain Reservoir. The perimeter fence is okay but needs some minor repairs. More information provided under Black Mountain Reservoir pertaining to site perimeter. Motion detection with flood lights used on perimeter of building.

Communication Observations:

The site has a microwave connection to Rancho Penasquitos PS and utilizes the fiber at Rancho Penasquitos PS for connectivity back to the Chollas SOC. Microwave radio and antenna are mounted to bldg. Fiber runs between pump house, the distribution bldg and the reservoir. There is 125 Amp commercial power with 2 open breakers. The existing communication rack contains the DVR, UPS and has one open rack space. Conduits run into the shelter. Scada connectivity is provided through scada antenna mounted to the building.

Recommendations:

The gate locations around the perimeter should be fixed to prevent access from underneath. The rain gutter next to the main entrance needs to be secured since it is easily penetrated- suggest welding several 8 inch pipes together and attach to the concrete to close the gap but also to allow water to flow freely. The foliage needs to be cut down around the perimeter, especially where it contacts the fence line (both inside/out).



Photo 3 - Security Cabinet

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SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Black Mtn Reservoir **Street Address:** 14600 Black Mtn. Road (approx.)
Inspection Date: 2/23/2011 **Phase:** 1 **City:** San Diego **Zipcode:** 92129
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.98568 **Longitude:** 117.12824

Site Lighting: On buildings only
Site Perimeter: 6' mesh with barbed wire.
Perimeter Condition: Good
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 4 PTZ: 2 None PTZ
Motion Sensor: Protech Pyramid XL2
Infrared: Extreme CCTV UF-100
Access Control: None
Gate Description: Card Reader with Mag locks and auto-sliding gate.
Foliage Condition: Overgrown



Photo 1 - Sample Perimeter Gate

General Security Observations:

The reservoir is connected to the lower Pump Station with fiber optics. There is a chemical building structure next to tank that has CCTV/IR/MD coverage on all sides. The tank has two PTZ cameras installed on top with IR. Coverage is limited to one side of reservoir leaving other side and vast perimeter largely uncovered. The perimeter fence is in good shape but needs some attention to restring some barbed wire and to close the gaps under the existing gates. Intruders have definitely been coming under the gates.



Photo 2 - View of Reservoir Tank with CCTV on top.

Communication Observations:

The cameras at the reservoir are linked via fiber to the Black Mtn PS and utilize the communication links at the Pump Station for connectivity.

Recommendations:

Install thermal cameras with video analytics at strategic points around the reservoir with special attention on the fence lines. The perimeter is extensive but coverage around the reservoir is paramount. Add audio speakers around site. Reference Black Mountain Pump Station for additional security discussion since they both reside within the same property line.



Photo 3 - Chemical Building next to tank.

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Cabrillo Palisades PS **Street Address:** 3190 Health Center Dr
Inspection Date: 2/24/2011 **Phase:** 2 **City:** San Diego **Zipcode:** 92123
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.80169 **Longitude:** 117.15269

Site Lighting: On shed only.
Site Perimeter: mesh with barbed wire
Perimeter Condition: Poor
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 0 PTZ: 0 None None
Motion Sensor: None
Infrared: None
Access Control: None
Gate Description: chain/lock
Foliage Condition: No issue.



Photo 1 - Main Gate

General Security Observations:

Site used to include a standpipe but that has since been demolished leaving just the pump station. The fenceline is in disrepair and needs total replacement. Upgrade pump house door. Many breach points, assumed by transients. Bordered by commercial businesses.

Communication Observations:

This site has no existing security connections. The pump station building does not have room and communication equipment will likely be outside in a FEMA cabinet. There is commercial power with 3 open breakers. The existing SCADA antenna is mounted to the building. There is room to install multiple microwave antennas if needed. Site used to have a reservoir, which has been removed.



Photo 2 - Pump House

Recommendations:

Demo and install new fence line with mesh and barbed wire. Replace pump house door/jamb. Install card reader/mag locks at new gate. Install card reader and door contacts at pump house with MD on the interior. Add two new security posts at opposite sides of property with CCTV/IR/MD. Add PTZ/IR/MD for new gate. Provide upgraded floodlights to top of pump house. Add audio speaker to pump house.



Photo 3 - General Site Conditions

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SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Carmel Mtn High PS **Street Address:** 11600 Shoal Creek Dr
Inspection Date: 2/23/2011 **Phase:** 1 **City:** San Diego **Zipcode:** 92128
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.96618 **Longitude:** 117.08033

Site Lighting: On building only
Site Perimeter: Wrought Iron and Mesh with barbed wire
Perimeter Condition: Good
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 2 PTZ: 1 Fixed PTZ
Motion Sensor: Protech Pyramid XL2
Infrared: Extreme CCTV UF-100
Access Control: card reader at door with door contacts
Gate Description: Card Reader with mag lock, chain/lock
Foliage Condition: Minor trimming required



Photo 1 - Main Gate



Photo 2 - Lone security pole on property

General Security Observations:

Large site enclosed with combination of ornamental wrought iron and mesh with barbed wire. Single PTZ for gate, single fixed CCTV for general site of building. CCTV at door side of building only with IR/MD. Rear corner not covered.

Communication Observations:

The site has an existing AT&T leased T-1 Circuit with a Cisco 2651 switch and a Cisco 2960 Router with 4 open ports. There is commercial power with 1 open breakers and backup power using portable generator. The existing communication rack contains the DVR, UPS and has one open rack space. Conduits run into the shelter. Scada connectivity is provided through scada antenna mounted to the building. This site had an HP server solution used.

Recommendations:

Add fixed CCTV/IR/MD on southwest corner of building to cover rear of property.



Photo 3 - View of building.

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Carmel Mtn High Reservoir **Street Address:** 13642 Shoal Summit Dr
Inspection Date: 2/23/2011 **Phase:** 1 **City:** San Diego **Zipcode:** 92128
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.96542 **Longitude:** 117.07719

Site Lighting: None
Site Perimeter: Mesh with barbed wire
Perimeter Condition: Good
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 5 PTZ: 1 Fixed PTZ
Motion Sensor: Protech Pyramid XL2
Infrared: Extreme CCTV UF-100
Access Control: n/a
Gate Description: Card Reader with mag locks, chain/lock
Foliage Condition: No issue



Photo 1 - Main Gate

General Security Observations:

Site is very clean and open. Good CCTV coverage. Has HP NVR solution.



Photo 2 - Typical Security Pole Installation

Communication Observations:

The site has an existing AT&T leased T-1 Circuit with a Cisco 2651 switch and a Cisco 2960 Router with 4 open ports. There is commercial power with 4 open breakers and backup power using portable generator. An outdoor stainless steel communication shelter contains the DVR, UPS and routers. Conduits run into the shelter. Scada connectivity is provided through pole mounted scada antenna.



Photo 3 - Outdoor Security Cabinet

Recommendations:

No security upgrades required at this site.

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Carmel Mtn Industrial PS **Street Address:** 11403 Rancho Carmel Dr.
Inspection Date: 2/23/2011 **Phase:** 1 **City:** San Diego **Zipcode:** 92128
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.98564 **Longitude:** 117.08197

Site Lighting: On building only
Site Perimeter: Mesh fence with barbed wire
Perimeter Condition: Good
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 2 PTZ: 1 Fixed PTZ
Motion Sensor: Protech Pyramid XL2
Infrared: Extreme CCTV UF-100
Access Control: No access control on door
Gate Description: Chain/Lock
Foliage Condition: No issue



Photo 1 - North side of building



Photo 2 - Problem area on SW corner

General Security Observations:

Location is adjacent to freeway. Fence line close to building edge and appear to be location of compromise. DVR has been stolen as well as a fixed CCTV camera from same suspect corner.

Communication Observations:

The site has an existing AT&T leased T-1 Circuit with a Cisco 2651 switch and a Cisco 2960 Router with 4 open ports. There is commercial power with 10 open breakers and backup power using portable generator. The existing communication rack contains the DVR, UPS and has one open rack space. Conduits run into the shelter. Scada connectivity is provided through scada antenna mounted to the building.

Recommendations:

Replace fixed CCTV camera. Add concertina wire along top at corner of site closest to the buildings roof line only. Recommend adding floodlights with motion sensors on both east/West sides of the building. Add audio speaker due to remoteness of site. Add card reader and door contacts to building door. Add card reader and mag locks at main gate.



Photo 3 - Missing DVR in Rack

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SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Carmel Mtn Mall PS **Street Address:** 11202 Rancho Carmel Dr.
Inspection Date: 2/23/2011 **Phase:** 1 **City:** San Diego **Zipcode:** 92128
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.98206 **Longitude:** 117.08338

Site Lighting: On building only
Site Perimeter: Mesh fence with barbed wire
Perimeter Condition: Good
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 1 PTZ: 1 Fixed PTZ
Motion Sensor: Protech Pyramid XL2
Infrared: Extreme CCTV UF-100
Access Control: Card Reader at door with door contacts
Gate Description: Card Reader with mag lock
Foliage Condition: No issue



Photo 1 - Building View

General Security Observations:

Building has motion detection on each corner. Fixed CCTV coverage of building from pole mounted CCTV camera at main gate. Second pole at Northeast corner is missing CCTV/IR detection equipment. Bad idea to moun to corner fence pole. Needs to be inside the property line. Obvious breach po in NE corner.

Communication Observations:

The site has an existing AT&T leased T-1 Circuit with a Cisco 2651 switch an a Cisco 2960 Router with 4 open ports. There is commercial power with 9 ope breakers and backup power using portable generator. The existing communication rack contains the UPS, but DVR was stolen. Rack has one open rack space. Conduits run into the shelter. Scada connectivity is provided through scada antenna mounted to the building.



Photo 2 - NW Corner - Missing camera and breach location

Recommendations:

Install new pole inside NE corner and mount two fixed CCTV/IR on pole to cover fence line. Repair mesh fence. Add audio speaker on building and floodlights at North side of building. Verify view angle from CCTV camera on SW pole has good image of building entrance. If not, consider adding additional fixed camera at door entrance.



Photo 3 - Main Gate

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Catalina PS **Street Address:** 4062 Varona St.
Inspection Date: 2/24/2011 **Phase:** 1 **City:** San Diego **Zipcode:** 92106
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.72563 **Longitude:** 117.24396

Site Lighting: On buildings only
Site Perimeter: Ornamental wrought iron security fence
Perimeter Condition: Good
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 0 PTZ: 3 PTZ: None
Motion Sensor: Protech Pyramid XL2
Infrared: Built into camera per SOC
Access Control: Card reader at doors
Gate Description: Card reader on post, automatic gate.
Foliage Condition: Minor trimming required



Photo 1 - Main Gate

General Security Observations:

Site uses integrated MD with PTZ cameras. No security issues at this site.

Communication Observations:

The site has an existing AT&T leased fiber Circuit with a Cisco 2950 Router with many open ports. There is commercial power with open breakers and backup power using portable generator. There is no existing communication rack. Equipment is mounted to the wall and is not well organized. Conduits run into the shelter. Scada connectivity is provided through scada antenna mounted to the building. Site also provides connectivity for Point Loma Res.



Photo 2 - Pump House

Recommendations:

No changes required.

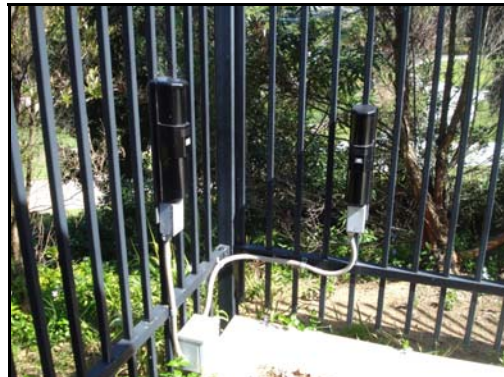


Photo 3 - IR Beam

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Chollas Facility **Street Address:** 2797 Caminito Chollas
Inspection Date: 2/22/2011 **Phase:** 1 **City:** San Diego **Zipcode:** 92105
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.73479 **Longitude:** 117.07166

Site Lighting: Combination pole lighting and building exterior lighting.
Site Perimeter: 6 foot chain link with 18 inch outriggers and 3 strand barbed wire
Perimeter Condition: Poor
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 3 PTZ: 3 Fixed/PTZ Fixed/PTZ
Motion Sensor: None observed
Infrared: None observed
Access Control: HID Readers to SOC
Gate Description: Automatic sliding gates - 3 locations
Foliage Condition: Overgrown around perimeter



Photo 1 - Main Entrance Gate

General Security Observations:

The Chollas site consists of multiple city branches occupying various areas of the overall site. This report is focused on the water branch only. Primary access to the site is through the main entrance that is unmanned until after hours. Access to the Water department area is controlled using card access through an automatic vehicle gate. The next layer is to pass through a pedestrian gate that is also equipped with a card reader and maglocks. The entrance to the EOC/SOC trailer is also equipped with a card reader. The main gate is closed at the end of the day and a guard is posted at the main gate guardhouse.



Photo 2 - Perimeter Photo #1

Communication Observations:

The site is the connecting point for the Oteman and T1 leased line. There is a Cisco 6509, and two 7206 routers at the control center. There is commercial power with open breakers. The existing communication room contains all the circuits and connections for the Security Operations Center. Conduits run into the center. The Scada system is also controlled in a separate room at the SOC. There is a tripod 60' tower on the site that is 1/3 full and is used by Public Safety.

Recommendations:

The perimeter fence/gates around the water branch needs to be replaced along the north, east and south sides of that area. This does not include the entire City property line, but only that portion that surrounds the general SOC boundaries. Recommend vehicle gate be installed in southeast corner of water department property to alleviate the need for a staffed guard further south. The gate should be equipped with a card reader and automatic sliding gate to control access into/out of the area.



Photo 3 - Perimeter Photo #2

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Chollas Heights PS **Street Address:** 3303 60th St
Inspection Date: 2/22/2011 **Phase:** 2 **City:** San Diego **Zipcode:** 92105
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.74105 **Longitude:** 117.06663

Site Lighting: Single light on structure
Site Perimeter: 5 foot chain link fence, no barbed wire
Perimeter Condition: Poor
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 0 **PTZ:** 0
Motion Sensor: None
Infrared: None
Access Control: None
Gate Description: Chain/Lock
Foliage Condition: Overgrown



Photo 1 - Proximity Photo

General Security Observations:

Location in neighborhood. Bordered on two sides by residential. North side to open area. Fence is too short and has no barbed wire on top. Generally low ri area.

Communication Observations:

This site has no existing security connections. The pump station building has room for an equipment rack. There is 60 amp commercial power with 11 oper breakers. This is higher elevation site. The existing SCADA antenna is mounted to the building. There is room to install multiple microwave antennas needed.



Photo 2 - Site Photo

Recommendations:

Replace entire fence line with 8 foot fence and 18 inch outriggers with 3 strands barbed wire. Install single door vehicle gate with access control reader and maglock. Mount dome cameras on opposing corners of building with fixed day/night vision cameras. Install motion detection inside/out and door sensors. Include on PTZ camera for main gate coverage. Mount security cabinet equipment inside building.



Photo 3 - Existing antenna

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Cielo and Woodman PS **Street Address:** 6599 Cielo Dr.
Inspection Date: 2/22/2011 **Phase:** 2 **City:** San Diego **Zipcode:** 92114
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.7037 **Longitude:** 117.05495

Site Lighting: None
Site Perimeter: 6 foot chain link fence with 3 strands barbed wire around sheds only
Perimeter Condition: Fair
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 0 PTZ: 0 None None
Motion Sensor: None
Infrared: None
Access Control: Chain/lock to pedestrian gate only.
Gate Description: Pedestrian Gate only
Foliage Condition: Recently mowed by City



Photo 1 - Proximity Photo

General Security Observations:

The Pump Station is an underground facility with equipment sheds above. The fence line surrounds the sheds only, the access hatch to the vault is outside the fence but was locked.

Communication Observations:

This site has no existing security connections. The pump station is in an underground vault, any equipment rack would likely be an outdoor FEMA cabinet. There is commercial power with open breakers. This is higher elevation site. The existing SCADA antenna is mounted a 15 foot pole. There room to install multiple microwave antennas if needed.



Photo 2 - Property Photo

Recommendations:

Property is much larger than the equipment area. City requested to fence in entire property line and include two vehicle access gates at the North and east sides of the property. Install new fence line with 8 foot chain link fence and 18 inch outriggers with 3 strands barbed wire. Install double door vehicle gates with access control reader and maglock. Install new poles with lighting and attach dome cameras on opposing corners of site with fixed day/night vision cameras. Install motion detection inside/out and hatch door sensors. Include one PTZ camera for North gate coverage. Install exterior mounted cabinet for new security equipment DVR and access control modules. Add HID reader inside hatch entrance and motion detectors inside vault. Add vehicle bollards protect roadside hatch and above ground equipment.



Photo 3 - Equipment Sheds

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Deerfield PS **Street Address:** 8002 Mission Gorge Rd.
Inspection Date: 2/25/2011 **Phase:** 1 **City:** San Diego **Zipcode:** 92120
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.81629 **Longitude:** 117.06245

Site Lighting: Perimeter lighting on poles.
Site Perimeter: Mesh fence - no barbed wire
Perimeter Condition: Good
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 4 PTZ: 0 Fixed None
Motion Sensor: None
Infrared: None
Access Control: None
Gate Description: Chain/Lock
Foliage Condition: Overgrown



Photo 1 - Site entrance

General Security Observations:

Generally clean site. Foliage overgrown. Fixed CCTV domes exist on each corner of building. No IR/MD. No access control into building. Fence missing barbed wire. Intrepid fence sensor system installed but not operational. Card reader at gate with mag locks.

Communication Observations:

The site has an existing AT&T leased T-1 Circuit with a Cisco 2651 switch and a Cisco 2960 Router with 4 open ports. There is commercial power with 5 open breakers and backup power using portable generator. The existing communication rack contains the DVR, but the UPS sits on the floor and routers are mounted to the wall. Conduits run into the shelter. Scada connectivity is provided through scada antenna mounted to the building.



Photo 2 - Building view

Recommendations:

Install MD/IR with each camera. Install outriggers and barbed wire on fencing. Add card reader to door into building. Install dual CCTV cameras/MD/IR on existing light poles at opposing corners of property. Add PTZ/IR pole with best view of gate. Trim foliage back. Add audio speaker.



Photo 3 - Perimeter View

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Del Cerro Highlands PS **Street Address:** 6097 Madra Ave
Inspection Date: 2/25/2011 **Phase:** 1 **City:** San Diego **Zipcode:** 92120
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.78906 **Longitude:** 117.05562

Site Lighting: n/a
Site Perimeter: Residential - Vault in sidewalk
Perimeter Condition: No Perimeter Fencing
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 0 PTZ: 0 None None
Motion Sensor: Not on exterior
Infrared: None
Access Control: Inside vault - Card Reader
Gate Description: Hatch style
Foliage Condition: No issue



Photo 1 - View of vault site

General Security Observations:

No issues.

Communication Observations:

The site has no existing cameras, but does have an existing AT&T leased fiber circuit for access control. The data connections were not observed during the site survey. There is commercial power with many open breakers. Underground vault with no backup power. Scada connectivity is provided through pole mounted scada antenna.



Photo 2 - View of vault Interior

Recommendations:

Install fixed camera and integrate with existing motion sensor in vault along with new DVR and UPS.

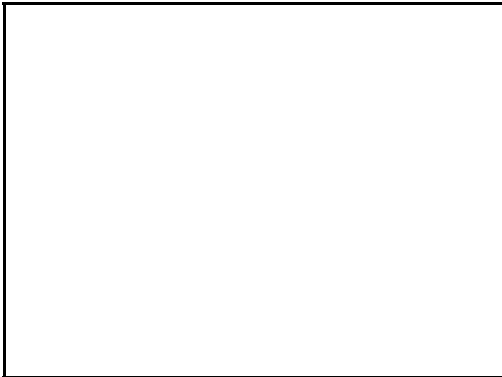


Photo 3 -

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Del Cerro PS **Street Address:** 5700 Marne Ave
Inspection Date: 2/25/2011 **Phase:** 1 **City:** San Diego **Zipcode:** 92120
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.78238 **Longitude:** 117.06158

Site Lighting: Street light only
Site Perimeter: Commercial property to North, Residential to the South and West.
Perimeter Condition: Good
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 4 PTZ: 0 Fixed None
Motion Sensor: None
Infrared: None
Access Control: Building is key locked only
Gate Description: Gate has broken card reader with mag locks
Foliage Condition: No issue



Photo 1 - Site view from street



Photo 2 - Broken card reader at ped gate

General Security Observations:

Site security needs attention, Missing IR/MD associated with three cameras on building corners. North side of building has no CCTV. Intrepid PIDS system is not operational per SOC. Vehicle gate located at rear of property and is chain locked. Primary entrance is through ped gate at street side.

Communication Observations:

The site has an existing AT&T leased T-1 Circuit with a Cisco 2651 switch and a Cisco 2960 Router with 4 open ports. There is commercial power with open breakers and backup power using portable generator. The existing aluminum rack is mounted to the wall with the UPS. The DVR is in a separate rack. Conduits run into the shelter. Scada connectivity is provided through 10 foot pole mounted to the building.

Recommendations:

Provide complement of IR/MD for existing cameras. Add additional Fixed CCTV/IR/MD on North side of building. Add PTZ/IR for view of pedestrian gate. Repair Card reader at ped gate.



Photo 3 - View of vehicle gate

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Del Cerro Reservoir **Street Address:** 5880 Rockhurst Ct.
Inspection Date: 2/25/2011 **Phase:** 1 **City:** San Diego **Zipcode:** 92120
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.78696 **Longitude:** 117.06046

Site Lighting: Minimal
Site Perimeter: Mesh with barbed wire
Perimeter Condition: Good
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 8 PTZ: 0 Fixed None
Motion Sensor: Protech Pyramid XL2
Infrared: Extreme CCTV UF-100
Access Control: None
Gate Description: Card reader with maglocks
Foliage Condition: Minor trimming required



Photo 1 - Main Gate

General Security Observations:

Current CCTV includes fixed cameras with IR/MD at all four corners of site. Fence line in good shape except at North end where steep grade causes problems with erosion under fence. Security cabinet located outdoors. Foliage needs to be cleared from fence lines and tress.

Communication Observations:

The site has an existing AT&T leased fiber Circuit with a Cisco 2811 switch and a Cisco 2960 Router with 4 open ports. There is commercial power. Equipment is in an outdoor stainless steel cabinet which contains routers, DVR, UPS and other communication equipment. Conduits run into the shelter Scada connectivity is provided through pole mounted scada antenna. Easy LOS to Redwood Standpipe.



Photo 2 - View of security pole

Recommendations:

Augment existing CCTV with thermal IR cameras with video analytics located at NE corner of property and SW corner of property to cover fence lines. Add PTZ/IR/MD to existing pole at SE corner. Add two audio speakers to site. Foliage needs to be trimmed back.



Photo 3 - Site overview

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Eagle Ridge PS **Street Address:** 7822 Wing Flight Ct.
Inspection Date: 2/25/2011 **Phase:** 1 **City:** San Diego **Zipcode:** 92119
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.8053 **Longitude:** 117.02766

Site Lighting: Low
Site Perimeter: No fence - in residential
Perimeter Condition: No Perimeter Fencing
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 0 PTZ: 0 None None
Motion Sensor: Interior only
Infrared: None
Access Control: None
Gate Description: Garage door with card reader
Foliage Condition: Trees but not an obstruction.



Photo 1 - View from front

General Security Observations:

This site is in residential area. Foot traffic paths from street heading North indicate a lot of passersby. Neighbor says they never heard of any problems here. No fence exists. Door contact switches on garage door are corroded.

Communication Observations:

The site has an existing AT&T leased fiber Circuit with a Cisco 2811 switch and a Cisco 2960 Router with 4 open ports. There is commercial power with 6 open breakers and backup power using portable generator. The pump station has a garage type door that opens. The existing communication rack contains the equipment needed to connect the door contacts. There are no cameras at this site. Conduits run into the shelter. Scada connectivity through scada antenna mounted to a street light pole.

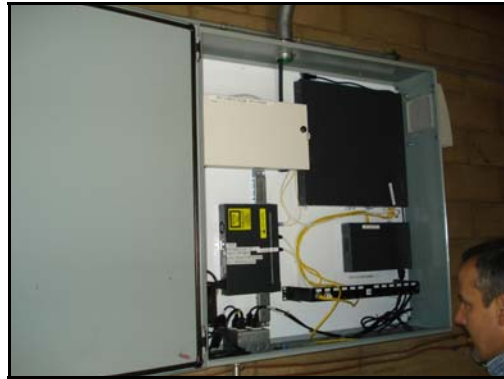


Photo 2 - Security cabinet

Recommendations:

Recommend not fencing it in. There isn't much room to work with and since it is all enclosed except for the garage door. Add fixed CCTV/IR on East and west walls with opposing views of garage entrance and new DVR with UPS. Glare from southern exposure would affect the a single view from South side. Replace door contact switches.



Photo 3 - Side view

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: East Gate Mall Regulator Street Address: 5302 Eastgate Mall
Inspection Date: 2/24/2011 Phase: 2 City: San Diego Zipcode: 92121
Inspected By: Billy Vanderbur and Budge Currier Latitude: 32.88054 Longitude: 117.18913

Site Lighting: None
Site Perimeter: None
Perimeter Condition: No Perimeter Fencing
CCTV Camera Number / Type: Perimeter: Gate:
Fixed: 0 PTZ: 0 None None
Motion Sensor: None
Infrared: None
Access Control: None
Gate Description: Hatch access only
Foliage Condition: No issue.



Photo 1 - Site Photo

General Security Observations:

This underground regulator location is on the inside bend of the road. The hatch cover is rusted off the hinges making it nonsecure.

Communication Observations:

This site has no existing security connections. The regulator is in an underground vault accessed via vault doors, any equipment rack would likely be an outdoor NEMA cabinet. There is commercial power. The existing SCADA antenna is mounted a 20 foot pole. There is an water treatment facility nearby that may provide connectivity.



Photo 2 - Hatch Photo

Recommendations:

Recommend replacing entire hatch cover. Install new perimeter fence around property line with outriggers and barbed wire. Install traffic rated bollards to protect site. Install 1 poles with dual day/night fixed cameras, IR/MD and a lig illuminating the area. Add HID reader and mag locks at new gate.



Photo 3 - Rusted Hatch Lid

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: El Capitan Dam **Street Address:** 16852 El Monte Rd
Inspection Date: 2/28/2011 **Phase:** 1 **City:** Lakeside **Zipcode:** 92040
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.88242 **Longitude:** 116.80952

Site Lighting: Limited given vast expanse of property
Site Perimeter: Fenced in areas, not all.
Perimeter Condition: Poor
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: PTZ: 6 PTZ PTZ
Motion Sensor: Protech Pyramid XL2
Infrared: Extreme CCTV UF-100
Access Control: None
Gate Description: Chain/Lock
Foliage Condition: No issue



Photo 1 - Tunnel

General Security Observations:

Vast expanse of area lends itself to using thermal IR cameras and video analytics technologies. Current system is not sufficient to handle night time operations effectively.

Communication Observations:

The site has an existing AT&T leased T-1 Circuit with a Cisco 2507 Router. We were unable to open the outdoor stainless steel communication cabinet. Conduits run into the shelter. There is commercial power, but no backup power. Scada connectivity is provided through pole mounted scada antenna. Several camera locations in the reservoir area all linked via fiber.



Photo 2 - City Building

Recommendations:

Provide PTZ thermal IR and video analytics a top dam with view angles towards water, sides of the dam and down below the dam. Add thermal IR and video analytics at lower level area of dam and at tunnel entrance. Add new thermal IR at City office trailers at end of road with vantage points toward Hwy 8, the boat piers and oncoming traffic to the parking lot. Add audio speakers at tunnel, top of dam and at city trailers.



Photo 3 - Security Cluster on lower level of dam

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Elliot Pipeline Regulator **Street Address:** 5592 Clairemont Mesa Blvd
Inspection Date: 2/24/2011 **Phase:** 2 **City:** San Diego **Zipcode:** 92117
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.83425 **Longitude:** 117.17223

Site Lighting: None
Site Perimeter: Located in plot of land next to motel.
Perimeter Condition: No Perimeter Fencing
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 0 PTZ: 0 None None
Motion Sensor: None
Infrared: None
Access Control: None
Gate Description: None
Foliage Condition: No issue.



Photo 1 - General Site View

General Security Observations:

This underground site is located adjacent to a motel. No fence, no security. About 2-3 feet of water sitting in bottom of vault.



Photo 2 - Vault Opening

Communication Observations:

This site has no existing security connections. The regulator is in an underground vault accessed via vault doors, any equipment rack would likely be an outdoor FEMA cabinet. There is commercial power. A 2 story building is directly north. The existing SCADA antenna is mounted a 20 foot pole. It is possible to mount multiple antennas at this site.

Recommendations:

Recommend that a fence be constructed around the site. The extent of the property line to be verified with the City surveyor. Install card reader, motion detection inside vault space. Add PTZ/IR/MD on new pole inside fenceline. Add outdoor security cabinet to house DVR, equipment. Add card reader and mag lock to new fence.



Photo 3 - Interior Sample

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Friars Rd Regulator Street Address: 2275 Rio Bonito Way
Inspection Date: 2/24/2011 Phase: 2 City: San Diego Zipcode: 92108
Inspected By: Billy Vanderbur and Budge Carrier Latitude: 32.77794 Longitude: 117.13535

Site Lighting: From adjacent parking lot only
Site Perimeter: Mesh with no barbed wire
Perimeter Condition: Fair
CCTV Camera Number / Type: Perimeter: Gate:
Fixed: 0 PTZ: 0 None None
Motion Sensor: None
Infrared: None
Access Control: None
Gate Description: Chain/Lock
Foliage Condition: No issue



Photo 1 - Main gate



Photo 2 - Vault Hatch

General Security Observations:

Site is adjacent to commercial building. No barbed wire on fence.

Communication Observations:

This site has no existing security connections. The regulator is above ground, but there is no building. Any equipment rack would be an outdoor FEMA cabinet. There is commercial power. The existing SCADA antenna is mounted on a 20 foot pole. It is possible to mount multiple antennas at this site.

Recommendations:

Add barbed wire to top of fence. Install card reader and mag lock to gate. Add PTZ/IR/MD on new pole inside yard. Add new outdoor security cabinet with DVR and UPS. replace vault hatch doors, rusted.



Photo 3 - Opposing view of site

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: La Jolla Country Club Reservoir **Street Address:** 7269 Encelia Dr.
Inspection Date: 2/24/2011 **Phase:** 2 **City:** San Diego **Zipcode:** 92037
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.84147 **Longitude:** 117.25769

Site Lighting: Not Evaluated
Site Perimeter: Wrought Iron
Perimeter Condition: Fair
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 0 PTZ: 0 None None
Motion Sensor: None
Infrared: None
Access Control: None
Gate Description: Vehicle gate with chain/lock
Foliage Condition: No issue.



Photo 1 - Proximity Photo

General Security Observations:

Location not included in this project and the fields are left blank. This site will be used for connectivity only.

Communication Observations:

This site has no existing security connections. The reservoir has an adjacent pump station that has room for communication equipment cabinet. There is commercial power with 3 open breakers. The existing SCADA antenna is mounted to the building. Multiple LMR (Public Safety) antennas are located at the site. There is room to install multiple microwave antennas if needed.



Photo 2 - Existing Antennas at Site

Recommendations:

This site will be used for communications connectivity only. This site is part of another project that will address security upgrades. Communication costs for this link were included with the La Jolla View Standpipe and Catalina PS sites

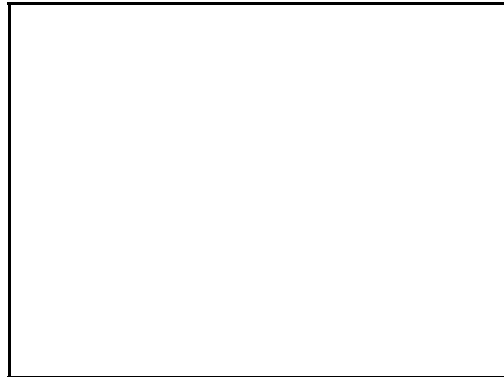


Photo 3 -

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: La Jolla View Standpipe **Street Address:** Brodiaea Way & Encelia Drive
Inspection Date: 2/24/2011 **Phase:** 2 **City:** San Diego **Zipcode:** 92037
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.84209 **Longitude:** 117.26151

Site Lighting: None
Site Perimeter: 6 foot chain link with outriggers and barbed wire
Perimeter Condition: Fair
CCTV Camera Number / Type: **Perimeter:** **Gate:**
 Fixed: 0 PTZ: 0 None None
Motion Sensor: None
Infrared: None
Access Control: None
Gate Description: Manual Gate
Foliage Condition: Overgrown



Photo 1 - Proximity Photo



Photo 2 - Site Photo

General Security Observations:

Standpipe is located at end of service road. Access to service road is a locked vehicle gate but area is approved for hiking. Site is fenced but fence is subpar and penetrations by intruders is evident. Site is considered a good vantage point of the lower valley.

Communication Observations:

This site has no existing security connections. The reservoir has no building; communication equipment would need to be installed in an outdoor NEMA cabinet. There is commercial power with a conduit running to existing SCADA cabinet. The existing SCADA antenna is mounted to a 15 foot pole. There is room to install multiple microwave antennas if needed.

Recommendations:

Demo and build new fence with outriggers and barbed wire with automated vehicle gate. Install thermal cameras with video analytics at opposing corners of property. Install PTZ/IR/MD at gate entrance. Install new outdoor security cabinet. Perimeter foliage needs to be trimmed back. Add audio speakers since this is a remote site. Install long range PTZ for city view.



Photo 3 - Main Gate

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Los Penasquitos PS **Street Address:** 15265 Andorra Way
Inspection Date: 2/23/2011 **Phase:** 1 **City:** San Diego **Zipcode:** 92129
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.99137 **Longitude:** 117.08451

Site Lighting: Underground vault
Site Perimeter: Located in residential area
Perimeter Condition: No Perimeter Fencing
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 0 PTZ: 0 None None
Motion Sensor: Interior Sensor
Infrared: None
Access Control: Key Locked Hatch with Card Reader inside vau
Gate Description: Vault Hatch with door contact sensors
Foliage Condition: No issue



Photo 1 - Vault Hatch with sensors.

General Security Observations:

The underground vault is located between two homes in a residential area. Hatch contact sensors and card reader are installed in vault.



Photo 2 - General site view

Communication Observations:

The site has an existing AT&T leased fiber Circuit with a Cisco 2811 switch and a Cisco 2960 Router with 4 open ports. There is commercial power with 3 open breakers. No Backup Power. The existing communication rack is in an underground vault and contains the DVR, UPS and has one open rack space. Conduits run into the shelter. Pole mounted Scada antenna.

Recommendations:

Add fixed CCTV camera inside vault with new DVR and UPS. Otherwise, this site has no issues.



Photo 3 - Card Reader with access indicator

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Los Penasquitos Reservoir **Street Address:** Penasquitos Dr. & Avenida Maria
Inspection Date: 2/23/2011 **Phase:** 1 **City:** San Diego **Zipcode:** 92129
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.98583 **Longitude:** 117.09238

Site Lighting: Limited to what is provided on tank.
Site Perimeter: Mesh with barbed wire
Perimeter Condition: Fair
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 8 PTZ: 1 Fixed PTZ
Motion Sensor: Protech Pyramid XL2
Infrared: Extreme CCTV UF-100
Access Control: n/a
Gate Description: Card reader with mag lock, chain/lock
Foliage Condition: Needs to be cleared away from fence line.



Photo 1 - Main Gate

General Security Observations:

The fence line is in poor condition. Obvious breach points around perimeter. Hiking trail runs along perimeter fence. This site connects to Pomerado Park Reservoir via wireless connection.

Communication Observations:

The site has a microwave connection to the Pomerado Park Res. Microwave radio and antenna mounted on a 20' pole. Conduit runs from pole to a outdoor stainless steel communication shelter. The shelter contains the routers, DVR, UPS and camera connections. There is commercial power at the site. Conduit run into the shelter. Scada connectivity is provided through pole mounted scada antennas.



Photo 2 - Pole Installation with CCTV/IR/MD

Recommendations:

Repair existing fence to close up breach points and to restring the barbed wire. Non-galvanized fence ties used and have since rusted out and need to be replaced. Consider building speed hump/bump under main gate to close gap. Otherwise installed security appears effective. Add audio speakers due to remoteness of site.



Photo 3 - Sample Breach Point

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Mercy Mira Mesa High PS **Street Address:** 9525 Babauta rd.
Inspection Date: 2/23/2011 **Phase:** 1 **City:** San Diego **Zipcode:** 92129
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.93642 **Longitude:** 117.12301

Site Lighting: On building only.
Site Perimeter: 6 foot black mesh fence with barbed wire
Perimeter Condition: Good
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 4 PTZ: 1 Fixed PTZ
Motion Sensor: Protech Pyramid XL2
Infrared: Extreme CCTV UF-100
Access Control: HID Reader with door sensor and interior motio
Gate Description: HID Reader with Maglock and chain/lock
Foliage Condition: Overgrown



Photo 1 - Main Gate

General Security Observations:

Overall the site is in great condition other than needing the foliage trimmed back.

Communication Observations:

The site has an existing AT&T leased Fiber Circuit with a Cisco 2811 switch and a Cisco 2960 Router with 4 open ports. There is commercial power with 3 open breakers and backup power using portable generator. The existing communication rack contains the DVR, UPS and has one open rack space. Conduits run into the shelter. Scada connectivity is provided through scada antenna mounted to the building.



Photo 2 - Foliage Around Camera Pole

Recommendations:

Trim back foliage.

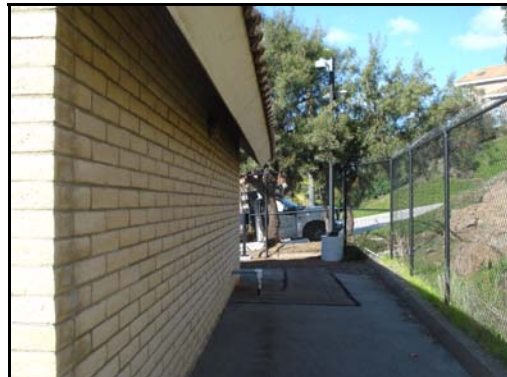


Photo 3 - Property Line View

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Miramar Ranch North PS **Street Address:** 11497 Weatherhill Way
Inspection Date: 2/23/2011 **Phase:** 1 **City:** San Diego **Zipcode:** 92131
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.92791 **Longitude:** 117.10117

Site Lighting: Site lighting exists around the reservoir
Site Perimeter: 6 foot fence with barbed wire
Perimeter Condition: Good
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 4 PTZ: 0 Fixed PTZ
Motion Sensor: Protech Pyramid XL2
Infrared: Extreme CCTV UF-100
Access Control: HID Reader at door with door contact and interi
Gate Description: See reservoir description
Foliage Condition: See reservoir description



Photo 1 - Entrance to Pump Station Building

General Security Observations:

The site is overall in good shape. The building is secured. Unfortunately, the security system was not operational at this time.

Communication Observations:

The site has an existing AT&T leased Fiber Circuit with a Cisco 2811 switch and a Cisco 2960 Router with 4 open ports. There is commercial power with 1 open breakers and backup power using portable generator. The existing communication rack contains the DVR, UPS and has one open rack space. Conduits run into the shelter. Scada connectivity is provided through scada antenna mounted to the building.



Photo 2 - Termination Field

Recommendations:

No security upgrades required at this building. Investigate problem why existi security system is not operational at this time. Site is collocated with the Miramar Ranch North Reservoir and communication costs are included with the reservoir site.



Photo 3 - Security Cabinet

The attached Materials contain Security Sensitive information that is "For Official Use Only" or other types of sensitive but unclassified information requiring protection against unauthorized disclosure. The attached materials will be handled and safeguarded in accordance with City directives governing protection and dissemination of such information.

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Miramar Ranch North Reservoir **Street Address:** 11496 Weatherhill Way
Inspection Date: 2/23/2011 **Phase:** 1 **City:** San Diego **Zipcode:** 92131
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.93642 **Longitude:** 117.12301

Site Lighting: Site lighting exists around the reservoir
Site Perimeter: 6 foot fence with barbed wire
Perimeter Condition: Good
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 8 PTZ: 1 Fixed PTZ
Motion Sensor: Protech Pyramid XL2
Infrared: Extreme CCTV UF-100
Access Control: Card Reader and maglock at gate
Gate Description: Two gates exist: One at the base of the driveway with chain/lock only; the other at the site entrance with HID/maglocks
Foliage Condition: Needs to be trimmed back in areas



Photo 1 - Driveway Entrance



Photo 2 - Stair to Reservoir Roof

General Security Observations:

The site is shared with the Pump Station. There are stairs up to the top of the reservoir with a gate that is not functioning properly and could be easily scale

Communication Observations:

The cameras at the reservoir are linked via Ethernet / fiber to the Miramar Ranch PS and utilize the communication links at the Pump Station for connectivity.

Recommendations:

Recommend enclosing stair entrance with 8 foot fence with barbed wire with pedestrian gate access. Gate would require HID reader and maglocks. Due to the elevation of this site, consider adding day/night PTZ on pole on western side of property for view of that area of the city.



Photo 3 - Site Interior with View of City

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Montezuma PS Street Address: 4998 Catocin Dr.
Inspection Date: 2/25/2011 Phase: 1 City: San Diego Zipcode: 92115
Inspected By: Billy Vanderbur and Budge Currier Latitude: 32.76881 Longitude: 117.05854

Site Lighting: None
Site Perimeter: Mesh with barbed wire
Perimeter Condition: Good
CCTV Camera Number / Type: Perimeter: Gate:
Fixed: 4 PTZ: 0 Fixed None
Motion Sensor: Protech Pyramid XL2
Infared: Extreme CCTV UF-100
Access Control: Card reader at bldg door
Gate Description: Card Reader with mag lock, chain/lock
Foliage Condition: No issue.



Photo 1 - Main Gate

General Security Observations:

No lighting at site. No PTZ view of main gate. Card readers not working at gate/door.

Communication Observations:

The site has an existing AT&T leased fiber Circuit with a Cisco 2811 switch and a Cisco 2960 Router with 4 open ports. There is commercial power with 4 open breakers and backup power using portable generator. The existing communication rack contains the DVR, UPS and has one open rack space. Conduits run into the shelter. Scada connectivity is provided through scada antenna mounted to the building.



Photo 2 - Site View

Recommendations:

Add floodlights with motion sensor on NW and NE side of building. Add PTZ/IR/MD on West corner of building with view of main gate. Investigate why card readers weren't operational.



Photo 3 - Typical security cluster

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Ocean View Hills PS **Street Address:** 4951 Ocean View Hills Pkwy
Inspection Date: 2/22/2011 **Phase:** 2 **City:** San Diego **Zipcode:** 92154
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.5818 **Longitude:** 117.0254

Site Lighting: Perimeter well lit.
Site Perimeter: 5 foot ornamental wrought iron
Perimeter Condition: Good
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 0 PTZ: 0 None None
Motion Sensor: None
Infrared: None
Access Control: None
Gate Description: Chain/Lock
Foliage Condition: Minor trimming along road required.

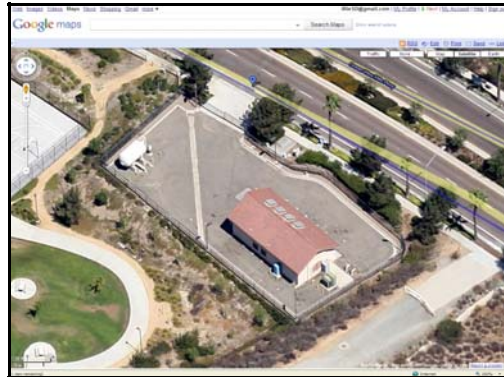


Photo 1 - Site Overview

General Security Observations:

Overall a clean site to work with. Existing light poles could facilitate security attachments. Fence is short and scalable.

Communication Observations:

This site has no existing security connections. The pump station building has room for an equipment rack. There is commercial power with 13 open breakers. The existing SCADA antenna is mounted to the building. There is room to install multiple microwave antennas if needed.



Photo 2 - View of North side of building

Recommendations:

Replace entire fence with 8 foot ornamental wrought iron security fence or augment existing through other means. Install fixed CCTV/IR/MD at all four corners of property with view of perimeter. Add PTZ/IR/MD at entrance gate. Add card reader and mag lock at Main gate. Add card reader, door contacts, interior motion sensors, DVR and UPS, and security cabinet in building.



Photo 3 - View of South side of building

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Paradise Mesa #1 PS **Street Address:** 1695 Plaza Crest Ridge Rd
Inspection Date: 2/22/2011 **Phase:** 2 **City:** San Diego **Zipcode:** 92114
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 37.69135 **Longitude:** 117.05228

Site Lighting: Street light only
Site Perimeter: 6 foot chain link fence with outriggers and 3 strands barbed wire
Perimeter Condition: Fair
CCTV Camera Number / Type: **Perimeter:** **Gate:**
 Fixed: 0 PTZ: 0 None None
Motion Sensor: None
Infrared: None
Access Control: None
Gate Description: chain/lock
Foliage Condition: Overgrown



Photo 1 - Proximity Photo

General Security Observations:

Location is secluded in small valley between subdivisions. Fence line butts up to building structure. Given the structure is in a secluded area but surrounded by residential lends itself to being prone to tampering/mischief activity.



Photo 2 - Site Photo

Communication Observations:

This site has no existing security connections. The pump station building has room for an equipment rack. There is 60 amp commercial power, but the panel may need to be updated. The existing SCADA antenna is mounted on a pole on a nearby hillside about 100m from the building and is connected via buried cable. There is room to install multiple microwave antennas if needed. There is a high berm just east of the site.

Recommendations:

Demo existing fence and rebuild to extent of city property line. Add PTZ/Fixed CCTV with IR/MD at gate. Add card reader and maglocks at gate. Add pole with fixed CCTV/IR/MD at opposite corner of site. Add card reader to building with door contacts and interior motion detection. Mount security equipment inside building. Add motion sensor with floodlight on building angled towards pump equipment. Suggest adding audio speaker.



Photo 3 -

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Paradise Mesa #2 PS **Street Address:** 2599 Alta View Dr.
Inspection Date: 2/22/2011 **Phase:** 2 **City:** San Diego **Zipcode:** 92139
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.67845 **Longitude:** 117.04575

Site Lighting: None
Site Perimeter: No fence currently
Perimeter Condition: No Perimeter Fencing
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 0 PTZ: 0 None None
Motion Sensor: None
Infrared: None
Access Control: None
Gate Description: Access to underground vault via locked hatch
Foliage Condition: Groundcover only



Photo 1 - Proximity Photo

General Security Observations:

The site resides on a residential corner. The vault is located underground.

Communication Observations:

This site has no existing security connections. The pump station is in an underground vault, any equipment rack would likely be in the underground vault. There is commercial power with 4 open breakers. The existing SCADA antenna is mounted a 15 foot pole. This is not a good site for multiple microwave antennas.



Photo 2 - Site View

Recommendations:

Recommend fencing the entire perimeter and provide a vehicle gate. Provide day/night cameras, motion detection and site lighting. Install HID reader, maglocks at gate. Install reader inside vault opening and attach hatch sensor. Mount day/night camera inside vault with motion detection sensors.



Photo 3 - Hatch View

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Paradise Mesa Hills #2 PS **Street Address:** 1930 Sea Star Lane
Inspection Date: 2/22/2011 **Phase:** 2 **City:** San Diego **Zipcode:** 92139
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.68428 **Longitude:** 117.05555

Site Lighting: None
Site Perimeter: 6 foot chain link, no barbed wire
Perimeter Condition: Fair
CCTV Camera Number / Type: **Perimeter:** **Gate:**
 Fixed: 0 PTZ: 0 Fixed PTZ
Motion Sensor:
Infrared:
Access Control: chain/lock
Gate Description: Manual Vehicle Gate
Foliage Condition: Overgrown



Photo 1 - Proximity Photo



Photo 2 - Pump Equipment

General Security Observations:

The site was a standpipe location as well as a pumping station but the standpipe has since been removed. There is no existing security at this location. The entrance is around the corner from the actual pump equipment. The existing fence line lacks outriggers and barbed wire. The foliage is very overgrown. The location offers a great vantage point to provide a broad area of coverage of that portion of the city.

Communication Observations:

This site has no existing security connections. The pump station has no building; communication equipment would need to be installed in an outdoor FEMA cabinet. There is commercial power with open breakers. The existing SCADA antenna is mounted to a 20 foot pole. There is LMR (Public Safety Radio) equipment at the site. There is room to install multiple microwave antennas if needed.

Recommendations:

The existing fence line needs to be upgraded to include outriggers and barbed wire. Access control card reader and maglocks need to be installed at the gate plus PTZ/IR/MS coverage. A single fixed CCTV camera with IR/MD needs to be installed to cover the pump equipment. Add additional pole with two fixed CCTV cameras/IR/MD on East side of lot to cover perimeter fence lines. Recommend adding motion sensor with flood lights to cover the pump area to add additional lighting to the area which is very dark at night. Recommend adding a pole with a CCTV PTZ camera to provide coverage of the site with a view angle of the driveway and the pump area. The PTZ could also provide coverage of the city from that vantage point. Mount the security equipment cabinet near the pump equipment. Trim back all foliage.



Photo 3 -

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Paradise Mesa Standpipe **Street Address:** 1513 Statton Ct.
Inspection Date: 2/22/2011 **Phase:** 2 **City:** San Diego **Zipcode:** 92114
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.69322 **Longitude:** 117.04622

Site Lighting: None observed
Site Perimeter: 6 foot chain link fence with outriggers and barbed wire
Perimeter Condition: Poor
CCTV Camera Number / Type: **Perimeter:** **Gate:**
 Fixed: 0 PTZ: 0 None None
Motion Sensor: None
Infrared: None
Access Control: None
Gate Description: chain/lock
Foliage Condition: Overgrown around perimeter



Photo 1 - Proximity Photo

General Security Observations:

Site is accessed through residential area through locked vehicle gate in cul-d-sac with service road leading up to main site gate. Fence is in disrepair and the site can be accessed at multiple locations under fence line.



Photo 2 - Main Gate

Communication Observations:

This site has no existing security connections. The standpipe has no building; communication equipment would need to be installed in an outdoor NEMA cabinet. There is commercial power. The existing SCADA antenna is mounted to a 15 foot pole. There is room to install multiple microwave antennas if needed.

Recommendations:

Recommend new fence be installed around complete perimeter. If possible, have all abandoned cell equipment reinstalled and removed from the site. Install 4 poles with dual day/night fixed cameras and motion detection and site lighting around perimeter. Install pole for day/night PTZ with motion detection cover main gate. Add HID reader and maglocks to new gate. Add two audio speakers due to remoteness of site up on hillside.



Photo 3 - Interior of Site

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Penasquitos Bluffs #8 PS **Street Address:** 9198 Oviedo St
Inspection Date: 2/23/2011 **Phase:** 1 **City:** San Diego **Zipcode:** 92129
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.96843 **Longitude:** 117.12959

Site Lighting: Floodlights all around building
Site Perimeter: Mesh fence with barbed wire
Perimeter Condition: Good
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 4 PTZ: 0 Fixed None
Motion Sensor: Protech Piramid XL2
Infrared: Extreme CCTV UF-100
Access Control: Key lock
Gate Description: Card reader with mag lock
Foliage Condition: Minor trimming required



Photo 1 - Side view of property

General Security Observations:

Site located on residential corner. All four sides of building covered with CCTV/IR/MD. Low risk area.

Communication Observations:

The site has an existing AT&T leased T-1 Circuit with a Cisco 2651 switch and a Cisco 2960 Router with 4 open ports. There is commercial power with no open breakers and backup power using portable generator. The existing communication rack contains the DVR, UPS and has one open rack space. Conduits run into the shelter. Scada connectivity is provided through scada antenna mounted to the building.



Photo 2 - Rear view of property

Recommendations:

No security upgrades required at this site.



Photo 3 - Typical security equipment cluster

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Point Loma Reservoir **Street Address:** 1061 Catalina blvd.
Inspection Date: 2/24/2011 **Phase:** 1 **City:** San Diego **Zipcode:** 92106
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.72498 **Longitude:** 117.24424

Site Lighting: Sparse pole lighting.
Site Perimeter: Ornamental wrought iron security fence
Perimeter Condition: Good
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 4 PTZ: 0 Fixed Fixed
Motion Sensor: None
Infrared: None
Access Control: Card access attached to outdoor security cabinet
Gate Description: Manual, Chain lock, mag locks not connected
Foliage Condition: Minor trimming



Photo 1 - Main gate

General Security Observations:

The site has four security poles with a fixed camera on each. No IR/MD. Use of SW Microwave 300B IDS units along Catalina Blvd. Problem is path between units is blocked with heavy tree vegetation causing the unit to sound off constantly. No other IDS system in use for remainder of fence line.

Communication Observations:

The cameras at the reservoir are linked via fiber to the Catalina PS and utilize the communication links at the Pump Station for connectivity.



Photo 2 - Security cabinet

Recommendations:

Recommend replacing the CCTV on the SE and NW corners with dual thermal IR cameras with video analytics. Add PTZ/IR/MD to main gate pole for main gate view. Either abandon the SW Microwave system and trim back foliage or replace with video analytics. Add two audio speakers to site. Communication cost estimates are included with the collocated Catalina PS site.



Photo 3 - Overgrown Tree

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Pomerado Park Reservoir **Street Address:** 16126 Avenida Venusto
Inspection Date: 2/23/2011 **Phase:** 1 **City:** San Diego **Zipcode:** 92128
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 33.00475 **Longitude:** 117.07508

Site Lighting: Limited lighting on poles
Site Perimeter: Mesh with barbed wire
Perimeter Condition: Good
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 8 PTZ: 1 Fixed PTZ
Motion Sensor: Protech Pyramid XL2
Infrared: Extreme CCTV UF-100
Access Control: None at cabinet
Gate Description: Card reader with mag lock, chain/lock
Foliage Condition: No issue.



Photo 1 - Main Gate

General Security Observations:

Site properly fenced and in good condition. 4 sets of poles with dual fixed/IR/MD. One pole missing IR unit (appears stolen). Outdoor cabinet has noisy fan unit-possibly bad bearing. Connects to Bernardo Heights Pump Station via buried fiber optic cable.



Photo 2 - Typical Pole Installation with CCTV/IR/MD

Communication Observations:

The cameras at the reservoir are linked via Ethernet / fiber to the Bernardo Heights PS and utilize the communication links at the Pump Station for connectivity. There is a fiber connection between PS and Reservoir. Site is also linked to Los Penasquitos Reservoir via microwave and the 10 cameras Los Penasquitos are routed through Pomerado Park and back to Chollas SO. Microwave is mounted to a 15' pole with radio on the pole.

Recommendations:

Replace missing IR unit. Repair/replace fan blower unit on cabinet. Add audio speakers due to remote location.



Photo 3 - Missing IR Unit

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Pomerado PS Street Address: 10455 Pomerado Rd
Inspection Date: 2/23/2011 Phase: 2 City: San Diego Zipcode: 92131
Inspected By: Billy Vanderbur and Budge Currier Latitude: 32.89857 Longitude: 117.10039

Site Lighting: On building only
Site Perimeter: Eucalyptus Trees, planted vegetation
Perimeter Condition: No Perimeter Fencing
CCTV Camera Number / Type: Perimeter: Gate:
Fixed: 0 PTZ: 0 None None
Motion Sensor: None
Infrared: None
Access Control: None
Gate Description: Vehicle Gate - Chain/lock
Foliage Condition: No issue.



Photo 1 - Pump Station Building

General Security Observations:

Site located off Pomerado Road. Existing vehicle entrance gate but no perimeter fence around site. No lighting except that attached to building. Mesh cage covering above ground valves at East corner of property. Plenty of room and power inside PS building for security cabinet.

Communication Observations:

This site has no existing security connections. The pump station building has room for an equipment rack. There is 100 amp commercial power with 18 open breakers. The existing SCADA antenna is on a 30 foot pole mounted to the building. There is room to install multiple microwave antennas if needed.



Photo 2 - Main Gate

Recommendations:

Install new fence with 8 foot fence and 18 inch outriggers with 3 strands barbed wire around property line. Install new automated vehicle gate with access control reader and maglock at main entrance, add two other gates at east and west ends of property for city vehicle access (if needed). Mount dome cameras on opposing corners of building with fixed day/night vision cameras. Install motion detection inside/out and door sensors. Include new day/night PTZ camera and motion sensor at main gate. Build gate further off roadside to allow for enough room for larger vehicles to stop in front of gate.



Photo 3 - Site Interior

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Princess Park PS **Street Address:** 1740 Masterson Ln
Inspection Date: 2/22/2011 **Phase:** 2 **City:** San Diego **Zipcode:** 92154
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.5656 **Longitude:** 117.03983

Site Lighting: Building only
Site Perimeter: Mesh fence only.
Perimeter Condition: Good
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 0 PTZ: 0 None None
Motion Sensor: None
Infrared: None
Access Control: None
Gate Description: chain/lock
Foliage Condition: Overgrown



Photo 1 - Valve Enclosure

General Security Observations:

Remote site at edge of residential. Perimeter fence has no barbed wire attached to top. Foliage overgrown.

Communication Observations:

This site has no existing security connections. The pump station building has room for an equipment rack. There is commercial power with many open breakers. The existing SCADA antenna is on a 20 foot pole next to the building. There is room to install multiple microwave antennas if needed.



Photo 2 - West view

Recommendations:

Cut back all foliage to allow for minimum of 6 months growth. Attach outrigger and barbed wire to existing fence/gate. Install two new poles for security equipment and lighting. Install card reader and mag locks at gate and install automatic gate opener. Install PTZ/IR on NE pole for gate view. Add card reader, door contacts, motion sensors and security cabinet in building. Install audio speaker to exterior of building. Add barbed wire and lock pedestrian gate to valve enclosure south of Pump Station.



Photo 3 - East view

The attached Materials contain Security Sensitive information that is "For Official Use Only" or other types of sensitive but unclassified information requiring protection against unauthorized disclosure. The attached materials will be handled and safeguarded in accordance with City directives governing protection and dissemination of such information.

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Rancho Bernardo Industrial PS **Street Address:** 16055 Big Springs Way
Inspection Date: 2/23/2011 **Phase:** 1 **City:** San Diego **Zipcode:** 92127
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 33.00751 **Longitude:** 117.08435

Site Lighting: None
Site Perimeter: Mesh fence with barbed wire
Perimeter Condition: Poor
CCTV Camera Number / Type: **Perimeter:** **Gate:**
 Fixed: 0 PTZ: 0 None None
Motion Sensor: Protech Pyramid XL2
Infrared: None
Access Control: Card Reader at door
Gate Description: Chain/Lock only
Foliage Condition: Overgrown



Photo 1 - Gate entrance to PS

General Security Observations:

Shared site with Rancho Bernardo Reservoir. Separate gate entrance into PS. Presently the gate is staggered and easily penetrated. The concrete drainage ditch to the side is also penetrable. Motion sensors located on all four sides of building but no CCTV/IR installed.

Communication Observations:

The site has an existing AT&T leased fiber Circuit with a Cisco 2811 switch and a Cisco 2960 Router with 4 open ports. There is commercial power and backup power using portable generator. The existing communication rack contains the DVR, UPS and has one open rack space. Conduits run into the shelter. Scada connectivity is provided through scada antenna mounted to the building. This site also provides connectivity for Rancho Bernardo Res. Communication estimates are included iwht the Rancho Bernardo Res.



Photo 2 - Rear view of PS

Recommendations:

ADD fixed CCTV/IR to al four corners of building. Trim all foliage back to allow for 6 months growth before next trimming. Existing grade into PS needs to be redone to facilitate a flat horizontal plane beneath the gates. Once this is done reset the gates and limit the gap below to 6 inches or less. Add vertical grate with no more than 8 inches between bars or fill concrete ditch with 8 inch pipe welded together to allow water flow but to prevent intrusion. Add card reader and maglocks to gate. Restretch mesh and restring barbed wire. Replace fence attachment wire with galvanized wire. See Reservoir upgrades for more details.



Photo 3 - PS Security Rack

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SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Rancho Bernardo Reservoir **Street Address:** 16059 Big Springs Way
Inspection Date: 2/23/2011 **Phase:** 1 **City:** San Diego **Zipcode:** 92127
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 33.00751 **Longitude:** 117.08435

Site Lighting: None
Site Perimeter: Mesh fence with barbed wire.
Perimeter Condition: Poor
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 0 PTZ: 1 PTZ: None
Motion Sensor: None
Infrared: IR Illuminator with PTZ Camera
Access Control: None
Gate Description: Chain/Lock
Foliage Condition: Overgrown



Photo 1 - Main Gate

General Security Observations:

Overall security is very light for this site. The main gate is flimsy with gaps under each side of gate. Fence mesh very loose and attached with non galvanized wire. Barbed wire ineffective and loose atop the fence. Single CCT camera coverage not sufficient for this type of site. Foliage overgrown in area of fence line.

Communication Observations:

The cameras at the reservoir are linked via fiber to the Rancho Bernardo Industrial PS and utilize the communication links at the Pump Station for connectivity.



Photo 2 - Single pole with PTZ/IR

Recommendations:

Restretch and attach the existing fencing around the perimeter. Ensure tensic wires are installed top/bottom. Attach using galvanized wire straps. Restrung barbed wire/replace outriggers if rusted. Either remove unused fence panel or mesh over it to prevent penetration. Install three new poles on the perimeter and attach thermal PTZ CCTV cameras with video analytics. Replace existing PTZ/IR with thermal PTZ CCTV cameras with video analytics. Replace main gate with automatic gate openers, add card reader and maglocks. Add audio speaker at PS for Main Gate and on new SW corner pole near soccer fields.



Photo 3 - Fence Panel segment

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Rancho Penasquitos PS **Street Address:** 8888 Sparren Way
Inspection Date: 2/23/2011 **Phase:** 1 **City:** San Diego **Zipcode:** 92129
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.97303 **Longitude:** 117.13501

Site Lighting: On building only
Site Perimeter: 8' ornamental wrought iron
Perimeter Condition: Good
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 4 PTZ: 1 Fixed PTZ
Motion Sensor: Protech Pyramid XL2
Infrared: Extreme CCTV UF-100
Access Control: card reader at doors
Gate Description: Auto sliding gate with card reader and intercom boxes - each side of fence.
Foliage Condition: No issue.



Photo 1 - Main Gate



Photo 2 - Intercom/Proximity Reader

General Security Observations:

This is a new site and all systems are operational and well covered.

Communication Observations:

The site has an existing AT&T leased fiber Circuit with a Cisco 2811 switch and a Cisco 2960 Router with 4 open ports. There is commercial power with 4 open breakers and backup power using portable generator. The existing communication rack contains the DVR, UPS and has one open rack space. Conduits run into the shelter. Scada antenna mounted to building. Microwave mounted to building that provides connectivity for Black Mtn PS and Reservoir

Recommendations:

No security upgrades required at this site. They should all look like this! Probable costs includes the cost to replace the router, switch and grounding & new communications are put in to replace the AT&T owned equipment.



Photo 3 - Building View

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SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Red Wood Village Standpipe **Street Address:** 6056 Hughes St.
Inspection Date: 2/22/2011 **Phase:** 2 **City:** San Diego **Zipcode:** 92115
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.74848 **Longitude:** 117.06703

Site Lighting: None
Site Perimeter: 6 foot chain link with outriggers and barbed wire
Perimeter Condition: Poor
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 0 PTZ: 0 None None
Motion Sensor: None
Infrared: None
Access Control: None
Gate Description: Chain/Lock
Foliage Condition: Overgrown



Photo 1 - Proximity Photo

General Security Observations:

Site is accessed through school property through locked gate to another gate entrance to site. Power is located to right of gate entrance. Several cell service providers have towers and cell equipment shacks on property that are segregated from main property. Access for these providers will need to be maintained.

Communication Observations:

This site has no existing security connections. The standpipe has no building; communication equipment would need to be installed in an outdoor FEMA cabinet. There is commercial power. The existing SCADA antenna is mounted to a 10 foot pole. There is room to install multiple microwave antennas if needed. Cell Phone providers are located at the site. Access to site is restricted due to school proximity.



Photo 2 - Interior View and Cell Provider Areas

Recommendations:

Recommend demo of existing fence and install new fence around complete perimeter. Install 2 poles with dual day/night fixed cameras and motion detection and site lighting around perimeter. Install pole for day/night PTZ with IR and motion detection to cover main gate. Add HID reader and maglocks and automatic gate opener to new gate. Install NEMA security cabinet on south side of property. This is a very good high site that consideration should be made to incorporate a high quality day/night PTZ camera to provide coverage for that part of the city. The pole for this camera would be placed along the eastern fence line.



Photo 3 - Interior View

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: San Andreas PS Street Address: 3042 Tercer Cerde
Inspection Date: 2/23/2011 Phase: 2 City: Del Mar Zipcode: 92014
Inspected By: Billy Vanderbur and Budge Currier Latitude: 32.98533 Longitude: 117.24517

Site Lighting: None
Site Perimeter: Block wall
Perimeter Condition: Good
CCTV Camera Number / Type: Perimeter: Gate:
Fixed: 0 PTZ: 0 None None
Motion Sensor: None
Infrared: None
Access Control: None
Gate Description: Wrought iron frame covered with painted plywood. Padlocked.
Foliage Condition: No Issue.



Photo 1 - Site Photo

General Security Observations:

The site is located with the main gate on the public side and the rest of the perimeter on the gated community side.

Communication Observations:

This site has no existing security connections. The pump station building has room for an equipment rack. There is commercial power with 10 open breakers. The existing SCADA antenna is mounted to the building. Site is in gated community.



Photo 2 - Pumps and Building Entrance

Recommendations:

Recommend 18-24 inch wrought iron spike fence to be attached to top of block wall. Add HID reader and maglocks to main gate and building entrance. Install new day/night PTZ and motion sensor to exterior of building with view of gate. Attach fixed camera with motion sensor to building with view of entrance door and external pumps. Add contact switches to hatch covers in public area outside fenced area.



Photo 3 - Hatches in Public Area

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SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: San Carlos Reservoir **Street Address:** 7944 Wingspan Dr (Tommy Dr.)
Inspection Date: 2/25/2011 **Phase:** 1 **City:** San Diego **Zipcode:** 92119
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.80774 **Longitude:** 117.02797

Site Lighting: Minimal
Site Perimeter: Mesh with barbed wire
Perimeter Condition: Fair
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 8 PTZ: 1 Fixed PTZ
Motion Sensor: Protech Pyramid XL2
Infrared: Extreme CCTV UF-100
Access Control: None
Gate Description: Card reader with mag locks, chain/lock
Foliage Condition: Minor trimming required.



Photo 1 - Main Gate

General Security Observations:

Overall site has good coverage of CCTV/IR/MD. Missing PTZ/IR/MD at gate. Few breach locations along fence line that need to be addressed. Ped gate at rear of site needs to be reworked with storm drain area - Erosion issue. Security cabinet mounted outdoors next to entrance.



Photo 2 - Typical security pole

Communication Observations:

The site has an existing AT&T leased fiber Circuit with a Cisco 2811 switch and a Cisco 2960 Router with 4 open ports. There is commercial power with 4 open breakers. No backup power. There is an outdoor stainless steel communication shelter for routers, DVR and UPS. Conduits run into the shelter. Scada connectivity is provided through pole mounted scada antenna.

Recommendations:

Install PTZ/IR/MD with view of main gate. Mitigate potential breach points. Repair rear ped gate area to better address breach point.



Photo 3 - Rear Ped Gate

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Scripps McMillan PS **Street Address:** 12225 Spring Canyon rd.
Inspection Date: 2/23/2011 **Phase:** 1 **City:** San Diego **Zipcode:** 92131
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.92199 **Longitude:** 117.06693

Site Lighting: None observed
Site Perimeter: 6 foot fence with barbed wire
Perimeter Condition: Good
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 6 PTZ: 1 Fixed PTZ
Motion Sensor: Protech Pyramid XL2
Infrared: Extreme CCTV UF-100
Access Control: None
Gate Description: HID Reader, Maglock, Chain/lock
Foliage Condition: Overgrown



Photo 1 - Main Gate

General Security Observations:

Site was reported not operational. System installed is comprehensive in coverage with CCTV and motion detection. Due to the elevation of this site, consider installing one day/night PTZ camera on 180 degree patrol on northwestern side of property.

Communication Observations:

The cameras at the reservoir are linked via Ethernet / fiber to the Scripps Ranch PS and utilize the communication links at the Pump Station for connectivity. There are cell companies at the site with two separate shelters.



Photo 2 - Entrance to Site

Recommendations:

No security upgrades required at this site. Investigate reason security system is not currently operating.



Photo 3 - Existing Camera

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Scripps Ranch **Street Address:** 12225 Spring Canyon rd.
Inspection Date: 2/23/2011 **Phase:** 1 **City:** San Diego **Zipcode:** 92131
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.92199 **Longitude:** 117.06693

Site Lighting: None observed
Site Perimeter: 6 foot fence with barbed wire
Perimeter Condition: Good
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 6 PTZ: 1 Fixed PTZ
Motion Sensor: Protech Pyramid XL2
Infrared: Extreme CCTV UF-100
Access Control: None
Gate Description: HID Reader, Maglock, Chain/lock
Foliage Condition: Overgrown



Photo 1 - Main Gate

General Security Observations:

Shared site with Scipps McMillan PS. Site security system not currently operational.

Communication Observations:

The site has an existing AT&T leased Fiber Circuit with a Cisco 2811 switch and a Cisco 2960 Router with 4 open ports. There is commercial power and backup power using portable generator. The existing communication rack contains the DVR, UPS and has one open rack space. Conduits run into the shelter. Scada connectivity is provided through a 20' pole mounted antenna.

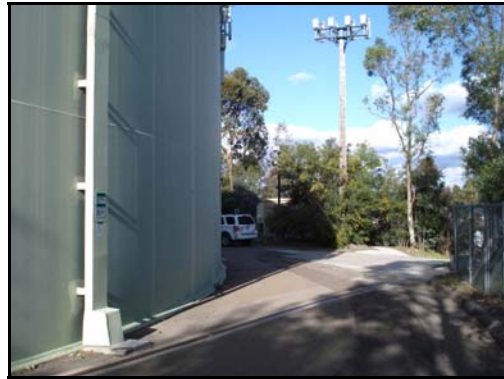


Photo 2 - Interior View #1

Recommendations:

No security upgrades required at this site. Investigate reason security system is not currently operating.



Photo 3 - Interior View #2

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Scripps Woods #2 PS **Street Address:** 12344 Semillon Blvd
Inspection Date: 2/23/2011 **Phase:** 2 **City:** San Diego **Zipcode:** 92131
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.91116 **Longitude:** 117.06514

Site Lighting: On exterior of building only
Site Perimeter: No fence.
Perimeter Condition: No Perimeter Fencing
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 0 PTZ: 0 None None
Motion Sensor: None
Infrared: None
Access Control: None
Gate Description: Vehicle Gate - Chain/lock
Foliage Condition: No issue.



Photo 1 - Pump Station Building

General Security Observations:

The site is located in a subdivision bordered by a home on one side and open outside of the rest of the property line. A generator has been staged at this location and was found unsecured (no towing lock on trailer).

Communication Observations:

This site has no existing security connections. The pump station building has room for an equipment rack. There is 200 amp commercial power with open breakers. The existing SCADA antenna is mounted to the building. There is room to install multiple microwave antennas if needed.



Photo 2 - Vehicle Entrance Gate

Recommendations:

Install new 6 foot fence with 18 inch outriggers and 3 strands barbed wire around property line. Install new vehicle gate with access control reader and maglock. Mount dome cameras on opposing corners of building with fixed day/night vision cameras. Install motion detection inside/out and door sensors. Include new day/night PTZ camera and motion sensor at main gate. Build gat further off roadside to allow for enough room for larger vehicles to stop in front of gate.



Photo 3 - Site View #1

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Security Operations Center (SOC) Street Address: 2794 Caminito Chollas
Inspection Date: 2/22/2011 Phase: 1 City: San Diego Zipcode: 92105
Inspected By: Billy Vanderbur and Budge Currier Latitude: 32.73479 Longitude: 117.07166

Site Lighting: Generally sufficient around building.
Site Perimeter: Reference Chollas Facility Observations
Perimeter Condition: Poor
CCTV Camera Number / Type: Perimeter: Gate:
Fixed: 1 PTZ: 0 None Fixed
Motion Sensor: None
Infrared: None
Access Control: HID Card reader at main entrance to EOC/SOC
Gate Description: n/a
Foliage Condition: No issue.

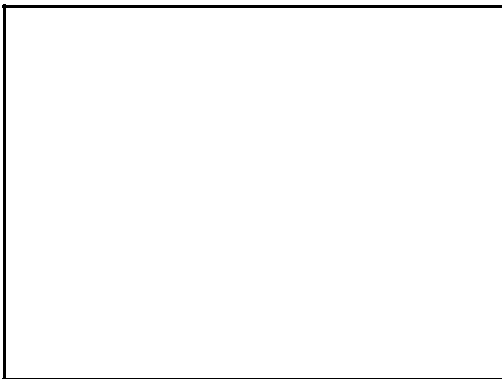


Photo 1 - No photos exist of this space.

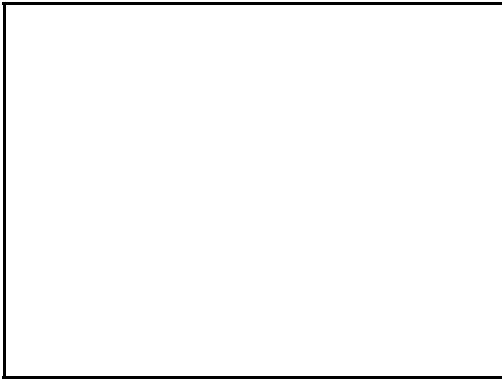


Photo 2 -

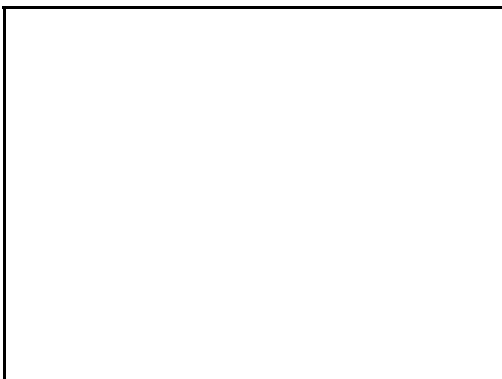


Photo 3 -

General Security Observations:

SOC resides in a pre-fab building, attached to the EOC pre-fab structure. The space is elongated and staffed by one security operator. There are 20+ flat screen desk monitors that run the length of the operator console that show CCTV images of Water facilities. There are 3 larger wall mounted LCD monitors; only 2 are operational. Equipment cabinets on the East side house variety of network equipment, video switchers, DVR's etc. The space and current systems are generally not conducive to effectively provide security operations due to the lack of an integrated security software platform such as Physical Security Information Management System (PSIM) providing automat alerts to the operator.

Communication Observations:

The communications at this facility are the internal intranet that is used to route the site data that is received from the Water Sites that have security to the Security Operations Center. The entry for Chollas Facility includes communication costs.

Recommendations:

Modify this space to incorporate the security and communications systems for the additional water facilities as well as the existing facilities and to make it an intelligent, intuitive space with information management. The space and the systems be assessed to determine the best approach and solution to integrate the CCTV, ACS and IDS systems along with video analytics at strategic facilities and alarm notification policies and procedures that should be implemented. This would greatly enhance the operators efficiency as well as creating the platform for better security monitoring and concise information collection of selected events.

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Soledad Reservoir and PS **Street Address:** 6751 La Jolla Scenic Dr
Inspection Date: 2/24/2011 **Phase:** 1 **City:** La Jolla **Zipcode:** 92037
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.83774 **Longitude:** 117.24859

Site Lighting: None except at pump room door
Site Perimeter: Main Road - Wrought Iron; remainder 6 foot chain link with barbed wire.
Perimeter Condition: Fair
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 6 PTZ: 1 Fixed Fixed
Motion Sensor: Protech Pyramid XL2
Infrared: Extreme CCTV UF-100
Access Control: HID and door contacts
Gate Description: HID with maglocks/manual gate
Foliage Condition: Overgrown



Photo 1 - Main Gate



Photo 2 - Interior View #1

General Security Observations:

Site is well covered with CCTV and motion sensors. Perimeter fence has a number of manmade penetrations that need to be repaired. The pump room has an HID reader and door contacts with motion sensors inside. The foliage very overgrown and blocking camera views. The SOC indicated the security at this site was not currently operational.

Communication Observations:

The site has an existing AT&T leased T-1 Circuit with a Cisco 2651 switch and a Cisco 2960 Router with 4 open ports. There is commercial power with no open breakers and backup power using portable generator. The existing communication rack is in a vault below ground and contains the DVR, UPS and has one open rack space. Conduits run into the shelter. Scada connectivity is provided through a 10 foot pole mounted antenna. The Soledad HLS is across the street.

Recommendations:

Solve reason security is not presently working at this site. Trim foliage away from entire perimeter. Repair fence penetrations (manmade) and lock pedestrian gate at northeast corner of property. Install 30 feet of new fenceline from ped gate to corner of property.

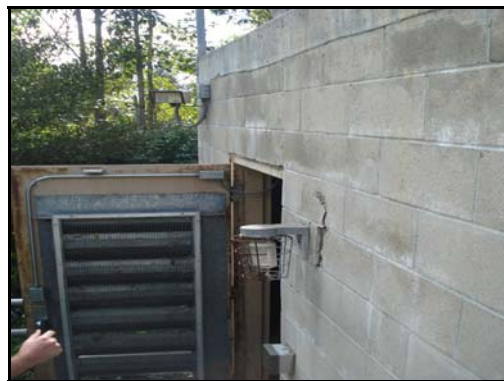


Photo 3 - Pump Room Entrance

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: South Creek PS **Street Address:** 12330 Springhurst Dr.
Inspection Date: 2/23/2011 **Phase:** 2 **City:** San Diego **Zipcode:** 92128
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.94236 **Longitude:** 117.07611

Site Lighting: On building only
Site Perimeter: 7 foot wrought iron fence.
Perimeter Condition: Good
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 0 PTZ: 0 None None
Motion Sensor: None
Infrared: None
Access Control: None
Gate Description: Dual vehicle gate with chain/lock.
Foliage Condition: Minor trimming required.



Photo 1 - Building Photo

General Security Observations:

Perimeter fence is sufficient. Clean site with good sightlines. Minor foliage trimming required. Good neighborhood.

Communication Observations:

This site has no existing security connections. The pump station building has room for an equipment rack. There is 50 amp commercial power with open breakers. The existing SCADA antenna is on a 20 foot pole mounted to the building. There is room to install multiple microwave antennas if needed.



Photo 2 - View Towards Main Gate

Recommendations:

Recommend installing two poles in opposite corners equipped with day/night fixed cameras and motion sensors to cover perimeter and all building access points. Install HID reader and maglocks on main gate. Install HID reader at building entrance, sensors on doors and motion detection on interior.



Photo 3 - Interior View #1

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: South San Diego Reservoir **Street Address:** 1998 Magdalena Avenue
Inspection Date: 2/22/2011 **Phase:** 1 **City:** Chula Vista **Zipcode:**
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.6011 **Longitude:** 116.9753

Site Lighting: None
Site Perimeter: Mesh with barbed wire
Perimeter Condition: Good
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 0 PTZ: 4 PTZ PTZ
Motion Sensor: Yes
Infrared: Built into camera
Access Control: None
Gate Description: Card reader with maglock, chain/lock
Foliage Condition: No issue.



Photo 1 - Perimeter view

General Security Observations:

Site is currently being refurbished. No security is operational at this time. Solar array has been slightly damaged and will require replacement of up to eight panels. Fence line is in good condition. Perimeter system not operational.



Photo 2 - Existing security array

Communication Observations:

The site has an existing AT&T leased T-1 Circuit, but the cabinet could not be opened to verify. There is solar power provided by 2 arrays with 16 BP Model SX160B panels in each array. There is an outdoor stainless steel communication cabinet with conduits. Scada connectivity is provided through pole mounted scada antenna.

Recommendations:

Replace all cameras with thermal IR cameras with video analytics. Attach to solar array system for power source. Replace main gate access control reader and mag locks. Abandon existing perimeter intrusion detection system. Replace damaged solar panels. Add audio speakers at all four corners.



Photo 3 - View of Main Gate with PV and cabinet

The attached Materials contain Security Sensitive information that is "For Official Use Only" or other types of sensitive but unclassified information requiring protection against unauthorized disclosure. The attached materials will be handled and safeguarded in accordance with City directives governing protection and dissemination of such information.

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Stonebridge PS #1 **Street Address:** 14079 Stonebridge Pkwy
Inspection Date: 2/23/2011 **Phase:** 2 **City:** San Diego **Zipcode:** 92131
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.92278 **Longitude:** 117.03413

Site Lighting: Site has perimeter lighting
Site Perimeter: Low block wall
Perimeter Condition: Good
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 0 PTZ: 0 None None
Motion Sensor: None
Infrared: None
Access Control: None
Gate Description: Dual vehicle gate - chain/lock
Foliage Condition: Minor trimming needed



Photo 1 - Building Photo



Photo 2 - Main Gate

General Security Observations:

The site has a low block wall around 3/4 of the site. The rear of the property has a 4 foot mesh fence installed on top of the block wall.

Communication Observations:

This site has no existing security connections. The pump station building has room for an equipment rack. There is 150 amp commercial power with 6 oper breakers. The existing SCADA antenna is mounted to the building. There is room to install multiple microwave antennas if needed.

Recommendations:

Recommend installing two poles in opposite corners equipped with day/night fixed cameras and motion sensors to cover perimeter and all building access points. Install HID reader and maglocks on main gate. Install HID reader at building entrance, sensors on doors and motion detection on interior. Install 1 24 inch wrought iron fence on top of low wall and add outriggers and barbed wire to existing mesh fence at rear of property.



Photo 3 - Sample of Low Wall

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: Stonebridge PS #2 **Street Address:** 14800 Stonebridge Pkwy
Inspection Date: 2/23/2011 **Phase:** 2 **City:** San Diego **Zipcode:** 92131
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.92673 **Longitude:** 117.00764

Site Lighting: Site is well lit around perimeter and on buildings

Site Perimeter: Contiguous solid block wall est. ~8 foot high

Perimeter Condition: Good

CCTV Camera Number / Type: **Perimeter:** **Gate:**

Fixed: 0 PTZ: 0 None None

Motion Sensor: None

Infrared: None

Access Control: None

Gate Description: Dual vehicle gate - chain/lock

Foliage Condition: No issue.

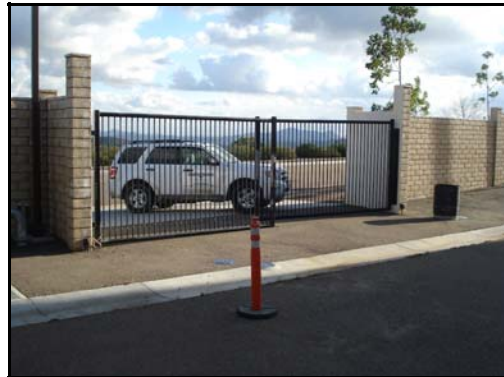


Photo 1 - Main Gate

General Security Observations:

The site contains a reservoir tank and a pump station.

Communication Observations:

This site has no existing security connections. The pump station building has room for an equipment rack. There is 300 amp commercial power with 6 oper breakers. The existing SCADA antenna is mounted to the building. There is room to install multiple microwave antennas if needed.



Photo 2 - Pump Station Building

Recommendations:

Recommend placing several camera poles around property with day/night fixed cameras, motion sensors and IR illuminators. Install HID Reader at main pump station building entrance and door sensors on all doors. Install motion sensor in pump room and power room. Install PTZ/IR/MD to cover main gate.

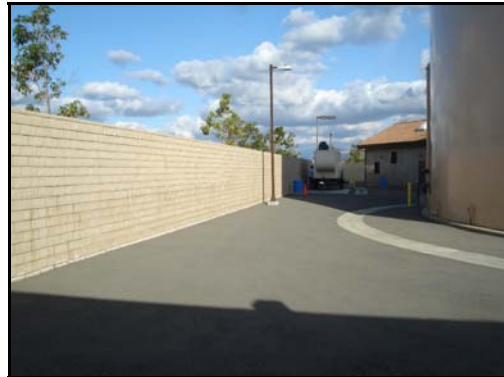


Photo 3 - Interior View #1

SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: University Heights PS **Street Address:** 4220 Idaho St
Inspection Date: 2/24/2011 **Phase:** 1 **City:** San Diego **Zipcode:** 92105
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.75428 **Longitude:** 117.13406

Site Lighting: Site/building lighting exists
Site Perimeter: Mesh with barbed wire
Perimeter Condition: Fair
CCTV Camera Number / Type: **Perimeter:** **Gate:**
Fixed: 1 PTZ: 0 Fixed None
Motion Sensor: Protech Pyramid XL2
Infrared: None
Access Control: Card reader at door
Gate Description: Card reader and mag locks
Foliage Condition: No issue



Photo 1 - Main Gate

General Security Observations:

Site has limited CCTV and no IR currently. Minor fencing issues including some missing barbed wire in areas. Segregation from adjacent property is not well defined and needs fencing installed.

Communication Observations:

The site has an existing AT&T leased T-1 Circuit with a Cisco 2651 switch and a Cisco 2960 Router with 4 open ports. There is commercial power with many open breakers and backup power using portable generator. The existing communication rack contains the DVR, UPS and has one open rack space. Conduits run into the shelter. Scada connectivity is provided through scada antenna mounted to the building.



Photo 2 - East View

Recommendations:

Repair minor problems with fence line, install barbed wire or concertina wire where the property adjoins the skate park next door. Add additional CCTV to accommodate thorough coverage.



Photo 3 - West View

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SECURITY UPGRADES for the CITY OF SAN DIEGO - WATER SITE SECURITY ASSESSMENT

Site Name: University Heights Reservoir **Street Address:** 4220 Idaho St
Inspection Date: 2/24/2011 **Phase:** 1 **City:** San Diego **Zipcode:** 92105
Inspected By: Billy Vanderbur and Budge Currier **Latitude:** 32.75428 **Longitude:** 117.13406

Site Lighting: Street lights / lighting on top of reservoir
Site Perimeter: 8 foot chain link
Perimeter Condition: Fair
CCTV Camera Number / Type: **Perimeter:** **Gate:**
 Fixed: 0 PTZ: 1 None None
Motion Sensor: Protech Piramid XL2
Infrared: Extreme CCTV UF-100
Access Control: None
Gate Description: Chain/Lock
Foliage Condition: Poor



Photo 1 - Oregon Street Sidewalk Vaults

General Security Observations:

Reservoir is an elevated concrete reservoir that occupies 2/3 of the city block. Top of reservoir is used as public park facility. Along one side of reservoir stairway provides access to top of reservoir with locked ped gate. At top of stairs the fence has large gaps that need repair. No cameras, sensors or latches around the facility. At one time intrusion detection along the top of fence was installed, but is no longer functional. Lighting is limited. One PTZ camera with MD/IR is located along Idaho Street. Trees along fence line need to be trimmed back.



Photo 2 - Rear Stairs to Breached Fence

Communication Observations:

The University Heights Reservoir shares the existing AT&T leased T-1 Circuit with the University Heights Pump Station which is adjacent to the reservoir. Cost estimates for the reservoir are included with the University Heights pump station.

Recommendations:

Clear all trees away from the fence. Repair holes in fencing at top of rear stair and install fencing / gate around stairway at street level. Add fixed CCTV/MD/IR around perimeter. Add additional lighting at rear ped gate. Add speakers at MW/SE corners. Add hatch lid contact switches. Add PTZ camera at NW pole. Relocate existing PTZ off of fence pole to new SE pole.



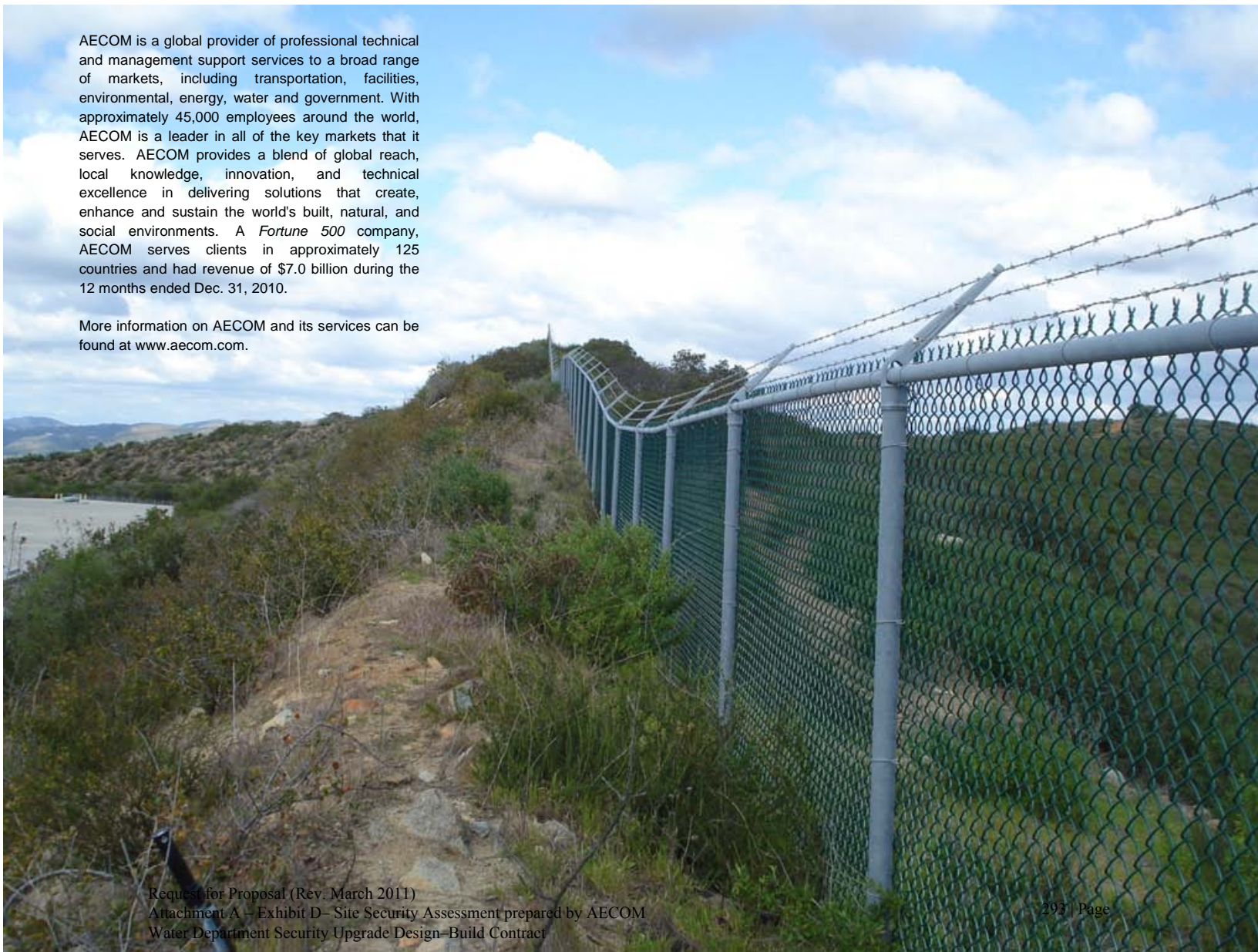
Photo 3 - View Across Skate Park (North to South)

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AECOM is a global provider of professional technical and management support services to a broad range of markets, including transportation, facilities, environmental, energy, water and government. With approximately 45,000 employees around the world, AECOM is a leader in all of the key markets that it serves. AECOM provides a blend of global reach, local knowledge, innovation, and technical excellence in delivering solutions that create, enhance and sustain the world's built, natural, and social environments. A *Fortune 500* company, AECOM serves clients in approximately 125 countries and had revenue of \$7.0 billion during the 12 months ended Dec. 31, 2010.

More information on AECOM and its services can be found at www.aecom.com.



**ATTACHMENT A
EXHIBIT E – VENDOR CUT SHEETS**

Eclipse – Digital Microwave Platform

Overview

Eclipse is one of the industry's leading platforms for microwave access, transport and backhaul applications and has been proven in network deployments all over the world for a wide variety of applications.

Introduced in 2004 and ever since consistently rated as No. 1 by customers, Eclipse provides the most comprehensive wireless solution available for transport of all types of traffic, from low-capacity PDH to high-capacity SDH/SONET to Carrier Ethernet.

Eclipse was the first platform to introduce the market's most innovative features, such as Super-PDH™ capacity migration, advanced nodal networking and Liquid Bandwidth assignment of available radio capacity between TDM and Ethernet traffic, all to deliver high-end performance at lower overall cost of ownership.

With proven performance under the most rugged conditions, Eclipse leads the way in supporting efficient and scalable wireless networks.



Aviat Networks supports the open source community. Please contact one of the [Aviat Networks Open Source Compliance Officers](#) if you would like additional information or access to the source code including BusyBox.

Key Features

- Compact split-mount architecture.
- Software-scalable capacity migration enables easy adaptation to changing conditions and future needs.
- Broad licensed frequency band support.
- Optimized nodal solution supports multiple radio paths with built-in traffic routing, add-and-drop and aggregation.
- Unique Super-PDH networking provides a simple and cost-effective alternative to SDH/SONET.
- Carrier Ethernet transport, with Liquid Bandwidth assignment between high-speed Ethernet and TDM traffic.

Aviat Networks supports the open source community. Please contact one of the Aviat Networks Open Source compliance officers at softwarecompliance@aviatnet.com for additional information.

Specifications

- Frequency bands: 5, L6, U6, 7, 8, 10, 11, 13, 15, 18, 23, 26, 32, 38 GHz
- Modulations: QPSK, 16, 32, 64, 128, 256 QAM
- Capacity/throughput (per channel, per polarization):
 - 6 to 360Mbit/s Ethernet/IP
 - 4 to 100xE1 (2Mbit/s), 4 to 127xDS1 (1.544Mbit/s)
 - 1 to 4xE3 (34Mbit/s), 1 to 6xDS3 (45Mbit/s)
 - 1 to 2xSTM1/OC3 (155Mbit/s)
- Channel bandwidths:
 - 3.5, 7, 13.75, 14, 27.5, 28, 55, 56 MHz (ETSI/ITU)
 - 5, 10, 20, 30, 40, 50, 80 MHz (ANSI/FCC)
- Capacity doubling: co-channel operation with XPIC
- Architecture options: nodal, terminal, repeater; split-mount with outdoor RF unit
- Nodal capability: up to six independent radio paths from a single indoor unit
- Nodal capacity: 200 Mbit/s (TDM + Ethernet)
- Environmental compliance: ETS 300 019

www.aviatnetworks.com

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Web: <http://www.aviatnetworks.com>, Email: webmaster@aviatnet.com



HotPort® 7000 (7010/7020) Wireless Mesh Nodes

Viable Alternative to Fiber

Infrastructure mesh technology from FireTide provides municipal, industrial and enterprise users with the bandwidth needed to expand the reach of their existing networks, while adding a variety of fixed and mobile applications: city-wide video surveillance, traffic management and intelligent transportation systems, Wi-Fi access for mobile city workers and wireless broadband for underserved areas.

Convenient Upgrade Paths

HotPort® 7000 mesh nodes ship as 802.11a/b/g/n dual-radio capable hardware, with enhanced functionality enabled through software licenses. Projects that do not require 802.11n MIMO (multiple input, multiple output) capacity or dual-radio capability can start with 802.11a/b/g-enabled single-radio configuration. Dual-radio functionality can easily be enabled through a software license at an additional cost. Similarly, a separate software license can enable MIMO functionality for operation in 40 MHz channels, and to take advantage of 802.11n technology to achieve throughput of up to 300 Mbps outdoors and 400 Mbps indoors.



HotPort 7000 Indoor Mesh Node



HotPort 7000 Outdoor Mesh Node

Easier Deployments & Network Management

Unlike wired networks, where deployment is cumbersome, the self-forming nature of the FireTide mesh network ensures rapid deployment of large-scale networks. The HotPort 7000 mesh features integrated spectrum analysis, network capacity planning and antenna alignment tools for easier deployments and network management.

Higher Reliability

The HotPort 7000 nodes form a multi-point to multi-point ad hoc wireless mesh network with no single point of failure. Unlike a wired network, where a cut in the cable could take several days to resolve, the FireTide mesh routes the traffic immediately on an alternate link ensuring continuous service and network availability.

Dual-radio Performance

To maximize performance, dual-radio HotPort 7000 nodes support two radio modes. In the “bonded” mode, both radios are combined to operate as a single unit that provides double the bandwidth of a single radio equivalent. In the “linear” mode, both radios operate independently enabling sustained bandwidth levels over an unlimited number of hops. This enables long linear topologies, such as when networking a railway line, and provides a sustained level of service to every node, which is also critical for large municipal networks.

Quality of Service

FireTide’s patented AutoMesh™ flow based routing protocol supports advanced load balancing and congestion control mechanisms for optimal routing within the mesh network. The HotPort 7000 mesh infrastructure also provides extensive VLAN capabilities critical for deploying a multi-service network on a large scale.

Metro-scale Deployments

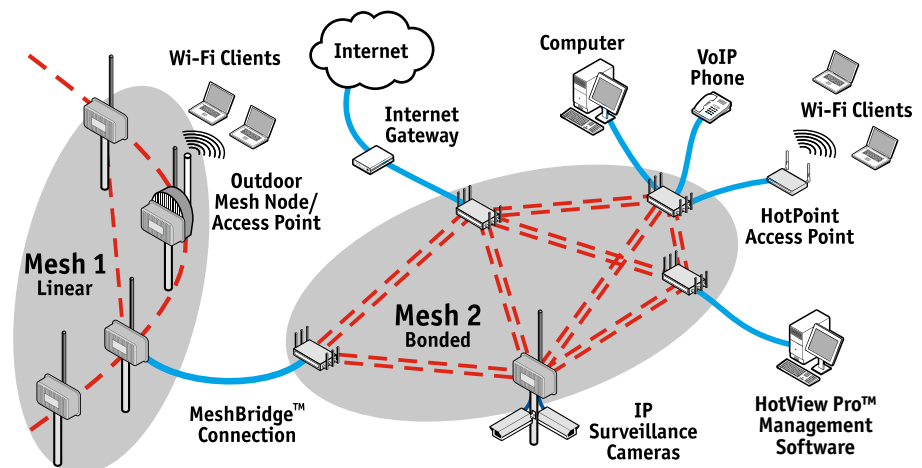
FireTide’s network easily scales up to several hundreds of mesh nodes for city-wide deployment. Advanced features like MeshBridge™ and Gigabit EthernetDirect™ support mesh connectivity across multiple locations.

Multicast & Security

FireTide infrastructure provides reliable multicast capabilities critical for large-scale public safety and broadband access networks. FireTide mesh provides advanced security, including 802.11i support, dual-layer of FIPS140-2 certifiable 256-bit AES encryption, digital certificates on network elements, digitally signed firmware files, MAC based access control lists and VLAN based access control lists.

Flexible Configuration

Indoor and outdoor HotPort 7000 nodes feature dual or single configurable radios in the 2.4, 4.9 (U.S. public safety licensed band) and 5 GHz frequency ranges. HotPort 7000 mesh can utilize channel widths of 5, 10, 20 and 40 MHz (MIMO only), with 5 and 10 MHz channel widths only available on the 4.9 GHz band.



HotPort® 7000 (7010/7020) Wireless Mesh Nodes

Specifications

Models

- HotPort 7010—Indoor Mesh Node*
- HotPort 7020—Outdoor Mesh Node*
- * Purchase of software license(s) required for dual-radio and/or 802.11n MIMO functionality

Mesh Protocol

- Firetide AutoMesh™ Protocol

Security and Encryption

- 40 bit, 104 bit WEP keys
- 128 bit, 256 bit AES keys (WPA2, end-to-end data)
- MAC address filtering
- Digitally signed firmware files
- Digital certificates on nodes

Traffic Prioritization

- Quality of Service (QoS 802.1p)

Wireless Interface

- IEEE 802.11a/b/g/h/n ad hoc; 3X3 MIMO with 2 streams*
- * Purchase of software license required for 802.11n MIMO functionality
- 3X3 MIMO with 2 streams
- Transmit power up to 400 mW per stream
- Frequency ranges
 - 2.412 – 2.483 GHz
 - 4.94 – 4.99 GHz (US public safety band)
 - 5.15 – 5.25 GHz (Indoor use only)
 - 5.25 – 5.35 GHz
 - 5.470 – 5.725 GHz
 - 5.725 – 5.850 GHz
- Receive sensitivity (typical)
 - 2.4 GHz, DSSS
 - 1 Mbps: -95 dBm
 - 11 Mbps: -88 dBm
 - 2.4 GHz, OFDM
 - 6 Mbps: -90 dBm
 - 54 Mbps: -73 dBm
 - 5 GHz, OFDM
 - 6 Mbps: -90 dBm
 - 54 Mbps: -73 dBm
- Ability to configure 5, 10, 20 and 40 Mhz (MIMO only) channel bandwidth
- Dynamic Frequency Selection (DFS)
- Transmit Power Control (TPC)

Mesh Management Software

- HotView Pro™ mesh management software (required)

Regulatory Agency Certifications

- Contact your Firetide dealer for product availability and certifications for your country
- RoHS and WEEE compliant

Warranty

- Hardware: one year limited warranty
- Software: 90 days limited warranty



HotPort 7000 Outdoor Connectors

Outdoor Model—7020

Network Ports

- Three GigE 10/100/1000 Mbps Ethernet ports with weatherproof connectors, LED activity indicator
- IEEE 802.3, 802.3u compliant
- CSMA/CD 10/100 autosense
- Ports 2, 3 PSE Power over Ethernet per 802.3af

Enclosure

- Cast aluminum NEMA-4X/IP66 enclosure
- Six type-N female antenna connectors
- Two weatherproof power connectors: AC and DC
- Three weatherproof Ethernet connectors
- System LEDs (power, status, mesh)
- Weight: 12 lbs (5.4 kg) with bracket and sunshield
- Dimensions: 11.6" X 8.1" X 4.1"

Power

- AC Input: 100–240 VAC, 50–60 Hz, 0.9 A
- DC Input: 12 VDC ±15%, 4 A powering 2 PoE devices; 1.7 A without PoE
- Ports 2 and 3: IEEE 802.3af compliant PoE (PSE) consumption

Environmental Specifications

- Operating temperature: -40°C to +60°C
- Storage temperature: -40°C to +85°C
- Humidity (non-condensing): 10% to 90%
- Storage humidity (non-condensing): 5% to 95%
- Maximum altitude 15,000 feet (4600 meters)

Included Accessories

- Antennas: Six 2.4 GHz and six 5 GHz, 5 dBi, indoor-rated omni directional (included for network staging only)
- Bracket for pole and wall mounting
- External AC power cord (non-North America power cord is separate orderable item)
- Removable sunshield
- Three weatherized Ethernet connectors for watertight RJ-45 coupling

Optional Accessories

- Outdoor weatherized Ethernet transition cables for use with HotPoint® access points
- Omni, directional & panel antennas (Please see Antenna Guide)



HotPort 7000 Indoor Connectors

Indoor Model—7010

Network Ports

- Four GigE 10/100/1000 Mbps Ethernet ports with LEDs
- IEEE 802.3, 802.3u compliant
- CSMA/CD 10/100 autosense

Enclosure

- System LEDs (power, status, mesh)
- Ethernet port LEDs (link, status, activity)
- Connectors: Six RPSMA female antenna, one power, four Ethernet (RJ-45)
- Reset button (recessed)
- Weight: 2 lb 14 oz (1.3 kg)
- Dimensions 9.4" X 5.9" X 1.6"

Power

- DC Input: 12 VDC, 2.5 A
- Port 1: IEEE 802.3at compliant PoE (PD)
- External power supply: 100–240 VAC, 50/60 Hz

Environmental Specifications

- Operating temperature: 0°C to +60°C
- Storage temperature: -20°C to +70°C
- Humidity (non-condensing): 10% to 90%
- Storage humidity (non-condensing): 5% to 95%
- Maximum altitude 15,000 feet (4600 meters)

Included Accessories

- AC power adapter with cord (non-North America power cord is separate orderable item)
- Antennas: Six 2.4 GHz and six 5 GHz, 5 dBi, omni directional

Optional Accessories

- Wall or cubicle-mount bracket

Other Firetide Products



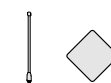
Access Points
HotPoint Indoor & Outdoor Access Points



CPE
HotClient Indoor & Outdoor Customer Premises Equipment



Software
HotView Pro Network Management Software, Firetide Mobility Controller, Firetide WLAN Controller



Accessories
Antennas, Mounting Kits, Cables, etc.



www.firetide.com

140 Knowles Drive, Los Gatos, CA 95032

Phone: +1 408-399-7771 | Fax: +1 408-399-7756 | Email: info@firetide.com

AXIS Q1921/-E Thermal Network Cameras

High quality detection and wide range coverage.



- > Thermal imaging for IP-Surveillance
- > Lens alternatives for different applications
- > High-quality detection
- > Intelligent video capabilities
- > Power over Ethernet

AXIS Q1921/-E Thermal Network Cameras are a perfect complement to any network video system that needs to secure an area 24 hours a day, seven days a week. The cameras use thermal imaging, which allows users to detect people, objects and incidents in complete darkness and difficult conditions such as smoke, haze, dust and light fog.

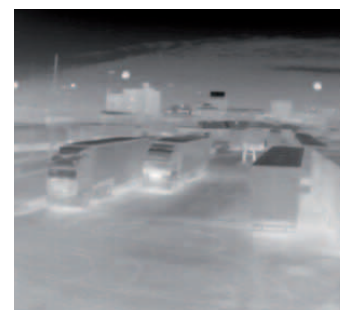
AXIS Q1921 is intended for indoor environments, while AXIS Q1921-E is an out-of-the-box, outdoor-ready model with a built-in window heater that is designed to withstand harsh weather conditions.

A resolution of 384x288 and a range of lenses make it possible to optimize detection performance to meet most application requirements. Advanced software processing and a frame rate of up to 30 fps will further improve the thermal image quality.

Since thermal cameras are immune to problems with light conditions and normal shadows, they can achieve higher accuracy than conventional cameras in most intelligent video applications.

AXIS Q1921/-E cameras offer motion detection, audio detection, and detection of tampering attempts. The cameras also provide capacity for third-party analytics modules, including support for AXIS Camera Application Platform. AXIS Q1921/-E cameras support ONVIF for interoperability between network video products.

Installation is made easy and cost effective with Power over Ethernet (IEEE 802.3af). AXIS Q1921/-E cameras support H.264 video compression, which reduces bandwidth usage and storage needs. The cameras provide multiple, individually configurable video streams in H.264 and Motion JPEG.



Technical specifications – AXIS Q1921/-E Thermal Network Cameras

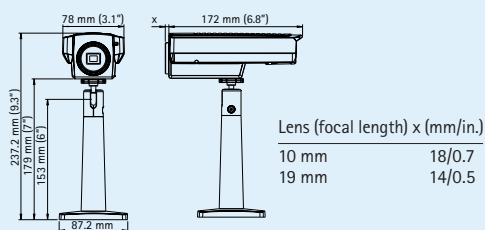
Camera																										
Models	Indoor: Q1921, 10 mm and 19 mm Outdoor: Q1921-E, 10 mm, 19 mm, 35 mm and 60 mm																									
Image sensor	Uncooled Micro bolometer 384x288 pixels																									
Detection range	<table border="1"> <thead> <tr> <th>Lens (TA lens)</th> <th>F</th> <th>Horizontal angle of view</th> <th>Human (1.8x0.5 m)</th> <th>Vehicle (2.3x2.3 m)</th> </tr> </thead> <tbody> <tr> <td>10 mm</td> <td>1.2</td> <td>55°</td> <td>200 m/220 yd.</td> <td>460 m/505 yd.</td> </tr> <tr> <td>19 mm</td> <td>1.0</td> <td>29°</td> <td>380 m/415 yd.</td> <td>870 m/950 yd.</td> </tr> <tr> <td>35 mm</td> <td>1.2</td> <td>15°</td> <td>700 m/765 yd.</td> <td>1610 m/1760 yd.</td> </tr> <tr> <td>60 mm</td> <td>1.2</td> <td>9°</td> <td>1200 m/1312 yd.</td> <td>2760 m/3020 yd.</td> </tr> </tbody> </table> <p>Calculated with Johnson's criteria. The detection range varies in different weather conditions.</p>	Lens (TA lens)	F	Horizontal angle of view	Human (1.8x0.5 m)	Vehicle (2.3x2.3 m)	10 mm	1.2	55°	200 m/220 yd.	460 m/505 yd.	19 mm	1.0	29°	380 m/415 yd.	870 m/950 yd.	35 mm	1.2	15°	700 m/765 yd.	1610 m/1760 yd.	60 mm	1.2	9°	1200 m/1312 yd.	2760 m/3020 yd.
Lens (TA lens)	F	Horizontal angle of view	Human (1.8x0.5 m)	Vehicle (2.3x2.3 m)																						
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35 mm	1.2	15°	700 m/765 yd.	1610 m/1760 yd.																						
60 mm	1.2	9°	1200 m/1312 yd.	2760 m/3020 yd.																						
Sensitivity	NETD < 100 mK																									
Video																										
Video compression	H.264 (MPEG-4 Part 10/AVC) Motion JPEG																									
Resolutions	Sensor is 384x288. Image can be scaled up to 768x576 and to standard VGA resolutions																									
Standard frame rate	Up to 30 fps within EU, Norway, Switzerland, Canada, USA, Japan, Australia, New Zealand Up to 8.3 fps in other countries* <i>*Frame rate above 9 fps may be subject to export control regulations</i>																									
Video streaming	At least 1 stream in H.264 and Motion JPEG: simultaneous, individually configured streams in max. resolution at 30 fps Controllable frame rate and bandwidth. VBR/CBR H.264																									
Image settings	Compression, brightness, exposure control, rotation, mirroring of images, text and image overlay, privacy mask, multiple palettes																									
Audio																										
Audio streaming	Two-way, half duplex																									
Audio compression	AAC LC 8/16 kHz, G.711 PCM 8 kHz, G.726 ADPCM 8 kHz Configurable bit rate																									
Audio input/output	AXIS Q1921: Built-in microphone, external microphone or line input, line output AXIS Q1921-E: External microphone or line input, line output																									
Network																										
Security	Password protection, IP address filtering, HTTPS* encryption, IEEE 802.1X* network access control, digest authentication, user access log																									
Supported protocols	IPv4/v6, HTTP, HTTPS*, QoS Layer 3 DiffServ, FTP, SMTP, Bonjour, UPnP, SNMPv1/v2c/v3(MIB-II), DNS, DynDNS, NTP, RTSP, RTP, TCP, UDP, IGMP, RTCP, ICMP, DHCP, ARP, SOCKS. Wide range of PT heads supported (drivers available for download at www.axis.com).																									

* This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. (www.openssl.org)

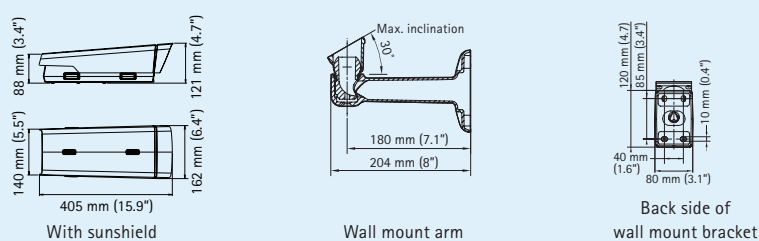
More information is available at www.axis.com

System integration	
Application Programming Interface	Open API for software integration, including the ONVIF specification available at www.onvif.org , as well as VAPIX® and AXIS Camera Application Platform from Axis Communications, specifications available at www.axis.com Support for AXIS Video Hosting System (AVHS) with One-Click Camera connection
Intelligent video	Video motion detection, active tampering alarm, audio detection. Support for AXIS Camera Application Platform enables installation of additional applications
Alarm triggers	Intelligent video and external input
Alarm events	File upload via FTP, HTTP and email; notification via email, HTTP and TCP; external output activation
Video buffer	32 MB pre- and post alarm
General	
Casing	AXIS Q1921: Zinc chassis AXIS Q1921-E: IP66-rated aluminum casing and a germanium window
Processor and memory	ARTPEC-3, 128 MB RAM, 128 MB Flash
Power	Power over Ethernet IEEE 802.3af Class 3 8-20 V DC/20-24 V AC AXIS Q1921: max 6 W, max 10 VA AXIS Q1921-E: max 10 W, max 16 VA Power supply not included
Connectors	RJ-45 10BASE-T/100BASE-TX PoE, terminal block for power, terminal block for two configurable inputs/outputs 3.5 mm mic/line in, 3.5 mm line out RS-422/RS-485 Terminal block for AXIS Q1921/-E heater
Local storage	SD/SDHC memory card slot (card is not included)
Operating conditions	AXIS Q1921/-E: -40 °C to 60 °C (-40 °F to 140 °F) Humidity 20-80% RH (non-condensing)
Approvals	EN 55022 Class B, EN 61000-3-2, EN 61000-3-3, EN 55024, EN50121-4, EN 61000-6-1, EN 61000-6-2, EN 60950-1, KC Class B , FCC Part 15 Subpart B Class B, VCCI Class B ITE IEC TR 60721-4-3 3M4/-4-4 4M4 (shock/vibration) IEC 60529 IP66
Weight	AXIS Q1921: 950 g (2.10 lb.) - 970 g (2.14 lb.) AXIS Q1921-E: 3475 g (7.66 lb.) - 3650 g (8.05 lb.)
Included accessories	Connector kit, Installation Guide, CD with User's Manual, recording software, installation and management tools, Windows decoder 1-user license AXIS Q1921-E: wall mount bracket, 5 m (16 ft.) Ethernet cable
Optional accessories	Wall bracket accessories Pan/tilt motor Lenses: 10 mm, 19 mm, 35 mm and 60 mm AXIS Camera Station and video management software from Axis' Application Development Partners. For more information, see www.axis.com/products/video/software/

Dimensions: AXIS Q1921 Network Camera



Dimensions: AXIS Q1921-E Network Camera including wall mount bracket with internal cable channel





DS150i Series Request-to-exit Detectors



- ▶ Single or double door use
- ▶ Wall or ceiling mountable
- ▶ Internal vertical pointability
- ▶ Wrap-around coverage pattern
- ▶ Selectable relay trigger mode
- ▶ Selectable fail safe/fail secure modes

The DS150i Series consists of the DS150i Detector (light gray) and the DS151i Detector (black). They are specifically designed for Request-to-exit (REX) applications. The DS150i and DS151i detect motion in their coverage area and signal an access control system or door control device.

Functions

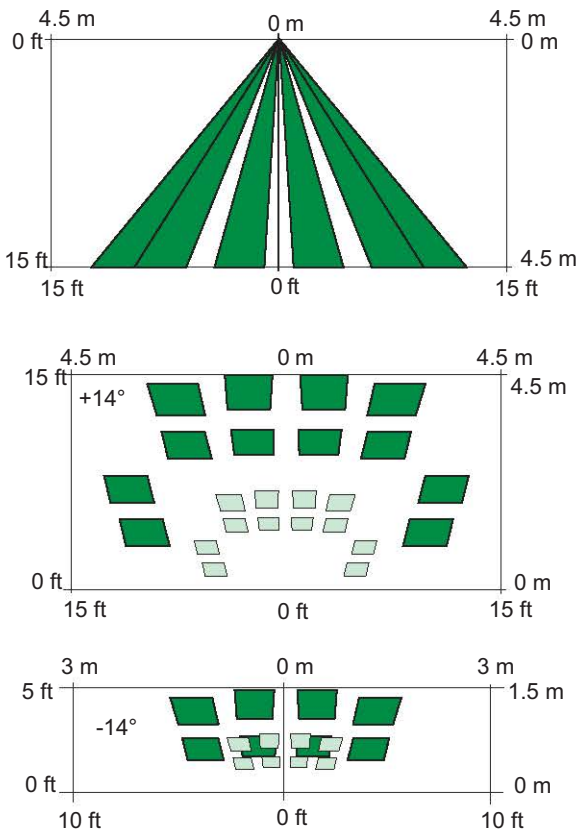
Test Features

Externally visible activation LED.

Certifications and Approvals

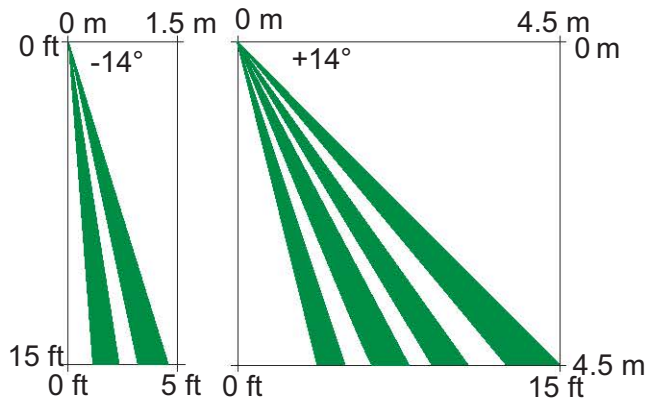
Region	Certification	
Europe	CE	89/336/EEC, EN55022: 1998 +A1: 2000 +A2: 2003, EN50130-4: 1996 +A1: 1998 +A2: 2003, EN61000-4-2: 1995 +A1: 1998 +A2: 2001, EN61000-4-3: 2002 +A1: 2003, EN61000-4-4: 1995 +A1: 2000 +A2: 2001, EN61000-4-5: 1995 +A1: 2001, EN61000-4-6: 1996 +A1: 2001 +A2: 2001, EN61000-4-11:1994 +A1: 2001, EN60950-1: 2001 2004/108/EC; EN 50130-4:1996 +A1:1998 +A2:2003; EN 60950-1:2006
USA	UL	ALVY: Access Control Systems Units (UL294)

Installation/Configuration Notes



Front View and Top Views

A front view of the DS150i and DS151i coverage, as well as top views of the coverage pattern on the floor. The typical coverage measurements are 2.4 m x 3 m (8 ft x 10 ft).



Side View

A side view of the DS150i and DS151i coverage pattern.

Technical Specifications

Electrical

Current Draw: 26 mA at 12 VDC
Voltage: 12 VAC or VDC; 24 VAC or VDC

Mechanical

Alarm Output: Two Form C relay contacts
Indicators: One activation LED
Relay Latch Time: Adjustable to 60 sec
Enclosure Dimensions: 3.8 cm x 15.9 cm x 3.8 cm (1.5 in. x 6.25 in. x 1.5 in.)
Enclosure Material: High impact ABS plastic enclosure
Power Loss Default Mode: Programmable fail-safe or fail-secure modes.
Timer Mode: Programmable reset (accumulative) or non-reset (counting) mode.
Mounting Location: Surface mount on wall or ceiling

Environmental

Operating Temperature: -29°C to +49°C (-20°F to +120°F)
Radio Frequency Interference (RFI) Immunity: No alarm or setup on critical frequencies in the range from 26 MHz to 1000 MHz at 50 V/m.

Ordering Information

DS150i Request-to-exit PIR Detector Gray enclosure. For use in request-to-exit (REX) applications. Provides 2.4 m x 3 m (8 ft x 10 ft) coverage.	DS150i
DS151i Request-to-exit PIR Detector Black enclosure. For use in request-to-exit (REX) applications. Provides 2.4 m x 3 m (8 ft x 10 ft) coverage.	DS151i
Accessories	
TP161 Trim Plate A black trim plate used when mounting the sensor over a standard single-gang box.	TP161
TP160 Trim Plate A light gray trim plate used when mounting the detector over a standard single-gang box.	TP160

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www.boschsecurity.com


BOSCH

Invented for life

DS860 Series TriTech PIR/Microwave Detector



- ▶ **Artificial Intelligence**
- ▶ **Five layers of detection including look-down zone**
- ▶ **Supervised microwave and PIR**
- ▶ **Selectable PIR sensitivity**
- ▶ **Draft/insect immunity**
- ▶ **Five mounting options**
- ▶ **Two coverage patterns**
- ▶ **Vertical and horizontal pointability**

The DS860 Series TriTech Detectors with their passive infrared and microwave processing provide excellent catch performance with freedom from false alarms. These surface or corner mount detectors are available with two different microwave frequencies:

Model	Microwave Frequency
DS860	10.525 GHz
B models	9.9 GHz

Functions

Signal Processing

Uses passive infrared and microwave technologies to provide an alarm condition when both fields of protection are simultaneously activated. Alarm signals must meet the signaling requirements of both technologies to activate an alarm.

Adjustable PIR and Microwave Sensitivity

- **PIR Signal Processing:** Motion Analyzer II uses multiple thresholds and timing windows to analyze timing, amplitude, duration and polarity of signals to make an alarm decision. Will not alarm on extreme levels of thermal and illumination disturbances caused by heaters and air conditioners, hot and cold drafts, sunlight, lightning, and moving headlights. Two sensitivity settings are provided.

- **Microwave Signal Processing:** Pattern recognition circuitry identifies and ignores repetitive false alarm sources. Adaptive processing adjusts to background disturbances. This helps to reduce false alarms while maintaining catch performance.

Test Features

Externally visible alarm LED flashes to indicate a trouble condition.

Supervised Microwave and PIR

Patented fully supervised microwave and PIR circuitry provides single technology coverage in the event the microwave subsystem fails. Use the memory circuit to force a self-test at anytime.

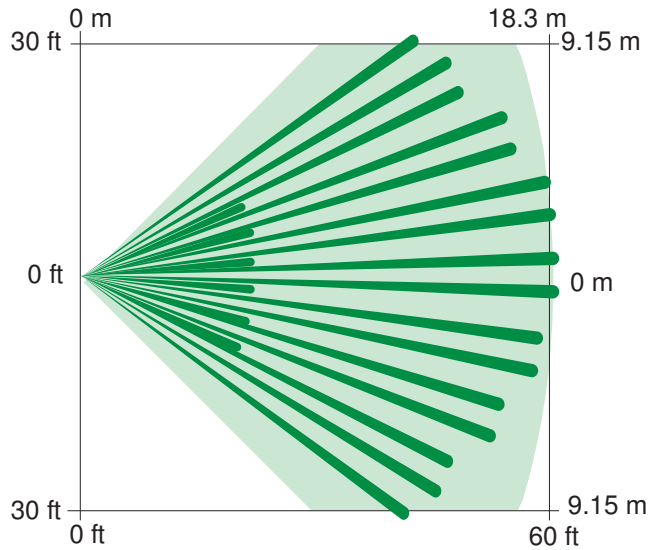
Draft and Insect Immunity

The sealed optical chamber provides immunity to drafts and insects.

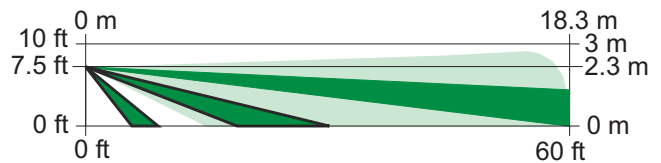
Certifications and Approvals

Region	Certification	
Europe	CE	All models: 89/336/EEC, 1999/5/EC, EN55022:1998 +A1:2000 +A2:2003, EN50130-4:1996 +A1:1998 +A2:2003, EN61000-4-2: 1995 +A1:1998 +A2:2001, EN61000-4-3: 2002 +A1:2003, EN61000-4-4: 1995 +A1:2000 +A2:2001, EN61000-4-5: 1995 +A1:2001, EN61000-4-6: 1996 +A1:2001 +A2:2001, EN61000-4-11: 1994 +A1:2001, EN60950-1: 2001 +A11:2004, EN 300 400-2 V1.1.1 (2001-09), EN 301 489 Parts -1 and -3 V1.2.2 (2000-08) DS860 only: 1999/5/EC, ETS 300 400 April 1996, ETS 300 683 April 1997, EN60950 Dec. 1992
Belgium	INCERT	DS860 only: B-509-0014/c
USA	UL	DS860 only: ANSR: Intrusion Detection Units (UL639)
	FCC	DS860 only: ESVDS730 ESVDS730
Italy	IMQ	DS860-ITA only: U0627
Canada	ULC	DS860 only: ANSRC: Intrusion Detection Units
	IC	DS860 only: 12499102781
China	CCC	DS860-CHI only: 2009031901000563
Brazil	ANATEL	DS860 only: 0667-03-1855
Singapore	iDA	DS860 only: LPREQ-S0150-2004
Europe		DS860-A complies with the requirements of EN50131-1 Grade 2

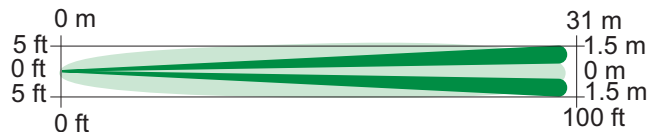
Installation/Configuration Notes



Top View
Standard Broad Coverage: 18.3 m x 18.3 m (60 ft x 60 ft)



Side View
Standard Broad Coverage: 18.3 m x 18.3 m (60 ft x 60 ft)



Top View
Optional Long Range Coverage: 30.5 m x 3 m (100 ft x 10 ft)
Requires optional ORL92-3 lens.



Side View
Optional Long Range Coverage: 30.5 m x 3 m (100 ft x 10 ft)
Requires optional ORL92-3 lens.

Mounting

The recommended mounting height is 2.3 m (7.5 ft). They mount to a standard single gang electrical box.

Technical Specifications

Enclosure Design

Dimensions: 12.7 cm x 7.1 cm x 5.6 cm
(5 in. X 2.8 in. X 2.2 in.)

Material: High impact ABS plastic enclosure.

Environmental Considerations

Operating Temperature: -40°C to +49°C (-40°F to +120°F)
For UL Certified installations, 0°C to +49°C (+32°F to +120°F)

Radio Frequency Interference (RFI) immunity: No alarm or setup on critical frequencies in the range from 26 MHz to 950 MHz at 50 V/m.

DS860-A: Complies with Environmental Class II (EN50130-5)

Mounting

Height Range: 1.8 m to 2.4 m (6 ft to 8 ft)

Location: Surface or corner mount

Outputs

Alarm: Normally-closed reed relay rated at 3.0W, 125 mA at 28 VDC for resistive loads and protected by a 4.7 Ω resistor in the common C leg.

Tamper: Normally-closed tamper switch. Contacts rated at 28 VDC, 125 mA maximum.

Power Requirements

Current Draw: 16 mA at 12 VDC

Voltage: 9 VDC to 15 VDC

Trademarks

Trademark names are used throughout this document. In most cases, these designations are claimed as trademarks or registered trademarks in one or more countries by their respective owners. Rather than placing a trademark symbol in every occurrence of a trademark name, Bosch Security Systems, Inc. uses the names only in an editorial fashion and to the benefit of the trademark owner with no intention of infringing the trademark.

TriTech is a registered trademark of Bosch Security Systems in the United States.

Ordering Information

DS860 Detector (10.525 GHz)

DS860

Operates at 10.525 GHz. Provides five layers of detection, supervised microwave and PIR. selectable sensitivity, draft and insect immunity, five mounting options, and two coverage patterns.

DS860-CHI Detector (10.525 GHz)

DS860-CHI

Operates at 10.525 GHz. For use in China. Provides five layers of detection, supervised microwave and PIR. selectable sensitivity, draft and insect immunity, five mounting options, and two coverage patterns.

DS860B-ITA Detector (9.9 GHz)

DS860B-ITA

Operates at 9.9 GHz. For use in Italy. Provides five layers of detection, supervised microwave and PIR. selectable sensitivity, draft and insect immunity, five mounting options, and two coverage patterns.

Accessories

B328 Gimbal-mount Bracket

B328

Mounts on a single-gang box and allows rotation of a detector. Wires are hidden inside.

Swiveling B335-3 low-profile mount

B335-3

Swiveling, low-profile, plastic mount for wall mounting. The vertical swivel range is +10° to -20°, while the horizontal swivel range is ±25°. Available in triple packs.

B800 Ceiling-mount Bracket

B800

Surface mounts detectors to the ceiling. The vertical pivot range is +7° to -16°; the horizontal pivot range is ±45°. Do not use for pet applications.

OLR92-3 Long-range Lens

OLR92-3

Provides long-range coverage with a 30.5 m x 3 m (100 ft x 10 ft) pattern. Shipped in packages of three.

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Represented by



BOSCH
Invented for life

NWD-495 FlexiDomeDN IP Cameras



- ▶ **High-impact, vandal-resistant enclosure**
- ▶ **Advanced Day/Night camera with mechanically switching IR filter**
- ▶ **15-bit DSP technology with XF-dynamic extended dynamic range**
- ▶ **High-quality MPEG-4 at full D1/4CIF/2CIF/Half D1/CIF/QCIF**
- ▶ **iSCSI recording**
- ▶ **Storage efficient tri-streaming: dual MPEG-4 and JPEG simultaneously**
- ▶ **Power over Ethernet (IEEE 802.3af compliant)**

The NWD-495 FlexiDome^{DN} IP is a high-performance 1/3-inch CCD Day/Night network camera, designed to ensure the highest possible image quality at all times. This ultra-compact and vandal-resistant camera provides DVD-like quality MPEG-4 video at up to 25 and 30 images per second (for PAL and NTSC respectively). Network video signals are sent over IP networks and can be received and displayed on a PC web browser, viewed and recorded using the DiBos hybrid recording system, or managed as part of a VIDOS or BVMS video management system. Moreover, send the MPEG4 stream to a BOSCH Video over IP (BVIP) decoder for viewing on a CVBS or VGA monitor.

The camera combines 15-bit digital video processing (which enhances sensitivity) and XF-Dynamic (which extends the dynamic range) to provide a sharper, more detailed image with outstanding accuracy in color reproduction.

Depending on the available light, the NWD-495 automatically switches from color to monochrome, enhancing sensitivity for IR illumination to provide high-quality images even in challenging low-light conditions.

FlexiDome IP uses MPEG-4 compression, bandwidth throttling, and multicasting capabilities to manage bandwidth and storage requirements efficiently while delivering the best image quality and resolution. The analog monitoring video output and On-screen Displays (OSD) simplify focus adjustment and network configuration,

leading to lower installation and support costs. Power over Ethernet (PoE) makes installation easier and more cost-effective because cameras no longer need AC power

Functions

Day/Night Mode

In Night Mode, the NWD-495 provides enhanced night viewing by increasing the IR sensitivity. The IR filter can switch automatically from color to monochrome by sensing the illumination level or be remotely switched via a web browser. An internal, through-the-lens IR detector enhances monochrome mode stability by preventing the camera from returning to the color mode when IR illumination is dominant.

XF-Dynamic

The highly accurate 15-bit digital signal is automatically processed to reveal every detail of the image in both the highlight and low-light areas of the scene simultaneously.

Intelligence

The FlexiDome Day/Night IP supports increased intelligence at the edge that provides powerful tamper detection for various combined picture cases arising from: video loss, masking, hooding, defocusing, and diverted camera. Bosch also offers Intelligent Video Motion Detection (IVMD) as an additional licensable option. This provides video content analysis (VCA) directly at the video input for even more advanced VCA.

MPEG-4 Video Encoding

The FlexiDome MPEG-4 encoder creates high-quality streaming video at low bit rates, minimizing bandwidth and storage requirements, which further reduces costs. Each FlexiDome IP camera can deliver up to 25 and 30 images per second (PAL and NTSC) at true 4CIF video resolution.

Tri-streaming Video

FlexiDome IP cameras can generate two separate MPEG-4 video streams and one JPEG stream simultaneously, while giving access to five users at a time. This advanced tri-streaming capability, not typically found in other IP CCTV systems, enables the user to optimize live viewing and recording requirements to meet specific site and enterprise needs. For example, BOSCH Video over IP Systems (BVIP) can be configured to record video at one quality setting (e.g. 3.75 IPS at 2CIF), while simultaneously providing live images at the best possible image quality (e.g. 30 IPS at 4CIF). Alternatively, the system deliver a high bandwidth, MPEG-4 stream to a local LAN user, while simultaneously streaming a low bandwidth MPEG-4 stream to a remote user over a WAN connection, while using the JPEG stream for remote viewing, for instance, on a PDA.

Power Options

Three power options, PoE, 24 VAC (12 to 28 VAC) and 12 VDC (+11 to +36 VDC), are available on the NWD-495. Utilizing PoE makes installation easier and more cost-effective, since cameras do not require a local AC power source. Additionally, they can use an uninterruptible power supply (UPS), which will allow continuous operation, even during a power failure, e.g. in emergencies.

OSD-based Network Set-up

Network parameters and basic camera set-up, such as lens set-up and back focus, are quickly and easily performed using the on-screen displays (OSD) and composite video monitoring output. Unlike other IP cameras, no network connection, PC configuration utilities, or other tools are required to set up FlexiDome IP.

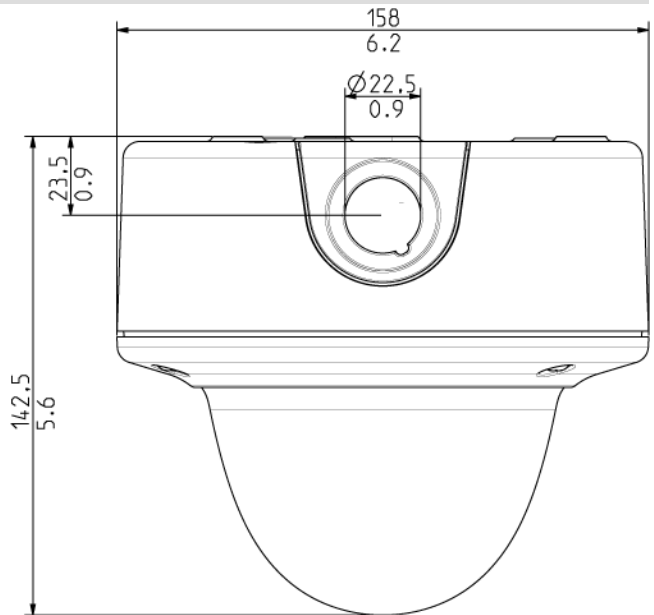
Recording

The FlexiDome IP cameras offer unparalleled recording options – network-attached utilizing iSCSI devices, and of course centrally, using network video recorders (NVRs). The iSCSI RAID 5 storage support enables a camera to act as a conventional DVR, while streaming high-performance live video across the network. The cameras also offer 10 Mb internal RAM storage.

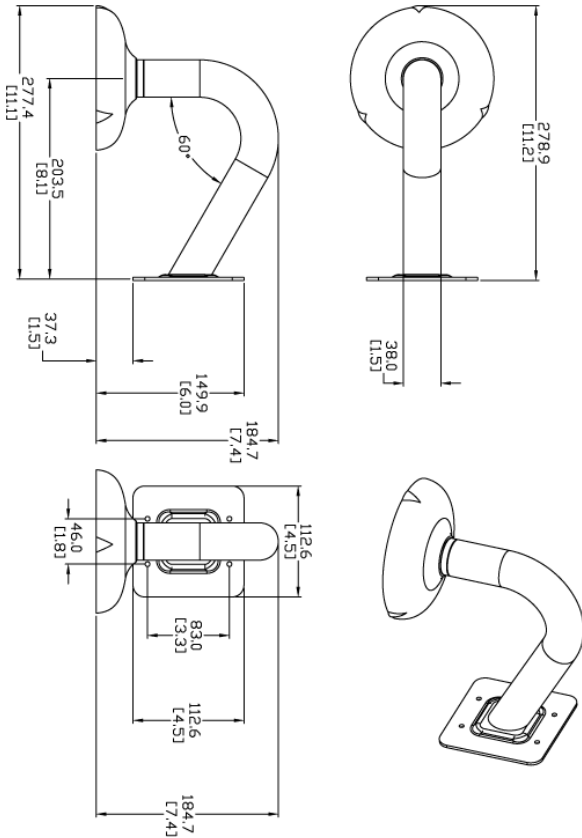
Certifications and Approvals

Safety	acc. to EN 60950-1 (CE) acc. to UL 60950-1
Immunity	acc. to EN 50130-4 (CE)
Emission	acc. to EN 55022 class B (CE) acc. to EN 61000-3-2 (CE); EN 61000-3-3 (CE) acc. to FCC CFR 47 Part 15, Class B acc. to AS/NZS CISPR 22 (equal to CISPR 22)

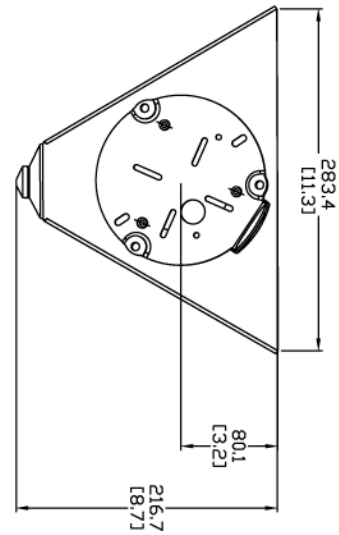
Installation/Configuration Notes



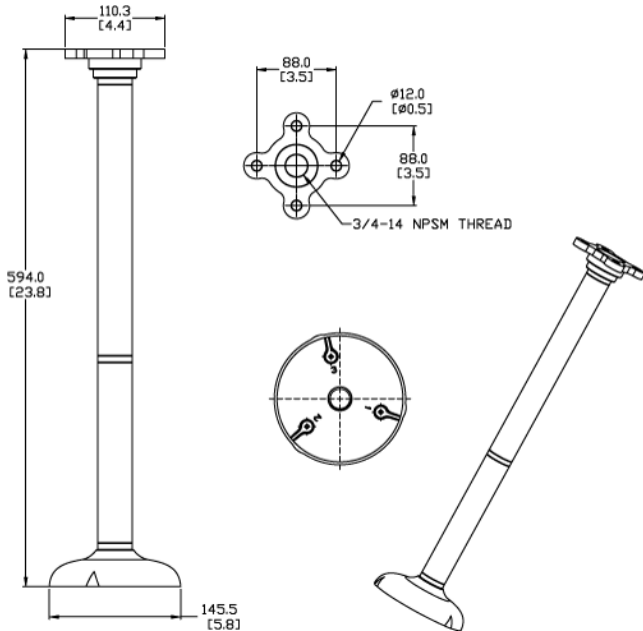
VDA-NWDWMT Wall Mount



VDA-NWDCMT Corner Mount



VDA-NWDPMT Pipe Mount



Parts Included

Quantity	Component
1	NWD-495 FlexiDome ^{DN} IP Cameras
1	Focus aid
1	Quick Installation Guide
1	CD-ROM with manual, software, and tools

Technical Specifications

Electrical

Power

Input voltage	+11 to +36 VDC (750 mA) 12 to 28 VAC, 45/65 Hz* (850 mA) PoE, IEEE 802.3af
Power consumption	10.5 VA (max)
Connector	3-pole push-in

Video

Video standards	MPEG-4; JPEG
GOP structure	I, IP
Data rate	9.6 Kbps to 6 Mbps (const. and variable)
Sensor	1/3-inch interline CCD
Sensor matrix	
PAL	752 x 582
NTSC	768 x 494

Resolutions and frame rates	PAL	NTSC
4CIF: 25/30 IPS	704 x 576	704 x 480
2CIF: 25/30 IPS	704 x 288	704 x 240
half D1: 25/30 IPS	352 x 576	352 x 480
CIF: 25/30 IPS	352 x 288	352 x 240
QCIF: 25/30 IPS	176 x 144	176 x 120

Video

Video out signal connector	1 x Analog composite (NTSC or PAL) BNC, 75 ohm		
Video S/N	50 dB		
Sensitivity (3200 K, scene reflectivity 89%)	Usable picture (30 IRE)	Usable picture (50 IRE)	Full video (100 IRE)
NightMode	0.11 lx (0.01 fc)	0.27 lx (0.026 fc)	1.1 lx (0.1 fc)
color	0.32 lx (0.031 fc)	0.69 lx (0.064 fc)	2.7 lx (0.26 fc)
NightMode + SenseUp	0.011 lx (0.001 fc)	0.027 lx (0.003 fc)	0.11 lx (0.01 fc)
color + SenseUp	0.032 lx (0.003 fc)	0.069 lx (0.007 fc)	0.27 lx (0.026 fc)
SenseUp	Off; auto up to 10 x		
Dynamic range	32 x		
BLC	On/off; area; manual selectable		
Gain	Fixed; auto with selectable limit (max 28 dB)		
White balance	Auto (2500 to 10000 K); AWB hold; fixed selectable		
Auto black	On/off selectable		
Electronic shutter	Auto; fixed; flickerless; default		
PAL	1/50 to 1/150000 s		
NTSC	1/60 to 1/150000 s		

Optical

Varifocal	IR-corrected, manual zoom and focus adjustment
Iris control	Automatic
Viewing angle	Wide 90.3° x 66.4° (H x V)
3 to 9 mm	Tele 31.9° x 23.9° (H x V)

Software control

Unit configuration	Via web browser or Configuration Manager
Flicker control	50/60 Hz, selectable
Contour	Horizontal and vertical, symmetrical
Firmware	Flash ROM, remote update

Network

Protocols	Telnet, RTP, HTTP(S), ARP, TCP, UDP, IP, ICMP, DHCP, IGMPv2/v3, SNMP, 802.1x
Ethernet	10/100 Base-T, auto-sensing, half/full duplex, RJ45
Overall unit delay	120 ms (MPEG-4)
PoE	IEEE 802.3af compliant

Mechanical

Dimensions (H x W x D)*	See drawing
Weight (without lens)	Approx. 1.8 kg (3.96 lb)
Color	White (RAL 9010), black inner liner
Material dome bubble	Polycarbonate, clear, UV-blocking, anti-scratch coating
trim ring, camera body	Aluminum
Lens mounting	C/CS
Adjustment range	360° pan, 90° tilt, ±90° azimuth
Environmental	
Operating temperature	-10 °C to +40 °C (+14 °F to +104 °F)
Storage temperature	-25 °C to +70 °C (-13 °F to +158 °F)
Humidity	20% to 80% relative humidity (noncondensing)
Water/dust protection	IP 54, NEMA-3R

Ordering Information

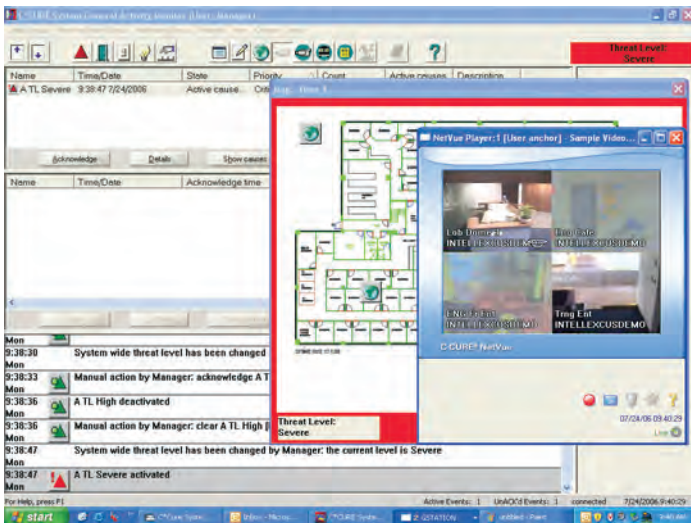
NWD-495V03-10P PAL, 3 to 9 mm F1.4 lens	NWD-495V03-10P
NWD-495V03-20P NTSC, 3 to 9 mm F1.4 lens	NWD-495V03-20P
TC 1334 Power Supply Unit 120 VAC/24 VAC, 60 Hz, 30 VA	TC1334
TC 120PS Power Supply Unit 110-120 VAC/15 VDC, 50/60 Hz, 300mA	TC120PS
TC 220PS Power Supply Unit 230 VAC/12 VDC, 50 Hz, 10 VA	TC220PS
TC 220PSX-24 Power Supply Unit 230 VAC/20 VAC, 50 Hz, 20 VA	TC220PSX-24
Accessories	
VDA-NWDPMT PENDANT MOUNT FOR FLEXIDOME IP SERIES	VDA-NWDPMT
VDA-NWDWMT WALL MOUNT FOR FLEXIDOME IP SERIES	VDA-NWDWMT
VDA-NWDCMT CORNER MOUNT FOR FLEXIDOME IP SERIES	VDA-NWDCMT

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Represented by



C•CURE® 800/8000 Security Management Solution

Features that make a difference:

- Advanced event and alarm monitoring solution provides flexible and powerful control
- Easily integrate with digital video management systems and other business-critical applications
- Significantly enhance security with intrusion zones and keypad commands
- Easily create cardholder unique identifiers (CHUIDs) with extended card number support
- Assign up to 5 cards per cardholder, including a PIN only credential
- Monitor multiple locations from a single guard station
- Extraordinary threat level support allows you to change the operation of the system based on current events
- Dynamic clearance filters ensure personnel clearance numbers match the clearance number of the protected area
- Intuitive .NET badging solution provides high performance, cost-effective identification management system
- Powerful database partitioning gives maximum security to buildings with multiple tenants

Complete Integration with Unlimited Applications

C•CURE 800/8000 is a scalable security management solution encompassing complete access control and advanced event monitoring. The system integrates with critical business applications including CCTV and digital video such as the American Dynamics Intellex® digital video management system, visitor management, ERP, HR/time and attendance, and third party devices such as fire alarms, intercoms, burglar and other alarms.

Easy to Network

C•CURE 800/8000 client workstations and iSTAR® and iSTAR eX controllers can be placed directly on an existing network and across a wide area network (WAN). iSTAR controllers support dual network connectivity and Dynamic Host Configuration Protocol (DHCP), easing connectivity to most existing networks.

C•CURE 800/8000's open architecture design ensures universal support and enormous system flexibility by allowing the system to interact with industry standard databases, video recorders and cameras, and network devices.

Ideal for government and enterprise customers

Whether it's specifically complying with FIPS regulations, or ensuring that safety precautions are augmented when critical security events occur, C•CURE 800/8000 is the system of choice for meeting today's most stringent security regulations and demanding administrative operations. In addition, C•CURE 800/8000 supports the iSTAR eX Ethernet-ready controller to provide an encrypted security solution for government applications or for any enterprise looking for the highest security available in the industry.

Accountability and Auditing

A comprehensive audit trail is critical for pharmaceuticals and healthcare facilities that must comply with process regulations. C•CURE 800/8000's field-level audit trail enhances the control you have of data and system integrity by tracking changes made to all relevant security objects, including configuration and clearance data.

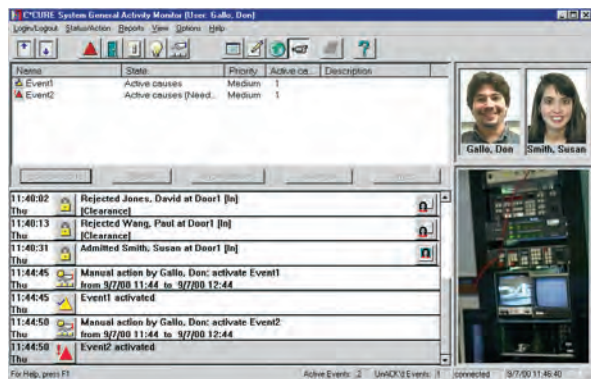
Unlimited Scalability

C•CURE 800/8000 is completely scalable and lets you easily add functionality and increase capacity as your security needs grow. Using .MSI, Microsoft's standard installer technology, C•CURE 800/8000 lets you easily install, upgrade, and repair remote C•CURE 800/8000 workstations quickly and easily without visiting every site.

take a closer look

Advanced event and alarm monitoring station provides flexible and powerful control

The C•CURE 800/8000 monitoring station displays cardholder images based on granted/rejected access or events. For added convenience, you can name, prioritize and sort alarms as they occur right at the C•CURE 800/8000 monitoring station. For example, you can choose to name your alarm categories, such as “1-Life Safety, 2-SCI, 3-DoD, and 4-General” in place of the default Critical, High, Medium and Low, which allows you to customize the interface based on your security parameters. You can also easily sort alarms by priority and/or date and select from up to eight unique defined priority labels and more than 16 million colors for coding priorities.



For an easy way to manage critical alarms, a powerful dual acknowledgment screen lets you retain a record of events after all of the active causes behind them have been resolved. It's an extremely effective way to manage new alarms as they arise without losing track of those still under investigation.

Monitor multiple locations from a single guard station

With the C•CURE 800/8000 central monitoring option, users can monitor multiple widely dispersed locations from a single monitoring station, providing total enterprise security management.

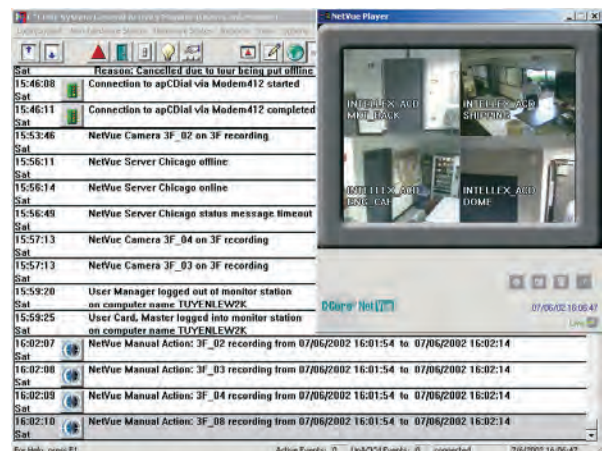
Powerful database partitioning gives maximum security to buildings with multiple tenants

C•CURE 800/8000 allows groups to share a single database while, at the same time, partitioning to maintain individual groups' security. Partitioning supports multiple tenant locations at one site or it can support a single organization occupying multiple buildings, ensuring that security officials have access only to information that is pertinent to their facility.

Integration with digital video management systems and other business-critical applications ensures total control

Using the powerful application programming interface (API), C•CURE 800/8000 provides seamless integration with select digital video management systems (DVMS), including American Dynamics Intellex, via its NetVue application. This integration allows you to tie an event generated on C•CURE 800/8000 to live video. With enhanced alarm management, NetVue can automatically activate C•CURE 800/8000 events based on motion detection alarms received from a DVMS. Refer to the C•CURE NetVue datasheet on www.swhouse.com for more detailed information.

For integration with many other devices, such as fire panels and intrusion detection systems, the bi-directional serial interface can be used to receive and interpret messages sent to C•CURE 800/8000. These messages can trigger events and generate a journal entry on the monitoring station. The interface can communicate with the C•CURE 800/8000 via an RS-232 serial port or remotely through TCP/IP via a qualified terminal server.



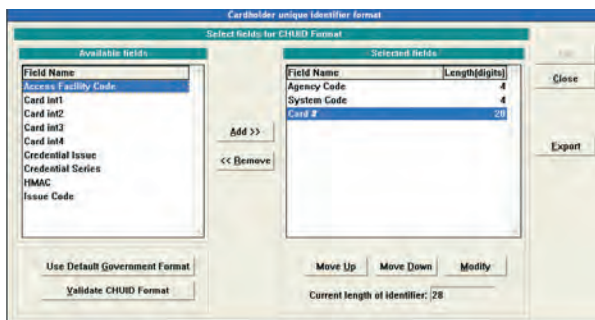
features

Significantly enhance security with intrusion zones and keypad commands

An intrusion zone is a group of doors and inputs that defines a physical area that is monitored for alarms. Grouping inputs and doors into intrusion zones allows easy collective arming and disarming of alarm monitoring points (inputs) as well as locking and unlocking groups of doors while displaying their current mode and status. Leveraging the intrusion zone feature, you can use keypad commands to remotely activate camera, door and other events from an RM reader keypad connected to an iSTAR controller. Keypad commands provide a powerful way to trigger a duress call, sound an alarm, lock and unlock doors, and more, directly from an RM reader keypad. Keypad commands can be configured to require a card presentation and/or a PIN to validate the command.

Easily create CHUIDs with extended card number support

C•CURE 800/8000 supports extended card numbers⁽¹⁾ which allows users in government applications to comply with certain federal guidelines (such as FIPS 201) that require a multi-field CHUID. In addition, iSTAR controllers support card numbers of up to 256 bits, eliminating the need for multiple facility codes, site codes, or offset in order to avoid card duplication. Longer card numbers offer greater protection against card duplication and are especially valuable to customers who require card numbers that exceed 10 digits.



(1) Only with iSTAR controller

Assign up to 5 cards per cardholder, including a PIN only credential

C•CURE 800/8000 lets you assign up to 5 cards per cardholder record, rather than having to create a separate record for each card. Using this powerful feature, you can assign a PIN as one of the cards, providing a flexible and secure solution and greatly simplifying the management and maintenance of personnel records.

For additional flexibility, you can use iSTAR controllers to support up to 128 card formats system-wide and 10 card formats per reader. This expanded ability to use multiple card types (such as 26-bit, 37-bit, or Corporate 1000) at a single reader frees you from having to consolidate or re-issue new cards.

Controlling areas and managing occupancy levels helps you maintain safety regulations

Once someone is granted access to the building the real work begins to ensure that confidential areas are kept protected, occupancy levels are maintained for safety, and the general well being of employees and visitors is ensured. C•CURE 800/8000 lets you easily configure all of the areas in your building and across multiple buildings and identify inbound and outbound readers to enforce anti-passback. This allows you to prevent someone from passing his/her access card back to another person for unauthorized entry, using either a timed or event-driven configuration. Area Lockout operates in much the same way, but takes it a step further by actually locking a cardholder out of an area based on a decrementing timer specification.

Managing occupancy levels is another powerful capability that lets you define how many people and/or what type of person is allowed in a room. This type of control is essential for extremely classified areas, such as Secured Compartmentalized Information Facilities (SCIFs) which exist most often in the government-related marketplace. In these sensitive instances, you can configure C•CURE 800/8000 to require a supervisor to be present before allowing an employee to access the area. This type of restriction can also apply to visitors who may require an escort as they pass through restricted doors.

Threat level support allows you to change the operation of the system based on current events

C•CURE 800/8000 provides a solution for government agencies needing to comply with the Department of Homeland Security requirements by allowing them to change the operation of the security system based on a threat level. For example, if the national threat level (defined as “Low”, “Guarded”, “Elevated”, “High”, and “Severe”) is raised, the administrator can react by changing the threat levels in the C•CURE 800/8000 system, which may then be configured to react in the following user-defined ways:

- Cardholders may be required to present a higher level of credential to gain access to a door.**
 During a “High” threat level, cardholders may be required to use a Personal Identification Number (PIN) in addition to presenting their proximity card. In some instances, an elevated threat level might also require that personnel have approved escorts in order to gain access.
- Operators or guards may need to validate their manual actions with an approved response.**
 Under normal circumstances, guards may be able to freely execute manual actions, such as temporarily unlocking a door or gracing a card from the guard station. But, in higher threat levels, these types of manual actions would be challenged by the system, requiring an approved response from the operator performing the action.

For example, the operator will be required to enter in a secret code, or input a journal entry before the manual action will be approved. In addition, operators may be required to acknowledge each and every alarm on the guard station, ensuring proper attention is being paid to potential risks.

- Events may be automatically activated**
 When the system is set at certain threat levels, specific events can be activated throughout the entire facility, on a wide range of readers, or on specific controllers. For example, if the threat level is set to “Critical” on the C•CURE 800/8000, this can automatically deploy road bollards in designated security-critical roadways. Or, clearance filters, a powerful, new feature that forces the cardholders’ credentials to exactly match the credential at an affected reader, can be enforced based on specific security or threat levels.
- Display current threat level color on maps and monitoring station for consistent reminder of status**
 Ensuring that the current threat level is kept top of mind by the operator or guard, the monitoring station and maps both highlight the color that is associated with the threat level.
- An escort may be required**
 During elevated threat levels, the system may require that all visitors must be escorted by authorized personnel in order to gain access to protected areas.

	MODEL 1	MODEL 5	MODEL 10	MODEL 20	MODEL 30	MODEL 40	8000 Enterprise Server	8000Plus Enterprise Server
Number of Online Readers*	32	64	128	256	512	1000	2500	*
Number of Online Inputs	128	256	512	1024	2500	5000	10000	*
Number of Online Outputs	128	256	512	1024	2500	5000	10000	*
Number of Addressable Controllers	No limit	No limit	No limit	No limit	No limit	No limit	No limit	No limit
Number of Cardholders*	10K	40K	40K	250K	250K	250K	500K	500K
Number of Assets	N/A	40K	40K	250K	250K	250K	500K	500K
Number of Simultaneous Client PCs Included with Server	2	3	4	8	16	64	128	128
Number of Client PCs Definable on Server	999	999	999	999	999	999	999	999
Sentinel Required	YES	YES	YES	YES	YES	YES	YES	YES

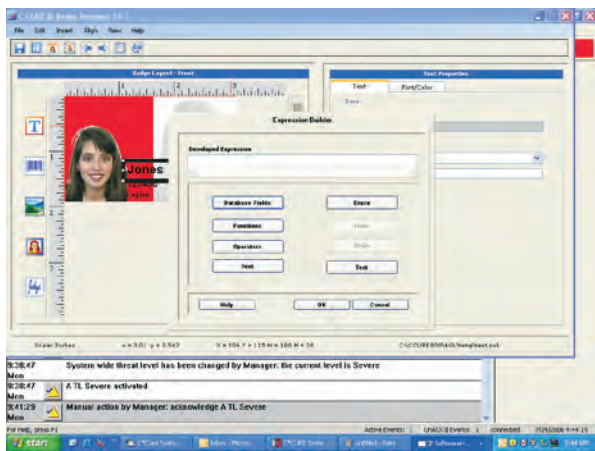
* C•CURE 800/8000 is designed for unlimited expansion. The often stated 3,000 reader and 32,000 input/output handling are tested limits only and do not represent expansion restrictions. System performance will vary depending upon specific hardware configuration including number of communication lines/ports, download/upload frequency, etc.

Dynamic clearance filters ensure personnel credentials match the clearance number of the protected area

C•CURE 800/8000 includes a feature that allows you to assign a clearance filter number to personnel which must match the clearance filter number of the reader in a protected area. For example, an operating room may be accessible to all hospital personnel during non-surgery times. At these times, the reader that secures the room has a clearance number of “1” and each person with a clearance filter number “1” can gain access. During operations, however, the clearance filter on the reader automatically changes to a “3”, which means only those personnel who have a clearance filter of “3” will be permitted access. This is done without changing the underlying clearance available to the area.

Intuitive .NET badging solution provides high performance, cost effective identification management system

Access control cards are essential for security, but can also be a nice way to communicate your company’s message to employees and the public. The C•CURE 800/8000 badging solution utilizes Microsoft’s .NET guidelines for the graphical user interface and offers superior control of color and graphics, providing the ability to create professional, sophisticated badges.



Specialized display needs for badge layouts are common and the Expression Builder allows you to easily meet these needs by simply picking fields from a list that builds sophisticated expressions, without ever having to understand the complexity of expressions. For example, if you want to ensure that an employee’s middle initial is printed wherever appropriate, an expression allows the customer to easily do this without adding blank lines where cardholders may not have a middle initial.

In many instances, a company can have hundreds, even thousands, of badges in the system. C•CURE 800/8000 also makes it extremely easy to manage your badges by allowing you to query on a common field and then print those found by that query in one batch. Refer to the C•CURE ID datasheet on www.swhouse.com for more detailed information.

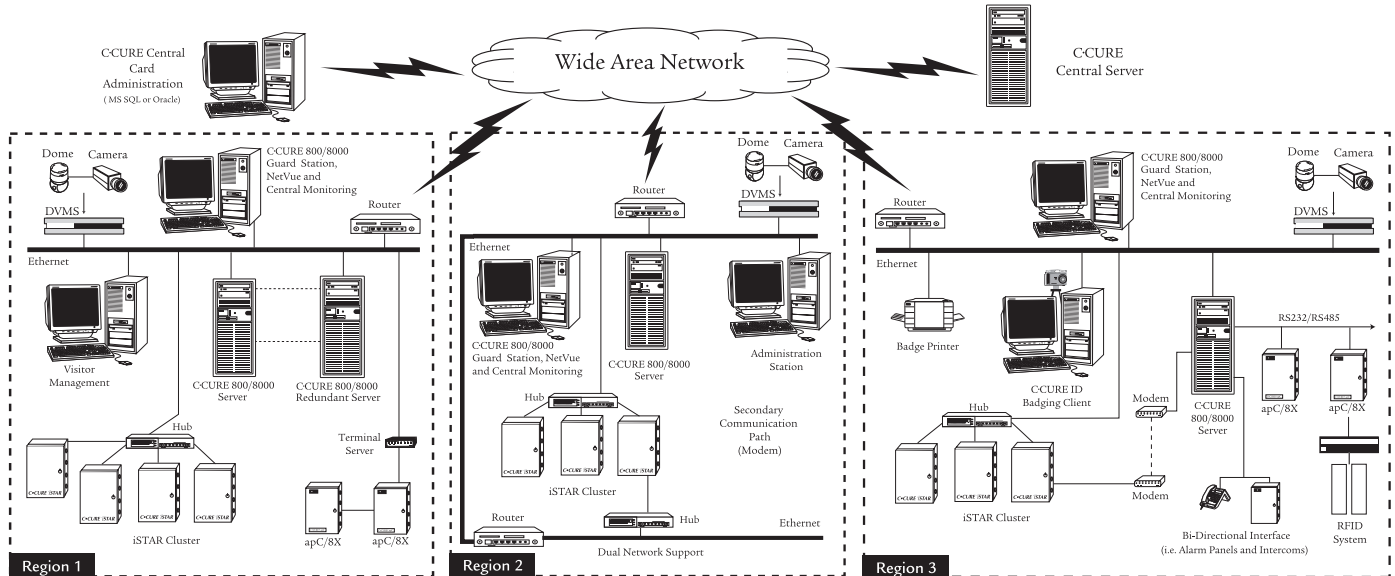
Managing access control using a graphical interface



C•CURE 800/8000’s map interface allows you take any CAD drawing or Visio file, save it as .bmp and then populate your map with icons that reflect security objects, such as doors, inputs, outputs, cameras, events, video tours and views. You can also nest maps within maps to provide an easy interface that lets you travel graphically around your facility and manage events directly from the map.

At the monitoring station, you’ll immediately see the benefits of the mapping feature when a critical event such as “Door Forced Open” occurs. This event can cause a live video window to automatically pop-up on the map, giving you the exact location and corresponding video footage. Here, the nested maps come in very handy to help you drill down to graphically navigate through the facility looking for the person who may have caused the Door Forced Open event. Using the dynamic icons and the powerful NetVue interface, you can even launch a video tour of the affected area to immediately investigate.

For more sophisticated management of a building layout, C•CURE 800/8000 has solid integration with a third party graphical interface called AEGIS which lets you account for walls that have been knocked down, doors that may have been moved, expansion projects and more.



C•CURE 800/8000 Server Recommended Minimum Requirements

Processor

Model Number 1 through 10	1.5 GHz Intel Pentium III or higher
Model Number 20 through 40	1.8 GHz Intel Pentium III or higher
Model 8000 and 8000 Plus	2.4 GHz Intel Pentium IV or higher
Free Hard Disk Space	3.0 GB

Memory

Model Number 1 through 40	1 GB RAM
Model 8000 and 8000 Plus	2 GB RAM
Network Card	10/100 Base-T
DVD Drive	2X
Monitor/Video Adapter board	17" SVGA (1024 x 768)
Operating System	Windows® Server 2003, Windows XP Professional (Service Pack 2)
Mouse	PS/2 bus type
Ports	2 serial, 1 parallel, USB (with C•CURE 800/8000 v8.x a USB port is required)
Backup	Tape or CDRW
Modem	56.7 Kbps
Sentinel	Supplied by Software House
Digiboard	8 port (Models 20/30/40)

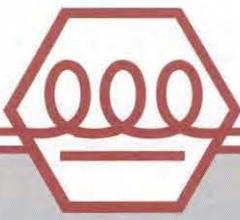
C•CURE 800/8000 Client Recommended Minimum Requirements

Processor	1.5 GHz Intel Pentium or higher
Free Hard Disk Space	2.0 GB
Memory	512 MB RAM
Network Card	10 Base-T
CD-ROM Drive	10X
Monitor/Video Adapter board	17" SVGA (1024 x 768), 64 MB RAM
Operating Systems	Windows XP Professional (Service Pack 2)
Mouse	PS/2 bus type

Note: It is recommended that customers use the most current firmware release for each controller.

Product offerings and specifications are subject to change without notice. Actual products may vary from photos. Not all products include all features. Availability varies by region; contact your sales representative. Certain product names mentioned herein may be trade names and/or registered trademarks of other companies.

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1000 INDUSTRIAL MAGNETIC LOCK

**1200 Pounds
Holding Force**

Compact Size

**Field Selectable
12 or 24 Voltage**

**Extra Low
Current Draw**

**Inswing/Outswing
Universal Mount**



Interior or Exterior Applications

The 1000 Series electromagnetic locks can be used in harsh environments to secure doors and gates. All electronics are sealed in epoxy and are protected by the stainless steel housing cover. The housing, armature and exposed face of the electric lock are nickel plated to resist rust and corrosion. A rigid conduit fitting can be provided on one end of the lock to protect power wiring in gate control installations.

Fail-Safe Operation

All Dortronics electromagnetic locks are fail-safe, releasing instantly upon command or loss of power. There are no moving parts to wear, stick or bind. Without any bolt travel time or possibility of misalignment to raise concern, both locking and unlocking are accomplished with ease and efficiency.

Extended Service Life

The rugged design and durable construction of this lock assures virtually unlimited actuations without fear of electrical fatigue or mechanical breakdown. Proudly made in the USA, a *LIFETIME WARRANTY* is provided by Dortronics Systems on all electromagnetic locks.

Universal Mounting

The standard #1000 model is supplied with an adjustable mounting plate for use on outswing doors. The #TJ-1000 unit is furnished with an angle lock mounting plate and an armature "Z" bracket for inswinging door installations. Any 1000 series lock may be converted in the field for inswing door applications by adding the 1099-00 conversion kit. An optional conduit fitted lock is available for exterior gate control applications.

Low Current Draw

All 1000 series locks can operate on either 12 or 24 VDC. The efficient design of these locks requires only 170ma. at 24 volts DC to maintain the rated 1200 pound holding force.

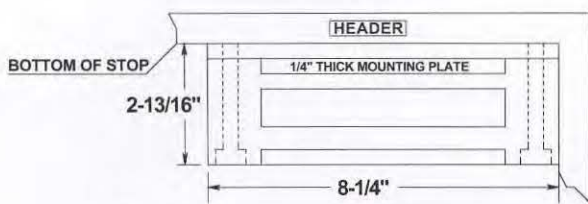
The well confined magnetic field combined with the built-in spike and surge suppression system of these locks, allow integration with any access control system. Able to be controlled individually or simultaneously from one or several locations make the use of these locks ideal for securing manual or automatically operated doors and gates.

**ANSI/BHMA
A256.23**

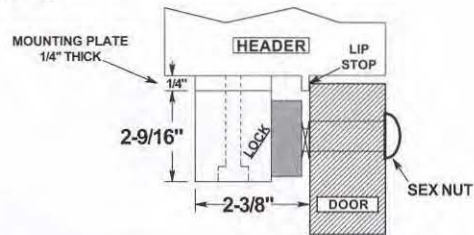
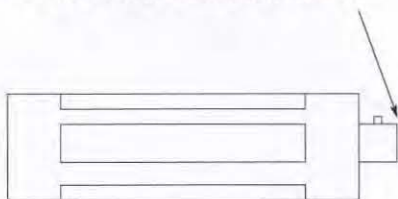
 **DORTRONICS
SYSTEMS, INC.**

1000 SERIES ELECTRO-MAGNETIC LOCKS

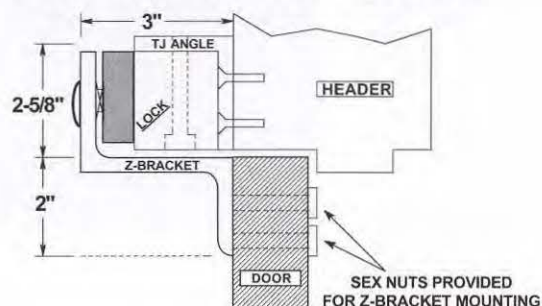
1000 FOR STANDARD OUTSWING DOOR APPLICATIONS



1000XCF
OPTIONAL 3/4" FEMALE
CONDUIT FITTING
FOR GATE APPLICATIONS



TJ1000
STANDARD INSWING DOOR
WITH Z-BRACKET & TOP JAMB ANGLE



Specifications:

Physical Size

- #1000 Lock - 8-1/4" long x 2-9/16" high x 1-1/2" deep
- #1000 Armature - 8-1/4" long x 2-1/4" high x 5/8" thick
- #1000 Mounting Plate - 8-1/4" long x 1-1/2" wide x 1/4" thick
- #1095 Top Jamb Mounting Angle - 8-1/4" long x 2" x 1-1/2" x 1/4" thick

Electrical

- 170ma @24 VDC
- 340ma @12 VDC

In-swinging Doors:

- TJ-1000 - 1000 series lock with top jamb mounting hardware.
- 1099-00 Kit converts any 1000 to TJ1000

Finish:

1000 series locks are encased in a brushed Stainless Steel housing suitable for interior or exterior applications. Electro-magnet face and armature are electroless nickel plated for high resistance to rust and corrosion.

Options:

- xD** Integral Door Position Switch SPDT
- xCF** Conduit Fitting option is available for this lock.

Applications:

The 1000 series locks are supplied with a 4-conductor, 20 gauge power cable (equal to Belden #M-8444) 18" long. By the order in which these leads are connected to the DC power source, the operating voltage of the unit is determined. This allows any of these locks to be used with a 12 or 24 volt DC power supply.

Gate mounting:

1000xCF Specifies Conduit Fitting
When installing these locks on exterior swing and slide gates, #1000xCF locks should be specified to receive units with the conduit fitting. This will afford protection to the power wiring for the lock.

Installation:

Typically these locks are mounted on outswinging doors using the mounting plate accompanying the unit. This mounting plate has elongated slots for ease of alignment and reinforced threaded holes for secure attachment of the lock to the plate. An access hole is also provided in the mounting plate to accommodate the power cable.

The TJ-1000 units are supplied with an angular mounting plate prepared for attaching the mounting angle to the face of the door frame. A "Z" bracket is also furnished for the mounting of the armature plate to the door.

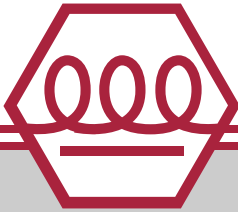
Gate/Inswing Conversion Kit

1099-00 Conversion kit includes (1) Z-Bracket and (1) angle bracket with all mounting hardware needed to convert a standard 1000 lock into a TJ-1000 for swinging gates or inswinging doors.



**DORTRONICS
SYSTEMS, INC.**

1668 SAG HARBOR TURNPIKE, SAG HARBOR, NY 11963
www.dortronics.com - (800) 906-0137 - (631) 725-8148 FAX



1106/1115 ELECTRO-MAGNETIC LOCKS

**650 Pounds
Holding Force**

**Shallow 2”
Mounting Profile**

**Low Efficient
Current Draw**

**Easy Access
Security Housing**

**Field Selectable
12 or 24 Voltage**



1106



1115

Reliable Security:

This state of the art electro-magnetic locking device provides positive, instantaneous door control. Offered in models for single and pairs of out-swinging, in-swinging, sliding, and overhead doors. Filler plates, angle brackets, and other mounting adapters are available to satisfy a wide range of door and frame types and conditions.

Safe Operation:

ULTRA-LOCK locking devices are inherently failsafe, releasing instantly upon command or loss of power. With no moving parts to wear, stick or bind; no mechanical linkages to bend or break; and no bolt travel time or misalignment to raise concern, both unlocking and locking are always accomplished with ease and efficiency.

Extended Service:

The rugged design and durable construction insures virtually endless actuations without fear of electrical fatigue or mechanical breakdown. This, combined with manufacturing to the most stringent quality control standards, allows Dortronics to offer a *ten year limited warranty* on all electromagnetic locks.

NFPA Life Safety Compatible:

As electromagnetic locking devices function independently of any mechanical type locks, magnetic locks will not jeopardize the fire door rating of an opening. These units are ideal for use with fire and hazard detection systems to provide unobstructed egress. Highly recommended for use on Exit Door Control Systems requiring code acceptable delayed releasing, per NFPA 101.

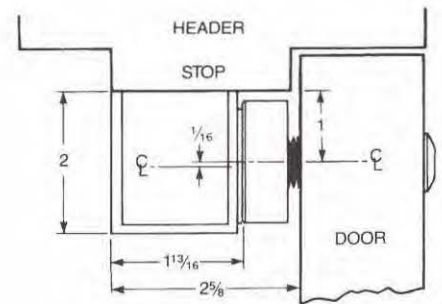
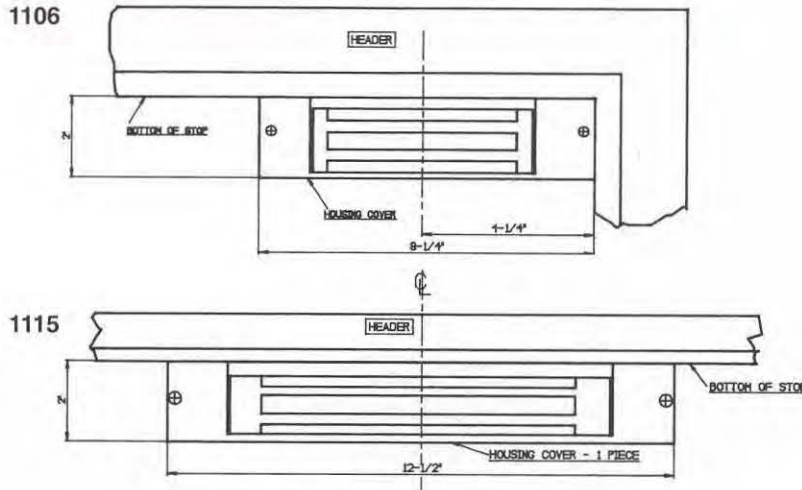
Universal Control:

Able to be controlled and monitored individually, sequentially, or simultaneously from one or several locations, make the application of ULTRA-LOCKS ideal in perimeter protection systems with automatic swinging and sliding door systems, and intrusion alarm systems.

The well confined magnetic field of the lock allows it to be used in sensitive computer areas. With the built-in suppressor system protecting circuitry and components from noise and spikes, ULTRA-LOCK systems can be reliably interfaced with any electronic access control and monitoring equipment .



1106/1115 SERIES ELECTRO-MAGNETIC LOCKS



ON FULL WIDTH STOP WITH SURFACE MOUNTED ARMATURE

Specifications

Physical Size:

- 1106 Housing - 8-1/2" long x 2" high x 1-13/16" deep overall
- 1115 Housing - 12-1/2" long x 2" high x 1-13/16" deep overall
- 1106/1115 Projection - 2-5/8" total depth including armature

Electrical:

- Operating voltage field selectable
- 1106 - 245ma @ 24 VDC
480ma @ 12 VDC
- 1115 - 290ma @ 24 VDC
580ma @ 12 VDC

In-Swinging Doors

- TJ (prefix) - Top jamb mounting for in-swinging doors (includes back mount housing and Z bracket for mounting armature)
- See also 1190 armature mounting assembly for all glass doors.

Custom Housings

- G (prefix) - Extruded housing guard lip conceals and protects armature
- LV (prefix) - Extra long housing for vertical jamb mounted locks
- LW (prefix) - Extra wide housing for horizontal full width mounted locks

Custom Finishes

- x DBA - Dark Bronze Anodize
- xGBA - Gold Bronze Anodize
- xSBA - Black Satin Anodized
- xUS3 - Polished Brass
- xUS4 - Satin Brass
- xUS26 - Polished Chrome
- xUS26D - Satin Chrome

Factory Options

- xD = Concealed Door Position Switch SPDT rated @ .1 amp @ 30 volts
- x2D = Two Door Position Switches (as above for use with pairs of doors)
- xL = Bi-color LED recessed into end plate of housing with resistor for use with 12 or 24 VDC
- xB = Dual magnetic bond sensors detect improper armature mating or lack of sufficient lock power to provide rated holding force
- x2B = Two dual magnetic bond sensors (same as above for pairs of doors)
- xAT = Housing enclosed adjustable (2 to 120 second) time delay with SPDT form C relay output
- xR = AC to DC Rectifier concealed in housing, mounted to electromagnet (one required for each magnet if operating from AC power)
- x2R = Two AC to DC Rectifiers (one per electromagnet, see above)
- xCF = 1/2" Rigid conduit fitting mounted in housing end plate (for use in exposed wiring conditions such as perimeter gate control)
- xCT = Concealed cover tamper switch SPDT snap action actuated by removal of housing cover
- xTS = Tamper resistant cover attachment screws for enhanced security
- xS = Miniature piezo sounder mounted to housing provides an audible alert during alarm conditions

Installation

The elongated mounting holes on the mounting plate permit easy adjustments. Two of the four small holes behind the electro-magnet are used to secure the unit firmly in place and keep it from rotating. The other two round holes can be used should moving the magnet slightly be required later. Four point versus 2 point mounting, increases the stability and life of the installation.

A wire trough behind the electro-magnet provides a convenient channel for leads, allowing the installer to use the chamber at either end for field connections.

Lock operating voltage is field selectable to match the supply voltage. Locks are shipped ready for 24 volt DC power but can be field wired for 12 volt DC power.

The armature mounting pack, includes a specially designed shoulder screw to insure proper floating action of the lock armature at all times. The armature mounting screw can be fully tightened without affecting floating action. Roll pins furnished also allow the armature to flex while maintaining alignment.

Distributed by:

DORTRONICS SYSTEMS, INC. 1668 SAG HARBOR TURNPIKE, SAG HARBOR, NY 11963
www.dortronics.com - (800) 906-0137 - (631) 725-8148 FAX



7201 SERIES HI-INTENSITY LEDs

Highly Visible

Daylight Viewing

Exterior / Interior Applications

**Maintenance-free
Long Lasting**

**Compact Standard
or Custom Plates**

**Quick & Easy
Mounting**

**Optional Piezo
Sounder**



Super Bright LEDs

These hi-intensity LEDs are highly visible in virtually any lighting condition, including bright sunlight. Door security status can be immediately conveyed to system users and security personnel.

Wide Angle Viewing

The large diameter lens on the standard hi-intensity LEDs are easily viewed even from off-center. The weather-resistant hi-intensity LEDs are furnished with an even larger sealed LED lens for maximum outdoor visibility.

Interior or Exterior Use

The weather-resistant units are ideal perimeter access control gates exposed to the weather. If mounted near card readers, the LEDs can be used to clearly indicate when individual doors and/or gates can be accessed. Perfect for industrial applications, these LEDs are easily seen when viewed from a truck cab or forklift.

Compact Size

Two LEDs, typically one red and one green will easily fit on a standard single gang wall plate. When mullion mounting is required a narrow 1-3/4' wide plate can be supplied.

Easy Universal Installation

Standard mounting hardware allows easy installation onto standard single gang junction boxes. All Dortronics LED indicators are field selectable for 12 or 24 volts DC operation.

Long Lasting

Dortronics hi-intensity indicators are solid-state LEDs manufactured from high quality semiconductor materials. LEDs are noted for their extremely long life and these may never need replacement. In addition, LEDs typically draw only about 5% of the power of a comparable incandescent component, allowing smaller, less costly power supplies.

Customized Configurations

The 7200 series hi-intensity LEDs can be used in lieu of standard bi-color T-1-3/4 LEDs and factory applied onto double or triple gang switch plates with any of the Dortronics standard push buttons or key switches. Other configurations are also possible using custom-sized plates. Contact the factory for assistance in determining the exact size of custom plates.

Optional Piezo sounder

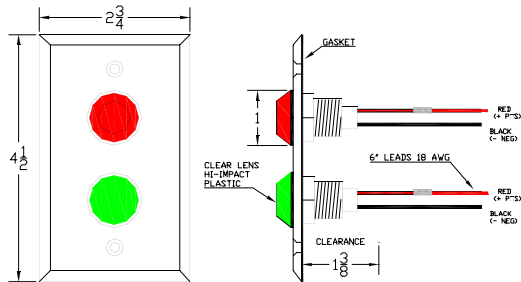
Available with either indoor or Weather proof outdoor Piezo mounted on the plate.



7201 SERIES HI INTENSITY LEDs

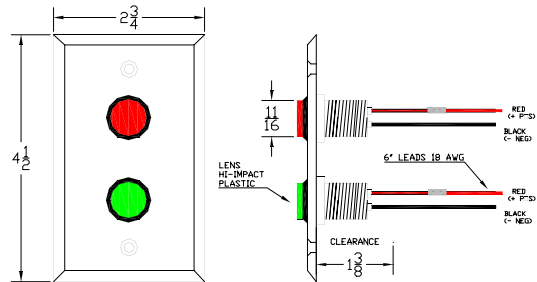
WATER PROOF SERIES 7201xL2-HWR

1 GANG STAINLESS STEEL PLATE
2 HI-INTENSITY WATER PROOF LED'S



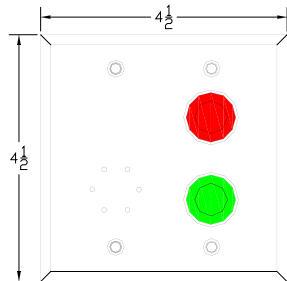
INDOOR SERIES 7201xL2-H

1 GANG STAINLESS STEEL PLATE
2 HI-INTENSITY LED'S



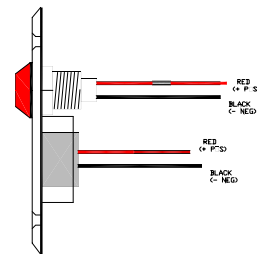
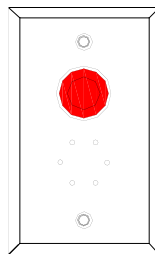
7202xL2-HWRxCS

2 GANG STAINLESS STEEL PLATE
2 HI-INTENSITY WATER PROOF LED'S
1 WATERPROOF PIEZO SOUNDER



7201xL1-HWRxCS

1 GANG STAINLESS STEEL PLATE
1 HI-INTENSITY WATER PROOF LED'S
1 WATERPROOF PIEZO SOUNDER



Example Model Descriptions

- 7201xL1-H = 1 High Intensity LED mounted on a 1 gang Stainless Steel Plate
- 7201xL2-H = 2 High Intensity LEDs mounted on a 1 gang Stainless Steel Plate
- 7202xL2-HxCS = 2 High Intensity LEDs with continuous Piezo sounder mounted on a 2 gang Stainless Steel Plate
- 7201xL1-HWR = 1 High Intensity Water Proof LED on a 1-gang Stainless Steel Plate
- 7201xL2-HWR = 2 High Intensity LEDs Water Proof LEDs on a 1-gang Stainless Steel Plate
- 7202xL2-HWRxCS = 2 High Intensity Water Proof LEDs with Water Proof Piezo sounder mounted on a 2 gang Stainless Steel Plate

Ratings

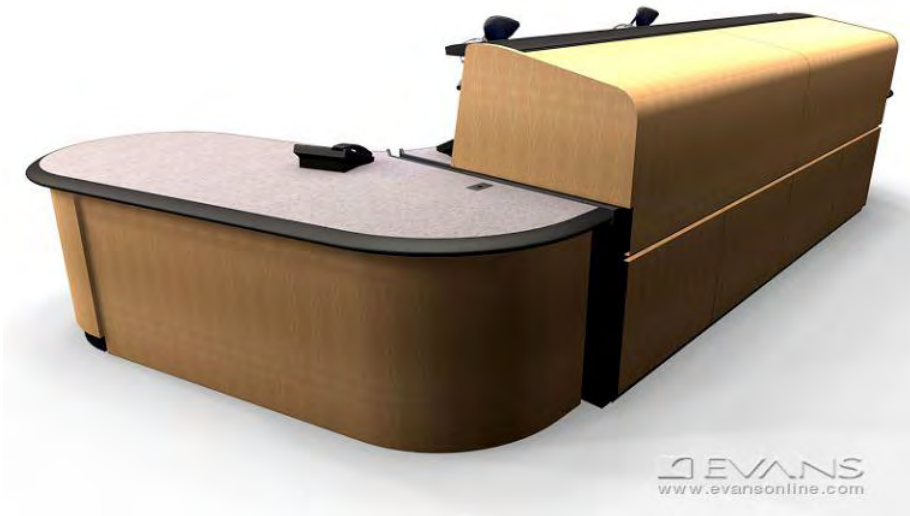
- LEDs - Rated .04 Amps @ 12 - 24 VDC.
- Nylon Body with Polycarbonate lens
- HWR Water Proof series has gaskets behind each LED and Plate
- Piezo Sounder - **Standard indoor**
Rated 20 mA @ 3-28 VDC.
Sound Pressure- 100 dBA @ 10 cm (Min.)
Resonant Frequency- 4500 Hz
- Piezo Sounder - **Water Proof**
Rated 35 mA @ 12 VDC.
(not available in 24VDC)
Sound Pressure- 95 dBA @ 10 cm (Min.)
Resonant Frequency- 2800 Hz
- Gang Plates - Stainless Steel 304
US23D Satin Finish
1-Gang 4-1/2 x 2-3/4"
2-Gang 4-1/2 x 4-1/2"
Narrow 4-1/2 x 1-3/4"

Specifications

- High Intensity LED Indicators shall be manufactured by Dortronics Systems, Inc. Furnish 7200 series LED indicators using standard indoor or weather-resistant exterior units as may be appropriate. Exterior mounted indicators shall have sealing gaskets behind each LED and between the mounting plate and the junction box.
- Where noted, supply Dortronics optional indoor style piezo sounder or optional weather-resistant outdoor piezo sounder.
- Mounting plates shall be constructed of #304 stainless steel US23D Satin Finish in single or double gang and supplied with optional paint filled engraving as noted. Attachment screws shall be slotted oval head stainless steel. For extra security, pin-in-hex head tamper-resistant screws shall be supplied where required.



1668 SAG HARBOR TURNPIKE, SAG HARBOR, NY 11963
www.dortronics.com - (800) 906-0137 - (631) 725-8148 FAX



**RESIDENTIAL & LIGHT COMMERCIAL
SLIDE GATE OPERATOR WITH BATTERY BACKUP**

RSL12V



DC-POWERED SLIDE GATE OPERATOR WITH BUILT-IN BATTERY BACKUP

Our most advanced residential and light commercial pad mounted slide gate operator. Features a powerful DC motor with soft start/stop operation for quiet and reliable performance and rated for gates up to 800 lbs. and 25 ft. in length and cycling up to 120 times per day.

The RSL also utilizes the EverCharge® Power Management System to provide industry leading power efficiency maximizing cycles when running on battery backup or optional solar power while maintaining optimum battery integrity. LiftMaster® Elite Series® gate operators offer innovative features to meet a variety of applications and feature a 3 year warranty.

On-Board Receiver



Exclusive from Chamberlain, a single remote control solution for gate access and additional access points. Ability to add up to 50 remote controls.

RSL12V

STANDARD FEATURES

DC Motor – soft start/stop operation

Reduces the stress and shock to the gate system by slowly ramping up gate speed on open and ramping down gate speed on close. This type of operation promotes longer gate and operator life and quieter operation.

Battery Backup

Provides complete operation of gate and all DC control devices and sensing devices in the event of power loss. 12V 7AH battery standard, upgrade to 2nd 7AH battery or 33AH battery for extended battery backup.

Electronic Limit System

Simple-to-set electronic limit system allows limit setting with just the push of a button.

Electronic Braking System

Innovative brake design keeps brake engaged with or without power when the gate is in closed position. Only open input or selectable auto open feature will override braking system. Operator uses electromotive technology to power brake upon power loss/battery depletion or in solar applications.

External Manual Disconnect Switch

Simply press manual disconnect switch to push gate open. No need to drop drive chain to manually open gate. Operator retains open/close limit setting when resuming normal operation. No special tools required.



Inherent Obstruction Sensing

This unit's internal obstruction sensing system offers force adjustment for the open and closed directions. If the gate strikes an obstruction, a closing gate will reverse to open and an opening gate will stop.

External Obstruction Sensing

To meet UL325 safety standards, secondary entrapment devices must be added. Inputs are provided to simplify adding secondary non-contact or contact sensors such as photo-eyes and edge devices. Installer will be able to recommend best secondary entrapment device for the application.

Clear Impact Resistant Poly Carbonate Control Box

Cover Allows clear view to key diagnostic LEDs, speeds troubleshooting, and saves time and money. Includes fuse holders.

Control Inputs

Control inputs allow for the connection of external devices.

Accessories include; loop detectors, LiftMaster® photo eyes, free exit probe, wireless access control equipment, and solenoid lock.

LED Indicators

Operator input, status and diagnostic LEDs simplify setup and troubleshooting.

SPECIFICATIONS

Power

110v/60Hz or solar power

Operator Weight

100 lbs.

Power

12VDC/500 mA Accessory Power

UL Listed

UL325 & UL991 Listed Class I & II

Construction

Gear Reduction:
10:1 Reducer in synthetic oil bath

Motor:

Heavy-Duty 12VDC

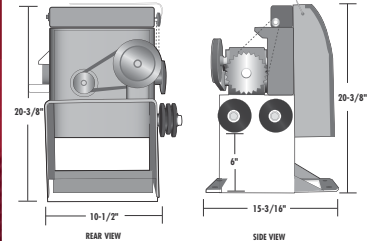
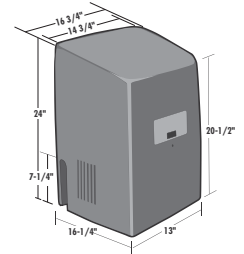
Chassis:

Zinc coated steel

Cover:

UV stabilized cover

Dimensions



ADDITIONAL FEATURES

Universal controller with multiple inputs

Timer-to-close: 0-180 seconds

Surge/spike protection

Dual gate compatible

Right- or left-handed operation

Ability to auto-open or failsecure when power fails/battery depletion

Heater model available

3-YEAR WARRANTY

OPTIONAL FEATURES

Solar Ready

Operator can be solar powered by adding optional solar panel. EverCharge® Power Management System delivers power when needed most for operating a gate while conserving power at all other times for best solar performance. **Solar gate operators and accessories qualify for 30% tax credit through 2016.** See www.liftmaster.com for more details.

The Protector System® Safety Sensors 50-220**

Prevents the gate from closing onto people, pets or objects. Includes mounting brackets.

**Only 50-220 photo eyes go into power save mode and minimize powerdraw when gate is not opening

Recommended Capacities

- Cycles per day - 120
- Gates up to 800 lbs. and 25 ft. in length

Battery Backup Operation

(16 ft. / 650 lbs. slide gate. Stand alone system)

Battery	Cycles
1 - 7AH	40
2 - 7AH	100
1 - 33AH*	275

Low Power draw safety sensors and accessories recommended for best performance on battery backup

*33AH battery not available in combination with heater option

Go to www.liftmaster.com for full list of accessories

LiftMaster®

Gate Access Systems

THE CHAMBERLAIN GROUP, INC.
845 Larch Avenue • Elmhurst, IL 60126

Request for Proposal (Rev. March 2011)
www.liftmaster.com

Attachment 1 - Exhibit L - Vendor Cut Sheets
Water Department Security Upgrade Design-Build Contract



I.C./F.C.C.
Certified



**RESIDENTIAL & LIGHT COMMERCIAL
SWING GATE OPERATOR WITH BATTERY BACKUP**

RSW12V



**DC-POWERED SWING GATE OPERATOR
WITH BUILT-IN BATTERY BACKUP**

Our most advanced residential and light commercial pad mounted swing gate operator. Features a powerful DC motor with soft start/stop operation for quiet and reliable performance and rated for gates up to 600 lbs. or 16 ft. in length and cycling up to 250 times per day.

The RSW also utilizes the EverCharge® Power Management System to provide industry leading power efficiency maximizing cycles when running on battery backup or optional solar power while maintaining optimum battery integrity. LiftMaster® Elite Series® gate operators offer innovative features to meet a variety of applications and feature a 3 year warranty.

On-Board Receiver



Exclusive from Chamberlain, a single remote control solution for gate access and additional access points. Ability to add up to 50 remote controls.

LiftMaster®
ELITE SERIES™

RSW12V

STANDARD FEATURES

DC Motor – soft start/stop operation

Reduces the stress and shock to the gate system by slowly ramping up gate speed on open and ramping down gate speed on close. This type of operation promotes longer gate and operator life and quieter operation.

Battery Backup

Provides complete operation of gate and all DC control devices and sensing devices in the event of power loss. 12V 7AH battery standard, upgrade to 2nd 7AH battery or 33AH battery for extended battery backup.

Electronic Limit System

Simple-to-set electronic limit system allows limit setting with just the push of a button.

Bi-Part Delay

Allows for swing gate designs where the wings overlap by letting one wing open or close before the other wing. Unique patent pending **synchronized close feature** monitors the speed and position of each wing, detects any change and adjusts the speed as necessary to ensure primary gate closes last avoiding potential damage to the gate.



Inherent Obstruction Sensing

This unit's internal obstruction sensing system offers force adjustment for the open and closed directions. If the gate strikes an obstruction, a closing gate will reverse to open and an opening gate will stop.

External Obstruction Sensing

To meet UL325 safety standards, secondary entrapment devices must be added. Inputs are provided to simplify adding secondary non-contact or contact sensors such as photo-eyes and edge devices. Installer will be able to recommend best secondary entrapment device for the application.

Clear Impact Resistant Poly Carbonate Control Box Cover

Allows clear view to key diagnostic LEDs, simplifies set-up, speeds troubleshooting, and saves time and money. Includes fuse holders.

Control Inputs

Control inputs allow for the connection of external devices. Accessories include; loop detectors, LiftMaster® photo eyes, free exit probe, wireless access control equipment, and solenoid lock.

SPECIFICATIONS

Power

110v/60Hz or solar power

Operator Weight

180 lbs.

Power

12VDC/500 mA Accessory Power

UL Listed

UL325 & UL991 Listed Class I & II

Construction

Gear Reduction:
Equipped with two heavy-duty gear reducers in synthetic oil bath

Motor:

Heavy-Duty 12VDC

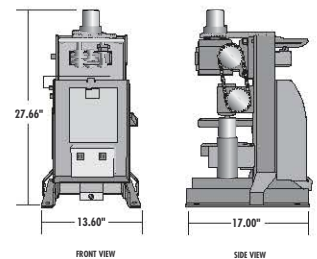
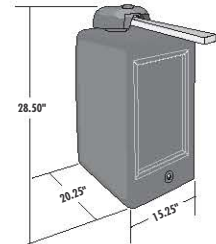
Chassis:

Zinc coated steel

Cover:

UV stabilized polyethylene

Dimensions



ADDITIONAL FEATURES

Universal controller with multiple inputs

Timer-to-close: 0-180 seconds

Surge/spike protection

Dual gate compatible

Right- or left-handed operation

Ability to auto-open or fail-secure when power fails/battery depletion

Heater model available

3-YEAR WARRANTY

OPTIONAL FEATURES

Solar Ready

Operator can be solar powered by adding optional solar panel. EverCharge® Power Management System delivers power when needed most for operating a gate while conserving power at all other times for best solar performance. **Solar gate operators and accessories qualify for 30% tax credit through 2016.** See www.liftmaster.com for more details.

MAGLOCK

MG1300

Additional security from forced entry or exit by firmly holding the gate in the closed position.

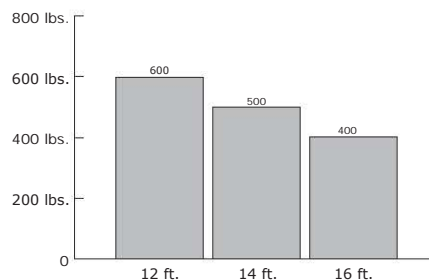
The Protector System® Safety Sensors 50-220**

Prevents the gate from closing onto people, pets or objects. Includes mounting brackets.

***Only 50-220 photo eyes go into power save mode and minimize powerdraw when gate is not opening*

Recommended Capacities

• Cycles per day - 250



Battery Backup Operation

(16 foot / 400 lbs. swing gate)

Battery	Cycles
1 - 7AH	40
2 - 7AH	100
1 - 33AH	275

Low Power draw safety sensors and accessories recommended for best performance on battery backup

Go to www.liftmaster.com for full list of accessories

LiftMaster®

Gate Access Systems

THE CHAMBERLAIN GROUP, INC.
845 Larch Avenue • Elmhurst, IL 60126

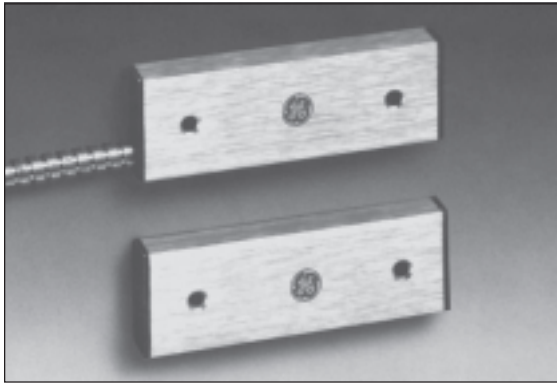
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Attachment 1 - Exhibit L - Vendor Cut Sheets
Water Department Security Upgrade Design-Build Contract



I.C./F.C.C.
Certified





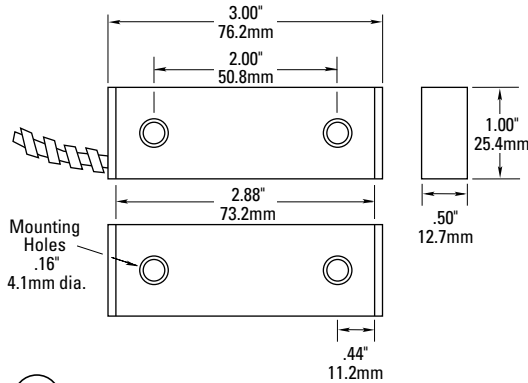
Aluminum Housing Armored Cable Wide Gap 2500 Series

Applications

- Mounting brackets available for gates, garage doors, freezers
- Rugged construction for long life
- Convenient surface mounting
- 2507AH is polarity-sensitive with reference to magnet direction

General Specifications

Enclosure	Brushed anodized aluminum with ABS plastic end caps (L)
Temperature Range	-40°F to 150°F (-40°C to 65°C)
Environmental	Hermetically Sealed Reed Switch Encapsulated in Polyurethane
NEMA Rating	1, 2, 3, 4, 4x, 5, 6, 12
Protection Class	IP 67
Response Time	1 msec max.
Life Cycles	100,000 Under Full Load, 10,000,000 Under Dry Circuit
Lead Types/O.D.	Stainless Steel Armored Cable with #22 wire / (0.28") (0.71cm)
UL/ULC Listed	Most Models



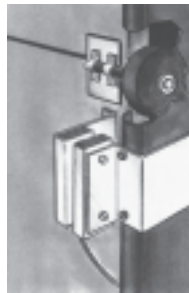
Mounting Kits for 2500 Series

1092A Garage Door Track

Mounting Kit for Model 2505A

Includes:

- 1- 1940 bracket
- 1-1912 bracket
- 1-2505A contact,
- mounting screws
- and instructions



1094A Curtain Door

Mounting Kit for Model 2507AH

Includes:

- 1- 1941 bracket
- 1-1942 bracket
- 1-2507AH contact,
- mounting screws
- and instructions



Order Information

Electrical Specifications

Part Number	Contact ¹ Configuration	Load Rating (AC/DC)	Switching Voltage (AC/DC)	Switching Current (AC/DC)	Contact Resistance	Sense Range ² Nominal	Lead Length
2505A-L	N.O.	7.5W/VA	100V	0.5A	0.2 Ohms	3.0" (7.6cm)	3'
2507A-L	SPDT	3W/VA	30V	0.25A	0.25 Ohms	3.0" (7.6cm)	3'
2507AD ⁴ -L	DPDT	3W/VA	30V	0.25A	0.25 Ohms	1.5" (3.8cm) Min	3'
2507AH ^{3,4} -L	SPDT	3W/VA	30V	0.25A	0.25 Ohms	0.8" (1.9cm) Min	3'

Warning— Each electrical rating is an individual maximum and cannot be exceeded!

¹ Configuration with actuator away from the switch

² Proximity of ferrous materials usually reduces sense range — typically by 50%. The shape and type of material cause a wide diversity of effects. Testing is required to determine actual sense range for specific applications. As measured on a nonferrous surface.

Gap distances are nominal make distance ± 20%. Gap Specifications are for switch to make. Break distance is approximately 1.1 to 1.5 times make.

³ Note: 2507AH biased type temperature rating: -20°F to 150°F (-28°C to 65°C).

⁴ Not ULC Listed

iSTAR Pro 2U Rack Mount Rack-mountable access controller

Features That Make a Difference:

- Saves wall space and lowers installation costs
- Leverages standard IT server racks
- Controls up to 16 readers using space-saving 2U enclosure
- Patent-pending design allows fast field wiring using quick connects
- Front panel LCD and LEDs enable quick diagnostics and troubleshooting
- Industrial handles and slide rails ensure easy installation
- Hinged cover provides easy access to diagnostic port
- Dual network LAN ports for redundant network connection
- Compatible with C•CURE 800/8000 and C•CURE 9000
- Optional external 2U rack power supply can provide lock power
- Supports multiple cards per cardholder and multiple card formats, including FIPS 201 extended formats, for a highly secure, flexible solution



The space-saving Software House iSTAR Pro 2U Rack Mount controls up to 16 readers and supports most types of Wiegand and RM output card readers. Coupled with removable wire connectors that enable quick installation, iSTAR Pro Rack Mount reduces the space requirements and costs associated with installing a panel on the wall, making it a desirable solution for IT professionals.

The patent-pending rack design allows administrators to centrally install and monitor the panel in a standard depth 4-post IT rack or a standard 2-post Telco rack, saving valuable wall space. When used with an external 2U lock power supply that requires minimal wiring, installation costs are further reduced while taking advantage of the controlled environment of an IT server room. The stable temperature and ideal environmental conditions of the IT server room help to preserve the life of the unit, thereby saving maintenance and replacement costs over the long term.

iSTAR Pro Rack Mount supports Dynamic Host Configuration Protocol (DHCP) to simplify and expedite installation. For easy setup, this device also supports Domain Name Services (DNS), Windows Internet Naming Service (WINS), Fully Qualified Domain Naming (FQDN), and provides a comprehensive approach to network management.

A front panel LCD displays real-time system diagnostics for quick troubleshooting. LED status lights indicate power and high temperature. With external diagnostics and status lights, administrators and IT staff can view and easily handle system duress without having to open the enclosure. These security features significantly reduce the risk of system downtime and, with remote web diagnostics, you can find and fix performance issues remotely from anywhere in your facility.

Each controller has front and rear tamper switches to ensure it is not accessed by unauthorized personnel. With encrypted communications, protection against network intrusion, dual network paths, and optional dial-up secondary communications, iSTAR Pro Rack Mount is a highly secure network device that even the most cautious IT manager will trust.

Physical

Dimensions (H x W x D)	8.9 x 48.3 x 58.4 cm (3.5 x 19.0 x 23.0 in)
Rack Space Requirements	2U (standard rack units)
Environmental	0° to 50°C (32° to 122°F) 5 to 95% relative humidity, non-condensing
Weight	15 kg (33 lbs)
High Temperature Alarm	60° +/- 6°C (140° +/- 10°F)

Electrical

Power Requirements	90/264 VAC, 50/60 Hz
Input Protection	4A/250V fuse
Power (Max)	75W
Heat Dissipation (Typical)	320 BTU/h
Memory and RTC Backup	Onboard, rechargeable NimH batteries provide minimum 12 hrs retention of RAM and RTC
Network Communications	10/Base-T Ethernet onboard
Second LAN Port	Using optional 10/100 PCMCIA network card

Indicators and Switches

LED for power, high temp
LCD for diagnostics

System Memory

64 MB RAM standard; expandable to 128 MB

Regulatory

Tested and certified by ETL per ANSI/UL standard 294-2004
CSA 22.2 by cETL
CE
FCC Part 15 Class B
RoHS
Power supply certified to CSA C22.2 No. 60950-1-03

Reader, Inputs and Outputs

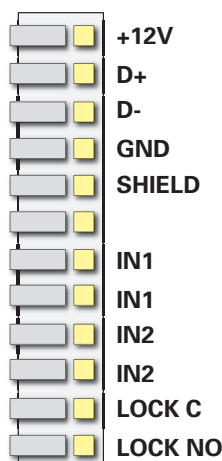
Reader Ports	16
Reader Support	RM readers or RM reader modules, or Wiegand output readers
Reader Technologies Supported	<ul style="list-style-type: none"> Multi-Technology Smart Card Magnetic Stripe Proximity Wiegand
Maximum Distance to Door	RM: 1,219 m (4,000 ft) Wiegand: 150 m (500 ft)
RM Bus Communications	RS-485 half duplex, two wire, plus optional two wires for device power
Supervised Inputs	32, double-resistor
Input Expansion	Up to 128 additional inputs using I8 input modules on RM bus
Outputs	16 dry contact relay outputs
Output Rating	30 V AC/DC, 2.5A inductive, 5.0A non-inductive
Output Expansion	Up to 128 additional Form C Relay outputs using R8 output modules on RM bus
Tamper Switches	Two, front and rear cover

Model Numbers

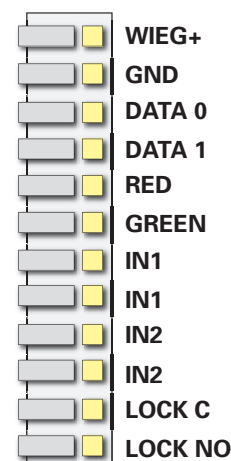
STAR008-2URM	iSTAR Pro 2U Rack Mount, supports eight RM readers (16 inputs and eight outputs included)
STAR016-2URM	iSTAR Pro 2U Rack Mount, supports 16 RM readers (32 inputs and 16 outputs included)
STAR008-2UW	iSTAR Pro 2U Rack Mount, supports eight Wiegand readers (16 inputs and eight outputs included)
STAR016-2UW	iSTAR Pro 2U Rack Mount, supports 16 Wiegand readers (32 inputs and 16 outputs included)

	Controller Capacity 64 MB	Controller Capacity 128 MB
Number of personnel records with one clearance, one card/person, ten-digit cards	525,000	1,200,000
Number of personnel records with ten clearances, one card/person, ten-digit cards	295,000	680,000
Number of personnel records with one clearance, five cards/person, ten-digit cards	170,000	375,000
Number of personnel records with ten clearances, five cards/person, 40-digit cards	110,000	250,000

Typical Rear Wiring per Door, RM Models



Typical Rear Wiring per Door, Wiegand Models



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NICE Situator

Situation Management Solution

NICE Situator, the leading Situation Management solution, integrates and correlates information in real time from multiple and diverse systems across the enterprise. At the same time, it coordinates the most effective responses, ensuring that everyone in the operational chain knows what is happening, where it's happening and how to respond.

NICE Situator provides the tools necessary to address every aspect of the control room management lifecycle.

Unified Management, Centralized Control

Growing expectations for continuously improving, cost-effective operations have dramatically increased the scope of new technologies and information in the control room. Now, along with the pressures of managing safety, security, and operations, personnel must also oversee multiple systems while complying with expanding regulations and policies.

NICE Situator effectively addresses these challenges by merging all of your cameras, sensors, communication systems, data sources and operating procedures into a single unified platform. It is able to identify potential — or unfolding — situations by intelligently *connecting the dots* between seemingly unrelated events.

Furthermore, NICE Situator enforces processes, automates specific tasks and complex workflows, and intelligently adapts them as an event unfolds to reduce the risk of human error. This ensures that the right action is taken at the right time by empowering organizations and their personnel to make effective and informed decisions.

The ability to identify unfolding events, manage them effectively and mitigate their risk can potentially save lives and cost, while ensuring business continuity. For commercial, critical infrastructure and Homeland Security markets, NICE Situator sets the pace for the future of Situation Management and establishes the foundation for your operations.

Response time improves by 75%

NICE Situator's ability to optimize control room management allowed a major US electric utility company to improve their incident response time by 75%. Having detection, verification, automated response and workflows in place for real-time action dramatically reduced their safety, security and operational risks.

Corporate complex reduces drain on manpower

Almost 2,000 weekly 'gate access denied' alerts consumed the time and resources of security personnel at a large corporate complex. NICE Situator made instant verification of these alerts possible, and reduced them by 75%, allowing personnel to focus on essential activities.

Solution Highlights

Faster, more efficient response

NICE Situator correlates all of your incoming data and analyzes an unfolding event for immediate Situational Awareness. By automatically presenting all relevant information, procedures and workflows, a consistent, pre-defined response is always followed mitigating the risk of human error, while enabling optimal Situation Management no matter who is sitting in the control room.

Future proof, with past investment protection

You've already invested heavily in your existing technology, making rip-and-replace costs a real barrier to improved operations. As an open, overlay solution, NICE Situator protects past investments and even boosts their functionality. At the same time, it is future-ready for new technologies, providing the platform to continuously improve operations.

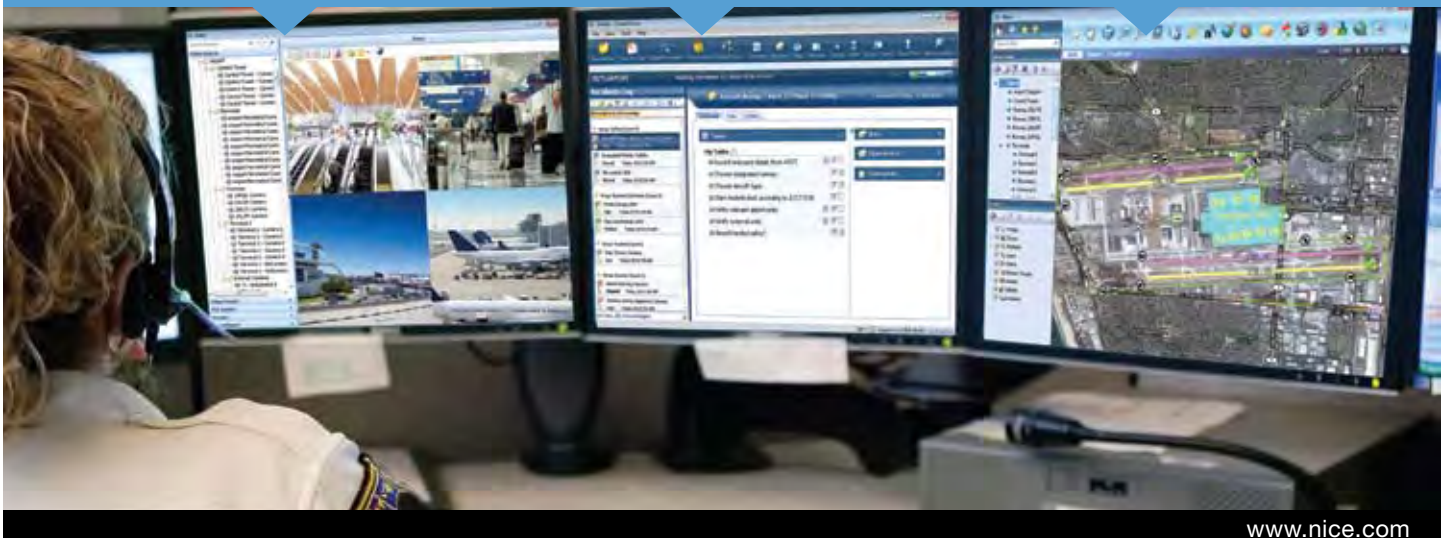
Ensure and sustain compliance

In an increasingly regulated environment, non-compliance is not only costly but it can increase risk. Through automated workflows and reporting, NICE Situator ensures that policies and procedures are followed uniformly, helping organizations sustain compliance at any given time.

WHAT IS HAPPENING

HOW TO RESPOND

WHERE IT'S HAPPENING



Situator customer saves \$1.4M annually in labor costs

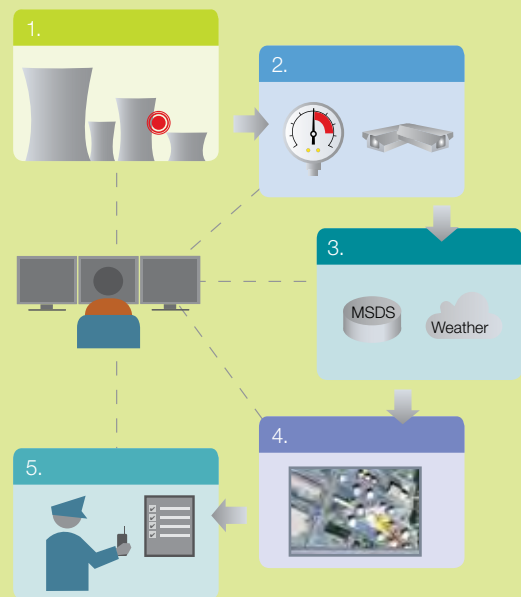
NICE Situator's ability to effectively monitor remote facilities 24/7, allowed one customer to save \$1.4M in labor costs by consolidating the management of those remote locations. Not only did the customer gain a huge savings, the actual monitoring of all locations substantially improved.

From 14 to 250 sites without increasing personnel

With NICE Situator, a large US-based utility company went from managing 14 sites to 250, all without increasing headcount. Through capabilities such as the automation of tasks, integration of systems, and remote viewing and verification, NICE Situator allowed the organization to expand and improve, while using the same resources.

SAMPLE SCENARIO

1. Gas sensor sends alert to Situator
2. Situator checks for pressure changes and pops up relevant video feeds to verify the alert
3. Situator accesses relevant information sources
4. Situator correlates data with rate of pressure change and environmental information and displays GIS plume model
5. Situator locates and sends task assignments to people best equipped to respond. Using mobile devices, Situator procedure asks responders: "Initiate Evacuations?" If responder answers "Yes" Situator activates evacuation procedures and displays relevant GIS layers



Extensive reporting and debriefing capabilities

Crucial to compliance, debriefing, investigation and prosecutorial actions, reporting is also extremely time-consuming and damaging when done inaccurately. NICE Situator's automated and customizable reporting capabilities save time and cost, in addition to providing accurate and complete accounts of every action taken related to an incident.

Visualizing the situation effectively

NICE Situator presents a Common Operating Picture with real-time alerts and information from all integrated systems in an intuitive multi-layered Geographical Information System (GIS)-based display. With the relevant GIS information layers (any number of aerial photos, maps,

floor plans, CAD drawings or 3D models) automatically presented, you can continuously monitor and interact with all systems, people and assets, providing you with comprehensive situational awareness and an extremely robust platform to effectively manage them. As an open solution, NICE Situator can also leverage an organization's existing GIS infrastructure.

Automate your workflows

Using the advanced, yet easy-to-use NICE Situator Planning and Workflow tools, administrators can develop even the most complex response workflows for routine and emergency situations. For tasks and notifications that are not handled properly within a pre-defined timeframe, escalation policies ensure that they are either dynamically or manually reassigned to alternate people or other resources.

ABOUT NICE

NICE Systems (NASDAQ: NICE), is the worldwide leader of intent-based solutions that capture and analyze interactions and transactions, realize intent, and extract and leverage insights to deliver impact in real time. Driven by cross-channel and multi-sensor analytics, NICE solutions enable organizations to improve business performance, increase operational efficiency, prevent financial crime, ensure compliance, and enhance safety and security. NICE serves over 25,000 organizations in the enterprise and security sectors, representing a variety of sizes and industries in more than 150 countries, and including over 80 of the Fortune 100 companies. www.nice.com.

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NiceVision eXpress

NiceVision eXpress is a high-end open IP video management solution tailored for systems up to 64 cameras. Statistically the majority of video security installations are under 64 cameras, but they are no less critical than one with thousands. eXpress shares the same DNA as NiceVision Enterprise, which has been used for years in demanding multi-site multi-thousand camera installations around the world.

With NiceVision eXpress, Professional and Enterprise, System Integrators can now master one core video management system for any size project without recertification. Learn how NiceVision eXpress can meet your project needs today, with the flexibility to grow as your requirements evolve.

Complete

NiceVision eXpress (NVX) is available as a compact completely self-contained single-server solution which includes the most popular NICE Enterprise features. The NVX platform is easily expanded to add additional features, and simple license upgrades grow your project to a NICE Professional or Enterprise deployment.

NVX offers flexible deployment options, available as a turnkey or software-only solution. Turnkey NVX includes 8TB of internal RAID storage (or 2TB / 4TB non-RAID), which runs on optimized brand-name IT hardware, and the convenient all-in-one solution comes pre-loaded and ready to go, simplifying installation and maintenance.

NVX is also available as a software-kit, which gives you the flexibility to install it on your own computer servers, storage and workstations.

Open

The open architecture of NiceVision eXpress works with a wide range of IP cameras (including Standard Definition, HD and Megapixel), encoders, and analog cameras from the world's leading edge-device manufacturers. NVX also works with leading access control and other 3rd-party systems and includes the NiceVision Software Development Kit for additional integration requirements.

Reliable

It's hard to quantify reliability. How can you conclude whether one video management system is more reliable than another? NiceVision Professional and Enterprise's DNA is derived from a long history of large and distributed systems, and their owners are among the most demanding and exacting in the world. NiceVision eXpress has the same DNA, but packaged for simplicity and convenience. For example, the same award-winning encoder redundancy used in many of our Professional and Enterprise projects is also available for NVX. And while NiceVision eXpress is specifically engineered to be a reliable and stable system, you can upgrade the system to incorporate additional resiliency features. These include SVR failover, Central Server (Application Management Software) failover, direct streaming and multicast, level of service and dual recording.

Evolutionary

NiceVision eXpress can be expanded at any time, so you can start with only 16 cameras and upgrade to 32, 48 or 64 cameras by simply adding license packages. Further expansion is made simple with license upgrades to NiceVision Professional (up to 200 cameras) or NiceVision Enterprise (unlimited cameras). When used with encoders, or in its hybrid form, NVX also enables your migration from analog to IP, maximizing the use of your existing analog infrastructure. Additionally, NVX expansions allow you to reuse existing hardware and storage. The only change in an expansion is the software key, which unlocks higher camera counts and other features such as recorder failover, LDAP, video analytics, and PDA access.



Architecture

To understand how NVX differs from NiceVision Professional and Enterprise it is useful to know that all NiceVision-based video management systems (not just NVX) are comprised of 5 simple elements: edge devices, recorders, management software, client software and the virtual matrix.

1. Edge devices such as fixed and PTZ IP cameras and encoder-enabled analog cameras. IP cameras include HD and Megapixel cameras.
2. NICE "Smart Video Recorders" (SVRs) include a wide range of value-added services such as video analytics, camera tampering detection and visual parameter optimization (improving the brightness, contrast and saturation of the video on-the-fly).
3. The Application Management Server (AMS) centralizes and coordinates system administrative features like users and privileges, recorder failover, alarm management, PTZ priorities and health monitoring. The AMS also enables NiceVision integrations to 3rd party systems such as Access control – this is referred to as an SDK connection.
4. The NiceVision suite of client applications includes NiceVision Control Center for live surveillance, Investigator for review, reporting and evidence production, SiteBuilder for configuration, and Supervision for health monitoring. Other applications include Player for review and Administrator for managing profiles and privileges.
5. The virtual matrix enables live or recorded video to appear on a remote PC workstation or decoder appliance's typically large monitor. Each display on a PC or NVD 5104 can present up to 16 cameras (4x4).

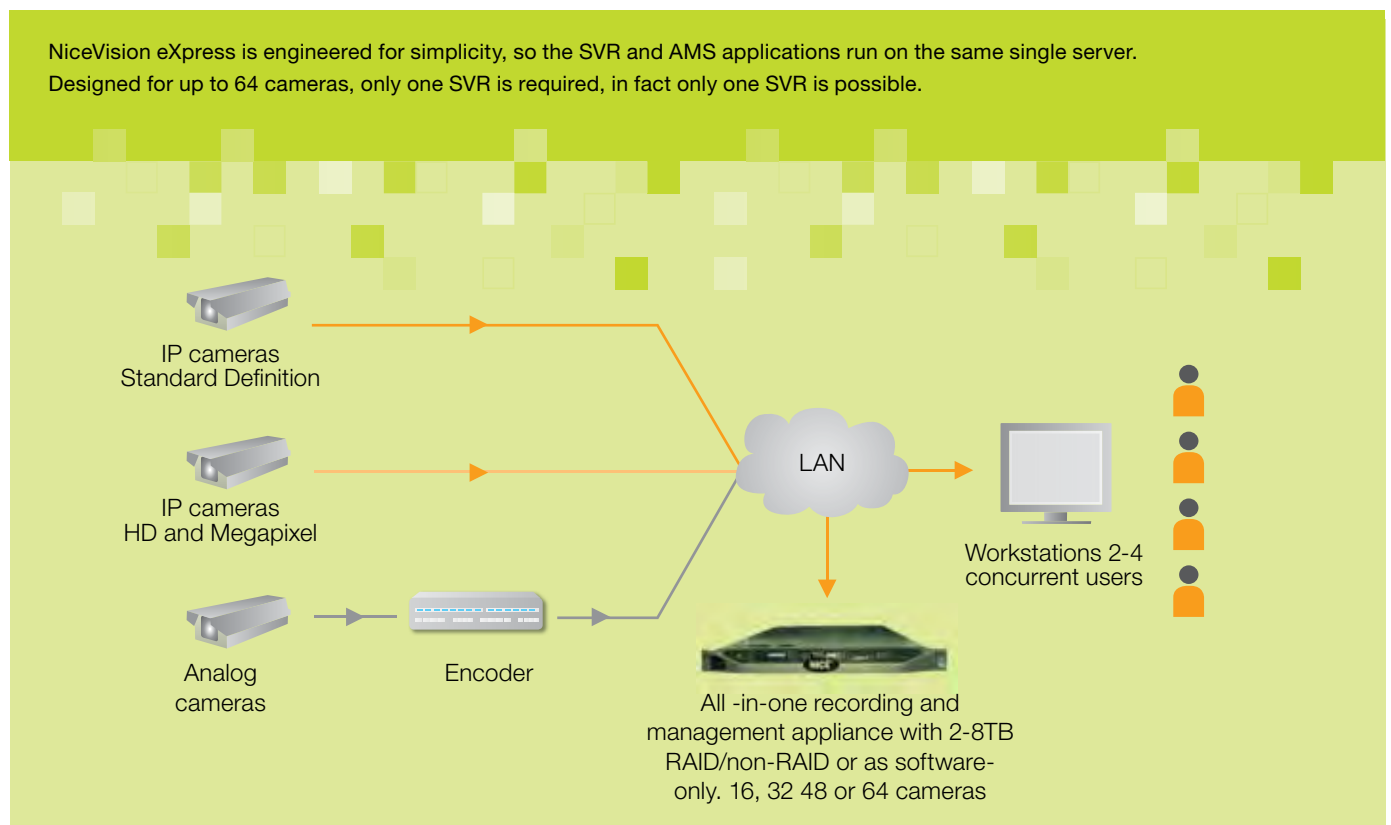
NiceVision eXpress shares the same DNA as Enterprise, so it is compatible with the same edge devices and 3rd party systems as NiceVision Professional and Enterprise.

Partner	SD IP Cameras	HD/MP Cameras	Encoders
NICE	N/A	N/A	✓
Arecont	✓	✓	
Axis	✓	✓	✓
Bosch	✓	N/A	✓
Canon	✓	N/A	N/A
Ganz	✓	N/A	N/A
GE	✓	N/A	N/A
Grandeye	✓	N/A	N/A
HikVision	✓	N/A	N/A
Infinova	✓	✓	N/A
IQinVision	✓	✓	N/A
Mobotix	✓	✓	N/A
Panasonic	✓	✓	N/A
Pelco	✓	✓	
Samsung	✓	N/A	N/A
Siemens	✓	N/A	N/A
Sony	✓	✓	N/A

Compatible camera and encoder manufacturers.

For exact model numbers and supported features see NICE's IP Plug-In Guide

NiceVision eXpress system architecture



The client application suite runs on workstations, so you will need at least one workstation for users. User licensing is based on concurrent users (2 to 4), not physical workstations, so you can have 10 registered users as long as they don't all try to use the system at the same time.

All NiceVision eXpress licenses have a default of zero virtual matrix licenses but up to 2 may be added if required. E.g. for a 32 camera system you could choose to view 16 cameras on each of 2 decoder PCs in a 4x4 layout.

Package		eXpress	Professional	Enterprise
Channels	Max video channels	64	200	Unlimited
	Audio support	Audio-in only	✓	✓
	Advanced video quality pack Vpo & camera tampering	—	✓	✓
	Advanced streaming pack Direct streaming & multicast	—	✓	✓
	SVR redundancy Licensed per source channel	—	✓	✓
	Advanced resilience pack CSS support	—	—	✓
	Video analytics support	—	—	✓
Site	Site management & recording license Including 2 user licenses	✓	✓	✓
	Site redundancy	—	—	✓
	Active directory integration	—	—	✓
	No. of VMX displays	2	Unlimited	Unlimited
	Software deployment tool	—	✓	✓
	SDK support	✓	✓	✓
Users	Application suite features	—	✓	✓
	Concurrent users / web clients	2 (32 ch) / 4 (64 ch)	Up to 20	Unlimited
	Mobile client support	—	—	✓

✓ Optional – extra cost ✓ Included in channel price

Features

- Upgradable between 16, 32, 48 or 64 cameras
- Open: supports IP, HD, megapixel and encoder-enabled analog cameras
- Supports H.264, MPEG4 and JPEG cameras
- Storage: 2-8TB internal RAID/non-RAID. 42TB external
- Up to 2 virtual matrix displays
- Direct interface for PTZ keyboard control
- Scenario Reconstruction delivers authenticated evidence
- Full audit-trail of all users' activities
- Integrates directly with 3rd party access control systems

Benefits

- All-in-one system for ease of installation and maintenance or available as software-only to reuse servers and storage capacity
- Shares NiceVision Enterprise DNA including camera compatibility, uptime, system integration and usability
- Non-proprietary IT-friendly platforms improve serviceability
- Simple, single-line-item pricing
- Upgradable to NiceVision Profession or Enterprise for unlimited cameras and additional features while preserving initial investment

NiceVision eXpress Ordering Information

Software Only

The following items are pure software. You will need to supply the storage (42TB max) and servers to run the SVR and the AMS software, which can co-exist on a single server. You will need to supply one or more workstations to administer and operate the system.

Part	Cameras	Concurrent Users	Virtual Matrix Licenses
NV-NVX-16CH	16	2	2
NV-NVX-32CH	32	2	2
NV-NVX-48CH	48	4	2
NV-NVX-64CH	64	4	2

Turnkey Solutions

The turnkey solutions include a single server preinstalled with the SVR and AMS software. The server includes internal storage with the option of RAID or non-RAID. You will need to supply one or more workstations to administer and operate the system.

*The estimated days of storage assumes all cameras are being recorded at 1Mbps, 24x7 without using motion recording. Many factors affect the actual bitrate including framerate, resolution, compression algorithm, lighting, scene activity, vibration, PTZ motion and consequently they are all camera and situation dependent. However 1Mbps is a reasonable starting point, with 2Mbps considered as casino quality video. This table is presented for your convenience but for a more accurate estimate please call for a custom quote.

Part	Cameras	Concurrent Users	Capacity TB	Storage	Height	Days*
NV-NVX-9200-16CH-OLS-2TB	16	2	2	Internal	1U	10
NV-NVX-9200-16CH-OLS-4TB	16	2	4	Internal	1U	21
NV-NVX-9200-32CH-OLS-2TB	32	2	2	Internal	1U	5
NV-NVX-9200-32CH-OLS-4TB	32	2	4	Internal	1U	10
NV-NVX-9200-48CH-OLS-4TB	48	4	4	Internal	1U	7
NV-NVX-9420-16CH-RIN5-8TB	16	2	8	Internal RAID	2U	42
NV-NVX-9420-32CH-RIN5-8TB	32	2	8	Internal RAID	2U	21
NV-NVX-9420-48CH-RIN5-8TB	48	4	8	Internal RAID	2U	14
NV-NVX-9420-64CH-RIN5-8TB	64	4	8	Internal RAID	2U	10

Part	Description
NV-NVX-EXP-16CH	16 additional channels expansion kit, up to a maximum of 64
NV-NVX-VMX-1MON	Single VMX monitor license for eXpress package
NV-NVX-SDK-1CC	Single license for SDK concurrent connection (max 10)

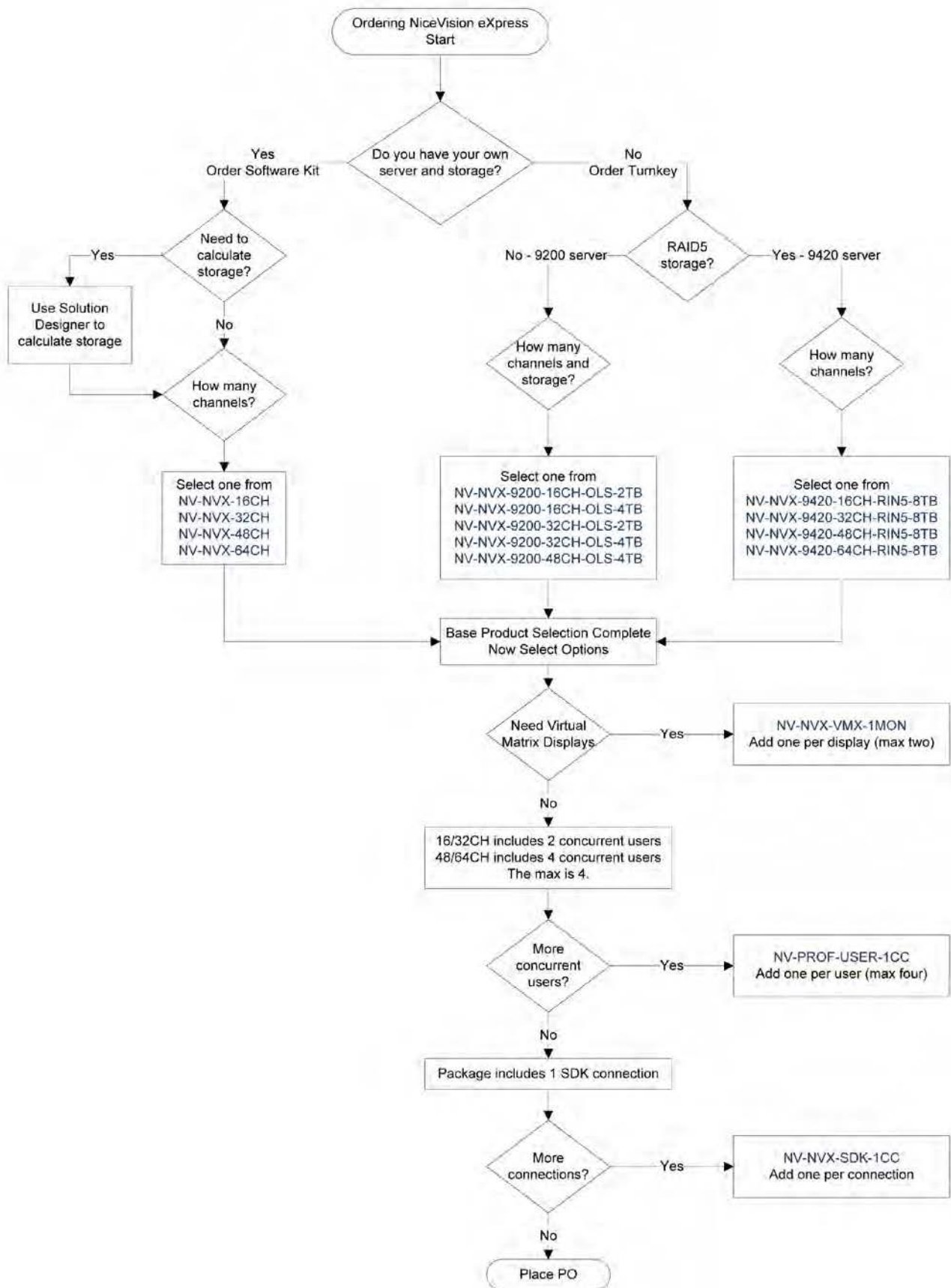
All include one Audio In per channel, and 1 SDK connection.

For full information please consult the NICE pricelist.

Channel Count	SW Kit	Non-RAID Turnkey Platform		RAID5 Turnkey Platform
		2TB	4TB	8TB
16	✓	✓	✓	✓
32	✓	✓	✓	✓
48	✓	—	✓	✓
64	✓	—	—	✓

Various storage options

Ordering workflow



Client Workstation System Requirements

Processor type	Intel® Core™2 Quad 525W, Q6600 (1066MHz FSB, Quad Core) or higher. 2.4 GHz (min) with 8 MB L2 Cache
Storage	250 GB (7,200rpm) SATA II Hard Drive or more. DVD-RW to burn DVDs
Memory	4.0 GB (4 x 1.0 GB DIMM) DDR2 ECC SDRAM 667 MHz or more
Video card	NVIDIA PX8400 GS 512 MB or higher
VGA monitor	1024x768 and 32-bit color or higher
Operating system	Windows XP Professional SP3 or Vista SP2 Business edition or Vista SP2 Ultimate edition or Windows Ultimate edition. 64-bit Windows is not supported.

64 Cameras Svr/Ams System Requirements (For Software Only)

Processor	Intel® Xeon® Processor E5620 (12M Cache, 2.40 GHz, 5.86 GT/s Intel® QPI)
Memory	3 GB DDR3 or more
Free disk space	180 GB
OS disk	Hot swappable RAID 1 or better is recommended
PSU	Redundant PSU is recommended
Network	1 Gb Ethernet
Modem 56K	Recommended as access point for maintenance
Operating system	Windows Server 2003 R2 Std. Edition (SP2) or Server 2008 R2 Std. Edition

32 Cameras Svr/Ams System Requirements (For Software Only)

Processor	Intel® Xeon® Processor X3440 (8M Cache, 2.53 GHz)
Memory	4 GB DDR2 or more
Free disk space	180 GB
OS disk	Hot swappable RAID 1 or better is recommended
PSU	Redundant PSU is recommended
Network	1 Gb Ethernet
Modem 56K	Recommended as access point for maintenance
Operating system	Windows Server 2003 R2 Std. Edition (SP2) or Server 2008 R2 Std. Edition



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NiceVision Net 2.5 PRODUCT SUITE

Redefining IP video security

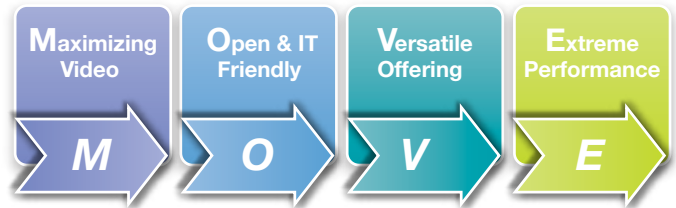
NiceVision Net 2.5 is a comprehensive, enterprise-class, open-platform IP video surveillance solution providing surveillance coverage and control for security-conscious environments. As an end-to-end IP video surveillance solution seamlessly managed by the NiceVision ControlCenter application suite, Net 2.5 includes encoders and smart video recorders (SVRs) embedded with video analytics, high-performance decoders, extensive event management, and control room visualization. The combination of flexible software and turnkey solutions with open, standard support and leading video recording capabilities enables all organizations to extract security and business insights from IP and analog cameras and other integrated devices.

NiceVision NET 2.5 value

NiceVision Net 2.5 provides unrivaled value to security operators, integrators and IT managers with its focus on evolving market needs.

The NiceVision solution ensures:

- **Maximized Video Management:** Getting the most from any video technology using Video Value Added Services
- **Open & IT Friendliness:** Designed for easy 3rd party integration and IT requirements compliance
- **Versatile Offering:** Enterprise class, end-to-end IP video surveillance solution that fits all customers & implementations
- **Extreme Performance:** Offering the best TCO and unsurpassed reliability



Maximizing Video

Ease of video management and situation handling improve the quality and speed of critical decision making and investigation. The result is more efficient and effective detection, verification, and resolution of security events.

Net 2.5 maximizes your video handling for effective operations with:

- 3D Visual Navigation feature
- Multi-monitor, multi-tabbed video management
- Advanced event management
- Seamless connectivity with smartphones and web clients
- Streamlined management and reduced cost of ownership
- Advanced and visual query capabilities and synchronized video
- Smart video analytics for security and business insight to ensure video quality and integrity

Open & IT Friendly

With an open platform that supports ONVIF standards, Net 2.5 provides you with maximum flexibility by seamlessly integrating with new and existing edge devices, as well as security management and access control systems. And with no special client download needed, Net 2.5's web and smartphone support allows access to your surveillance system anytime, anywhere.

Open & IT Friendly features include:

- Support for virtualization
- Standard infrastructure support: operating systems, databases, and maintenance tools
- Dedicated design tool for integrators and A&E's, enabling cost-effective system design
- Recording information report provides a complete view of solution deployment for auditing and inventory
- Advanced and comprehensive Software Development Kit (SDK) to simplify integration with all system components

Versatile

Security-conscious organizations come in all shapes and sizes, and they all need effective security solutions. Understanding this, NICE has developed customized packages that address these needs, with consideration for the security officer, the integrator, and the IT manager.

Available as software kits or turnkey solutions, NiceVision Net 2.5 Product Packages have a solution to fit your needs:

NiceVision eXpress

Perfect for initiating pilot projects, NiceVision eXpress is an enterprise-class solution for the small-scale facility or installation.

NiceVision Professional

This recording and management solution has been tailored for mid-sized deployments such as mass transit, and critical-services facilities such as power plants.

NiceVision Enterprise

NiceVision Enterprise is ideal for large-scale deployments such as airports, railways, and city centers. Allowing an unlimited number of cameras and users, the solution is both future-ready and scalable.

Extreme Performance

The solution includes outstanding throughput (up to 512 mbps), enhanced compression, and video handling excellence. The system's unique high-availability architecture ensures that all major components are designed for redundancy, delivering maximum availability and the resilience of NICE's 'Zero Point of Failure' feature.

NiceVision Net 2.5 combines extreme performance with the lowest total cost of ownership:

- Outrivaled CAPEX – high performance and optimized redundancy requires fewer servers
- Lowest OPEX in the market – less floor space, easy upgrades, lower maintenance cost
- Future-ready solution ensures investment protection
- Smooth migration to IP, maximizing existing assets

Product Briefs

The NiceVision Net product suite includes edge devices, smart video recorders (SVRs), video analytics, extensive event management, and control room visualization. Net 2.5 provides a unified, fully integrated solution that delivers high-quality, consistent performance.

Smart Video Recorders

NiceVision SVRs are complete, high-performance network video recording and management solutions that can turn any channel into a smart one. Fully scalable and with the ability to support thousands of channels through its video management capabilities, NICE SVRs simultaneously manage encoders with third-party IP devices while providing a unique and cost-effective migration path from analog to IP.

NiceVision ControlCenter management components

- Virtual Matrix (VMX): a cost-effective alternative to an analog matrix
- Event Management: for real time monitoring and advanced investigation
- Smartphone solution: enables security on the move
- Web Interface: for easy installation and launch of the ControlCenter application

NiceVision Net 2.5 Highlights:





















- Unmatched recording and streaming performance
- Assured service with 99.999% availability
- Reduced OPEX and CAPEX resulting in best TCO
- Open to any edge device and security management system
- Enabling IP performance and quality for analog cameras and smooth migration path

Encoders

NiceVision encoders are compact, intelligent video devices that enable you to seamlessly record, manage, and analyze high-quality 4CIF realtime video images from analog cameras over an IP network.

Decoders

NiceVision NVD 5204 and NVD 1002 are high-quality video decoders that enable video streams from IP networks to be displayed in real time on a variety of monitors. NiceVision decoders support a wide range of video sources — all controlled by one unified management application.

Collaborative Event Management	 Management Workstation	 Decoders	 Virtual Matrix	 Tablet / Smartphone	 Web Client	
	Control Room Management			Remote Viewing		
Video Insights	 Crowd Management	 Intrusion Management	 PTZ Tracking	 VPO	 AVMD	 Camera Tampering
	Video Analytics			Video Value Added Services		
Multimedia Recording	 SVR 9000 Enterprise-Class Scalable Solution	 NVS 1200 External Storage	 Hybrid-Ready Smart Video Recorder	 Analog Expansion Board (AEB) 1016		
	Smart Video Recording & Storage		Hybrid Smart Video Recorder			
Edge Devices	 NVE 1008 Eight Channel Encoders	 NVE 1002 Indoor Encoder	 NVE1002 / XT Outdoor Enc.	 IP Cameras	 Megapixel Cameras	
	NICE Encoders			Third-party IP Cameras Integration		

Complete Video Surveillance Offering

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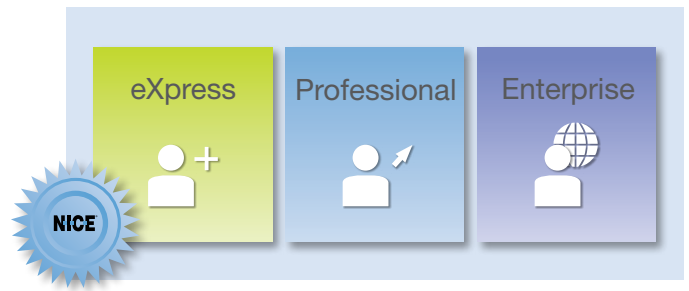
NiceVision Net PRODUCT PACKAGES

Enterprise solutions for every installation

NiceVision's Net is a next-generation, enterprise-class, open-platform IP video surveillance solution that provides coverage for security conscious environments. NiceVision has now made available customized solution packages that better address a customer's specific profile, while simplifying the entire acquisition process for our partners. More organizations can now benefit from NiceVision's enterprise class solution, no matter what their size.

Addressing the needs of our partners and customers

Security conscious organizations come in all shapes and sizes. Some are large and distributed across an entire nation, as is the case with railway organizations, while some are smaller, such as a national monument or educational institution. In both scenarios, concern for security can be of equal priority and just as critical. By providing customized solution packages, NICE and our partners can address the wide variety of customers in today's market and their desire to implement and expand solutions at their own pace.



A Market-leading solution that fits any organization

Provides enterprise-class solutions for all, with NiceVision expertise and core technology across all products

- Addresses all types and sizes of customers and installations
- Enables new business opportunities
- Offers a simplified selling process
- Creates greater up-selling opportunities with scalable and future-ready solutions
- Seamless upgrade path between product packages
- Available as software kits or turnkey solutions
- Provides a better fit to actual requirements, without having to invest in complex feature sets when unnecessary

NiceVision eXpress

Our smallest recording and management solution has been optimized for smaller sites. Perfect for initiating pilot projects, and customers such as corporate and retail facilities, educational institutions, and the banking industry, NiceVision eXpress is an enterprise-class solution for the small-scale facility or installation. Future ready and completely scalable, the eXpress package is easily upgraded at any time.

Available as a software kit or turnkey solution, NiceVision eXpress is the first step towards expanding your customer's IP video surveillance platform.

The main features of NiceVision eXpress:

- Supports up to 64 cameras & 10 users
- Single-server solution
- Integration ready (1 SDK license included)
- Offered in bundles of: 4/8/12/16/32/48/64 channels

Capturing More Opportunities

NiceVision is making it easier for you to capture more opportunities, expand your offering and increase revenues. With a simplified selling process, quoting, budget proposals and design options are now so much easier to provide. With NiceVision packages, you can better address the needs of specific target segments and more of them. Additionally, with seamless upgrading, future-ready platforms and complete scalability, up-selling opportunities increase, as does your customer's satisfaction.

NiceVision's enterprise-class next-generation IP video surveillance and security solutions are cost-effective and easily deployed for all your customers. NiceVision Net makes complete sense now and in the future.

NiceVision Professional

This recording and management solution has been tailored for mid-sized deployments. Organizations such as mass transit and critical-services facilities such as power plants, and commercial compounds will be well served by NiceVision Professional. Upgrading or expanding the Professional package is a seamless process, as the entire system has been designed to be easily expandable.

Available as a software kit or turnkey solution, NiceVision Professional main features are:

- Multi-server solution
- Supports up to 200 cameras and 20 users
- Allows multiple recording sites
- Enables both centralized and localized monitoring
- Includes optional advanced features such as:
 - Video Parameter Optimizer (VPO)
 - Advanced Video Motion Detection (AVMD)
 - Camera Tampering (CT)
 - Direct Streamlining and Multicast

NiceVision Enterprise

When a high-end recording and management solution is called for, NiceVision Enterprise is the answer. Designed for large-scale deployments, the Enterprise solution is ideal for environments such as airports, railways (freight and passenger) and city centers. Allowing an unlimited number of cameras and users, the Enterprise solution is both future-ready and scalable. Supporting all of NiceVision’s state-of-the-art value-added features, including field-proven Video Analytics, provides customers with a highly effective and robust security solution, customizable to your customer’s specific needs, NiceVision Enterprise main features include:

- Ideal for large-scale, multi-site deployments
- Supports an unlimited number of cameras and users

- Includes optional features such as:
 - Advanced resilience features
 - Field-proven Video Analytics
 - Site redundancy
 - Active directory integration
- Advanced features included in channel price as a standard:
 - Video Parameter Optimizer (VPO)
 - Advanced Video Motion Detection (AVMD)
 - Camera Tampering (CT)
 - Direct Streamlining and Multicast

Package		eXpress	Professional	Enterprise
Channels	Max video channels	64	200	Unlimited
	Audio support	✓ Audio-in only	✓	✓
	Advanced Video Tools Pack VPO, AVMD & Camera Tampering	–	✓	✓
	Advanced streaming pack Dual & Direct streaming, multicast	–	✓	✓
	SVR redundancy Licensed per source channel	–	✓	✓
	Advanced resilience pack CSS support & Redundant Recording	–	–	✓
	Video Analytics, Crowd Control & Automatic PTZ Tracking	–	–	✓
Site	Site management & recording license Including 2 users & 1 SDK licenses	eXpress Bundle	Professional Site	Enterprise Site
	Site redundancy	–	–	✓
	Active directory integration	–	–	✓
	No. of VMX displays	✓ Up to 2	✓ Unlimited	✓ Unlimited
	Software deployment tool for Smart Video Recording	–	✓	✓
	SDK support	✓	✓	✓
Users	Concurrent users	✓ Up to 10	✓ Up to 20	✓ Unlimited
	Web / Mobile client support	✓	✓	✓

✓ Included in price ✓ Optional (extra cost) – Not Available

ABOUT NICE

NICE Systems (NASDAQ: NICE), is the worldwide leader of intent-based solutions that capture and analyze interactions and transactions, realize intent, and extract and leverage insights to deliver impact in real time. Driven by cross-channel and multi-sensor analytics, NICE solutions enable organizations to improve business performance, increase operational efficiency, prevent financial crime, ensure compliance, and enhance safety and security. NICE serves over 25,000 organizations in the enterprise and security sectors, representing a variety of sizes and industries in more than 150 countries, and including over 80 of the Fortune 100 companies. www.nice.com.

ABOUT NiceVision

NiceVision helps leading organizations enhance their security operations and improve performance using intelligent digital video solutions. NiceVision integrates real-time analysis, IP networking, recording and management to enable automatic threat detection, instant verification, event resolution and effective investigation.

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NiceVision VIDEO ANALYTICS

Enhancing security effectiveness and operational efficiency

As the number of cameras deployed across a video surveillance network increases, the ability of security personnel to attentively scan all the video feeds actually decreases. Clearly, the need for an intelligent system that functions as a detection solution for the accurate, immediate identification of suspicious situations is crucial for security personnel to do their jobs effectively. Widely regarded as one of the leading players in the development and deployment of comprehensive IP video surveillance systems for proactive security management, NICE Systems offers a portfolio of field-proven Video Analytics applications that function as your system's intelligent detection solution. When expertly deployed with NICE's Professional Services teams, Video Analytics provides the clarity security organizations need for their surveillance operations.

NiceVision Video Analytics Takes Video Surveillance to The Next Level

NiceVision Video Analytics (VA) applications have been deployed and proven to perform effectively in a variety of real-life, mission critical locations, including airports, public transport hubs, and government facilities as well as commercial facilities around the world. The success and levels of performance reached with our VA deployments is in large part due to the holistic approach NICE takes in designing, delivering and then servicing our solutions. Nice achieves next-level results for our customers by knowing just how to extract the maximum — continually.

Your Smart Recorder

NiceVision's Smart Video Recorder (SVR) software can potentially turn any channel into a smart one. It also provides you with valuable flexibility when allocating VA and non-VA channels and with future expansion options. Since NiceVision's Video Analytics processing is done in the recorder, it eliminates dependency on the capabilities of any particular edge device.

- **Fully flexible** — no need to define VA channels in advance
- **Edge device agnostic** — eliminates all dependency on peripheral equipment for VA's functionality
- **One platform** — for both recording and VA processing, reducing overall cost and energy consumption
- **Simplified maintenance** — with storage and VA on the same platform
- **Future ready** — VA can be applied to any new channel
- **Implementation options** — available as both a turnkey project and software solution

The NICE Advantage

Professional services

Video Analytics reaches its full potential only when combined with a set of professional services that assure optimal results. NICE's Professional Services team helps customers set and achieve objectives, provides consulting during your system's design, handles installation and setup and fine tunes the system's performance in on-going improvement cycles ensuring that VA's potential is fully realized.

Part of a complete solution

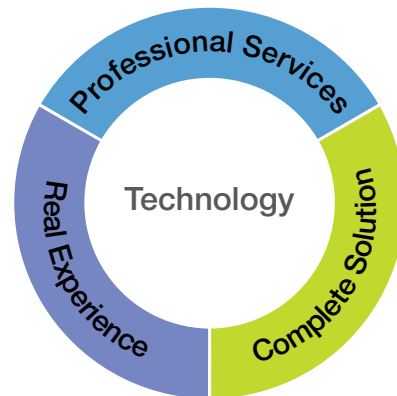
While an effective algorithm, the robustness of a system and proficiency of an implementation are vitally important to success of Video Analytics, equally important is its ability to be integrated into the larger surveillance system. All surveillance processes — from recording to investigation — are integrated with VA applications by presenting alerts, highlighting decision data, and facilitating complex surveillance operations. NICE's customers enjoy the advantages of having a single vendor for all their surveillance solution components.

Real experience

Unquestionably, Video Analytics' success depends heavily on field experience from real-life situations. NICE has delivered larger, more demanding VA projects for longer than many other vendors in the industry. Thousands of NICE's VA solutions are installed in international airports, transportation terminals, government facilities and traffic management operations throughout the world.

The technology

NICE's VA applications support any kind of analog or digital camera equipment, and without the need for a dedicated server. NICE has developed unique weather and motion filters proven to provide the most reliable results even in the harshest conditions. NICE keeps VA technology development in-house, assuring our continuous commitment to its evolution.



Visual Parameter Optimizer

Coverage for public transport infrastructure

One of the biggest challenges Public Transport operators face is securing and controlling the vast environment they operate in. Additionally, public transportation has the added challenge of safety issues and accident prevention. To address these challenges, video surveillance is widely implemented, and when applying NiceVision's VA applications it also can become a highly effective solution.

- Alerts to hazardous situations at bridges and level crossings
- Detects unauthorized personnel in tunnels and on tracks
- Provides platform crowd control
- Protects train yards, parking lots and depots
- Identifies queuing and crowding bottlenecks



Smoothing the path through airports

One of the biggest challenges facing airport operators is maintaining the highest levels of security. From monitoring critical areas to sterile zone protection and potential threat detection, almost all daily airport tasks involve security considerations. As more precautions are taken for security purposes, there is an increasing incidence of delays and crowding. This in itself poses security issues and reduces time and money spending in commercial areas, not to mention lower level of passenger satisfaction. NiceVision's video surveillance and VA applications help airport operators secure their facilities and their passenger's satisfaction.

- Provides perimeter protection
- Detects bottlenecks at security checks, gates and check-in counters
- Identifies breaches in gate security
- Indicates overcrowding throughout the terminal
- Alerts for people moving in the wrong direction in security-critical locations



First line of defense for critical infrastructure, educational and correctional facilities

Facilities like government buildings, public utility plants, and universities rely heavily on video monitoring for the early detection of potential security breaches. Intrusion detection and perimeter control is mission critical for many of these locations, being their first line of defense. NiceVision's VA applications alert security organizations in real-time to suspicious activity, allowing them to verify then allocate resources and respond immediately.

- Reports unauthorized access to secured areas
- Indicates overcrowding



Efficient resource allocation for city centers

The smart and efficient allocation of resources is absolutely necessary when tackling the problems of our busiest and most congested urban centers. By utilizing video surveillance and NiceVision's VA applications, first responders and emergency authorities can allocate the necessary resources to diffuse potential hotspots before they become problematic. With an ability to verify incoming alerts using real-time video feeds, precious resources can be conserved and additional congestion avoided.

- Alert to crowd gathering near sensitive locations
- Intrusion detection of restricted or dangerous areas
- Early notification of traffic congestion
- Monitors occupancy levels at designated locations



Securing your security systems

Camera tampering can seriously impede video capture and incident investigation and often goes undetected, especially in remote locations where you need it most. The manual inspection of large-scale video networks can be prohibitively expensive and time consuming. Detecting a problem often only happens when searching through recorded video — only to find it unusable. NiceVision's Camera Tampering Detection solution automatically identifies and alerts to problems such as camera redirection, scene too dark, scene too bright, covered camera and out-of-focus camera.

- Guarantees video image integrity for 24/7 operation
- Protects your video surveillance investment
- Supports H.264 streams



The NICE Choice

NICE solutions are effectively deployed all over the world securing international airports, transportation terminals, world monuments and government facilities. In order to provide solutions capable of effectively addressing the challenge of securing such critical operations and organizations, a company must not only have state-of-the-art technological capabilities, but the service teams to implement and operate them, along with ample experience in large scale deployments and an offering comprehensive enough to provide complete coverage. NICE offers the experience and expertise, financial stability and industry leadership that are necessary for today and for the future of your security systems. NICE Systems is not just a market leader – we are leading the way.

<p>Collaborative Event Management</p> 	<p>Control Room Management</p>  Management Workstation  Decoders  Virtual Matrix			<p>Remote Viewing</p>  PDA Client  Web Client	
<p>Video Insights</p> 	<p>Video Analyst</p>  Crowd Control  Perimeter Protection		<p>Video Applications</p>  VPO  PTZ Tracking  Camera Tampering		
<p>Multimedia Recording</p> 	<p>Smart Video Recording & Storage</p>  SVR 9000 Enterprise-Class Scalable Solution  NVS 1200 External Storage			<p>Hybrid Smart Video Recorder</p>  Hybrid ready Smart Video Recorder  Analog Expansion Board (AEB)1016	
<p>Edge Devices</p> 	<p>Encoders</p>  NVE 1008 Eight Channel Encoders  NVE 1002 Smart Indoor Encoder  NVE1002/XT/CT Smart Outdoor Encoder			<p>Third-party IP Cameras</p>  IP Cameras  Megapixel Cameras	

NiceVision Video Surveillance Portfolio

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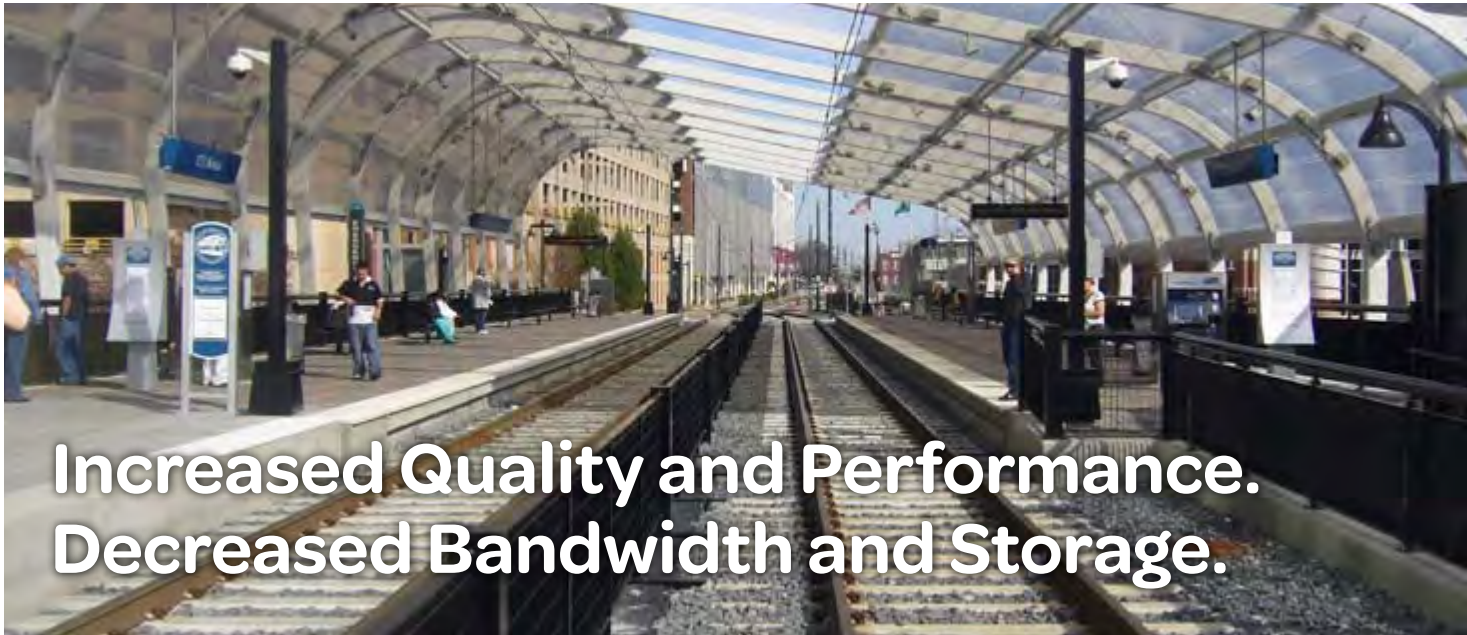
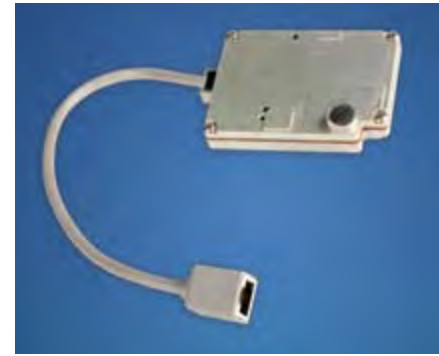
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**Increased Quality and Performance.
Decreased Bandwidth and Storage.**

Spectra® IV IP Network Dome System Now with the Power of H.264 Compression

Spectra IV IP now features H.264 compression for optimized image quality and minimized bandwidth, along with MJPEG and MPEG4 compression for the flexibility to meet various system requirements. Compared to MPEG4 compression, H.264 is more efficient for optimized video quality and minimal bandwidth consumption. And of course, Spectra® IV IP dome systems incorporate all of the features and functions of Spectra IV (including analog), while allowing you to control and monitor video over an IP network from virtually anywhere in the world. Spectra IV IP is a high-speed dome with a built-in 100Base-TX network interface for live streaming to any network application. The use of H.264 compressed video files greatly reduces storage and bandwidth requirements as compared to MJPEG and MPEG4 compression, making network video storage more affordable.



Powerful video compression for efficient bandwidth and storage.



by Schneider Electric

The Power of Spectra IV IP

Crisp, High Quality Color, Full Motion Video Over IP

Spectra IV IP allows you to view and control analog video while viewing, recording, and controlling network IP video. There is no need to abandon your current analog infrastructure if you are making the move to network video as a recording solution. Continue to monitor and control video in the analog domain while recording video in the network domain, and let Spectra IV IP's professional compression method do the work for you without the need for external encoders. And because not all compression methods are created equal, Spectra IV IP technology gives users the flexibility to select MJPEG, MPEG4, or H.264 compression.

Spectra® IV IP Series Network Dome System

H.264, Digital P/T/Z High-Speed Dome

Product Features

- Ability to Control and Monitor Video Over IP Networks
- Simultaneous Hybrid IP and Analog Video and Control
- H.264, MPEG-4, and MJPEG Compression
- Supported Protocols: TCP/IP, UDP/IP (Unicast, Multicast IGMP), UPnP, DNS, DHCP, RTP, NTP, QoS, SNMP, and RTSP, IPv4, HTTP, HTTPS, LDAP (client), SSH, SSL, SMTP, FTP, mDNS (Bonjour), and 802.1x (EAP)
- Multilevel Password Protection
- 3 Autofocus, High Resolution Integrated Camera/Optics Packages
- Horizontal Zone and Window Blanking
- Sensitivity Down to 0.00015 lux PAL; 0.00018 lux NTSC
- On-Screen Compass and Tilt Display
- Up to 2 Simultaneous Video Streams
- Web Viewing, Unlimited Simultaneous Viewers in Multicast mode; up to 16 Simultaneous Cameras in Unicast Mode
- Open IP Standards
- Bidirectional Full-Duplex Audio

Spectra IV IP features the industry's largest selection of options for any P/T/Z system, including eight models, three camera options, 15 different mounting options including standard and environmental in-ceiling and pendant, heavy duty, stainless steel and horizon. All back boxes feature built-in memory, which can be used to store camera and location-specific dome settings, including labels, presets, patterns, and zones. All cameras in Spectra IV IP dome drives feature an EXview HAD™ imager for increased sensitivity and LowLight™ technology allowing the cameras to compensate for scenes where minimal light is present.

Both the 27X and the 35X cameras feature built-in motion detection and advanced 128X wide dynamic range (WDR) that enables the system to compensate for scenes where dramatic contrasts in lighting are present. The 35X day/night camera's electronic image stabilization digitally reduces blurring of the camera image due to vibration caused by external sources, such as wind and traffic.

Web Interface

Spectra IV IP uses a standard Web browser for powerful remote setup and administration. Up to 16 cameras can be viewed on the same network with unlimited multicast viewers. Network protocols such as Secure Sockets Layer (SSL) configuration for security certificates, Secure Shell (SSH) for remote logon, and Quality of Service (QoS) for priority or guarantee data flow can be managed using a Web browser.

Systemization

Spectra IV IP easily connects to Pelco IP and hybrid systems such as Endura® version 1.5 (or later), MPEG-4; Endura version 2.0 (or later), H.264; Digital Sentry® version 4.2 (or later); DX8100 version 2.0 (or later); and DVR5100 version 1.5.4 (or later). The camera also features open architecture connectivity to third-party software. Pelco offers an application programming interface (API) for interfacing to Pelco network cameras.



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Model #: SU1000RTXL2UA

SmartOnline 1kVA On-Line Double-Conversion UPS, 2U Rack/Tower, 100/110/120V NEMA outlets

Highlights

- 1000VA / 1kVA / 800 watt on-line double-conversion 2U rack/tower UPS
- 100/110/120V +/-2% output at 50/60Hz, high efficiency economy mode option
- Expandable runtime, Hot-swappable battery modules, Installed depth of only 13.5 in / 34.3cm
- USB, RS232 & EPO ports; support for SNMP/WEB card options
- Front panel status LEDs with detailed load and battery metering
- 2 independently switchable output load banks
- NEMA 5-15P input; 5-15R outlets



Description

1000VA on-line, double-conversion UPS system for critical server, network and telecommunications equipment. 2U rackmount form factor with an installed depth of only 13.5 inches. Extended runtime available with optional BP24V15RT2U (limit 1), BP24V28-2U (limit 1) or BP24V70-3U (multi-pack compatible) external battery packs. Full-time sine wave 100, 110 or 120V output with +/-2% voltage regulation. Online, double-conversion Uninterruptible Power Supply (UPS) actively converts raw incoming AC power to DC, then re-converts output back to completely regulated, filtered AC output. Operates continuously without using battery power during brownouts to 65V and overvoltages to 150V. Highly efficient operation in optional economy mode saves BTU heat output and energy costs. NEMA 5-15P input plug; NEMA 5-15R output receptacles. Network-grade AC surge and noise suppression. Zero transfer time between AC and battery operation. Network management interfaces support simultaneous communications via USB port, DB9 serial port and SNMP/WEB CARD slot. Built-in DB9 port offers both enhanced RS-232 enabled monitoring data, plus contact closure monitoring ability. HID-compliant USB interface enables integration with built-in power management and auto shutdown features of Windows and Mac OS X. Supports simultaneous detailed monitoring of equipment load levels, self-test data and utility power conditions via all 3 network interfaces. Includes PowerAlert monitoring software and complete cabling. Emergency Power Off (EPO) interface. Integrated two-bank PDU switching supports load shedding and remote reboot of connected equipment. 3-stage metered current monitoring and battery charge status LEDs. LED display panel easily rotates for viewing in rackmount or tower configurations. Dateline surge suppression for dialup, DSL or network Ethernet connection. Utility power and voltage regulation LEDs. Audible alarm. Self-test. Fault-tolerant auto-bypass mode. 4-post rackmount accessories included; 2-9U STAND tower kit and 2-POSTRMTKITWM 2-post rack & wallmount accessories available. Field-replaceable, hot-swappable internal batteries and external battery packs. Attractive all-black color scheme. 2-year warranty and \$250,000 [connected equipment insurance](#) extended warranty and service contracts available.

Package Includes

- SU1000RTXL2Ua Online Double-Conversion UPS System
- PowerAlert Software and cabling
- Mounting hardware for 4 post rack enclosures
- Instruction manual

Features

- SmartOnline high performance UPS system is ideal for critical voice, data, medical and industrial network applications
- True on-line, double-conversion UPS provides perfectly regulated sine wave output within 2% of 100/110/120V (user selectable) under all

usage conditions

- Maintains continuous operation through blackouts, voltage fluctuations and surges with zero transfer time
- Highly efficient operation in optional economy mode setting, saving BTU heat output and energy costs
- Removes harmonic distortion, fast electrical impulses, frequency variations and other hard to solve power problems not addressed by other UPS types
- Corrects line voltage conditions as low as 65V and as high as 150V back to selectable 100/110/120V (+/-2%) values
- Standard internal battery set offers 14 minutes runtime at half load (400W) and 4.5 minutes at full load (800W)
- Extended runtime available with optional BP24V15RT2U (limit 1), BP24V28-2U (limit 1) or BP24V70-3U (no limit) external battery packs
- Compact rackmount form factor installs using only 2 rack spaces (2U) with a maximum installed depth of only 13.5 inches
- Ships with all mounting accessories for 4 post rackmount installation
- Optional 2POSTRMKITWM enables 2 post rackmount or wallmount installation
- Optional 2-9USTAND accessory enables small-footprint upright tower placement
- Fault tolerant electronic bypass maintains utility output during a variety of UPS fault conditions
- Network interfaces support simultaneous communications via built-in USB, DB9 serial / contact-closure and SNMPWEBCARD slot
- HID-compliant USB interface enables integration with built-in power management and auto shutdown features of Windows and Mac OS X
- Included PowerAlert UPS monitoring software supports safe unattended shutdown, monitoring and control via local connected servers, plus any number of additional servers over IP
- UPS interface supports on-battery, low-battery, power-restored, AC-voltage, DC-voltage, output current monitoring, battery charge current, battery capacity, AC line frequency, timed inverter shutoff, activate self-test, load bank output power control and remote reboot, UPS nominal voltage adjustment and UPS line to battery power voltage set points
- Built-in Emergency Power Off (EPO) interface with cable
- NEMA 5-15P input plug/NEMA 5-15R output receptacles
- Integrated 2 bank switched PDU enables remote outlet management for load shedding or remote reboot of individual devices (each load bank consists of one outlet)
- Front panel LEDs offer current monitoring and battery charge level information
- UPS ships fully assembled in full compliance with DOT regulations, no time consuming connection of internal batteries by user required
- Single line TEL/DSL or network Ethernet line surge suppression
- 2 year manufacturer's product warranty, \$250,000 [Ultimate Lifetime Insurance](#)

Specifications

OUTPUT	
Output Volt Amp Capacity (VA)	1000
Output kVA capacity (kVA)	1
Output Watt Capacity (watts)	800
Output power factor	0.8
Crest Factor	3:1
Nominal Output Voltage(s) Supported	100V; 110V; 120V
Nominal Voltage details	120V default
Frequency compatibility	50 / 60 Hz
Frequency compatibility details	Output frequency matches input nominal on startup, defaults to 60 Hz on cold-start
Output voltage regulation (line mode)	+/- 2%
Output voltage regulation (Economy line mode)	+/- 10%

Output voltage regulation (Battery mode)	+/- 2%
Built-in UPS output receptacles	6 5-15R outlet(s)
Built-in controllable switched load banks	Two switchable single-outlet 5-15R load banks
Output AC waveform (AC mode)	Sine wave
Output AC waveform (battery mode)	Pure Sine wave
INPUT	
Rated input current (at maximum load)	8.6A
Nominal Input Voltage(s) Supported	100V AC; 110V AC; 120V AC
UPS input connection type	5-15P
Input circuit breaker	15A
UPS Input cord length (ft.)	10
UPS Input cord length (m)	3
Recommended Electrical Service	15A 120V
BATTERY	
Full load runtime (minutes)	4.5 min. (800w)
Half load runtime (minutes)	14 min. (400w)
Expandable battery runtime	Extended runtime supported via optional external battery packs
External battery pack compatibility	BP24V15RT2U (limit 1); BP24V28-2U (limit 1); BP24V70-3U (multi-pack compatible)
DC system voltage (VDC)	24
Battery recharge rate (included batteries)	Less than 6 hours from 10% to 80%
Replacement battery cartridge (internal UPS battery replacement)	RBC92-2U
Battery Access	Front panel battery access door
Battery replacement description	Hot-swappable, user replaceable batteries
VOLTAGE REGULATION	
Voltage regulation description	Online, double-conversion power conditioning

Overvoltage correction	2% output voltage regulation during overvoltages to 150
Undervoltage correction	2% output voltage regulation during undervoltages to 80
Severe undervoltage correction	2% output voltage regulation during undervoltages to 65 (under 70% load only)
LEDS ALARMS & SWITCHES	
LED Indicators	14 LEDs indicate line power, online mode, economy/bypass mode, on-battery, overload, battery low, replace battery and fault status information; 4-LED meter displays load and battery charge levels; LED panel rotates for viewing in rack/tower formats
Alarms	Audible alarm indicates UPS startup, power-failure, low-battery, overload, UPS fault and remote shutdown conditions
Alarm cancel operation	Power-fail alarm can be silenced using alarm-cancel switch
Switches	2 switches control off/on power status and alarm-cancel/self-test operation
SURGE / NOISE SUPPRESSION	
UPS AC suppression joule rating	510
UPS AC suppression response time	Instantaneous
UPS Dataline suppression	1 line TEL/DSL (1 in / 1 out); 10/100Base T Ethernet
EMI / RFI AC noise suppression	Yes
PHYSICAL	
Installation form factors supported with optional accessories	2 post rackmount (2POSTRMKITWM); Wallmount (2POSTRMKITWM); Tower (2-9USTAND)
Primary form factor	Rackmount
UPS / Power Module dimensions in primary form factor (height x width x depth / inches)	3.5 x 17.5 x 13.5
UPS / Power Module dimensions in primary form factor (height x width x depth / cm)	8.9 x 44.4 x 34.3
Installed whole system total rack space height (rack spaces)	2U
Secondary form factor	Tower (requires 2-9USTAND)
UPS / Power Module weight (lbs)	29
UPS / Power Module weight (kg)	13.2
UPS Shipping dimensions (height x width x depth / inches)	9.5 x 20 x 24

UPS Shipping dimensions (height x width x depth / cm)	24.1 x 50.8 x 61
Shipping weight (lbs)	41
Shipping weight (kg)	18.6
UPS housing material	Steel
Cooling method	Fan
ENVIRONMENTAL	
Operating Temperature Range	+32 to +104 degrees Fahrenheit / 0 to +40 degrees Celsius
Storage Temperature Range	+5 to +122 degrees Fahrenheit / -15 to +50 degrees Celsius
Relative Humidity	0 to 95%, non-condensing
AC mode BTU / hr. (full load)	406.4
AC economy mode BTU / hr. (full load)	173.6
Battery mode BTU / hr. (full load)	442.8
AC economy mode efficiency rating (100% load)	94%
COMMUNICATIONS	
Communications interface	USB (HID enabled); DB9 Serial; Contact closure; EPO (emergency power off); Slot for SNMP/Web interface
Network monitoring port description	Supports detailed monitoring of UPS and site power conditions; DB9 port supports RS232 and contact closure communications
PowerAlert software	Included
Communications cable	USB and DB9 cabling included
WatchDog compatibility	Supports Watchdog application, OS and hard-reboot restart options for remote applications
LINE / BATTERY TRANSFER	
Transfer time	No transfer time (0 ms.) in online, double-conversion mode
Low voltage transfer to battery power (setpoint)	80V (100% load), 65V (
High voltage transfer to battery power (setpoint)	150
SPECIAL FEATURES	
Cold Start (startup in battery mode during a power failure)	Cold-start operation supported
High availability UPS features	Automatic inverter bypass; Hot swappable batteries

Green & high efficiency features	High efficiency economy mode operation; Individually controllable load banks; Schedulable daily hours of economy mode operation
CERTIFICATIONS	
UPS Certifications	Tested to UL1778 (USA); Tested to CSA (Canada); Meets FCC Part 15 Category B (EMI)
WARRANTY	
Product Warranty Period (U.S., Canada & Puerto Rico)	2-year limited warranty
Connected Equipment Insurance (U.S., Canada & Puerto Rico)	\$250,000 Ultimate Lifetime Insurance

Related Items

Optional Products

Product Type	Related Model	Description	Qty.
SNMP Accessories	SNMPWEBCARD	For remote monitoring and control via SNMP, Web, or Telnet.	-
SNMP Accessories	ENVIROSENSE	Monitors temperature, humidity and contact-closure inputs. (Requires SNMPWEBCARD or switched PDU.)	-
UPS Accessories	RELAYIOCARD	Programmable Relay I/O Card	-
UPS Accessories	MODBUSCARD	For remote monitoring and control via MODBUS protocol	-
Shutdown Cable Kits	AS400CABLE KIT	Power Management Tools - UPS Communication Cable Kit for System i / AS400 / iSeries Servers	-
Tower Stands	2-9USTAND	Enables Tower Placement of Rackmount UPS Systems	-
Rackmount/Wallmount Kits	2POSTRMKITWM	Enables 2-Post Rackmount or Wallmount Installation of Select Rackmount UPS Systems	-
External Battery Packs	BP24V15RT2U	BP24V15RT2U - External Battery Pack for UPS System	-
External Battery Packs	BP24V28-2U	BP24V28-2U - External Battery Pack for UPS System	-
External Battery Packs	BP24V70-3U	BP24V70-3U - External Battery Pack for UPS System	-
Extended Warranties	WEXT3-500-1500	3-Year Extended Warranty - For Smart Line-Interactive and Online Tower or Rack models, 1500VA or less	-
Extended Warranties	WEXT5-500-1500	5-Year Extended Warranty - For Smart Line-Interactive and Online Tower or Rack models, 1500VA or less	-
Power Distribution	PDUB15	Dual source Power Distribution Unit / PDU with Manual Transfer Switch enables Hot-swappable UPS Replacement in Critical Network Applications	-
Power Distribution	PDU1215	Basic PDU / Power Distribution Unit - Safe, reliable power distribution for critical networking equipment	-
Power Distribution	PDUNV	Basic PDU / Power Distribution Unit - Safe, reliable power distribution for critical networking equipment	-
Power Distribution	PDUV15	Safe, reliable power distribution for critical networking equipment	-
Power Distribution	PDUMH15	Metered PDU / Power Distribution Unit - Safe, reliable power distribution with digital current meter	-
Power Distribution	PDUMV15	Metered PDU / Power Distribution Unit - Safe, reliable power distribution with digital current meter	-
Power Distribution	PDUMH15AT	Metered PDU with ATS - Power Distribution Unit with dual-input Auto Transfer Switching	-

Power Distribution	PDUMNH15	Monitored PDU / Power Distribution Unit supports real-time remote monitoring of load level, voltage and frequency with options for remote environmental and security monitoring	-
Power Distribution	PDUMNV15	Monitored PDU / Power Distribution Unit supports real-time remote monitoring of load level, voltage and frequency with options for remote environmental and security monitoring	-
Power Distribution	PDUMH15ATNET	Switched, Metered PDU with ATS - Power Distribution Unit with dual-input Auto Transfer Switching, individual outlet control and remote network interface	-
Power Distribution	PDUMV15NET	Switched, Metered PDU with Remote Monitoring - 0U Vertical Rackmount Power Distribution Unit for Networks with Individually Switchable Outlets, Current Metering, Remote Monitoring and Control	-
Power Cables	P007-002	2-ft. Heavy-Duty 14AWG Power cord (IEC-320-C13 to NEMA 5-15P)	-
Power Cables	P007-006	6-ft. Heavy-Duty 14AWG Power cord (IEC-320-C13 to NEMA 5-15P)	-
Power Cables	P007-010	10-ft. Heavy-Duty 14AWG Power cord (IEC-320-C13 to NEMA 5-15P)	-
Power Cables	P010-012	12-ft. 18AWG Power cord (NEMA 5-15P to IEC-320-C13)	-
Power Cables	P022-001	1-ft. 18AWG Power Extension cord (NEMA 5-15R to NEMA 5-15P)	-
Power Cables	P023-001	1-ft. 14AWG Power Adapter cord (NEMA L5-15R to NEMA 5-15P)	-
Power Cables	P034-010	10-ft. 14AWG Heavy Duty Power cord (IEC-320-C19 to NEMA 5-15P)	-

More information, including related products, owner's manuals, and additional technical specifications, can be found online at www.tripplite.com/en/products/model.cfm?txtModelID=2948.

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VIP-480L IP Paging Horn

INTRODUCTION

The VIP-480L IP Paging Horn is a self contained paging system which enables voice paging up to 1200 feet from an Ethernet connection. The VIP-480L consist of a high efficiency 3 Watt Class-D Horn and a VIP-LLE Network Extender allowing stand alone capability when used with a SIP Phone System or can be accessed from a variety of Valcom managed VoIP products.



SPECIFICATIONS

Access Methods

- PBX, FXO Port w/VIP-811
- POTS telephone set w/VIP-811
- PBX, FXS Port w/VIP-821
- Valcom M Cast Page Group
- SIP

Features

- RJ-45 network connection
- LED Status Indicator
- Network activity LEDs
- 802.3af compliant
- High Efficiency Class-D 3 Watt Amplifier

Dimensions/Weight (HORN)

- 6.8"H x 8.3"W x 3.3" D
(17.3cm H x 21.1cm W x 8.4cm D)
- 2.1 lbs. (0.95 kg)

Network Extender (VIP-LLE)

- 1.30" H x 6.10" W x 6.00" D
(3.51 cm H x 15.72 cm W x 13.51 cm D)
- Weight: 0.85 lbs. (0.39 kg)

Nominal Specifications – HORN

Input Impedance: 600 Ohms
 Input Level: -10dBm
 Output Impedance: 600 Ohms
 Output Level: -10dBm nominal

Nominal Specifications – VIP-LLE

Via 802.3af PoE Ethernet Switch:
 Class 3 (12.95W)

Environment

Temperature: 0 to +40° C
 Humidity: 0 to 85% non-precipitating

Packing List

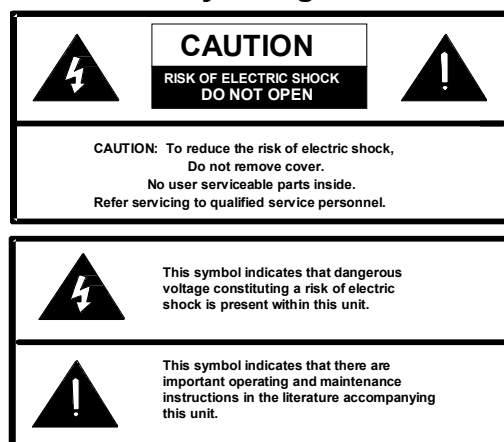
Qty	Item
1	VIP-LLE Network Extender
1	3 Watt High Efficiency Horn
1	VSP Document
2	Mounting Brackets
1	VIP Quick Start Guide
4	Rubber Feet
4	Wood Screws
1	RJ-45 Termination Block
1	RJ-45 Patch Cable
1	"C" Clamp

INSTALLATION

FCC Information

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area may cause harmful interference in which case the user will be required to correct the interference at his own expense.

Precautionary Designations



Mounting (VIP-LLE)

The VIP-LLE Network Extender is designed for wall or shelf mounting and must be within 300 feet of the network switch.

Shelf: Provided with the VIP-LLE Network Extender are four rubber stick on feet. Peel these feet off their carrier backing and place at the four corners of the bottom of the unit.

Wall: Using the brackets and wood screws provided, secure the VIP-LLE Network Extender to the wall.

Mounting (HORN)

FLUSH MOUNT

Using the template packaged with the speaker, draw the speaker outline on the wall to be cut. Make appropriate wiring connections and test the speaker for operation. Using appropriate mounting screws (not furnished) drill and mount the flange as shown.

UNIVERSAL BRACKET

Loosen or separate the universal bracket leaves by loosening or removing the handle and hardware. Using the back leaf as a template, mark the wall through the mounting holes, drill and mount to the wall using appropriate screws (not furnished) or mount directly to a junction box. Mount the T-bracket to the back of the horn as shown using the (2) ½ inch screws provided.

“C” CLAMP FOR “I” BEAM MOUNTING

A “C” clamp is provided with the horn to allow mounting to a beam. Place the bolt through the hole in the bottom of the base to secure the “C” clamp to the beam. It is suggested that the horn be mounted to the underside of the “I” beam to provide maximum positioning adjustments. Mount (2) ½ inch screws provided.

Interconnections

The only method of powering a VIP-480L IP Paging Horn is via a power over Ethernet switch or power injector meeting the 802.3af specification.

Make all required signal connections before connecting to Ethernet switch or power injector meeting the 802.3af specification. Power is supplied to the horn assembly via the VIP-LLE Network Extender.

Network Connection (Fig. 1)

The VIP-LLE Network Extender has one CAT-5 RJ-45 "NETWORK" connector and one CAT-5 color-coded connector on the rear panel.

Use the supplied CAT-5 patch cable to connect the NETWORK connector of the VIP-LLE Network Extender to a 802.3af compliant PoE port (300 feet maximum distance).

Signal Connections (Fig. 1)

Connect CAT-5 cable from the rear panel color coded connector of the VIP-LLE Network Extender to the supplied RJ-45 terminal block (900 feet maximum distance). Using the supplied CAT-5 patch cable to connect to RJ-45 connector to horn to RJ-45 termination block.

Status Indicator Lights

The VIP-LLE Network Extender has 3 status indication lights:

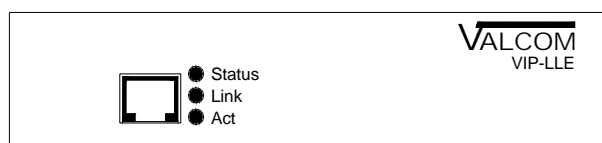
STATUS: Flashes during normal operation, and solid when unit in reset.

LINK: Indicates 100 Mbit Ethernet connection when illuminated. No activity indicates 10 Mbit connection.

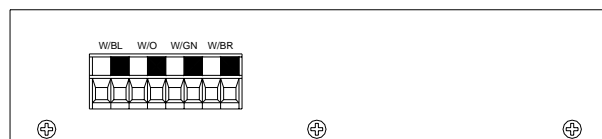
ACT: Indicator flashes to indicate network activity.

Operation:

Provides paging from SIP connection or from another Valcom VIP unit. Interface to customer telephone system can be via SIP registration, FXO port (with VIP-811), or FXS port (with VIP-821).



Front View



Rear View

TECHNICAL ASSISTANCE

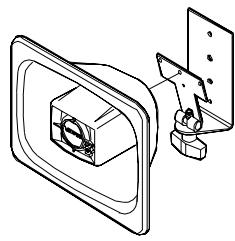
Assistance in troubleshooting is available from the factory. Call (540) 563-2000 and press 1 for Technical Support or via email at support@valcom.com.

When requesting assistance, you should include all available information. It is strongly suggested that you go to the web site and follow the trouble resolution procedure at <http://voip.valcom.com>.

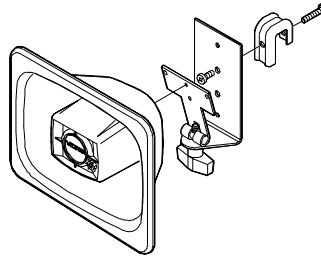
Valcom equipment is not field repairable. Valcom, Inc. maintains service facilities in Roanoke, VA. Should repairs be necessary, attach a tag to the unit clearly stating your company name, address, phone number, contact person and the nature of the problem. Send the unit to:

Valcom, Inc.
Repair & Return Dept.
5614 Hollins Road
Roanoke, Va. 24019-5056

UNIVERSAL BRACKET

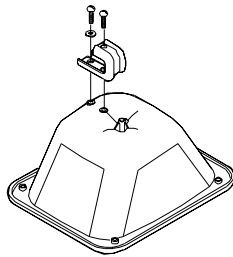


SURFACE MOUNTED WITH A UNIVERSAL MOUNTING BRACKET

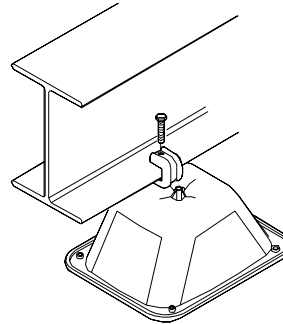


UNIVERSAL BRACKET WITH CLAMP

"C" CLAMP FOR "I" BEAM MOUNTING

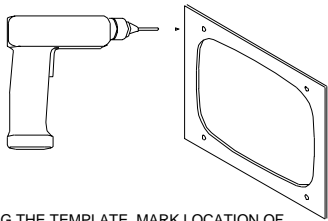


ATTACH CLAMP TO HORN

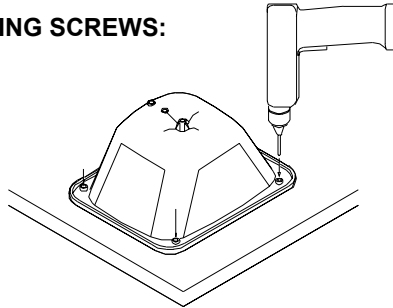


ATTACH FLEXHORN TO BEAM

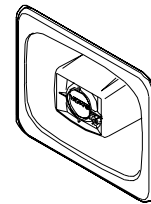
FLUSH MOUNT USING MOUNTING SCREWS:



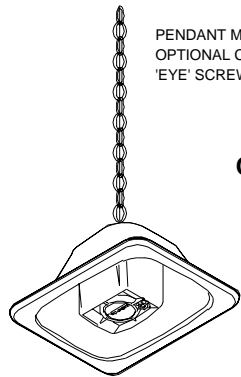
USING THE TEMPLATE, MARK LOCATION OF OPENING AND MOUNTING HOLES ON WALL. DRILL HOLES APPROPRIATE TO MOUNTING HARDWARE AND CUT OUT THE OPENING.



HOLDING FLEXHORN FIRMLY AGAINST A FLAT SURFACE, DRILL THROUGH EACH MOUNTING BOSS AS SHOWN.

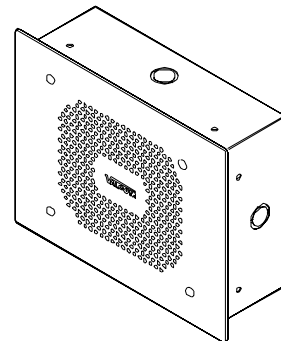


FLUSH MOUNTING IN A STUD WALL INSTALLED WITH MOUNTING SCREWS OR CONSTRUCTION CEMENT.



PENDANT MOUNTING WITH OPTIONAL CHAIN AND 'EYE' SCREW

OTHER MOUNTING OPTIONS:



OPTIONAL V-9805 VANDAL RESISTANT ENCLOSURE

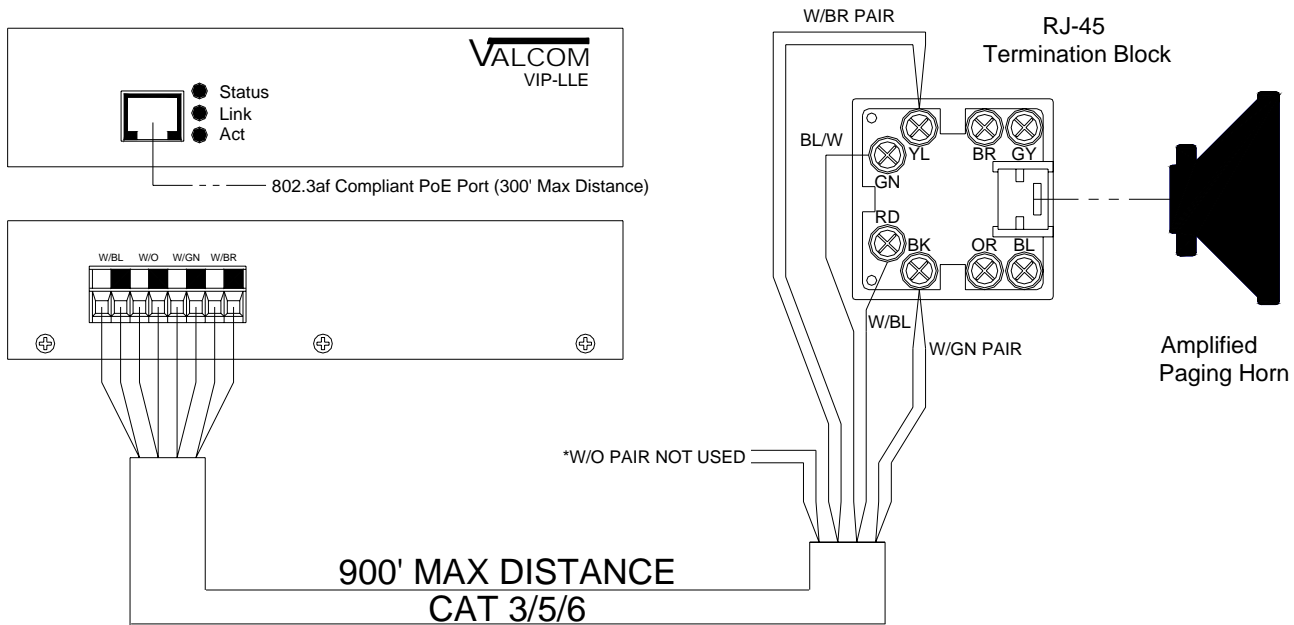


FIGURE 1

VALCOM LIMITED WARRANTY

Valcom, Inc. warrants its products to be free from defects in materials and workmanship under conditions of normal use and service for a period of one year from the date of shipment. The obligation under this warranty shall be limited to the replacement, repair or refund of any such defective device within the warranty period, provided that:

1. inspection by Valcom, Inc. indicates the validity of the claim;
2. the defect is not the result of damage, misuse, or negligence after the original shipment;
3. the product has not been altered in any way or repaired by others and that factory sealed units are unopened (a service charge plus parts and labor will be applied to units defaced or physically damaged);
4. freight charges for the return of products to Valcom are prepaid;
5. all units 'out of warranty' are subject to a service charge. The service charge will cover minor repairs (major repairs will be subject to additional charges for parts and labor).

This warranty is in lieu of and excludes all other warranties, expressed or implied and in no event shall Valcom, Inc. be liable for any anticipated profits, consequential damages, loss of time or other losses incurred by the buyer in connection with the purchase, operation, or use of the product.

This warranty specifically excludes damage incurred in shipment. In the event a product is received in damaged condition, the carrier should be notified immediately. Claims for such damage should be filed with the carrier involved in accordance with the F.O.B. point.

Headquarters:
 Valcom, Inc.
 5614 Hollins Road
 Roanoke, VA 24019-5056
 Phone: (540) 563-2000
 FAX: (540) 362-9800

NETWORKED PAGE ZONE EXTENDER MODEL VIP-801

FEATURES:

- 1 Audio Output
- 1 Audio Input
- 2 Form C Relay Contacts
- 1 Contact Closure Input
- RJ-45 For Network Connection
- Front Panel Activity LED
- Provides Audio For Up To 150 Valcom One-way Amplified Speaker Assemblies
- Aux Audio Input Via RCA Jack
- Contact Closure Or VOX Operation Of Audio Input
- Removable Screw Terminal Connector Provided For Audio And Relay Interface
- Page With Music Output, Music Mutes During Page
- Output Control Contact Closure Provided During Paging Output
- Compatible With 25 Or 70 Volt Amplifiers
- 2.5mm Jack For DC power
- Power over Ethernet 802.3af Compliant
- No Server Required
- 1 to 11 Digit Dial Plans
- Easy Windows Based Setup



DESCRIPTION:

The VIP-801 Networked Page Zone Extender enables voice access to one zone of one-way paging over an IP-based LAN/WAN. This allows page zone extension anywhere on the network. Multiple VIP-801 Networked Page Zone Extenders can be used on the same network to create very large and distributed public address systems.

Example applications include: Multiple floors in a single building, Multiple buildings in a campus environment, City wide paging of all Fire & Rescue buildings, Interstate paging between bank branches.

SPECIFICATIONS:

Nominal Specifications

Input Impedance: 600 Ohms
Input Level: -10dBm nominal
Voice Switch Sensitivity: -21dBm
Music Source Input Impedance: 8 to 600 Ohms
Music Input Level: -10dBm nominal
Output Impedance: 50 Ohms
Output Level: -10dBm nominal
Relay Current: 1 AMP @ 24VDC
Protocols: DHCP, IGMP v3, UDP, TCP, HTTP, Telnet, FTP
Voice Algorithm:
G.711 (64kbts/s) (ulaw)
Echo Suppression

Nominal Power Requirements

Via back panel barrel connector:
Voltage: 24VDC
Current: 325mA
Via 802.3af PoE Ethernet Switch:
802.3af: Class 3

Environment

Temperature: +32 to +104 °F (0 to +40 °C)
Humidity: 0 to 85% non-precipitating

Dimensions/Weight

1.38" H x 6.22" W x 5.75" D
(3.51 cm H x 15.80 cm W x 14.61 cm D)
Weight: 1.75 lbs. (0.80 kg)

ARCHITECTS' AND ENGINEERS' SPECIFICATIONS
MODEL VIP-801
NETWORKED PAGE ZONE EXTENDER

The Networked Page Zone Extender Model VIP-801 will provide a single 10/100 Ethernet port, 1 audio input/output circuits, one contact closure input and 2 N.O./N.C. relay contact outputs. The Networked Page Zone Extender Model VIP-801 will provide all circuitry and software to convert network data to zone page audio output. The Networked Page Zone Extender Model VIP-801 will provide all circuitry and software to convert input audio to zone page audio and control information suitable for transmission to other Valcom IP Solutions products over a data network. The Networked Page Zone Extender Model VIP-801 shall form one part of a serverless Network based communications system.

The Networked Page Zone Extender Model VIP-801 shall be powered via either an external 24 Vdc power supply or via a 802.3af PoE Ethernet switch port.

All setup and configuration of the Networked Page Zone Extender Model VIP-801 will be via the Valcom VIP- 102 IP Solutions Setup Tool.

The Networked Page Zone Extender Model VIP-801 shall be constructed of steel and be wall or table mountable.

The maximum dimensions shall be: 1.38" H x 6.22" W x 5.75" D (3.51 cm H x 15.80 cm W x 14.61 cm D). Shipping Weight shall be approximately: 1.75 lbs. (0.80 kg).

Limited Warranty

Valcom, Inc. warrants its products to be free from defects in materials and workmanship under conditions of normal use and service for a period of one year from the date of shipment. The obligation under this warranty shall be limited to the replacement, repair or refund of any such defective device within the warranty period, provided that:

1. inspection by Valcom, Inc. indicates the validity of the claim,
2. the defect is not the result of damage, misuse, or negligence after the original shipment,
3. the product has not been in any way repaired by others and that factory sealed units are unopened.
(A service charge plus parts and labor will be applied to units defaced or physically damaged).
4. freight charges for the return of products to Valcom, Inc. are prepaid,
5. all units "out of warranty" are subject to a service charge. The service charge will cover minor repairs
(major repairs will be subject to additional charges for parts and labor).

This warranty is in lieu of and excludes all other warranties expressed or implied, and in no event shall Valcom, Inc. be liable for any anticipated profits, consequential damages, loss of time or other losses incurred by the buyer in connection with the purchase, operation or use of the product.

This warranty specifically excludes damage incurred in shipment. In the event a product is received in damaged condition, the carrier should be notified immediately. Claims for such damage should be filed with the carrier involved in accordance with the F.O.B. point.

5614 Hollins Road Roanoke, Virginia 24019 Phone: 540-563-2000 Fax: 540-362-9800
E-Mail: support@valcom.com www.valcom.com

ANCHOR BOLTS

Anchor Bolts are fabricated from carbon steel bar conforming to AASHTO M314 Grade-55 or ASTM F1554 Grade-55. Bolts have an “L” bend on one end and are galvanized a minimum of 12 inches on the threaded end. Four anchor bolts are provided per pole. Each anchor bolt is furnished with two hex nuts and two flat washers.

ANCHOR BASE

The anchor base (base plate) is fabricated from structural quality hot rolled carbon steel plate conforming to ASTM A36. The base plate telescopes the pole shaft and is circumferentially welded top and bottom. The base is provided with a slotted anchor bolt opening that enables a range of bolt circles to be utilized. The pole chart information lists bolt circle ranges for each pole type.

POLE SHAFT

The pole shaft is fabricated from weldable grade hot rolled commercial quality carbon steel and is supplied in 11 gauge (0.1196") or 7 gauge (0.1793") material thickness having a guaranteed minimum yield strength of 55,000 psi. Shafts are of one-piece construction with a full length longitudinal high frequency electric resistance weld. The shaft is uniformly square in cross section with flat sides, rounded corners (.75" per corner), and no taper.

HANDHOLE

The reinforcing handhole rim consists of a rectangular shaped tubing material having a nominal 2.5" x 5" opening. It is provided with a steel attachment bar, steel cover, and one round head machine screw. The handhole is welded in the pole shaft and is located 1'-6" above the base.

ELECTRICAL GROUND

A nut holder is provided near the handhole and includes a 0.5"-13 UNC hex head bolt and nut.

FULL BASE COVER (STANDARD)

The standard full base cover is fabricated from ABS plastic. It is a two-piece cover secured together with two plastic hand push rivets.

POLE TOP CAP (STANDARD)

A removable top cap is provided and is used in conjunction with drilled pole shafts for accommodation of a direct mounted luminaire arm attachment.

POLE TOP TENON (OPTIONAL)

Pole top tenons are fabricated from structural quality hot rolled carbon steel with a guaranteed minimum yield strength of 30,000 psi. A pole top plate and tenon of weldable grade hot rolled commercial quality carbon steel is circumferentially welded to the top of the pole shaft. This plate provides an internal weather resistant wiring raceway into the pole top tenon. Standard sizes are of either 2.38" O.D. x 4" long (P2) or 4" O.D. x 6" long (P4) steel tubing.

STANDARD FINISH

Standard finishes available are galvanized, prime coat (powder), and finish coat (powder). For information regarding the scope and application of these coatings please refer to page 5.

FASTENING HARDWARE

All structural fasteners are galvanized high strength carbon steel. All other fasteners are galvanized or zinc plated carbon steel or stainless steel.

DESIGN

The standards shown in this section are designed to withstand dead loads and theoretical dynamic loads developed by variable wind speeds,

as charted, with an appropriate gust factor under the following conditions:

The wind velocities are based on 10 mph increments from 80 mph through 100 mph (reference wind map). Standards to be located in areas of known abnormal conditions require special consideration. For example: coastal areas, airports, and areas of special winds such as the Chinook Winds along the eastern slope of the Rocky Mountains.

Standards are designed for ground mounted applications. Standards mounted on structures (such as bridges and buildings) also necessitate special consideration requiring Valmont's recommendation.

Height correction factors and drag coefficients are applied to the entire structure. An appropriate safety factor is maintained based on the minimum yield strength of the material incorporated in the standard.

Valmont Industries, Inc. reserves the right to install various, engineer approved, material hanging accommodations to facilitate the manufacturing process. If this method is not acceptable, Valmont Industries, Inc. must be notified by the customer prior to manufacturing.

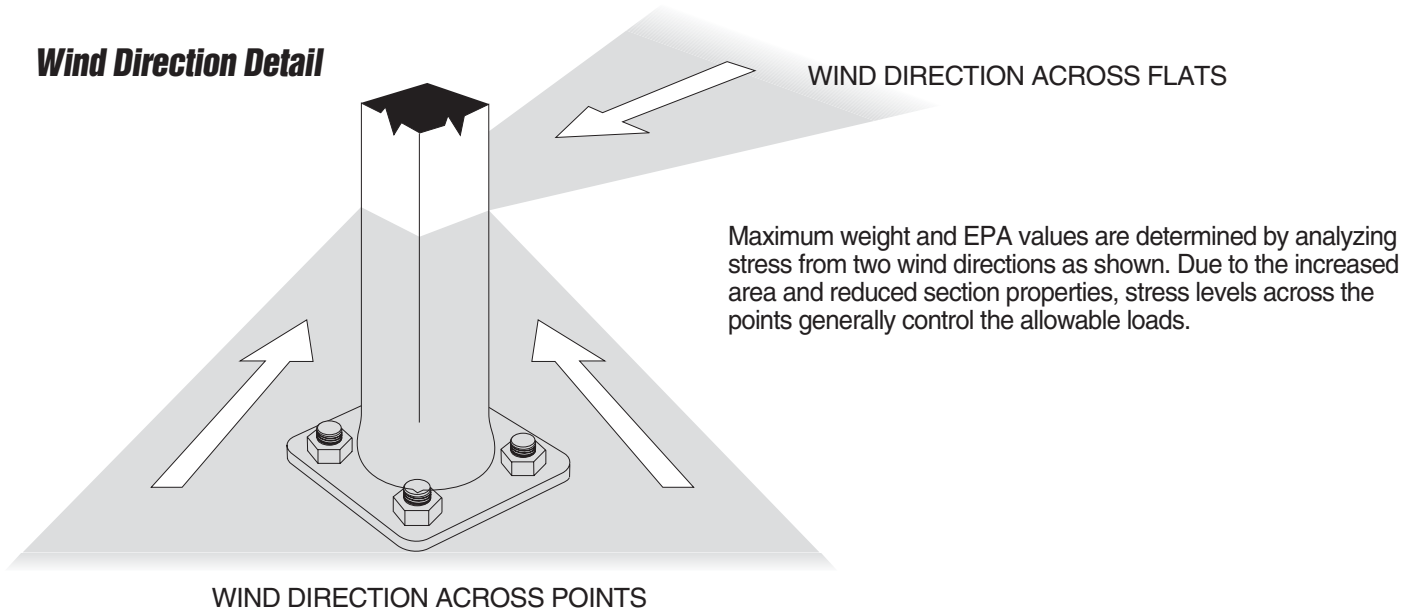
FATIGUE RESISTANT PRODUCT

This product was specially designed to reduce the effects of fatigue in the welded connection between the pole shaft and base plate. Square poles, by the very nature of their shape, are more susceptible to fatigue at this critical joint than in any other geometric pole shape or design. By flaring out the shaft, and creating a round section at this critical welded connection point, the stress and resulting fatigue occurring at this point is more evenly distributed and thus enhances the structures longevity and overall performance.

Nominal Mounting Height (ft)	Shaft				Pole Base				Anchor Bolts	80MPH w/1.3 Gust		90MPH w/1.3 Gust		100MPH w/1.3 Gust	
	Designation Number	Base O.D. (in)	Wall Thk. (ga)	Struct. Weight (lbs)	Bolt Circle		Square (in)	Thk. (in)	Dia. x Lngth. x Hk. (in)	Max. EPA (ft ²)	Max. Weight (lbs)	Max. EPA (ft ²)	Max. Weight (lbs)	Max. EPA (ft ²)	Max. Weight (lbs)
10	400Q100	4.00	11	75	8.5	0.5	8.25	0.75	.75 x 17 x 3	30.6	765	23.8	595	18.9	473
12	400Q120	4.00	11	90	8.5	0.5	8.25	0.75	.75 x 17 x 3	24.4	610	18.8	470	14.8	370
14	400Q140	4.00	11	100	8.5	0.5	8.25	0.75	.75 x 17 x 3	19.9	498	15.1	378	11.7	293
16	400Q160	4.00	11	115	8.5	0.5	8.25	0.75	.75 x 17 x 3	15.9	398	11.8	295	8.9	223
18	400Q180	4.00	11	125	8.5	0.5	8.25	0.75	.75 x 17 x 3	12.6	315	9.2	230	6.7	168
20	400Q200	4.00	11	140	8.5	0.5	8.25	0.75	.75 x 17 x 3	9.6	240	6.7	167	4.5	150
	500Q200	5.00	11	185	11.0	1.0	11.00	1.00	.75 x 17 x 3	17.7	443	12.7	343	9.4	235
	500W200	5.00	7	265	11.0	1.0	11.00	1.00	.75 x 17 x 3	28.1	703	21.4	535	16.2	405
25	400Q250	4.00	11	170	8.5	0.5	8.25	0.75	.75 x 17 x 3	4.8	150	2.6	100	1.0	50
	400W250	4.00	7	245	8.5	0.5	8.25	0.88	.75 x 17 x 3	10.8	270	7.7	188	5.4	135
	500Q250	5.00	11	225	11.0	1.0	11.00	1.00	.75 x 17 x 3	9.8	245	6.3	157	3.7	150
	500W250	5.00	7	360	11.0	1.0	11.00	1.00	.75 x 17 x 3	18.5	463	13.3	333	9.5	238
30	400W300	4.00	7	291	8.5	0.5	8.25	0.75	.75 x 17 x 3	6.7	168	4.4	110	2.6	65
	500Q300	5.00	11	265	11.0	1.0	11.00	1.00	.75 x 17 x 3	4.7	150	2.0	50	-	-
	500W300	5.00	7	380	11.0	1.0	11.00	1.00	.75 x 17 x 3	10.7	267	6.7	167	3.9	100
	600W300	6.00	7	520	12.0	1.0	12.50	1.00	1.00 x 36 x 4	19.0	475	13.2	330	9.0	225
35	500W350	5.00	7	440	11.0	1.0	11.00	1.00	.75 x 17 x 3	5.9	150	2.5	100	-	-
	600W350	6.00	7	540	12.0	1.0	12.50	1.00	1.00 x 36 x 4	12.4	310	7.6	190	4.2	105
40	600W400	6.00	7	605	12.0	1.0	12.50	1.00	1.00 x 36 x 4	7.2	180	3.0	75	-	-

DS330 NOTES:

1. All designs provided with 2.5" x 5" nominal handhole.
2. Structure weight is a nominal value which includes the pole shaft and base plate only.
3. Maximum weight and EPA values are based on side mounted fixtures only. Consult Valmont on loading criteria for pole top mounted luminaires and/or brackets.



Valmont is widely recognized throughout the industry as the leader in product design.

The DS330 square steel lighting pole is just another example why.

INCREASED PERFORMANCE

The unique bell-shaped base minimizes the effects of pole vibration by improving the fatigue performance of the shaft to base plate connection.

HOW WE DID IT

We evenly distributed the stress by flaring out the bottom 4" of the pole shaft and creating a round section at the critical welded connection point.

UPDATED EXTERIOR DESIGN

The DS330's rounded corners match many of today's softer corner fixture styles.

ENDLESS CHOICE OF COLORS

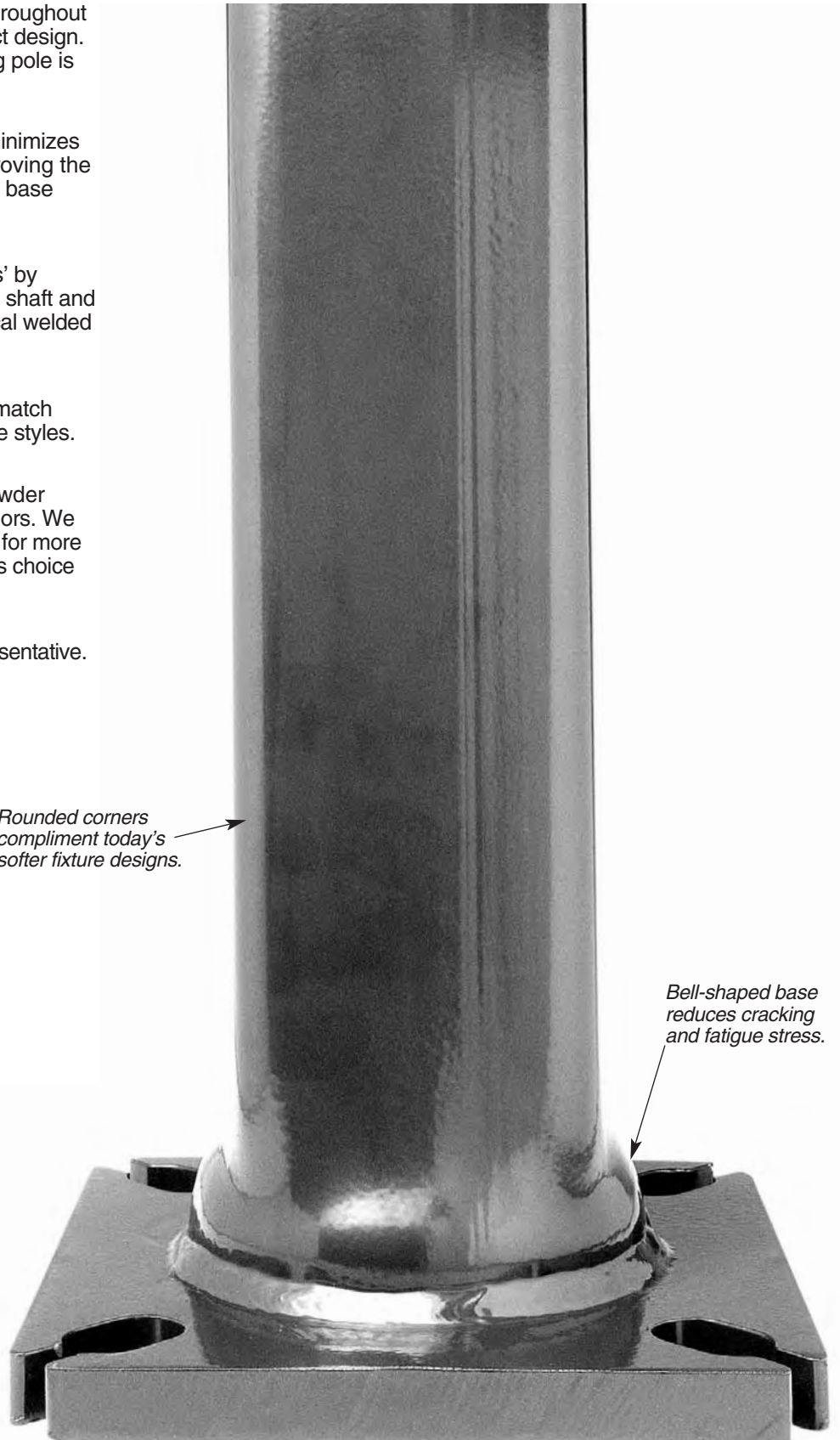
Valmont delivers top quality powder coatings in an endless choice of colors. We can match any color you need. Call for more information about Valmont's endless choice of colors.

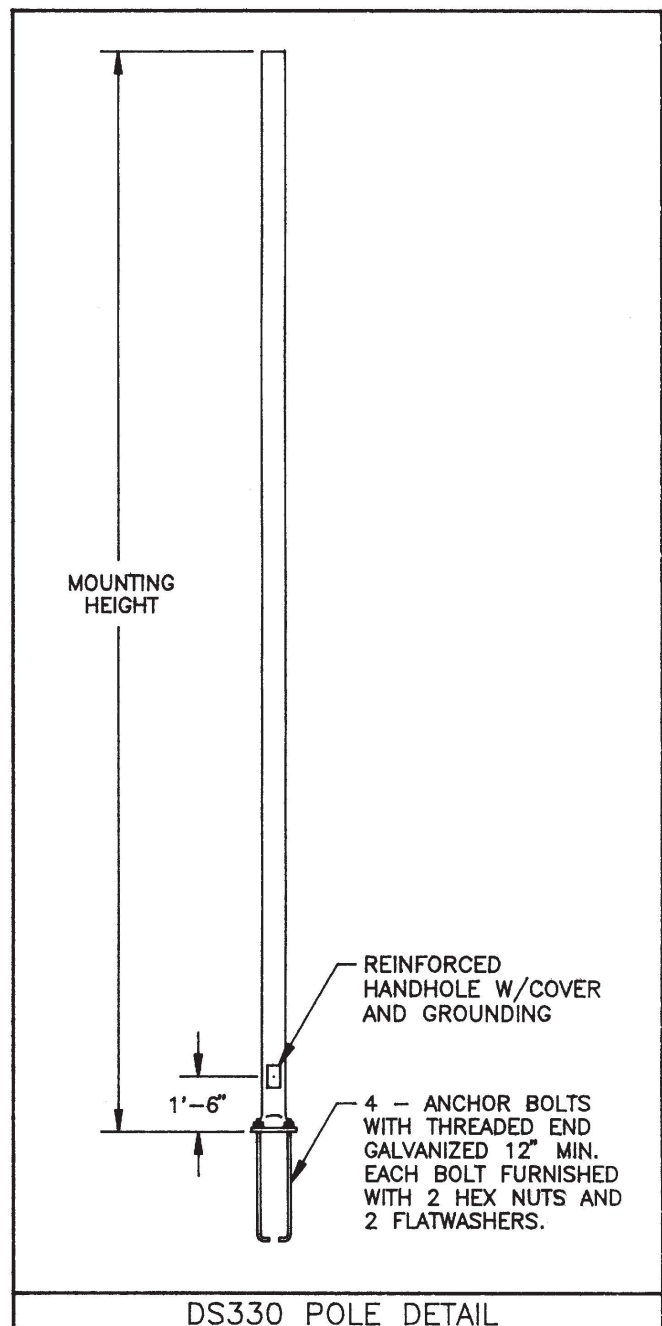
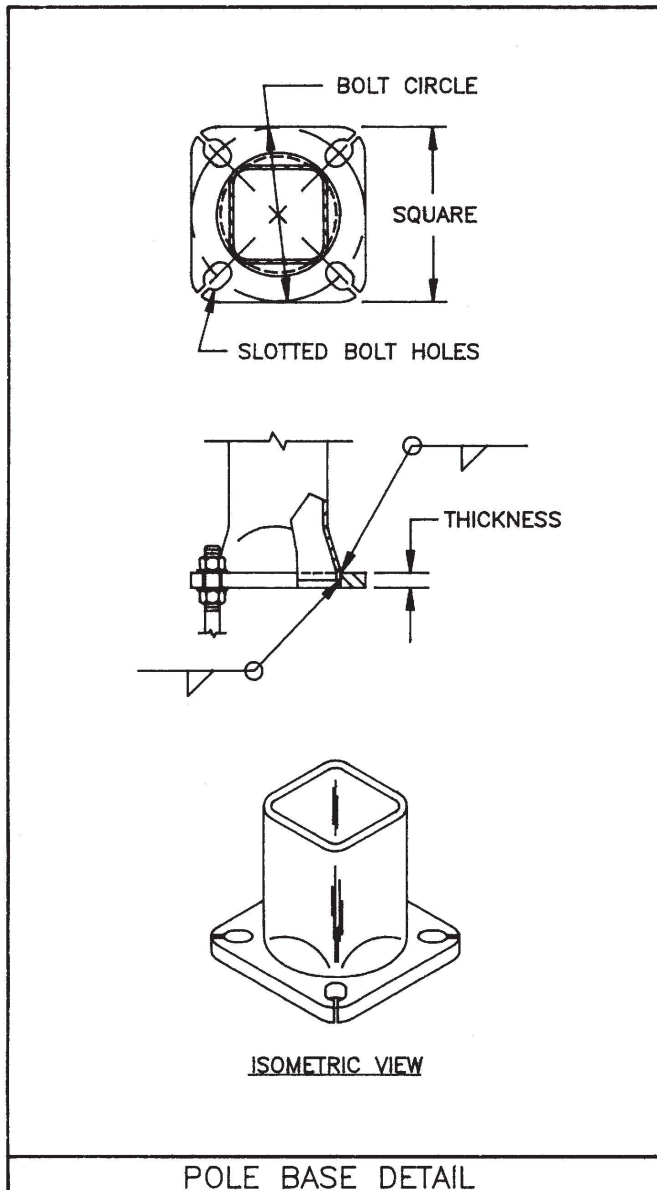
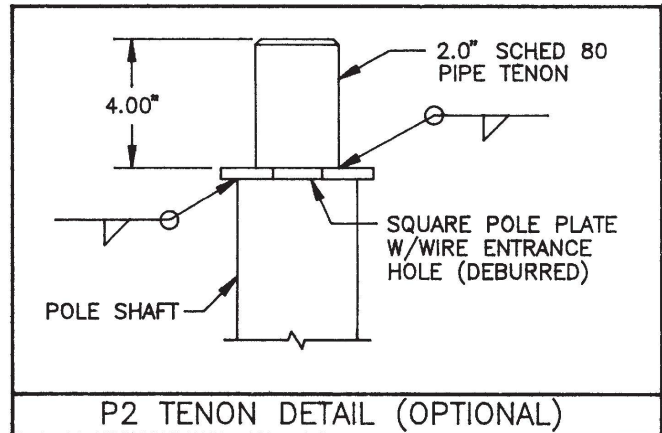
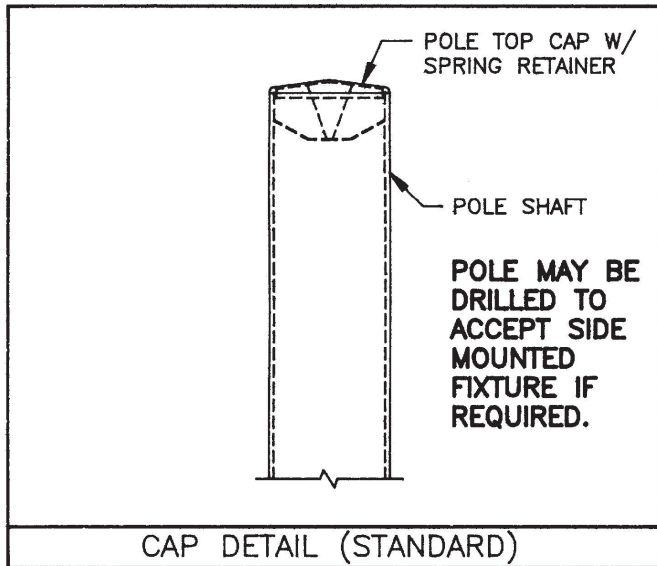
QUESTIONS?

Contact your local Valmont representative.

*Rounded corners
compliment today's
softer fixture designs.*

*Bell-shaped base
reduces cracking
and fatigue stress.*





ATTACHMENT B

PROPOSAL SUBMITTAL REQUIREMENTS AND SELECTION CRITERIA

PROPOSAL SUBMITTAL REQUIREMENTS AND SELECTION CRITERIA

ENGINEERING & CAPITAL PROJECTS DEPARTMENT

Proposals submitted in response to this RFP shall be in the following order and shall include:

1. **Addenda to this RFP (PASS/FAIL)**

Design-Builder shall confirm in its Technical Proposal the receipt of all addenda issued to this RFP. Failure to acknowledge all addenda issued, will result in the Proposal being considered non-responsive and ineligible for further consideration.

Design-Builders are not required to include copies of the actual addenda in its Proposal.

2. **Exceptions to this RFP (PASS/FAIL)**

If the Design-Builder takes exception(s) to any portion of the RFP and its attachments, the specific portion of the RFP or attachment to which exception is taken shall be identified and explained to the City in writing a minimum of 10 days prior to the date established for submittal of the Technical Proposal. Exceptions taken after the stipulated period to this RFP may be cause for rejection of the Proposal and discontinue the Design-Builders participation to this selection process. The City reserves the right to waive exception(s) as it deems in the best interests of the City.

3. **Executive Summary (5 Points)**

Include a one- to two-page overview of the entire Proposal describing the highlights of the Proposal. Failure to provide the executive summary will result in the RFP being considered non-responsive and ineligible for further consideration.

4. **Project Team (5 Points)**

Describe the proposed management plan for this project. Describe the strength of key proposed construction and technical personnel, Subcontractors, and Subconsultants, including, but not limited to the following disciplines:

- a. Wireless Microwave Communication System Supplier
- b. Security Integrator
- c. Civil
- d. Electrical

5. **Technical Approach and Design Concept (30 Points)**

Describe in detail the proposed design concept for this project. Include detailed descriptions, conceptual design drawings, schematics, a list of major equipment, and any other information deemed necessary to allow the City to make an informed evaluation of the Design-Builder's technical approach. The completeness and technical merit of the design concept will be evaluated. The following elements shall be included in this Technical Proposal:

- a. **Security Upgrade:** Describe the proposed physical security upgrades, to include, at a minimum:

- Access Control System
- Surveillance system components and on-site video storage
- Stand-by power
- Fencing, lighting, and perimeter protection
- Electrical and video analytics

b. Communication System: Describe the proposed communication system, to include, at a minimum:

- Pump station and regulator components
- Water tanks/standpipes site components
- High site components and installation plan.
- Integration at Chollas SOC
-

c. Proposed Design Schedule: Outline the proposed design schedule, taking advantage of the design-build project delivery method, including sequencing of major design and construction components and proposed durations.

6. Construction Plan (20 Points)

a. Describe the proposed construction plan for this project, including the following, at a minimum:

- Construction approach and methods
- Plan for phasing of construction activities
- General plan for functional testing and start-up of security and communications system components.
- Proposed safety program
- Proposed emergency response plan
- Proposed construction schedule
- Traffic Control Management
- Community Impact

7. Extended Performance Phase (5 Points)

a. Describe the proposed plan for operations and maintenance of the security upgrades after start-up, including the following, at a minimum:

- Proposed Maintenance Plan and frequency of preventative maintenance
- Proposed Operations Plan
- Proposed methods of coordination with Owner's work force
- Proposed Operator Training Program

8. Equal Employment and Contracting Opportunity (25 Points)

Failure to submit the required EOCP information will result in SOQ or Proposal (as applicable) being determined as non-responsive.

a. Work Force Report

Include a completed Work Force Report found in Attachment 'D' of this RFP for its employees located within San Diego County only. The selected firm may be required to submit workforce data for a regional office prior to contract award.

b. Subcontractor Documentation

The Design-Builder shall, at a minimum, provide with its Technical Proposal a listing of at least 3 of the largest Subcontractors (constructors only) for the Project and all other Subcontractors (design professionals, etc.) that are known at the time it submits its Proposal, using form AA15 and AA30 provided in Volume 2, Attachment 'D' of this RFP. Note: Subcontractors include design professionals, as well.

Any changes to the listing of the proposed Subcontractors that have occurred in the information, required data or documentation submitted in the SOQ shall be submitted in accordance this section, and shall be included in an attachment, which shall be entitled "Subcontractor Documentation" using forms AA15 and AA30 provided in Volume 2, Attachment 'D' of this RFP.

Work which requires Subcontractors that are not listed by Design-Builder at time of Award shall be let by Design-Builder in accordance with a competitive bidding process performed solely at Design-Builder's expense. Design-Builder shall provide public notice of the availability of the Work to be subcontracted, obtain competitive bids, and provide a fixed date and time on which the subcontracted Work will be awarded. Subcontractors bidding on subcontracts pursuant to this provision shall be afforded the protection of all applicable laws, including Public Contract Code sections 4100 through 4114, inclusive.

The Design-Builder may select Subcontractors and Suppliers in one of 3 competitive ways i.e., lowest responsible bidder, best value for price and qualifications, or highest qualifications. Prior to construction NTP, the Design-Builder shall do the following:

- a. Submit the selection method used to the City in accordance with 2-5.3, "Submittals."
- b. Pre-qualify Subcontractors and Suppliers, in a manner at least as stringent as the City's pre-qualification standards.
- c. Review the Subcontractors and Suppliers ultimately chosen to verify that that they have not been debarred and are in good standing as a licensed contractor in California.
- d. Open all Subcontract bids and provide to the City one copy without reservation or redaction. All records relevant to the award and performance of Subcontractors and Suppliers shall be public and provided to the City upon request and without redaction.

The City may administer bidding itself for Subcontractors and Suppliers, or to direct the bidding procedures to be used by the Design-Builder.

The Design-Builder may use its corporate-generated subcontractor agreement to retain Subcontractors or Suppliers, provided the subcontractor agreement contains the terms required to be included in Subcontracts by this Contract.

The points will be awarded in only one of the possible outcomes as follows:

	OUTCOME	Maximum Possible Points
1	5% - 9% participation SLBE, ELBE, DVBE, or DBE	5
2	10%-14% participation SLBE, ELBE, DVBE or DBE	10
3	15%-19% participation SLBE, ELBE, DVBE or DBE	15
4	20%-24% participation SLBE, ELBE, DVBE or DBE	20
5	25% participation SLBE, ELBE, DVBE or DBE	25

In no case the points shall exceed 25.

9. Presentation and Interview (10 Points Max)

10. Reference Checks (5 Points Max)

Total Points: 105

Proposals that do not contain the aforementioned components will not be considered.

**ATTACHMENT C
CONTRACT FRONT END VOLUME 1**

City of San Diego

CONTRACTOR'S NAME: _____
ADDRESS: _____
TELEPHONE NO.: _____ FAX NO.: _____
CITY CONTACT: John Stohr, Address: 600 B Street, Ste 800, San Diego, CA, 92101 MS No. 908A
Email: JStohr@sandiego.gov, Phone No. 619-533-6626, Fax No. 619-533-5176

BD/RIR/CG

CONTRACT DOCUMENTS



FOR WATER DEPARTMENT SECURITY UPGRADE DESIGN-BUILD CONTRACT

VOLUME 1 OF 2

RFQ NO.: Security Upgrades for the City of San Diego Design-Build Contract – 5171
BID NO.: K-12-5463-DBA
RFP NO.: 5463
TASK ORDER NO.: 1
WBS NO.: S-11105, S-11107
CLIENT DEPARTMENT: 2013
COUNCIL DISTRICT: CITYWIDE
PROJECT TYPE: BL, BJ

THIS CONTRACT IS SUBJECT TO THE FOLLOWING:

- THE CITY'S SUBCONTRACTING PARTICIPATION REQUIREMENTS FOR SLBE PROGRAM.

((((((((((((((((((((ATTENTION))))))))))))))))))

The 2010 edition of the City of San Diego Standard Specifications for Public Works Construction (“The WHITEBOOK”) now contains the following distinct Contract Documents:

- 1) **Equal Opportunity Contracting Program Requirements** - This Contract Document sets forth the standard requirements for the City’s equal opportunity contracting program. When additional requirements by the funding source e.g., federal or state agencies are physically included in the contract documents or by reference and there is a discrepancy, the funding source requirements shall govern unless specified otherwise in the Special Provisions.

- 2) **City Supplement** – The City Supplement shall be used in conjunction with the Standard Specifications for Public Works Construction (“The GREENBOOK”), 2009 Edition. The specifications contained in City Supplement take precedence over the specifications contained in The GREENBOOK, 2009 Edition.

Certain parts of the City Supplement have been highlighted in yellow for the convenience of the users only and shall not affect the interpretation of the Contract.

To obtain The GREENBOOK contact the publisher at: <http://www.bnibooks.com>

The WHITEBOOK is available only in electronic format under Engineering Documents and References at: <http://www.sandiego.gov/engineering-cip/>

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REQUIRED DOCUMENTS SCHEDULE

This table is intended to serve as a convenient tool for listing forms and documents required at different times. It is neither exhaustive nor must be considered a Contract Document by itself. Therefore, the users must review the entire Contract Documents and become familiar with the required documentation and the submittal schedule associated with each document.

Bidder's attention is directed to the City's Municipal Code §22.0807(e), (3)-(5) for important information regarding required documentation.

ITEM	WHEN	BY	WHAT	FORMS ARE DUE WITH:	
				TECHNICAL PROPOSAL	PRICE PROPOSAL
1.	BID DUE DATE/TIME	ALL BIDDERS	Price Proposal Form		√
2.	BID DUE DATE/TIME	ALL BIDDERS	Non-collusion Affidavit to be Executed By Bidder and Submitted with Bid under 23 USC 112 and PCC 7106		√
3.	BID DUE DATE/TIME	ALL BIDDERS	Contractors Certification of Pending Actions		√
4.	BID DUE DATE/TIME	ALL BIDDERS	Equal Benefits Ordinance Certification of Compliance		√
5.	BID DUE DATE/TIME	ALL BIDDERS	Form AA05 – <u>Design-Build</u> List of Subcontractors		√
6.	BID DUE DATE/TIME	ALL BIDDERS	Form AA10 - Design-Build List of Subcontractors Additive/Deductive Alternate		√
7.	BID DUE DATE/TIME	ALL BIDDERS	Form AA15 - Design-Build List of Subcontractors	√	
8.	BID DUE DATE/TIME	ALL BIDDERS	Form AA20 - Design-Build List of Subcontractors Additive/Deductive Alternate	√	
9.	BID DUE DATE/TIME	ALL BIDDERS	Form AA25 - Design-Build Named Equipment/Material Supplier List		√
10.	BID DUE DATE/TIME	ALL BIDDERS	Form AA26 - Design-Build Named Equipment/Material Supplier Additive/Deductive Alternate		√
11.	BID DUE DATE/TIME	ALL BIDDERS	Form AA30 - Design-Build Named Equipment/Material Supplier List	√	

REQUIRED DOCUMENTS SCHEDULE

ITEM	WHEN	BY	WHAT	FORMS ARE DUE WITH:	
				TECHNICAL PROPOSAL	PRICE PROPOSAL
12.	BID DUE DATE/TIME	ALL BIDDERS	Form AA31 - Design-Build Named Equipment/Material Supplier Additive/Deductive Alternate	√	
13.	BID DUE DATE/TIME	ALL BIDDERS	Form BB05 – Work Force Report	√	
14.	WITHIN 1 WORKING DAY OF CLOSE RANKING MEETING	ALL BIDDERS	Form AA60 – List of Work Made Available	√ (if submitted with the Proposal)	
15.	WITHIN 1 WORKING DAY OF CLOSE RANKING MEETING	ALL BIDDERS	Proof of Valid DBE-MBE-WBE-DVBE Certification Status e.g., Certs.	√ (if submitted with the Proposal)	
16.	WITHIN 1 WORKING DAY OF CLOSE RANKING MEETING	ALL BIDDERS	SLBE-ELBE Good Faith Documentations	√ (if submitted with the Proposal)	
17.	WITHIN 10 WORKING DAYS OF BID OPENING	APPARENT LOW BIDDER	Names of the principle individual owners of the Apparent Low Bidder - In the event the firm is employee owned or publicly held, then the fact should be stated and the names of the firm's principals and officers shall be provided.		
18.	WITHIN 10 WORKING DAYS OF BID OPENING	APPARENT LOW BIDDER	If the Contractor is a Joint Venture, the following information must be submitted: o Joint Venture Agreement o Joint Venture License		
19.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	APPARENT LOW BIDDER	Contract Forms - Agreement		
20.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	APPARENT LOW BIDDER	Contract Forms – Performance Bonds and Labor and Materialmen's Bond		

REQUIRED DOCUMENTS SCHEDULE

ITEM	WHEN	BY	WHAT	FORMS ARE DUE WITH:	
				TECHNICAL PROPOSAL	PRICE PROPOSAL
21.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	APPARENT LOW BIDDER	Certificates of Insurance and Endorsements		
22.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	ALL BIDDERS	Contractor/Vendor Registration Form		
23.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	APPARENT LOW BIDDER	Contractor Certification - Drug-Free Workplace		
24.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	APPARENT LOW BIDDER	Contractor Certification - American with Disabilities Act		
25.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	APPARENT LOW BIDDER	Contractors Standards - Pledge of Compliance		
26.	BY 5th OF EACH MONTH	CONTRACTOR	CC20 - Monthly Employment Report		
27.	BY 5th OF EACH MONTH	CONTRACTOR	CC25 - Monthly Invoicing Report		
28.	PRIOR TO ACCEPTANCE	CONTRACTOR	CC10 - Contract Change Order (CCO)		
29.	PRIOR TO ACCEPTANCE	CONTRACTOR	CC15 - Final Summary Report		
30.	PRIOR TO ACCEPTANCE	CONTRACTOR	Affidavit of Disposal		

(((((RECENT CHANGES)))))

The Bidder’s attention is directed to some of the recent changes in the City’s standard Contract Documents. The list is not exhaustive and is provided for the convenience of the Bidders. It highlights what could possibly be of importance to most users. The Bidders are still required to review and become familiar with entire Contract Documents for the purpose of bidding.

	HEADING/TOPIC	SECTION	REMARKS
1	Equal Benefits	Instruction to Bidders	New ordinance
2	Pledge of Compliance	Instruction to Bidders	New ordinance
3	EOCP Forms	EOCP	Simplified/updated forms
4	Subcontractor Requirements	SSP, subsection 2-3.4	Additional license requirements
5	Trade Names or Equals	SSP, subsection 4-1.6.	Detailed specifications for substitution requests
6	Extended Warranty	SSP, subsection 6-8.3	New contact/bond requirements for the extended warranty periods
7	Open Trench Installations	SSP, subsection 306-1.6	Basis of payment revised
8	Pre-award Submittals	SSP, subsection 500-1.1.2.1	Experiences requirements
9	Work Involving The City Forces	SSP, SECTION 700	Revised roles and responsibilities of various field works by the City Forces and the Contractors
10	Water Discharges	SSP, subsection 805-2.7.	Revised base of payment for contaminated water work
11	Policies and Procedures.	SSP, subsection 7-3.1	Revised insurance policy

SPECIAL NOTICE
SMALL LOCAL BUSINESS ENTERPRISES (SLBE)
AND
EMERGING LOCAL BUSINESS ENTERPRISES (ELBE)
PROGRAM

This contract is subject to the requirements of the SLBE Program as specified in the SLBE-ELBE section of the City’s EOCP Requirements included in the Contract Documents i.e., The WHITEBOOK. **The Bidder(s) is (are) required to review The WHITEBOOK and become familiar with the detailed specifications including the required documentation and the submittal schedule as related to SLBE-ELBE program.**

To the WHITEBOOK, GENERAL EQUAL OPPORTUNITY CONTRACTING PROGRAM REQUIREMENTS CONSTRUCTION CONTRACTOR REQUIREMENTS, Equal Employment Opportunity Outreach Program (A), DELETE in its entirety and SUBSTITUTE with the following:

- A. Competitive Bids. If a contract is competitively solicited, the Apparent Low Bidder shall submit a *Work Force Report (Form BB05)* or an Equal Employment Opportunity (EEO) Plan, within 10 Working Days after receipt by the Bidder of Contract forms to the City for approval as specified in the Notice of Intent to Award letter from the City.

To the WHITEBOOK, SLBE-ELBE PROGRAM REQUIREMENTS, Section VIII(2)(b), “What Are The Six Good Faith Efforts?” DELETE in its entirety and SUBSTITUTE with the following:

“Make information of forthcoming opportunities available to SLBE-ELBE firms and arrange time for contracts and establish delivery schedules, where requirements permit, in a way that encourages and facilitates participation by SLBE-ELBE firms in the competitive process. This includes, whenever possible, posting solicitations for bids or proposals for a minimum of 10 days before the Bid or Proposal closing date.”

To The WHITEBOOK, SLBE-ELBE PROGRAM REQUIREMENTS, Section VIII (3) and (4), DELETE in their entirety and SUBSTITUTE with the following:

3. Good Faith Effort Documentation Requirements

If the stated SLBE-ELBE goals are not met, the Bidder shall submit, within 1 day of the Bid opening, information necessary to establish adequate good faith efforts were taken to meet the contract goal. The required documentation includes:

- A. ADVERTISEMENT REQUIREMENTS

Advertisements for subcontract work must comply with the following requirements:

1. Advertisements must be placed at least 10 business days prior to proposal due date. Provide the names and dates of each publication of where the advertisement was published. *[Note: The advertisement is not required to be placed everyday for the 10 business days prior to proposal due date.]*

2. There must be at least two advertisements published, one advertisement *in a trade publication and one in a focus group publication*. Additional advertising for SLBE-ELBE participation may be placed in newspapers, trade papers and on the Internet. For a listing of publications accepting advertisements, please visit the City of San Diego Equal Opportunity Contracting home page at <http://www.sandiego.gov/eoc/>
 - 2.1 Newspaper advertisements must be in the Bids Wanted, Legal Notices section of the Classified Ads, Subcontracting Opportunities or Business Opportunities **NOT** the Employment Opportunities Section.
3. Advertisements must state which items or portions of work the bidder is requesting subcontractor pricing.
 - 3.1. It is the bidder's responsibility to demonstrate that enough work sufficient to meet the SLBE-ELBE goal was made available to SLBE-ELBE firms. The bidder should make as many items of work available as possible to meet the goal, and at a minimum an amount of work equal to the goal. If necessary to reach the goal, the work should include those items normally performed by the bidder with its own forces, supplies and even items with a dollar value below 1/2 of 1% of the total bid. Bidders shall utilize Form AA60 to demonstrate compliance with this requirement and submit the completed form with Good Faith Effort documentation.
4. Advertisements must state that plans and specs are available at no cost to interested SLBE-ELBE firms and how to obtain them.
5. Advertisements must state that assistance is available from the bidder for SLBE-ELBE subcontractors in obtaining necessary equipment, supplies, or materials.
6. Advertisements must state that assistance is available from the bidder for SLBE-ELBE firms in obtaining bonding, lines of credit or insurance.
7. Bidders **MUST** provide proof of publication of each advertisement by providing the publication affidavit which must include a legible copy of the entire advertisement and the original ENTIRE page of the publication in which the advertisement appears.

B. SLBE-ELBE WRITTEN SOLICITATION REQUIREMENTS

Bidders must directly solicit SLBE-ELBE firms on the City's approved SLBE-ELBE list. Solicitations for subcontract/vendor work must comply with the following requirements:

1. The solicitation must be dated and list the name of the SLBE-ELBE firm. ***Solicitations must be made to the SLBE-ELBE firms at least 10 business days prior to bid opening.***
2. Solicitation must state which items or portions of work the bidder is requesting subcontractor pricing.
 - 2.1. It is the bidder's responsibility to demonstrate that enough work sufficient to meet the SLBE-ELBE goal was made available to SLBE-ELBE firms. The bidder should make as many items of work available as possible to meet the goal, and at a minimum an amount of work equal to the goal. If necessary to reach the goal, the work should include those items normally performed by the bidder with its own forces, supplies and even items with a dollar value below 1/2 of 1% of the total bid. Bidders shall utilize Form AA60 to demonstrate compliance with this requirement and submit the completed form with Good Faith Effort documentation.
3. Solicitation must state that plans and specs are available at no cost to interested SLBE-ELBE firms and how to obtain them.
4. Solicitations must state that assistance is available from the bidder for SLBE-ELBE subcontractors in obtaining necessary equipment, supplies, or materials.
5. Solicitations must state that assistance is available from the bidder for SLBE-ELBE firms in obtaining bonding, lines of credit or insurance.
6. Bidder must solicit ALL SLBE-ELBE firms on the City's approved list, who have the NAICS code for the subcontract work sought by the general contractor.
7. Bidders must provide copies of ALL solicitations with one of the following forms of verification that the solicitations were sent: a) If mailed: provide copies of the metered envelopes or certified mail receipts b) If faxed: provide copies of the fax transmittal confirmation sheet(s) c) If emailed: provide copies of the email delivery confirmation sheet(s). No credit shall be given for error messages, busy, cancelled, undeliverable, etc.

C. SLBE-ELBE WRITTEN SOLICITATION FOLLOW UP REQUIREMENTS

Bidders must follow-up with all SLBE – ELBE firms that were notified of the subcontracting opportunities to determine their level of interest and commitment to bid the project. When following up with the SLBE – ELBE firms, the bidder must do the following:

1. Follow up communications must start no less than 5 business days prior to bid opening.

2. Bidders must follow up with all SLBE-ELBE firms in writing. Bidders must provide copies of ALL written follow up notices with one of the following forms of verification that the follow up notices were sent: a) If mailed: provide copies of the metered envelopes or certified mail receipts b) If faxed: provide copies of the fax transmittal confirmation sheet(s) c) If emailed: provide copies of the email delivery confirmation sheet(s). No credit shall be given for error messages, busy, cancelled, undeliverable, etc.
3. Bidders must make at least three follow-up telephone calls to each SLBE – ELBE firm at least five days prior to bid opening date. Bidders must submit a telephone log as identified below.
 - 3.1. Submit a telephone log, as proof of telephone call, with the following requirements: project name, name of person making the phone call, name of firm contacted, contact person’s name, date of call, time of call, and details of conversation.

D. SUBCONTRACT AWARD SUMMARY

Bidders must act in good faith with interested SLBE-ELBE firms and may only reject bids for legitimate business reasons. The bidder must submit the following documentation:

1. A **DETAILED** summary sheet which includes bid item number, scope of work, subcontractor/vendor name, bid amount, certification type, subcontractor/vendor selection and reason for selection / non-selection of all the subcontractors/vendors that responded.
2. Copies of all subcontract/vendor bids received including bids for areas of work that were not included in the outreach and quotes from both certified and non-certified subcontractors/vendors. Subcontractor bid amounts **MUST** match the bid-listed dollar amounts on form AA35 and AA40 submitted with bidders sealed bid and the summary sheet dollar amounts **MUST** also match these amounts. If the Bidder decides to Self-Perform a scope of work, the Bidder **MUST** submit a detailed quote to show that the Bidder’s price is competitive to the price of the subcontractors that responded to outreach efforts. All dollar amounts and scopes of work on the subcontractor/vendor bid must not be altered by the prime bidder. If a revision is necessary, a revised quote must be obtained and provided. All verbal quotes **MUST** be substantiated by corresponding written quote from the subcontractor/vendor.

E. OUTREACH ASSISTANCE REQUIREMENTS

Written notice of subcontractor opportunities must be forwarded to local organizations or groups to assist with outreach efforts. When contacting local organizations or groups, the Bidder **must do** the following:

1. Contact a minimum of 5 local organizations or groups to provide assistance in contacting, recruiting and using SLBE-ELBE firms by written notice. For a listing of organizations or groups offering assistance, please visit the City of San Diego Equal Opportunity Contracting home page at <http://www.sandiego.gov/eoc/>
2. Written notice must indicate the date of the notice and name of the local organization or group. Written notices must be forwarded to the organizations or groups at least 10 business days prior to bid opening.
3. Written notice must state which items or portions of work the bidder is requesting subcontractor pricing.
 - 3.1. It is the bidder's responsibility to demonstrate that enough work sufficient to meet the SLBE-ELBE goal was made available to SLBE-ELBE firms. The bidder should make as many items of work available as possible to meet the goal, and at a minimum an amount of work equal to the goal. If necessary to reach the goal, the work should include those items normally performed by the bidder with its own forces, supplies and even items with a dollar value below 1/2 of 1% of the total bid. Bidders shall utilize Form AA60 to demonstrate compliance with this requirement and submit the completed form with Good Faith Effort documentation.
4. Written notice must state that plans and specs are available at no cost to interested SLBE-ELBE firms and how to obtain them.
5. Written notice must state that assistance is available from the bidder for SLBE-ELBE subcontractors in obtaining necessary equipment, supplies, or materials.
6. Written notice must state that assistance is available from the bidder for SLBE-ELBE firms in obtaining bonding, lines of credit or insurance.
7. Bidders must provide copies of **ALL** notices with one of the following forms of verification that the notices were sent: a) If mailed: provide copies of the metered envelopes or certified mail receipts b) If faxed: provide copies of the fax transmittal confirmation sheet(s) c) If emailed: provide copies of the email delivery confirmation sheet(s). No credit shall be given for error messages, busy, cancelled, undeliverable, etc.

NOTE: Be careful when referring to “See Attachments” without providing explicit information where to find the material. Clearly identifying these items as Attachment A, Attachment B, etc. is suggested. Attachments may include, but are not limited to, copies of advertisements, solicitations and logs of telephone follow-ups, e-mail or fax receipts.

If there is a conflict between any of the Contract Documents, and this Special Notice, this Special Notice shall control.

Subcontractor Participation. The City has determined a **10% mandatory** subcontracting participation of which **5% shall be SLBE-ELBE** subcontractors. The City has also determined a **voluntary subcontractor participation of 10%**, equating to **20% in total**, to enhance competition and maximize subcontracting opportunities. Percentages are based on the Contract Price.

Pre-Proposal Meeting: A Pre-Proposal Meeting is scheduled for this contract as specified in the RFP. The purpose of this meeting is to inform prospective Bidder(s) of the submittal requirements and provisions relative to the SLBE Program. Bidder(s) is (are) strongly encouraged to attend the Pre-Proposal Meeting to better understand the Good Faith Effort requirements of this contract.

Mandatory Conditions: Bid will be declared **non-responsive** if the Bidder fails the following mandatory conditions.

1. Bidder's inclusion of SLBE-ELBE certified subcontractors at the overall mandatory participation percentage identified in this document; **OR**
2. Bidder's submission of Good Faith Effort documentation demonstrating the Bidder made a good faith effort to outreach to and include SLBE-ELBE Subcontractors required in this document within 1 Working Day of the Public Ranking meeting if the overall mandatory participation percentage is not met.

Bid Discount: This contract **is not** subject to the Bid Discount program as described in The WHITEBOOK, SLBE-ELBE Program Requirements, Section IV(2).

Resources: The current list of certified SLBE-ELBE firms can be found on the Equal Opportunity Contracting Program Department website.

CITY OF SAN DIEGO, CALIFORNIA

INVITATION TO BIDS

- 1. DESCRIPTION OF WORK:** The Work involves furnishing all labor, materials, equipment, services, and other incidental works and appurtenances for the design and construction of the Project as described in the RFP.

The Work shall be performed in accordance with:

- Design-Build Bridging Documents included as attachment to the RFP.

- 2. LOCATION OF WORK:** The location of Work is Citywide.
- 3. CONTRACT TIME:** The Work shall be completed within **175 Working Days** from the date of issuance of the Notice to Proceed (i.e., Design Notice to Proceed for Design-Build contracts).
- 4. CITY PROJECT MANAGER CONTACT INFORMATION:**

See the cover of the RFP.

- 5. WAGE RATES:** Prevailing wages are not applicable to this project unless specified otherwise on the cover page of these specifications and when included in these specifications. See Funding Agency Provisions that follow this Invitation to Bid for more information.
- 6. INSURANCE REQUIREMENTS:** Upon receipt of the City's Notice of Intent to Award letter, the Contractor will be asked to submit all certificates of insurance and endorsements to the City.

Refer to sections 7-3, "LIABILITY INSURANCE", and 7-4, "WORKERS' COMPENSATION INSURANCE" of the Supplementary Special Provisions (SSP) for the insurance requirements which must be met.

You must ensure all required insurance certificates and endorsements are submitted accurately and on time. Failure to provide the requisite insurance documents by the date stated in the City's Notice of Intent to Award will result in delay of contract award and may result in annulment of the contract award or other more severe sanctions as provided in the City's Municipal Code §22.0807(e),(3)-(5).

Tony Heinrichs
Director
Public Works Department

INSTRUCTIONS TO BIDDERS

- 1. PREQUALIFICATION OF CONTRACTORS:** The contractor(s) who intend to submit Bid or Proposal in response to this invitation to bid, or RFP's for GRC or As-Needed Design-Build Task Orders valued over \$50,000, must be pre-qualified for the City estimated Contract Price or the specified Task Order limits prior to the date of Bid submittal.

For Design-Build As-Needed contracts, if the total active work issued would limit the RFP for a new Task Order authorization to only 1 eligible firm of the short-listed firms, thus creating a non-competitive situation, that Task Order authorization(s) will be held until enough active work is deemed by the City to be completed and closed, thereby creating available eligibility for competition, or the City at its sole discretion can advertize a new open RFP for the needed project requirement.

Bids from contractors who have not been pre-qualified as applicable, and Bids that exceed the maximum dollar amount at which contractors are pre-qualified, will be deemed non-responsive and ineligible for award or a Task Order authorization. Complete information and prequalification questionnaires are available at:

<http://www.sandiego.gov/engineering-cip/services/consultcontract/prequal.shtml>

The completed questionnaire, financial statement, and bond letter or a copy of the contractor's SLBE-ELBE certification and bond letter, must be submitted no later than 2 weeks prior to the bid opening to the Engineering & Capital Projects Department Prequalification Program, 1010 Second Avenue, Suite 1200, San Diego, CA 92101. For additional information or the answer to questions about the prequalification program, please contact David Stucky at 619-533-3474 or dstucky@sandiego.gov.

- 2. CONTRACTOR/VENDOR REGISTRATION:** Prospective bidder(s) as well as existing contractors and vendors are required to complete and submit the Contractor/Vendor Registration form. Registration will be a prerequisite for the following:
 - a) Submission of future contract or subcontract bids for City projects;
 - b) Acceptance of all future contractor and vendor bills and invoices to the City and;
 - c) Award of all future contracts issued by the City.

Contractor/Vendor Registration shall remain valid for 2 years from the date the registration form is submitted, and must be renewed at that time.

It shall be the Contractor's responsibility to obtain from all its proposed Subcontractors and Suppliers the Contractor/Vendor Registration form at time of notice of intent to award. Failure to do so may result in delay of NTP and/or impact on first payment. Electronic copy of the Contractor/Vendor Registration form is available for download from the following site: <http://www.sandiego.gov/purchasing/vendor/index.shtml>.

- 3. CITY'S RESPONSES AND ADDENDA:** The City at its option, may respond to any or all questions submitted in writing, via letter, or FAX in the form of an addendum. No oral comment shall be of any force or effect with respect to this solicitation. The changes to the Contract Documents through addendum are made effective as though originally issued with the Bid. The Bidders shall acknowledge the receipt of Addenda on the form provided for this purpose in the Bid.

4. **CITY'S RIGHTS RESERVED:** The City reserves the right to cancel the Invitation to Bids at any time, and further reserves the right to reject submitted Bids, without giving any reason for such action, at its sole discretion and without liability. Costs incurred by the Bidder(s) as a result of preparing Bids under the Invitation to Bid shall be the sole responsibility of each bidder. The Invitation to Bid creates or imposes no obligation upon the City to enter a contract.
5. **CONTRACT PRICING FORMAT:** This solicitation is for a Lump Sum contract with Unit Price provisions as set forth in the Bid Proposal Form(s), Volume 2 unless specified otherwise such as as-needed contracts e.g., GRC in the Contract Documents.
6. **SUBMITTAL OF "OR EQUAL" ITEMS:** See 4-1.6, "Trade Names or Equals."
7. **AWARD PROCESS:** The Award of this contract is contingent upon the Contractor's compliance with all conditions precedent to Award, including the submittal of acceptable insurance and surety bonds pursuant to San Diego Municipal Code § 22.3007. If the responsible Bid does not exceed the City's engineering estimate, the City will, in most cases, prepare contract documents for execution within 3 weeks of the date of the Bid opening and award the Contract within 5 Working Days of receipt of properly executed Contract, bond, and insurance documents.

This contract is deemed to be awarded, and effective, only upon the signing of the Contract by the Mayor or designee of the City.

8. **SUBCONTRACT LIMITATIONS:** The Bidder's attention is directed to Standard Specifications for Public Works Construction, Section 2-3, "SUBCONTRACTS" which requires the Contractor to perform not less than the amount therein stipulated with its own forces. Failure to comply with these requirements may render the Bid **non-responsive** and ineligible for award.
9. **AVAILABILITY OF PLANS AND SPECIFICATIONS:** Contract Documents may be obtained by visiting the City's website: <http://www.sandiego.gov/engineering-cip/services/consultcontract/advertising.shtml>. Plans and Specifications for this contract are also available for review in the office of the City Clerk or Public Works Department at the address listed below.
10. **QUESTIONS:** Questions about the meaning or intent of the Contract Documents as related to the scope of Work and of technical nature shall be directed to the Project Manager prior to Bid opening. Interpretations or clarifications considered necessary by the Project Manager in response to such questions will be issued by Addenda, which will be uploaded to eBidboard (or mailed or delivered to all parties recorded by the City as having received the Contract Documents for Minor Construction contracts).

The Director (or designee), Public Works Department is the officer responsible for opening, examining, and declaring of competitive Bids submitted to the City for the acquisition, construction and completion of any public improvement except when otherwise set forth in these documents. Questions in these areas of responsibility (e.g., i.e. Pre-qualification, SCOPE information, bidding activities, bonds and insurance, etc. as related to this contract shall be addressed to the Contract Administration, Public Works Department, 1200 Third Avenue, Suite 200, San Diego, California, 92101, Telephone No. (619) 236-6000.

Questions received less than 14 days prior to the date for opening of Bids may not be answered. Only questions answered by formal written addenda will be binding. Oral and other

interpretations or clarifications will be without legal effect. It is the Bidder's responsibility to become informed of any addenda that have been issued and to include all such information in its Bid.

- 11. ELIGIBLE BIDDERS:** No person, firm, or corporation shall be allowed to make, file, or be interested in more than 1 Bid for the same work unless alternate Bids are called for. A person, firm or corporation who has submitted a sub-proposal to a Bidder, or who has quoted prices on materials to a Bidder, is not hereby disqualified from submitting a sub-proposal or quoting prices to other Bidders or from submitting a Bid in its own behalf.
- 12. SAN DIEGO BUSINESS TAX CERTIFICATE:** All Contractors, including Subcontractors, not already having a City of San Diego Business Tax Certificate for the work contemplated shall secure the appropriate certificate from the City Treasurer, Civic Center Plaza, first floor, before the Contract can be executed.
- 13. PROPOSAL FORMS:** Bid shall be made only upon the Bidding Documents i.e., Proposal form attached to and forming a part of the specifications. The signature of each person signing shall be in longhand.

The entire specifications for the bid package do not need to be submitted with the bid. Bidder shall complete and submit, only, all pages in the "Bidding Document" Section (see Volume 2) as their Bid per the schedule given under "Required Documents" (see Volume 1). Bidder is requested to retain for their reference other portions of the Contract Documents that are not required to be submitted with the Bid.

The City may require any Bidder to furnish a statement of experience, financial responsibility, technical ability, equipment, and references.

Bids and certain other specified forms and documents shall be enclosed in a sealed envelope and shall bear the title of the work and name of the Bidder and the appropriate State Contractors License designation which the Bidder holds.

Bids may be withdrawn by the Bidder prior to, but not after, the time fixed for opening of Bids.

14. BIDDERS' GUARANTEE OF GOOD FAITH (BID SECURITY):

With the exception of the contracts valued \$5,000 or less, GRC and Design-Build contracts, and contracts subject to the Small and Local Business Program of \$250,000 or less e.g., ELBE contracts, each Bidder shall accompany its Bid with either a cashier's check upon some responsible bank, or a check upon such bank properly certified or an approved corporate surety bond payable to the City of San Diego, for an amount of not less than 10% of the aggregate sum of the Bid, which check or bond, and the monies represented thereby shall be held by the City as a guarantee that the Bidder, if awarded the contract, will in good faith enter into such contract and furnish the required final bonds.

The Bidder agrees that in case of Bidder's refusal or failure to execute this contract and give required final bonds, the money represented by a cashier's or certified check shall remain the property of the City, and if the Bidder shall fail to execute this contract, the Surety agrees that it will pay to the City damages which the City may suffer by reason of such failure, not exceeding the sum of 10% of the amount of the Bid.

A Bid received without the specified bid security will be rejected as being **non-responsive**.

15. AWARD OF CONTRACT OR REJECTION OF BIDS:

This contract may be awarded to the lowest responsible and reliable Bidder (for Design-Build contracts refer to the RFP for the selection and award information). Bidders shall complete the entire Bid schedule (e.g., schedule of prices). Incomplete price schedules will be rejected as being **non-responsive**.

The City reserves the right to reject any or all Bids, and to waive any informality or technicality in Bids received and any requirements of these specifications as to bidding procedure.

Bidders will not be released on account of their errors of judgment. Bidders may be released only upon receipt by the City from the Bidder within 3 Working Days, excluding Saturdays, Sundays, and state holidays, after the opening of Bids, of written notice which includes proof of honest, credible, clerical error of material nature, free from fraud or fraudulent intent, and of evidence that reasonable care was observed in the preparation of the Bid.

A non-selected Bidder may protest award of the Contract to the selected Bidder by submitting a written "Notice of Intent to Protest" including supporting documentation which shall be received by P&C Department no later than 10 days after the City's announcement of the selected Bidder or no later than 10 days from the date that the City issues notice of designation of a Bidder as non-responsible in accordance with San Diego Municipal Code Chapter 2, § 22.3029, "Protests of Contract Award."

The City of San Diego will not discriminate with regard to race, religious creed, color, national origin, ancestry, physical handicap, marital status, sex or age, in the award of contracts.

Each Bid package properly executed as required by these specifications shall constitute a firm offer, which may be accepted by the City within the time specified in the Invitation to Bids.

The City reserves the right to evaluate all Bids and determine the lowest Bidder (or winner for Design-Build contracts) on the basis of any proposed alternates, additive items or options, at its discretion.

- 16. BID RESULTS:** The Bid opening by the City shall constitute the public announcement of the Apparent Low Bidder (or Apparent Winner in case of Design-Build contracts). In the event that the Apparent Low Bidder (or Apparent Winner in case of Design-Build contracts) is subsequently deemed non-responsive or non-responsible, a public announcement will be posted in the City's web page, with the name of the newly designated Apparent Low Bidder (or Apparent Winner in case of Design-Build contracts).

To obtain Bid results, either attend Bid opening, review the results on the City's web site, or provide a self-addressed, stamped envelope, referencing Bid number, and Bid tabulation will be mailed to you upon verification of extensions. Due to time constraints, Bid results cannot be given out over the telephone.

- 17. THE CONTRACT:** The Bidder to whom award is made shall execute a written contract with the City of San Diego and furnish good and approved bonds and insurance certificates specified by the City within 10 Working Days after receipt by Bidder of a form of contract for execution unless an extension of time is granted to the Bidder in writing.

If the Bidder takes longer than 10 Working Days to fulfill these requirements, then the additional time taken shall be added to the Bid guarantee. The Contract shall be made in the form adopted

by the City, which includes the provision that no claim or suit whatsoever shall be made or brought by Contractor against any officer, agent, or employee of the City for or on account of anything done or omitted to be done in connection with this contract, nor shall any such officer, agent, or employee be liable hereunder.

If the Bidder to whom the award is made fails to enter into the contract as herein provided, the award may be annulled and the Bidder's Guarantee of Good Faith will be subject to forfeiture. An award may be made to the next lowest responsible and reliable Bidder who shall fulfill every stipulation embraced herein as if it were the party to whom the first award was made.

For contracts that are not Design-Build, pursuant to the San Diego City Charter section 94, the City may only award a public works contract to the lowest responsible and reliable Bidder. The City will require the Apparent Low Bidder to (i) submit information to determine the Bidder's responsibility and reliability, (ii) execute the Contract in form provided by the City, and (iii) furnish good and approved bonds and insurance certificates specified by the City within 10 Working Days, unless otherwise approved by the City, in writing after the Bidder receives notification from the City, designating the Bidder as the Apparent Low Bidder and formally requesting the above mentioned items.

The award of the Contract is contingent upon the satisfactory completion of the above mentioned items and becomes effective upon the signing of the Contract by the Mayor or designee. If the Apparent Low Bidder does not execute the Contract or submit required documents and information, the City may award the Contract to the next lowest responsible and reliable Bidder who shall fulfill every condition precedent to award. A corporation designated as the Apparent Low Bidder shall furnish evidence of its corporate existence and evidence that the officer signing the Contract and bond for the corporation is duly authorized to do so.

18. EXAMINATION OF PLANS, SPECIFICATIONS, AND SITE OF WORK: The Bidder shall examine carefully the Project Site, the Plans and Specifications, the GRC Unit Price Books if applicable, other materials as described in the Special Provisions, Section 2-7, and the proposal forms (e.g., Bidding Documents) therefore. The submission of a Bid or GRC Task Order Proposal shall be conclusive evidence that the Bidder has investigated and is satisfied as to the conditions to be encountered, as to the character, quality, and scope of Work, the quantities of materials to be furnished, and as to the requirements of the Bidding Documents Proposal, Plans, and Specifications.

19. DRUG-FREE WORKPLACE:

a) General:

City projects are subject to City of San Diego Resolution No. R-277952 adopted on May 20, 1991. Bidders shall become aware of the provisions of Council Policy 100-17 which was established by Resolution No. R-277952. The policy applies equally to the Contractor and Subcontractors. The elements of the policy are outlined below.

b) Definitions:

"Drug-free workplace" means a site for the performance of work done in connection with a contract let by City of San Diego for the construction, maintenance, or repair of any facility or public work by an entity at which employees of the entity are prohibited from engaging in

the unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance in accordance with the requirements of this section.

"Employee" means the employee of a contractor directly engaged in the performance of work pursuant to a contract as described in Section 3, "City Contractor Requirements."

"Controlled substance" means a controlled substance in schedules I through V of Section 202 of the Controlled Substances Act (21 U.S.C. Sec. 812).

"Contractor" means the department, division, or other unit of a person or organization responsible to the contractor for the performance of a portion of the work under the contract.

c) City Contractor Requirements:

Every person or organization awarded a contract or grant by the City of San Diego for the provision of services shall certify to the City that it will provide a drug-free workplace by doing all following:

- a. Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance is prohibited in the person's organization's workplace and specifying the actions that will be taken against employees for violations of the prohibition.
- b. Establishing a drug-free awareness program to inform employees about all of the following:
 - i. The dangers of drug abuse in the workplace.
 - ii. The person's or organization's policy of maintaining a drug-free workplace.
 - iii. Any available drug counseling, rehabilitation, and employee assistance programs.
 - iv. The penalties that may be imposed upon employees for drug abuse violations.
- c. Posting the statement required by subdivision (1) in a prominent place at contractor's main office. For projects large enough to necessitate a construction trailer at the job site, the required signage would also be posted at the Site.

The Contractor shall include in each subcontract agreement language which indicates the Subcontractor's agreement to abide by the provisions of subdivisions a) through c) above. The Contractors and Subcontractors shall be individually responsible for their own drug-free workplace programs.

Note: The requirements of a drug-free awareness program can be satisfied by periodic tailgate sessions covering the various aspects of drug-abuse education. Although an in-house employee assistance program is not required, contractors should be able to provide a listing of drug rehabilitation and counseling programs available in the community at large.

Questions about the City's Drug-free Workplace Policy shall be referred to the Director, Public Works Department.

20. AMERICANS WITH DISABILITIES ACT:

a) General: City projects are subject to City of San Diego Resolution No. R-282153 adopted on June 14, 1993. The Bidders shall become aware of the provisions of Council Policy 100-04 which was established by Resolution No. R-282153. The policy applies equally to the Contractor and all Subcontractors. The elements of the policy are outlined below.

b) Definitions:

"Qualified individual with a disability" means an individual with a disability who satisfies the requisite skill, experience, education and other job-related requirements of the employment position such individual holds or desires, and who, with or without reasonable accommodation, can perform the essential functions of such position.

"Employee" means the employee of the Contractor directly engaged in the performance of Work.

c) The City Requirements: Every person or organization entering into a contractual agreement with or receiving a grant from the City of San Diego shall certify to the City of San Diego that it will comply with the ADA by adhering to all of the provisions of the ADA listed below.

- i. The Contractor shall not discriminate against qualified persons with disabilities in any aspects of employment, including recruitment, hiring, promotions, conditions and privileges of employment, training, compensation, benefits, discipline, layoffs, and termination of employment.
- ii. No qualified individual with a disability may be excluded on the basis of disability, from participation in, or be denied the benefits of services, programs, or activities by the Contractor or Subcontractors providing services for the City.
- iii. The Contractor shall post a statement addressing the requirements of the ADA in a prominent place at the worksite. The Contractor shall include in each subcontract agreement, language which indicates the Subcontractor's agreement to abide by the provisions of subdivisions (a) through (c) inclusive of Section 3. The Contractor and Subcontractors shall be individually responsible for their own ADA employment programs. Questions about the City's ADA Policy should be referred to the Contract Administrator.

21. CONTRACTOR STANDARDS – PLEDGE OF COMPLIANCE: This contract is subject to City of San Diego Municipal Code §22.3224 as amended 11/24/08 by ordinance O-19808. Bidders shall become aware that the requirements apply to Contractors and Subcontractors for contracts greater than \$50,000 in value.

Upon award, amendment, renewal, or extension of this contract, the Contractors shall complete a Pledge of Compliance attesting under penalty of perjury that they complied with the requirements of this section.

The Contractors shall ensure that their Subcontractors whose subcontracts are greater than \$50,000 in value complete a Pledge of Compliance attesting under penalty of perjury that they complied with the requirements of this section. Subcontractors may access the Pledge of Compliance at:

http://www.sandiego.gov/purchasing/pdf/contractor_standards_questionnaire.pdf

The Contractors shall include in each subcontract agreement, language which requires Subcontractors to abide by the provisions of City of San Diego Municipal Code §22.3224. A sample provision is as follows:

“Compliance with San Diego Municipal Code §22.3224: Subcontractor acknowledges that it is familiar with the requirements of San Diego Municipal Code §22.3224 (“Contractor Standards”), and agrees to comply with requirements of that section. The Subcontractor further agrees to complete the Pledge of Compliance, incorporated herein by reference.”

- 22. NOTICE OF LABOR COMPLIANCE PROGRAM APPROVAL:** The City of San Diego received initial approval as a Labor Compliance Program on August 11, 2003. The Labor Compliance Program Manual is available at:

<http://www.sandiego.gov/eoc/laborcompliance/#manual>.

The limited exemption from prevailing wages pursuant to Labor Code §1771.5(a) does not apply to contracts under jurisdiction of the Labor Compliance Program. Inquiries, questions, or assistance about the Labor Compliance Program should be directed to: Equal Opportunity Contracting Program, 1200 Third Ave., Suite 200 MS56P, San Diego, CA 92101, Tel. 619-236-6000.

- 23. PAYROLL RECORDS:** The Contractor's attention is directed to the City of San Diego Labor Compliance Program, Section IV, pages 4-7, and the State of California Labor Code §§ 1771.5(b) and 1776 (Stats. 1978, Ch. 1249). These require, in part, that the Contractor and Subcontractors maintain and furnish to the City, at a designated time, a certified copy of each weekly payroll containing a statement of compliance signed under penalty of perjury.

The Contractor and Subcontractors shall submit weekly certified payrolls online via Prism® i.e., the City’s web-based labor compliance program. Instructions on how to use the system will be provided to the Contractor after the award.

The Contractor shall be responsible for the compliance with these provisions by Subcontractors. The City shall withhold contract payments when payroll records are delinquent or inadequate, or when it is established after investigation that underpayment has occurred.

- 24. APPRENTICES ON PUBLIC WORKS:** The Contractor shall abide by the requirements of §§1777.5, 1777.6, and 1777.7 of the State of California Labor Code concerning the employment of apprentices by contractors and subcontractors performing public works contracts.

- 25. EQUAL BENEFITS:** This contract is subject to the City’s Equal Benefits Ordinance (EBO), Chapter 2, Article 2, Division 43 of the San Diego Municipal Code (SDMC).

In accordance with the EBO, Bidders shall certify they will provide and maintain equal benefits as defined in SDMC §22.4302 for the duration of the Contract (SDMC §22.4304(f)). Failure to maintain equal benefits is a material breach of the Contract (SDMC §22.4304(e)). The Contractor shall notify employees of their equal benefits policy at the time of hire and during open enrollment periods and shall post a copy of the following statement in an area frequented by employees:

“During the performance of a contract with the City of San Diego, this employer will provide equal benefits to its employees with spouses and its employees with domestic partners.”

The Contractor shall give the City access to documents and records sufficient for the City to verify the contractors are providing equal benefits and otherwise complying with EBO requirements.

Full text of the EBO and the Rules Implementing the Equal Benefits Ordinance are posted on the City’s website at www.sandiego.gov/purchasing/ or can be requested from the Equal Benefits Program at (619) 533-3948.

26. LIMITED COMPETITION: Contracts designated with a Bid number beginning with “L” may only be bid by the Contractors on the approved SLBE-ELBE Construction Contractors List. For information regarding the SLBE-ELBE Construction Program and registration visit the City’s web site: <http://www.sandiego.gov>.

27. PRE-AWARD ACTIVITIES:

Pre-award Submittals - The Apparent Low Bidder (or winner in case of Design-Build contracts) shall provide the information required within the time specified in “Required Documents,” of this bid package. Failure to provide the information within the time specified may result in the Bid being rejected as **non-responsive**.

If the Bid is rejected as non-responsive, the Apparent Low Bidder (or winner in case of Design-Build contracts) shall forfeit the Bid Security required under Invitation to Bids, of this bid package. The decision that the Apparent Low Bidder (or winner in case of Design-Build contracts) is non-responsive for failure to provide the information required within the time specified shall be at the sole discretion of the City.

CONTRACT FORMS AGREEMENT

DESIGN-BUILD AGREEMENT

This Design-Build agreement [Contract] is made and entered into this ___ day of ___, 20 ___, by and between The City of San Diego [City], a municipal corporation, and **Siemens industry, Inc.** [Design-Builder], for the purpose of designing and constructing the **Water Department Security Upgrade Design-Build Contract** [Project] in the amount of **SIX MILLION THIRTY THOUSAND ONE HUNDRED ONE HUNDRED FIFTY-THREE DOLLARS AND .97/100 (\$6,030,153.97)**. City and Design-Builder are referred to herein as the "Parties."

RECITALS

- A. City desires to construct the Project located in the City of San Diego, California.
- B. City desires to contract with a single entity for design and construction of the Project, as set forth in this agreement.
- C. The City has issued a Request for Proposals [RFP] for **K-12-5463-DBA** pursuant to which the City solicited Proposals from design-build teams to design, rehabilitate, and build the Project.
- D. In accordance with City's RFP, Design-Builder submitted a Proposal for the Project and is prepared to enter into this agreement.
- E. The City has selected the Design-Builder to perform, either directly or pursuant to Subcontracts, hereinafter defined, the design, engineering, and construction services set forth in this agreement and the Contract Documents, hereinafter defined.
- F. The Design-Builder is ready, willing, and able to perform the services required in accordance with the terms and conditions of this agreement.
- G. Execution of this agreement by the Design-Builder is a representation that the Design-Builder has visited the Site, become familiar with the local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents.

In consideration of the above recitals and the mutual covenants and conditions set forth herein, and for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties hereby set forth their mutual covenants and understandings as follows.

INTRODUCTORY PROVISIONS

- A. The above referenced recitals are true and correct and are incorporated into this agreement by this reference.
- B. All Exhibits referenced in this agreement are incorporated into the Contract by this reference.
- C. This agreement amends the Standard Specifications for Public Works Construction [The GREENBOOK], including supplement amendments set forth in the City of San Diego Supplement [City Supplement]. All changes and or additions are stated herein and all other provisions remain unchanged.

**CONTRACT FORMS (continued)
AGREEMENT**

IN WITNESS WHEREOF, this agreement is signed by the City of San Diego, acting by and through its Mayor or designee, pursuant to Resolution No. R - 307417 authorizing such execution.

THE CITY OF SAN DIEGO

APPROVED AS TO FORM AND LEGALITY

Jan I. Goldsmith, City Attorney

By Tony Heinrichs

By Mark M. Mercer

Print Name: Tony Heinrichs,
Director of Public Works

Print Name: Mark M. Mercer
Deputy City Attorney

Date: 7/11/12

Date: 7/10/12

CONTRACTOR

By George T. Burck, JR.

Print Name: George T. Burck, JR.
Director, SOX & ICS

Title: _____

Date: 6/28/12

City of San Diego License No.: 02001011331

State Contractor's License No.: 758796

NAME: Noe G. Bermudez
TITLE: Assistant Secretary
DATE: _____

CONTRACT FORMS (continued)
PERFORMANCE BOND AND LABOR AND MATERIALMEN'S BOND

FAITHFUL PERFORMANCE BOND AND LABOR AND MATERIALMEN'S BOND:

Siemens Industry, Inc., a corporation, as principal, and Fidelity and Deposit Company of Maryland, a corporation authorized to do business in the State of California, as Surety, hereby obligate themselves, their successors and assigns, jointly and severally, to The City of San Diego, a municipal corporation in the sum of Six Million Thirty Thousand One * for the faithful performance of the annexed contract, and in the sum of Six Million Thirty Thousand One* for the benefit of laborers and materialmen designated below.

Conditions:

If the Principal shall faithfully perform the annexed contract: Water Department Security Upgrade Design-Build Contract, K-12-5463-DBA, San Diego, California then the obligation herein with respect to a faithful performance shall be void; otherwise it shall remain in full force.

If the Principal shall promptly pay all persons, firms and corporations furnishing materials for or performing labor in the execution of this contract, and shall pay all amounts due under the California Unemployment Insurance Act then the obligation herein with respect to laborers and materialmen shall be void; otherwise it shall remain in full force.

The obligation herein with respect to laborers and materialmen shall inure to the benefit of all persons, firms and corporations entitled to file claims under the provisions of Chapter 3 of Division 5 of Title I of the Government Code of the State of California or under the provisions of Section 3082 et seq. of the Civil Code of the State of California.

Changes in the terms of the annexed contract or specifications accompanying same or referred to therein shall not affect the Surety's obligation on this bond, and the Surety hereby waives notice of same.

* Hundred Fifty Three and 97/100ths (\$6,030,153.97)


CONTRACT FORMS (continued)
PERFORMANCE BOND AND LABOR AND MATERIAL MEN'S BOND

The Surety shall pay reasonable attorney's fees should suit be brought to enforce the provisions of this bond.

Dated June 27, 2012

Approved as to Form and Legality

Jan I. Goldsmith, City Attorney


By 
Deputy City Attorney

Approved:


Mayor or Designee

Siemens Industry, Inc.

Principal


By 

Noe G. Bermudez

Printed Name of Person Signing for Principal
~~Assistant Secretary~~

Federal Insurance Company &
Fidelity and Deposit Company of Maryland

Surety

By 

~~Attorney-in-fact~~ Stacy Rivera

15 Mountain View Road &
1400 American Lane

Local Address of Surety
Warren, NJ 07059 &
Schaumburg, IL 60196

Local Address (City, State) of Surety
908-903-3493 &
847-605-6000

Local Telephone No. of Surety

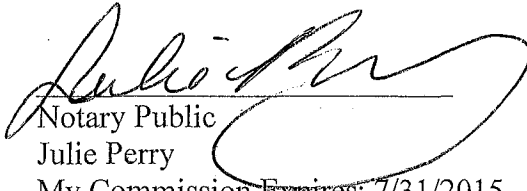
Premium \$ 28,493.00

Bond No. 82299719/9089255

ACKNOWLEDGEMENT OF SURETY

STATE OF CT
COUNTY OF Hartford

On this **27th** day of **June, 2012**, before me personally came **Stacy Rivera**, to me known, who, by me duly sworn, did depose and say that she is the attorney-in-fact of the **Federal Insurance Company & Fidelity and Deposit Company of Maryland**, that she knows the seal of the corporation; that the seal affixed to the said instrument is such company seal; that it was so affixed by order of the Board of Directors of said company and that she signed her name thereto by like order.


Notary Public
Julie Perry
My Commission Expires: 7/31/2015



**Chubb
Surety**

**POWER
OF
ATTORNEY**

**Federal Insurance Company
Vigilant Insurance Company
Pacific Indemnity Company**

**Attn: Surety Department
15 Mountain View Road
Warren, NJ 07059**

Know All by These Presents, That FEDERAL INSURANCE COMPANY, an Indiana corporation, VIGILANT INSURANCE COMPANY, a New York corporation, and PACIFIC INDEMNITY COMPANY, a Wisconsin corporation, do each hereby constitute and appoint Aiza Lopez, Jeannette Porrini and Stacy Rivera of Hartford, Connecticut -----

each as their true and lawful Attorney- in- Fact to execute under such designation in their names and to affix their corporate seals to and deliver for and on their behalf as surety thereon or otherwise, bonds and undertakings and other writings obligatory in the nature thereof (other than bail bonds) given or executed in the course of business, and any instruments amending or altering the same, and consents to the modification or alteration of any instrument referred to in said bonds or obligations.

In Witness Whereof, said FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY have each executed and attested these presents and affixed their corporate seals on this **5th** day of **October, 2011**.

Kenneth C. Wendel, Assistant Secretary

David B. Norris, Jr., Vice President

STATE OF NEW JERSEY
County of Somerset ss.

On this **5th** day of **October, 2011** before me, a Notary Public of New Jersey, personally came Kenneth C. Wendel, to me known to be Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY, the companies which executed the foregoing Power of Attorney, and the said Kenneth C. Wendel, being by me duly sworn, did depose and say that he is Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY and knows the corporate seals thereof, that the seals affixed to the foregoing Power of Attorney are such corporate seals and were thereto affixed by authority of the By- Laws of said Companies; and that he signed said Power of Attorney as Assistant Secretary of said Companies by like authority; and that he is acquainted with David B. Norris, Jr., and knows him to be Vice President of said Companies; and that the signature of David B. Norris, Jr., subscribed to said Power of Attorney is in the genuine handwriting of David B. Norris, Jr., and was thereto subscribed by authority of said By- Laws and in deponent's presence.

Notarial Seal



**KATHERINE J. ADELAAR
NOTARY PUBLIC OF NEW JERSEY
No. 2316685
Commission Expires July 16, 2014**

Notary Public

CERTIFICATION

Extract from the By- Laws of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY:

"All powers of attorney for and on behalf of the Company may and shall be executed in the name and on behalf of the Company, either by the Chairman or the President or a Vice President or an Assistant Vice President, jointly with the Secretary or an Assistant Secretary, under their respective designations. The signature of such officers may be engraved, printed or lithographed. The signature of each of the following officers: Chairman, President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary and the seal of the Company may be affixed by facsimile to any power of attorney or to any certificate relating thereto appointing Assistant Secretaries or Attorneys- in- Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such power of attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding upon the Company with respect to any bond or undertaking to which it is attached."

I, Kenneth C. Wendel, Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY (the "Companies") do hereby certify that

- (i) the foregoing extract of the By- Laws of the Companies is true and correct,
- (ii) the Companies are duly licensed and authorized to transact surety business in all 50 of the United States of America and the District of Columbia and are authorized by the U.S. Treasury Department; further, Federal and Vigilant are licensed in Puerto Rico and the U.S. Virgin Islands, and Federal is licensed in American Samoa, Guam, and each of the Provinces of Canada except Prince Edward Island; and
- (iii) the foregoing Power of Attorney is true, correct and in full force and effect.

Given under my hand and seals of said Companies at Warren, NJ this **27th** day of **June, 2012**



Kenneth C. Wendel, Assistant Secretary

IN THE EVENT YOU WISH TO NOTIFY US OF A CLAIM, VERIFY THE AUTHENTICITY OF THIS BOND OR NOTIFY US OF ANY OTHER MATTER, PLEASE CONTACT US AT ADDRESS LISTED ABOVE, OR BY Telephone (908) 903- 3493 Fax (908) 903- 3656 e-mail: surety@chubb.com

FEDERAL INSURANCE COMPANY

STATEMENT OF ASSETS, LIABILITIES AND SURPLUS TO POLICYHOLDERS

Statutory Basis

DECEMBER 31, 2011

(in thousands of dollars)

ASSETS	LIABILITIES AND SURPLUS TO POLICYHOLDERS
Cash and Short Term Investments..... \$ 151,942	Outstanding Losses and Loss Expenses \$ 12,300,432
United States Government, State and Municipal Bonds 10,312,572	Unearned Premiums..... 3,395,082
Other Bonds..... 4,146,378	Ceded Reinsurance Premiums Payable..... 320,332
Stocks 779,367	Provision for Reinsurance 80,930
Other Invested Assets..... 1,924,895	Other Liabilities..... 922,290
TOTAL INVESTMENTS 17,315,154	TOTAL LIABILITIES 17,019,066
Investments in Affiliates:	Special Surplus Funds 222,832
Chubb Investment Holdings, Inc. 3,212,072	Capital Stock 20,980
Pacific Indemnity Company..... 2,440,763	Paid-In Surplus..... 3,106,808
Chubb Insurance Investment Holdings Ltd... 1,237,556	Unassigned Funds 10,356,926
Executive Risk Indemnity Inc..... 1,076,901	
CC Canada Holdings Ltd..... 747,660	SURPLUS TO POLICYHOLDERS 13,707,546
Great Northern Insurance Company 436,665	
Chubb Insurance Company of Australia Limited 404,315	
Chubb European Investment Holdings SLP .. 251,756	TOTAL LIABILITIES AND SURPLUS TO POLICYHOLDERS..... \$ 30,726,612
Vigilant Insurance Company..... 233,604	
Other Affiliates 409,535	
Premiums Receivable 1,470,010	
Other Assets 1,490,621	
TOTAL ADMITTED ASSETS \$ 30,726,612	

Investments are valued in accordance with requirements of the National Association of Insurance Commissioners.
Investments with a carrying value of \$431,309,571 are deposited with government authorities as required by law.

State, County & City of New York, — ss:

Yvonne Baker, Assistant Secretary _____ of the Federal Insurance Company

being duly sworn, deposes and says that the foregoing Statement of Assets, Liabilities and Surplus to Policyholders of said Federal Insurance Company on December 31, 2011 is true and correct and is a true abstract of the Annual Statement of said Company as filed with the Secretary of the Treasury of the United States for the 12 months ending December 31, 2011.

Subscribed and sworn to before me
this March 31, 2012

Dorothy Baker

Notary Public

Yvonne Baker

Assistant Secretary

DOROTHY M. BAKER
Notary Public, State of New York
No. 31-4904994
Qualified in New York County
Commission Expires Sept. 14, 2013

**ZURICH AMERICAN INSURANCE COMPANY
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY
FIDELITY AND DEPOSIT COMPANY OF MARYLAND
POWER OF ATTORNEY**

KNOW ALL MEN BY THESE PRESENTS: That the ZURICH AMERICAN INSURANCE COMPANY, a corporation of the State of New York, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, a corporation of the State of Maryland, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND a corporation of the State of Maryland (herein collectively called the "Companies"), by **THOMAS O. MCCLELLEN, Vice President**, in pursuance of authority granted by Article V, Section 8, of the By-Laws of said Companies, which are set forth on the reverse side hereof and are hereby certified to be in full force and effect on the date hereof, do hereby nominate, constitute, and appoint **Jeannette PORRINI, Stacy RIVERA and Aiza LOPEZ, all of Hartford, Connecticut, EACH** its true and lawful agent and Attorney-in-Fact, to make, execute, seal and deliver, for, and on its behalf as surety, and as its act and deed: **any and all bonds and undertakings**, and the execution of such bonds or undertakings in pursuance of these presents, shall be as binding upon said Companies, as fully and amply, to all intents and purposes, as if they had been duly executed and acknowledged by the regularly elected officers of the ZURICH AMERICAN INSURANCE COMPANY at its office in New York, New York., the regularly elected officers of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at its office in Owings Mills, Maryland., and the regularly elected officers of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at its office in Owings Mills, Maryland., in their own proper persons.

The said Vice President does hereby certify that the extract set forth on the reverse side hereof is a true copy of Article V, Section 8, of the By-Laws of said Companies, and is now in force.

IN WITNESS WHEREOF, the said Vice-President has hereunto subscribed his/her names and affixed the Corporate Seals of the said **ZURICH AMERICAN INSURANCE COMPANY, COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and FIDELITY AND DEPOSIT COMPANY OF MARYLAND**, this 15th day of May, A.D. 2012.

ATTEST:

**ZURICH AMERICAN INSURANCE COMPANY
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY
FIDELITY AND DEPOSIT COMPANY OF MARYLAND**



By: *Eric D. Barnes*
Assistant Secretary
Eric D. Barnes


Thomas O. McClellen
Vice President
Thomas O. McClellen

State of Maryland
City of Baltimore

On this 15th day of May, A.D. 2012, before the subscriber, a Notary Public of the State of Maryland, duly commissioned and qualified, **THOMAS O. MCCLELLEN, Vice President, and ERIC D. BARNES, Assistant Secretary**, of the Companies, to me personally known to be the individuals and officers described in and who executed the preceding instrument, and acknowledged the execution of same, and being by me duly sworn, deposeth and saith, that he/she is the said officer of the Company aforesaid, and that the seals affixed to the preceding instrument are the Corporate Seals of said Companies, and that the said Corporate Seals and the signature as such officer were duly affixed and subscribed to the said instrument by the authority and direction of the said Corporations.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my Official Seal the day and year first above written.

Maria D. Adamski
Maria D. Adamski, Notary Public
My Commission Expires: July 8, 2015



FIDELITY AND DEPOSIT COMPANY

OF MARYLAND

600 Red Brook Blvd., Suite 600, Owings Mills, MD 21117

Statement of Financial Condition As Of December 31, 2011

ASSETS

Bonds	\$ 167,477,539
Stocks	23,576,974
Cash and Short Term Investments	235,580
Reinsurance Recoverable	12,886,175
Other Accounts Receivable	39,980,988
TOTAL ADMITTED ASSETS	\$ 244,157,256

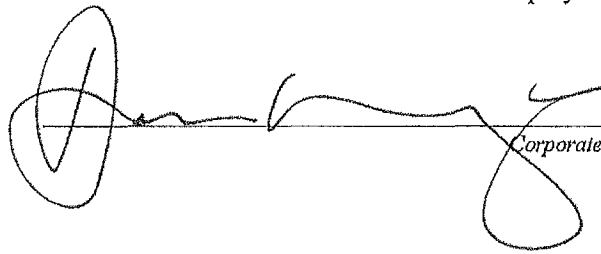
LIABILITIES, SURPLUS AND OTHER FUNDS

Reserve for Taxes and Expenses	\$ 127,987
Ceded Reinsurance Premiums Payable	48,215,682
Securities Lending Collateral Liability	1,022,500
TOTAL LIABILITIES	\$ 49,366,169
Capital Stock, Paid Up	\$ 5,000,000
Surplus	189,791,087
Surplus as regards Policyholders	194,791,087
TOTAL	\$ 244,157,256

Securities carried at \$59,049,993 in the above statement are deposited as required by law.

Securities carried on the basis prescribed by the National Association of Insurance Commissioners. On the basis of December 31, 2011 market quotations for all bonds and stocks owned, the Company's total admitted assets would be \$253,778,028 and surplus as regards policyholders \$204,411,859.

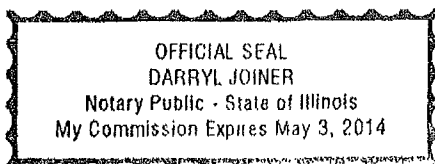
I, DENNIS F. KBERRIGAN, Corporate Secretary of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND, do hereby certify that the foregoing statement is a correct exhibit of the assets and liabilities of the said Company on the 31st day of December, 2011.



Corporate Secretary

State of Illinois }
City of Schaumburg } SS:

Subscribed and sworn to, before me, a Notary Public of the State of Illinois, in the City of Schaumburg, this 15th day of March, 2012.





Notary Public

CONTRACTOR CERTIFICATION

DRUG-FREE WORKPLACE

PROJECT TITLE: Water Department Security Upgrade Design-Build Contract

I hereby certify that I am familiar with the requirements of San Diego City Council Policy No. 100-17 regarding Drug-Free Workplace as outlined in INSTRUCTION TO BIDDERS, "Drug-Free Workplace", of the project specifications, and that;

Siemens Industry, Inc.

(Name under which business is conducted)

has in place a drug-free workplace program that complies with said policy. I further certify that each subcontract agreement for this project contains language which indicates the subcontractor's agreement to abide by the provisions of subdivisions a) through c) of the policy as outlined.

Signed 

Printed Name Richard J. Evans

Title Branch Manager

CONTRACTOR CERTIFICATION

CONTRACTOR STANDARDS – PLEDGE OF COMPLIANCE

PROJECT TITLE: Water Department Security Upgrade Design-Build Contract

I declare under penalty of perjury that I am authorized to make this certification on behalf of Siemens Industry, Inc., as Contractor, that I am familiar with the requirements of City of San Diego Municipal Code § 22.3224 regarding Contractor Standards as outlined in INSTRUCTION TO BIDDERS ("Contractor Standards"), of the project specifications, and that Contractor has complied with those requirements.

I further certify that each of the Contractor's subcontractors whose subcontracts are greater than \$50,000 in value has completed a Pledge of Compliance attesting under penalty of perjury of having complied with City of San Diego Municipal Code § 22.3224.

Dated this 29th Day of June, 2012.

Signed _____

Printed Name Richard J. Evans

Title Branch Manager

AFFIDAVIT OF DISPOSAL

WHEREAS, on the _____ DAY OF _____, 2____, the undersigned entered into and executed a contract with the City of San Diego, a municipal corporation, for:

Water Department Security Upgrade Design–Build Contract
(Name of Project or Task)

as particularly described in said contract and identified as Bid No. **K-12-5463-DBA** ; WBS Order No. **S-11105, S-11107**; and **WHEREAS**, the specifications of said contract requires the Contractor to affirm that "all brush, trash, debris, and surplus materials resulting from this project have been disposed of in a legal manner"; and **WHEREAS**, said contract has been completed and all surplus materials disposed of:

NOW, THEREFORE, in consideration of the final payment by the City of San Diego to said Contractor under the terms of said contract, the undersigned Contractor, does hereby affirm that all surplus materials as described in said contract have been disposed of at the following location(s)

and that they have been disposed of according to all applicable laws and regulations.

Dated this _____ DAY OF _____, 2_____.

by _____ Contractor

ATTEST:

State of _____
County of _____

On this _____ DAY OF _____, 2____, before the undersigned, a Notary Public in and for said County and State, duly commissioned and sworn, personally appeared _____ known to me to be the _____ Contractor named in the foregoing Release, and whose name is subscribed thereto, and acknowledged to me that said Contractor executed the said Release.

Notary Public in and for said County and State

SUPPLEMENTARY SPECIAL PROVISIONS (SSP)

THESE SUPPLEMENTARY SPECIAL PROVISIONS CONFORM TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (THE GREENBOOK) CURRENTLY ADOPTED BY THE CITY, INCLUDING ITS CURRENT SUPPLEMENT AMENDMENTS (CITY SUPPLEMENTS INCLUDED IN THE WHITEBOOK), EXCEPT FOR THE FOLLOWING:

STYLE OF SPECIFICATIONS

The City is gradually standardizing the style and language of the standard specifications for the public works construction. The new style and language follows the Federal guidelines for “Plain Language” to the extent possible.

The use of this new style does not change the meaning of a specification not yet using this style. Where used in the Contract Documents, statement or command type phrases (i.e., active voice and imperative mood) refer to and are directed at the Bidder or Contractor as applicable. The specifications are written to the Bidder before award and the Contractor after. Before award, interpret sentences written in the imperative mood as starting with "The Bidder must" and interpret "you" as "the Bidder" and "your" as "the Bidder's." After award, interpret sentences written in the imperative mood as starting with "The Contractor must" and interpret "you" as "the Contractor" and "your" as "the Contractor's." Similarly, interpret "we" and “us” as "the City" and "our" as "the City's.”

PART 1 – GENERAL PROVISIONS

SECTION 1 – TERMS, DEFINITIONS, ABBREVIATIONS, UNITS OF MEASURE, AND SYMBOLS

1-2 TERMS AND DEFINITIONS.

Agency – ADD the following:

Regulatory activities handled by the City of San Diego Developmental Services, Fire and Planning Departments, or any other City Department are not subject to the responsibilities of the City under this contract.

Contract Documents – To the City Supplement, DELETE in its entirety and SUBSTITUTE with the following:

The Agreement, Addendum, Invitation to Bid, Instructions to Bidders, special notice page, funding agency provisions, Bid and documentation accompanying the Bid and any post-bid documentation submitted prior to the Notice of Award when attached as an exhibit to the Contract, Bonds, permits from jurisdictional regulatory agencies, Supplementary Special Provisions (SSP), City’s EOC Requirements, City Supplement, Plans, Standard Plans, Construction Documents, Reference Specifications listed in the Invitation to Bid or the RFP for Design-Build contracts, Request for Qualifications (RFQ), Statement of Qualifications (SOQ), Request for Proposals (RFP), modifications issued after the execution of the Contract e.g., Change Orders, Construction Manager At Risk’s Guaranteed Maximum Price including written qualifications, assumptions and conditions thereto and Pre-construction Services Agreement.

Notice of Completion (NOC) – ADD the following:

See California Civil Code section 3093.

Samples - Physical examples which illustrate materials, equipment or workmanship and establish standards by which the Work will be evaluated.

Normal Working Hours. To the City Supplement, ADD the following:

The Normal Working Hours shall be 8:00 AM to 4:00 PM.

Certificate of Compliance – To the City Supplement, DELETE in its entirety and SUBSTITUTE with the following:

Certificate of Compliance – A written document signed and submitted by a supplier or manufacturer that certifies that the material or assembled material supplied to the Work site complies with the requirements of the Contract Documents.

Task – See Task Order.

DELETE the following definitions in their entirety and SUBSTITUTE with the following:

Task Order – For or As-Needed contracts, a project assigned to a specific As-Needed contract which will be constructed by the Contractor in accordance with the terms of the As-Needed contract to which it is assigned.

Task Order Authorization - For As-Needed contracts, the documents transmitted by the City to the Contractor which indicate the work instructions, scope of work, and time duration allotted for a particular As-Needed Task or Project.

Task Order Proposal - For As-Needed contracts, the Contractor’s irrevocable offer to perform Work associated with a Task Order and refers to the Contractor’s quote for a firm fixed-price and schedule for the completion of specified Scope of Work. The Contractor’s Proposal shall be on electronic forms provided by the City and in an electronic version compatible with the City’s systems. The Proposal Submittal may also require a work schedule, EOC forms, or other such documentation as the City might require for a specific Task Order.

SECTION 2 - SCOPE AND CONTROL OF WORK

2-1.2.2 Joint Venture Contractors. To the City Supplement, last paragraph, DELETE in its entirety and SUBSTITUTE with the following:

The Joint Venture shall designate an on-site representative and an alternate in writing. The on-site representative and the alternate shall have the full authority to bind all Joint Venture partners.

The Joint Venture shall provide a copy of the Joint Venture agreement and the Joint Venture license to the City within 10 Working Days after receipt by the Bidder of Contract forms.

2-3.1.2 Subcontractor List. ADD the following:

For Extra Work, the Contractor shall submit Form CC10, “CONTRACT CHANGE ORDER (CCO)” with each CCO proposal. Form CC10 is available for download from the EOCP site at: <http://www.sandiego.gov/eoc/pdf/cc10.pdf>

2-3.2 Self Performance. DELETE in its entirety and SUBSTITUTE with the following:

The Contractor shall perform, with its own organization, Contract work amounting to at least **30 percent** of the base bid alone or base bid and any additive or deductive alternate(s) that together when added or deducted form the basis of determining the Apparent Low Bidder as specified. The self performance percentage requirement will be waived for contracts when a “B” License is required or allowed.

2-3.3 Status of Subcontractors. ADD the following:

With every request for payment, the Contractor shall submit to the Engineer a breakdown showing monthly and cumulative amounts of the Work performed under Change Order by the Contractor and the Subcontractors. The reporting format shall be approved by the Engineer.

2-3.4 Subcontract Requirements. To the City Supplement, ADD the following paragraph:

The Contractor shall ensure that all of its Subcontractors are licensed at the time of the execution of their subcontract agreements. In the event a Subcontractor is not properly licensed, the Contractor shall cease payment to Subcontractor for all work performed when the Subcontractor was improperly licensed. Any payment made by the Contractor to a Subcontractor for work performed when the Subcontractor was unlicensed shall be returned to the City.

Where the Contract Documents require that a particular product be installed or applied by an applicator approved by the manufacturer, it is the Contractor’s responsibility to ensure the Subcontractor or Supplier employed for such work is approved by the manufacturer

2-5.2 Precedence of Contract Documents. To the Cit Supplement, DELETE in its entirety and SUBSTITUTE with the following:

2-5.2 Precedence of Contract DocumentsError! Bookmark not defined.. If there is a conflict between any of the Contract Documents, the document highest in the order of precedence shall control. The order of precedence, from highest to lowest, shall be as follows:

- 1) Permits (i.e., issued by jurisdictional regulatory agencies)
- 2) Change Orders and Supplemental Agreements; whichever occurs last
- 3) Contract and Agreement
- 4) Addenda
- 5) Bid (e.g., price Proposal for Design-Build contracts)
- 6) Request for Proposal (RFP)
- 7) Invitation to Bid
- 8) Instruction to Bidders
- 9) Request for Qualifications (RFQ)
- 10) Special Provisions (i.e., City’s EOCP Requirements, City Supplement, and Supplementary Special Provisions (SSP))
- 11) Plans

- 12) Construction Documents (for Design-Build contracts)
- 13) Standard Drawings
- 14) Reference Specifications (e.g., GREENBOOK)
- 15) Technical Proposal (for Design-Build contracts)
- 16) Statement of Qualifications (SOQ)

When additional requirements by the funding sources are physically or by reference incorporated in the Contract Documents, the funding source's requirements shall govern **unless specified otherwise**. Figured dimensions shall take precedence over scaled dimensions. Detailed drawings shall take precedence over general drawings.

2-5.3.1 General. DELETE in its entirety and SUBSTITUTE with the following:

When required by the Contract Documents or when requested by the Engineer, the Contractor shall provide the submittals as specified in 2-5.3.2, 2-5.3.3, and 2-5.3.4 to the Engineer. Materials shall neither be furnished nor fabricated, nor shall any work for which submittals are required be performed before the required submittals have been reviewed and accepted by the Engineer. The payment for the submittals shall be included in the various Bid items. Neither review nor acceptance of submittals by the Engineer shall relieve the Contractor from responsibility for errors, omissions, or deviations from the Contract Documents, unless such deviations were specifically called to the attention of the Engineer in the letter of transmittal. The Contractor shall be responsible for the correctness of the submittals.

The Contractor shall allow a minimum of 20 working days for review of submittals unless otherwise specified in the Special Provisions. Each submittal shall be accompanied by a letter of transmittal.

2-5.4.1 General. ADD the following:

Source Identification e.g., RFI numbers and Change Order numbers as required to identify the source of the change to the Contract Documents shall be noted.

2-5.4.2 Asset Specific Red-lines (d). ADD the following:

- Dimensional changes to the drawings.
- Revisions to details shown on drawings.
- Depths of foundations below first floor.
- Locations and depths of underground utilities.
- Revisions to routing of piping and conduits.
- Revisions to electrical circuitry.
- Actual equipment locations.
- Duct size and routing.
- Locations of concealed internal utilities.
- Changes made by Change Order.
- Details not on original Plans.

ADD the following:

- h) Slurry Seal and Asphalt Overlay Red-Lines: The Contractor shall clearly record on the City provided forms in MS Excel format the actual dates and quantity of each Bid

item applied to each street segment and comments regarding each segment. The Contractor shall record reasons if no work is performed.

2-5.5 As-built Drawings. ADD the following:

As-built Drawings shall be the responsibility of the Design-Builder.

2-6 WORK TO BE DONE. ADD the following:

In accordance with the provisions of California Law, the Contractor shall possess or require the Subcontractor(s) to possess valid appropriate license(s) for the Work being performed.

2-10 AUTHORITY OF BOARD AND ENGINEER. ADD the following:

Regulating agencies of the City, such as Developmental Services, Fire and Planning Departments, enforce Legal Requirements and standards. These enforcement activities are not subject to the responsibilities of the Engineer under this Agreement.

2-11 INSPECTION. ADD the following:

The City may utilize field inspectors to assist the Engineer during construction in observing performance of the Contractor. The inspector is for the purpose of assisting the Engineer and shall not be confused with an inspector with a City regulatory agency or with a Special Inspector.

Code compliance testing (including all Geotechnical requirements) and inspections required by codes or ordinances, or by a plan approval authority, shall be the responsibility of and shall be paid by the Contractor, unless otherwise provided in the Contract Documents.

The Contractor's quality control testing and inspections shall be the sole responsibility of the Contractor and paid by the Contractor included in the Bid price.

SECTION 3 – CHANGES IN WORK

3-3.2.2 Basis for Establishing Costs (a) Labor, City Supplement, first and second paragraphs, DELETE in entirety and SUBSTITUTE with the following:

The City reserves the right to request financial records of salaries for an employee, wages, bonuses and deductions to substantiate the actual cost of labor certified by a California licensed Certified Public Accountant. The Contractor shall use the City provided form i.e., "PUBLIC WORKS PAYROLL REPORTING FORM" which is available at <http://www.sandiego.gov/eoc/pdf/payrollreport.pdf> to list the labor rates of its personnel and Subcontractors who work on this Project. An initial submittal shall be made prior to NTP.

The payment for payroll records shall be included in the various Bid item unless a separate Bid item has been provided.

SECTION 4 - CONTROL OF MATERIALS

4-1.3.1 General. First paragraph, ADD the following:

Other standard items or materials typically accepted by Certificate of Compliance shall not require inspection at the source unless specified in the Special Provisions. For a list of these items or materials, the Contractor may refer to the Contract Documents.

4-1.3.5 Special Inspections. To the City Supplement, ADD the following:

Special Inspection and testing by the Special Inspectors shall meet the minimum requirements of the prevailing Codes and by the City's Development Services Department (DSD) and reference in <http://www.sandiego.gov/development-services/industry/special.shtml>

4-1.5 Certificates of Compliance. To the City Supplement, DELETE in its entirety and SUBSTITUTE with the following:

4-1.5 Certificates of Compliance. DELETE in its entirety and SUBSTITUTE with the following:

Certificates of Compliance shall be furnished to the Engineer prior to the use of any material or assembled material for which these Specifications so require or if so required by the Engineer.

The Engineer may waive the materials testing requirements of the Specifications and accept a Certificate of Compliance. Manufacturing test data may be required by the Engineer to be included with the submittal.

Materials used on the basis of a Certificate of Compliance may be sampled and tested at any time. The submission of a Certificate of Compliance shall not relieve the Contractor of responsibility for incorporating material in the Work which conforms to the requirements of the Contract Documents, and any material not conforming to the requirements will be subject to rejection whether in place or not.

When professional certification of performance criteria of materials, systems or equipment is required by the Contract Documents, the City shall be entitled to rely upon the accuracy and completeness of such calculations and certifications.

4-1.6 Trade Names or Equals. To the City Supplement, DELETE in its entirety and SUBSTITUTE with the following:

ADD the following:

Whenever materials or equipment are indicated in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the naming of the item is intended to establish the type, function, and quality required. Unless stated otherwise, materials or equipment of other Suppliers may be accepted if sufficient information is submitted to the Engineer for review to determine whether the material or equipment proposed is equivalent or equal to that named.

- a) The request for substitution shall include the following information:
 - i. Whether or not acceptance of the substitute for use in the Work will require a change in any of the Contract Documents to adopt the design to the proposed substitute.
 - ii. Whether or not incorporation or use of the substitute in connection with the Work is subject to payment of any license fee or royalty.
 - iii. All variations of the proposed substitute from the items originally specified will be identified.
 - iv. Available maintenance, repair, and replacement service requirements. The manufacturer shall have a local service agency within 50 miles of the site which maintains properly trained personnel and adequate spare parts and is able to respond and complete repairs within 24 hours.
 - v. Certification that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, and be similar and of equal substance to that indicated, and be suited to the same use as that specified.
- b) There is no guaranteed time frame for the City's review of the substitution requests.
- c) The burden of proof as to the type, function, and quality of any such substitute product, material or equipment shall be upon the Contractor. The Engineer may require at the Contractor's expense additional data about the proposed substitute.
- d) If the Engineer takes no exceptions to the proposed substitution, it shall not relieve the Contractor from responsibility for the efficiency, sufficiency, quality, and performance of the substitute material or equipment, in the same manner and degree as the material and equipment specified by name.

- e) The lack of action(s) on the Engineer's side within the Contractor's requested time shall not constitute acceptance of the substitution.
- f) Acceptance by the Engineer of a substitute item shall not relieve the Contractor of the responsibility for full compliance with the Contract Documents.
- g) For the substitution review process or to have materials listed on the AML, refer to the AML standard review process.
- h) The Bid submittal shall be based on the material and equipment specified by name in the Contract. If the proposal is rejected by the Engineer, the Contractor shall not be entitled to either an extension in Contract Time, increase in the Contract Price, or both.
- i) As applicable, no Shop Drawing or Working Drawing submittals shall be made for a substitute item nor shall any substitute item be ordered, installed, or utilized without the Engineer's prior written.
- j) The Contractor shall reimburse the City for the charges of the Engineer for evaluating each proposed substitute.
- k) For Design-Build contracts, one copy of all designer reviewed submittals shall be provided to the Engineer.

ADD: 4-1.11 Street Lighting And Traffic Signal Materials List. The Contractor shall be responsible for furnishing a Notice of Materials to Be Used at the preconstruction meeting. The list of materials shall identify Bid item number for which the material is to be incorporated, category of material to be supplied, and the name and address where the material can be inspected at the source where it is produced, not the Site. The Notice of Materials to Be Used shall include the following categories of material: signal poles, signal equipment and fixtures, foundation reinforcing steel, conduit, pull boxes, and conductor or cable. The Notice of Materials to Be Used form is provided in the Contract and shall be used to provide the required material information.

Certificates of Compliance conforming to 4-1.5, "Certificate of Compliance" are required for the major construction material categories identified above. A sample Certificate of Compliance is provided in the Contract. Certificates shall be furnished, to the Engineer, before the material is brought on the Site.

The payment for the material certification process shall be included in the lump sum price for the traffic signal system or be distributed in individual bid items if no lump sum quantity is identified in the bidding documents.

SECTION 6 - PROSECUTION, PROGRESS AND ACCEPTANCE OF WORK

6-1.2 Commencement of Work. To the City Supplement, DELETE the following:

1st sentence of the 2nd paragraph and the 5th paragraph in its entirety.

ADD: 6-8.1 Completion. To the City Supplement, DELETE in its entirety and SUBSTITUTE with the following:

6-8.1 Completion. The Contractor shall submit a written assertion that the Work has been completed. If, in the Engineer's judgment, the Work has been completed in accordance with the Contract Documents, the Engineer will set forth in writing the date the Work was completed. This will be the date when the Contractor is relieved from responsibility to protect and maintain the Work.

6-8.2 Acceptance. To the City Supplement, DELETE in its entirety and SUBSTITUTE with the following:

6-8.2 Acceptance. Acceptance will occur after all of the requirements contained in the Contract Documents have been fulfilled. If, in the Engineer's judgment, the Contractor has fully performed the Contract, the Engineer will accept the Contractor's performance of the Contract.

6-8.3 Warranty. To the City Supplement, DELETE in its entirety and SUBSTITUTE with the following:

6-8.3 Warranty. Unless specified otherwise, the Work shall be warranted by the Contractor against defective workmanship and materials for a period of 3 years.

- a) The warranty period shall start on the date of completion of the Work as determined by the Engineer.
- b) The Contractor shall provide an unconditional warranty on all installed fiber optic cable for a minimum period of 3 years.
- c) The Contractor shall involve the manufacturer in the installation and startup as needed to secure any extended warranty required.
- d) The warranty period for specific items covered under manufacturers' or suppliers' warranties shall commence on the date they are placed into service at the direction of or as approved by the Engineer in writing.
- e) All warranties express or implied, from Subcontractors or Suppliers, of any tier, for the work performed and materials furnished shall be assigned, in writing, to the City, and such warranties shall be delivered to the Engineer prior to acceptance of the Contractor's performance of the Contract.
- f) The Contractor shall replace or repair defective Work in a manner satisfactory to the Engineer, after notice to do so from the Engineer, and within the time specified in the notice. If the Contractor fails to make such replacement or repairs within the time specified in the notice, the City may perform the replacement or repairs at the Contractor's expense. If the Contractor fails to reimburse the City for the actual costs, the Contractor's Surety shall be liable for the cost thereof.
- g) Nothing in this warranty is intended to limit any manufacturer's warranty which provides the City with greater warranty rights than set forth in this section or the Contract Documents.
- h) These specifications are not intended to constitute a period of limitations or waiver of any other rights or remedies City may have regarding the Contractor's other obligations under the Contract Documents or federal or state law.
- i) The Contractor shall respond and initiate corrective action within 24 hours of notice of nonconforming Work that poses an imminent threat to person or property.

6-9 LIQUIDATED DAMAGES. To the City Supplement, DELETE in its entirety and SUBSTITUTE with the following:

MODIFY to increase the daily value from \$250 to \$1,000 for contracts with a value of over \$100,000.

SECTION 7 - RESPONSIBILITIES OF THE CONTRACTOR

7-3 LIABILITY INSURANCE. DELETE in its entirety and SUBSTITUTE with the following:

The insurance provisions herein must not be construed to limit your indemnity obligations contained in this contract.

ADD:

7-3.1 Policies and Procedures.

- a) You must procure the insurance described below, at your sole cost and expense, to provide coverage against claims for loss including injuries to persons or damage to property, which may arise out of or in connection with the performance of the Work by you, your agents, representatives, officers, employees or subcontractors.
- b) Insurance coverage for property damage resulting from your operations is on a replacement cost valuation. The market value will not be accepted.
- c) You must maintain this insurance for the duration of this contract and at all times thereafter when you are correcting, removing, or replacing Work in accordance with this contract. Your liabilities under this contract, e.g., your indemnity obligations, will is not deemed limited to the insurance coverage required by this contract.
- d) Payment for insurance is included in the various items of Work as bid by you, and except as specifically agreed to by the City in writing, you are not entitled to any additional payment. Do not begin any work under this contract until you have provided and the City has approved all required insurance.
- e) Policies of insurance must provide that the City is entitled to 30 days (10 days for cancellation due to non-payment of premium) prior written notice of cancellation or non-renewal of the policy. Maintenance of specified insurance coverage is a material element of this contract. Your failure to maintain or renew coverage or to provide evidence of renewal during the term of this contract may be treated by the City as a material breach of contract.

ADD: 7-3.2 Types of Insurance.

7-3.2.1 Commercial General Liability Insurance.

- a) Commercial General Liability Insurance must be written on the current version of the ISO Occurrence form CG 00 01 07 98 or an equivalent form providing coverage at least as broad.
- b) The policy must cover liability arising from premises and operations, XCU (explosions, underground, and collapse), independent contractors, products/completed operations, personal injury and advertising injury, bodily injury, property damage, and liability assumed under an insured’s contract (including the tort liability of another assumed in a business contract).
- c) There must be no endorsement or modification limiting the scope of coverage for either “insured vs. insured” claims or contractual liability. You must maintain the same or equivalent insurance for at least 10 years following completion of the Work.
- d) All costs of defense must be outside the policy limits. Policy coverage must be in liability limits of not less than the following:

<u>General Annual Aggregate Limit</u>	<u>Limits of Liability</u>
Other than Products/Completed Operations	\$2,000,000
Products/Completed Operations Aggregate Limit	\$2,000,000
Personal Injury Limit	\$1,000,000
Each Occurrence	\$1,000,000

7-3.2.2 Commercial Automobile Liability Insurance.

- a) You must provide a policy or policies of Commercial Automobile Liability Insurance written on the current version of the ISO form CA 00 01 12 90 or later version or equivalent form providing coverage at least as broad in the amount of \$1,000,000 combined single limit per accident, covering bodily injury and property damage for owned, non-owned, and hired automobiles (“Any Auto”).
- b) All costs of defense must be outside the limits of the policy.

ADD:

7-3.3 Rating Requirements.

Except for the State Compensation Insurance Fund, all insurance required by this contract as described herein must be carried only by responsible insurance companies with a rating of, or equivalent to, at least “A-, VI” by A.M. Best Company, that are authorized by the California Insurance Commissioner to do business in the State, and that have been approved by the City.

7-3.3.1 Non-Admitted Carriers.

The City will accept insurance provided by non-admitted, “surplus lines” carriers only if the carrier is authorized to do business in the State and is included on the List of Eligible Surplus Lines Insurers (LESLI list).

All policies of insurance carried by non-admitted carriers must be subject to all of the requirements for policies of insurance provided by admitted carriers described herein.

ADD:

7-3.4 Evidence of Insurance.

Furnish to the City documents e.g., certificates of insurance and endorsements evidencing the insurance required herein, and furnish renewal documentation prior to expiration of this insurance. Each required document must be signed by the insurer or a person authorized by the insurer to bind coverage on its behalf. We reserve the right to require complete, certified copies of all insurance policies required herein.

ADD:

7-3.5 Policy Endorsements.

7-3.5.1 Commercial General Liability Insurance

7-3.5.1.1 Additional Insured.

- a) You must provide at your expense policy endorsement written on the current version of the ISO Occurrence form CG 20 10 11 85 or an equivalent form providing coverage at least as broad.
- b) To the fullest extent allowed by law e.g., California Insurance Code §11580.04, the policy must be endorsed to include the City and its respective elected officials, officers, employees, agents, and representatives as additional insured.
 - 1. The additional insured coverage for projects for which the Engineer’s Estimate is \$1,000,000 or more must include liability arising out of: (a) Ongoing operations performed by you or on your behalf, (b) Your products, (c) Your work, e.g., your completed operations performed by you or on your behalf, or (d) premises owned, leased, controlled, or used by you.

2. The additional insured coverage for projects for which the Engineer's Estimate is less than \$1,000,000 must include liability arising out of: (a) Ongoing operations performed by you or on your behalf, (b) Your products, or (c) premises owned, leased, controlled, or used by you.

7-3.5.1.2 Primary and Non-Contributory Coverage.

The policy must be endorsed to provide that the coverage with respect to operations, including the completed operations, if appropriate, of the Named Insured is primary to any insurance or self-insurance of the City and its elected officials, officers, employees, agents and representatives. Further, it must provide that any insurance maintained by the City and its elected officials, officers, employees, agents and representatives must be in excess of the Contractor's insurance and must not contribute to it.

7-3.5.1.3 Project General Aggregate Limit.

The policy or policies must be endorsed to provide a Designated Construction Project General Aggregate Limit that will apply only to the Work. Only claims payments which arise from the Work must reduce the Designated Construction Project General Aggregate Limit. The Designated Construction Project General Aggregate Limit must be in addition to the aggregate limit provided for the products-completed operations hazard.

7-3.5.2 Commercial Automobile Liability Insurance.

7-3.5.2.1 Additional Insured.

Unless the policy or policies of Commercial Auto Liability Insurance are written on an ISO form CA 00 01 12 90 or a later version of this form or equivalent form providing coverage at least as broad, the policy must be endorsed to include the City and its respective elected officials, officers, employees, agents, and representatives as additional insured, with respect to liability arising out of automobiles owned, leased, hired or borrowed by you or on your behalf. This endorsement is limited to the obligations permitted by California Insurance Code §11580.04.

ADD:

7-3.6 Deductibles and Self-Insured Retentions.

You are responsible for the payment of all deductibles and self-insured retentions. Disclose deductibles and self-insured retentions to the City at the time the evidence of insurance is provided.

ADD:

7-3.7 Reservation of Rights.

We reserve the right, from time to time, to review your insurance coverage, limits, deductibles and self-insured retentions to determine if they are acceptable to the City. We will reimburse you, without overhead, profit, or any other markup, for the cost of additional premium for any coverage requested by the Engineer but not required by this contract.

ADD:

7-3.8 Notice of Changes to Insurance.

You must notify the City 30 days prior to any material change to the policies of insurance provided under this contract.

ADD:

7-3.9 Excess Insurance.

Policies providing excess coverage must follow the form of the primary policy or policies e.g., all endorsements.

ADD:

7-3.10 Architects and Engineers Professional Insurance (Errors and Omissions Insurance).

- a) For contracts with required engineering services (e.g., Design-Build, preparation of engineered Traffic Control Plans (TCP), etc. by you) for all of your employees or Subcontractors who provide professional engineering services under this contract, you must keep or must require your Subcontractor keep in full force and effect, Professional Liability coverage with a limit of **\$1,000,000** per claim and **\$2,000,000** annual aggregate.
- b) You must ensure both that: (a) the policy retroactive date is on or before the date of commencement of the Project; and (b) the policy will be maintained in force for a period of 3 years after completion of the Project or termination of this contract whichever occurs last. You agree that for the time period specified above, there will be no changes or endorsements to the policy that affect the specified coverage.
- c) If professional engineering services are to be provided solely by the Subcontractor, you must (a) certify this to the City in writing and (b) agree in writing to require the Subcontractor to procure Professional Liability coverage in accordance with the requirements set forth above.

7-4 WORKERS’ COMPENSATION INSURANCE. DELETE in its entirety and SUBSTITUTE with the following:

7-4.1 Workers’ Compensation Insurance and Employers Liability Insurance.

- a) In accordance with the provisions of §3700 of the California Labor Code, you must provide at its expense Workers’ Compensation Insurance and Employers Liability Insurance to protect you against all claims under applicable state workers compensation laws. The City, its elected officials, and employees will not be responsible for any claims in law or equity occasioned by your failure to comply with the requirements of this section.

- b) Limits for this insurance must be not less than the following:

<u>Workers’ Compensation</u>	<u>Statutory Employers Liability</u>
Bodily Injury by Accident	\$1,000,000 each accident
Bodily Injury by Disease	\$1,000,000 each employee
Bodily Injury by Disease	\$1,000,000 policy limit

- c) By signing and returning this contract you certify that you are aware of the provisions of §3700 of the Labor Code which require every employer to be insured against liability for worker’s compensation or to undertake self-insurance in accordance with the provisions of that code and you will comply with such provisions before commencing the Work as required by § 1861 of the California Labor Code.

7-4.1.1 Waiver of Subrogation.

The policy or policies must be endorsed to provide that the insurer will waive all rights of subrogation against the City, and its respective elected officials, officers, employees, agents, and representatives for losses paid under the terms of the policy or policies and which arise from work performed by the Named Insured for the City.

ADD: 7-6.2 Pre-construction Meeting. Prior to the commencement of any Work, the Engineer will schedule a pre-construction conference. The purpose of this conference is to establish a working relationship between the Contractor, utility firms, and various City agencies. The agenda will include critical elements of the work schedule, submittal schedule, cost breakdown of major lump sum items, Payment Requests and processing, coordination with the involved utility firms, the level of record

project documents required and emergency telephone numbers for all representatives involved in the course of construction.

7-8.6 Water Pollution Control. ADD the following:

Based on a preliminary assessment by the City, this contract is subject to Water Pollution Control Plan

For contracts subject to Construction General Permit (CGP), the Contractor’s QSD shall verify the City’s assessment prior to submittal through SMARTS.

The Contractor’s attention is directed to Section 801, “WATER POLLUTION CONTROL” of these specifications for more information.

7-9 PROTECTION AND RESTORATION OF EXISTING IMPROVEMENTS. ADD the following:

In any emergency affecting the safety of persons or property, the Contractor shall act, at its discretion, to prevent threatened damage, injury or loss. Any change in Contract Price or Contract Time resulting from emergency work shall be determined as provided in SECTION 3, “CHANGES IN WORK.”

7-10.1 Traffic and Access. To the City Supplement, DELETE the agency notification listing in its entirety and SUBSTITUTE with the following:

The Contractor shall notify Metropolitan Transit System (MTS), a minimum of 5 Working Days prior to excavation, construction, or traffic control affecting bus stops. The Contractor shall notify the remaining agencies a minimum of two 2 Working Days prior to construction activities affecting the agencies:

Fire Department Dispatch	(Street or alley closure)	(858) 573-1300
Police Department Traffic	(Street or alley closure)	(858) 495-7800
Street Division/Electrical	(Traffic signals)	(619) 527-7500
U.S. Navy	(32nd Street Naval Station)	(619) 556-1319
Underground Service Alert	(Any excavation)	(800) 422-4133
MTS	(Street Closure and Bus Stops)	(619) 238-0100 Ext 6451

7-10.6 Traffic Plate Bridging. To the City Supplement, DELETE in its entirety and SUBSTITUTE with the following:

Transverse or longitudinal cuts, voids, trenches, holes, and excavations in the right-of-way that cannot be properly completed within 1 Working Day shall be protected by adequately designed barricades and structural steel plates [plates] that will support legal vehicle loads in such a way as to preserve unobstructed traffic flow.

The Contractor shall secure approval, in advance, from authorities concerning the use of any bridging proposed on the Work.

Plates shall conform to the following:

- a) The trench shall be adequately shored to support the bridging and traffic loads.
- b) Plates shall be designed for HS 20-44 truck loading in accordance with Caltrans Bridge Design Specifications Manual.
- c) For the minimum thickness of plates refer to Table 7-10.6(A):

Table 7-10.6(A) - Trench Width / Minimum Plate Thickness

Trench Width	Minimum Plate Thickness
10" (0.25 m)	1/2" (13 mm)
1'-11" (0.58 m)	3/4" (19 mm)
2'-7" (0.80 m)	7/8" (22 mm)
3'-5" (1.04 m)	1" (25 mm)
5'-3" (1.6 m)	1 1/4" (32 mm)

For spans greater than 5'-3" (1.6 m), a structural design shall be prepared by a California Registered Civil Engineer and approved by the Engineer.

- d) Plates shall have a skid-resistant surface with a nominal Coefficient Of Friction (COF) of 0.35 as determined by California Test Method 342.
- e) Plates shall extend a minimum of 12" (300 mm) beyond the edges of the trench.
- f) Plates shall provide complete coverage to prevent any person, bicycle, motorcycle or motor vehicle from being endangered due to plate movement causing separations or gaps.
- g) Plates shall be secured against movement or displacement by using adjustable cleats, shims, welding, or other devices, and shall be installed in a manner that will minimize noise as traffic drives over them. Plates shall be installed using either Method (1) or (2):
 - i. Method 1 [For speeds greater than 45 mph (70 Km/hr)]: The pavement shall be cold planed to a depth equal to the thickness of the plate and to a width and length equal to the dimensions of the plate.
 - ii. Method 2 [For Speeds less than 45 mph (70 Km/hr)]: Approach plate(s) and ending plate (if longitudinal placement) shall be attached to the roadway by a minimum of 2 dowels pre-drilled into the corners of the plate and drilled 2" (50 mm) into the pavement. Subsequent plates are butted to each other. Fine graded asphalt concrete shall be compacted to form ramps, maximum slope 8.5 % with a minimum 12" (305 mm) taper to cover all edges of the plates.

Alternative installation method may be submitted in accordance with 2-5.3, "Submittals" for the Engineer's approval.

- h) The Contractor shall be responsible for maintenance of the plates, shoring, and asphalt concrete ramps or any other approved device used to secure the plates. The Contractor shall immediately mobilize necessary personnel and equipment after being notified by the Engineer, the City's station 38, or a member of the public of a repair needed e.g., plate movement, noise, anchors, and asphalt ramps. Failure to respond to the emergency request within 2 hours will be grounds for the City to perform necessary repairs that will be invoiced at actual cost including overhead or \$500 per incident, whichever is greater. Failure by the Contractor to comply may result in automatic grounds suspension of permit, Contract, or both.

- i) When plates are removed, any damage to the pavement shall be repaired with fine graded asphalt concrete mix or slurry seal satisfactory to the Engineer.

Payment for traffic plate bridging shall be included in the various Bid items unless a Bid Item has been provided for steel plate bridging.

7-13.2 Access for Disabled Persons. To the City Supplement, DELETE in its entirety and SUBSTITUTE with the following:

For Design-Build contracts, the Design-Builder shall warrant and certify that all Project Plans and Specifications prepared in accordance with this contract shall meet all current requirements of the California Building Code, California Code of Regulations, Title 24 (Title 24) and the Americans with Disabilities Act (ADA) and the ADA Standards for Accessible Design. When a conflict exists between the ADA Standards for Accessible Design, Title 24 and the WHITEBOOK - City Supplement, the most restrictive requirement shall be followed. As a condition precedent to Award of this contract, the Design-Builder shall submit to City the Design-Builder Certification for Title 24/ADA Compliance.

The Design-Builder shall comply with all portions of the ADA and Title 24. (For specific services and public accommodations, The Design-Builder may contact the Office of the Americans with Disabilities Act, Civil Rights Division, U.S. Department of Justice, P.O. Box 66118, Washington, D.C. 20035-6118; phone number (202) 514-0301.) The Design-Builder acknowledges and agrees that the Design-Builder is aware of and will comply with Council Policy 100-04, incorporated herein by this reference, adopted by Resolution No. R-282153, relating to the federally-mandated ADA. The Design-Builder and contractors will be individually responsible for administering their own ADA and Title 24 program.

Code Implementation:

- a) The 2010 Americans with Disabilities Act (ADA) regulations will take effect on March 15, 2011.
- b) The 2010 ADA Standards for Accessible Design will take effect on March 15, 2012. Designers may choose either the 1991 ADAAG or the 2010 ADA Standards if the project is to be designed before the adoption date but all new construction and alteration projects must comply with the 2010 ADA Standards if construction is to start on or after March 15, 2012.
- c) The 2010 California Building Code, California Code of Regulations, Title 24 will take effect on January 1, 2011.

The Design-Builder shall pay all claims, costs, losses and damages incurred by the City in undertaking remedial action to correct City determined violations of ADA or Title 24. To effectuate remedial action, the City will issue a Change Order incorporating the necessary revisions in the Construction Documents. The City will be entitled to an appropriate decrease in the Contract Price, and, if the Parties are unable to agree as to the amount thereof, The City may unilaterally issue the Change Order.

SECTION 8 - FACILITIES FOR AGENCY PERSONNEL

8-2 FIELD OFFICE FACILITIES. To the City Supplement, DELETE in its entirety.

ADD: PART 8 – ENVIRONMENTAL WORKS

SECTION 801 – WATER POLLUTION CONTROL

801-2.9 Post-Construction Requirements. To the City Supplement second paragraph, ADD the following:

The decal-disc inlet markers shall be “das Duracast Curb Marker®” or approved equal.

END OF SUPPLEMENTARY SPECIAL PROVISIONS (SSP)

APPENDIX A

NOTICE OF EXEMPTION

**[TO BE PROVIDED BY CITY OF SAN DIEGO
PRIOR TO ISSUANCE OF THE CONSTRUCTION
NOTICE TO PROCEED (NTP)]**

APPENDIX B

MATERIALS TYPICALLY ACCEPTED BY CERTIFICATE OF COMPLIANCE

Materials Typically Accepted by Certificate of Compliance

1. Soil amendment
2. Fiber mulch
3. PVC or PE pipe up to 16 inch diameter
4. Stabilizing emulsion
5. Lime
6. Preformed elastomeric joint seal
7. Plain and fabric reinforced elastomeric bearing pads
8. Steel reinforced elastomeric bearing pads
9. Waterstops (Special Condition)
10. Epoxy coated bar reinforcement
11. Plain and reinforcing steel
12. Structural steel
13. Structural timber and lumber
14. Treated timber and lumber
15. Lumber and timber
16. Aluminum pipe and aluminum pipe arch
17. Corrugated steel pipe and corrugated steel pipe arch
18. Structural metal plate pipe arches and pipe arches
19. Perforated steel pipe
20. Aluminum underdrain pipe
21. Aluminum or steel entrance tapers, pipe downdrains, reducers, coupling bands and slip joints
22. Metal target plates
23. Paint (traffic striping)
24. Conductors
25. Painting of electrical equipment
26. Electrical components
27. Engineering fabric
28. Portland Cement
29. PCC admixtures
30. Minor concrete, asphalt
31. Asphalt (oil)
32. Liquid asphalt emulsion
33. Epoxy

APPENDIX C
SAMPLE CITY INVOICE

City of San Diego, Field Engineering Div., 9485 Aero Drive, SD CA 92123						Contractor's Name:					
Project Name:						Contractor's Address:					
SAP No. (WBS/IO/CC)											
City Purchase Order No.						Contractor's Phone #:			Invoice No.		
Resident Engineer (RE):						Contractor's Fax #:			Invoice Date:		
RE Phone#:			RE Fax#:			Contact Name:			Billing Period:		
Item #	Item Description	Contract Authorization				Previous Estimate		This Estimate		Totals to Date	
		Unit	Qty	Price	Extension	%/QTY	Amount	% / QTY	Amount	% / QTY	Amount
1	2 Parallel 4" PVC C900	LF	1,380	\$34.00	\$46,920.00						
2	48" Primary Steel Casing	LF	500	\$1,000.00	\$500,000.00						
3	2 Parallel 12" Secondary Steel	LF	1,120	\$53.00	\$59,360.00						
4	Construction and Rehab of PS 49	LS	1	\$150,000.00	\$150,000.00						
5	Demo	LS	1	\$14,000.00	\$14,000.00						
6	Install 6' High Chain Link Fence	LS	1	\$5,600.00	\$5,600.00						
7	General Site Restoration	LS	1	\$3,700.00	\$3,700.00						
8	10" Gravity Sewer	LF	10	\$292.00	\$2,920.00						
9	4" Blow Off Valves	EA	2	\$9,800.00	\$19,600.00						
10	Bonds	LS	1	\$16,000.00	\$16,000.00						
11	Field Orders	AL	1	80,000	\$80,000.00						
11.1	Field Order 1	LS	5,500	\$1.00	\$5,500.00						
11.2	Field Order 2	LS	7,500	\$1.00	\$7,500.00						
11.3	Field Order 3	LS	10,000	\$1.00	\$10,000.00						
11.4	Field Order 4	LS	6,500	\$1.00	\$6,500.00						
12	Certified Payroll	LS	1	\$1,400.00	\$1,400.00						
CHANGE ORDERS											
Change Order 1			4,890								
Items 1-4					\$11,250.00						
Item 5-Deduct Bid Item 3		LF	120	-\$53.00	(\$6,360.00)						
Change Order 2			160,480								
Items 1-3					\$95,000.00						
Item 4 Deduct Bid Item 1		LF	380	-\$340.00	(\$12,920.00)						
Item 5-Encrease bid Item 9		LF	8	\$9,800.00	\$78,400.00						
Change Order 3 (Close Out)			-121,500								
Item 1 Deduct Bid Item 3			53	-500.00	(\$26,500.00)						
Item 2 Deduct Bid Item 4		LS	-1	45,000.00	(\$45,000.00)						
Items 3-9			1	-50,500.00	(\$50,500.00)						
SUMMARY								Total This	\$ -	Total Billed	\$0.00
A. Original Contract Amount						Retention and/or Escrow Payment Schedule					
B. Approved Change Order 1 Thru 3						Total Retention Required as of this billing					
C. Total Authorized Amount (A+B)						Previous Retention Withheld in PO or in Escrow					
D. Total Billed to Date						Add'l Amt to Withhold in PO/Transfer in Escrow:					
E. Less Total Retention (5% of D)						Amt to Release to Contractor from PO/Escrow:					
F. Less Total Previous Payments											
G. Payment Due Less Retention						Contractor Signature and Date:					
H. Remaining Authorized Amount											

10

CONTRACTORS CERTIFICATION OF PENDING ACTIONS

As part of its bid or proposal (Non-Price Proposal in the case of Design-Build contracts), the Bidder shall provide to the City a list of all instances within the past ten years where a complaint was filed or pending against the Bidder in a legal or administrative proceeding alleging that Bidder discriminated against its employees, subcontractors, vendors or suppliers, and a description of the status or resolution of that complaint, including any remedial action taken.

CHECK ONE BOX ONLY.

- The undersigned certifies that within the past 10 years the Bidder has NOT been the subject of a complaint or pending action in a legal administrative proceeding alleging that Bidder discriminated against its employees, subcontractors, vendors or suppliers.
- The undersigned certifies that within the past ten years the Bidder has been the subject of a complaint or pending action in a legal administrative proceeding alleging that Bidder discriminated against its employees, subcontractors, vendors or suppliers. A description of the status or resolution of that complaint, including any remedial action taken and the applicable dates is as follows:

See additional response attached

Contractor Name Siemens Industry, Inc.

Certified By Eric Ackermann Title Area Sales Manager

Eric Ackermann
Name

Signature Date 11/04/2011

USE ADDITIONAL FORMS AS NECESSARY

SIEMENS

Additional responses: The City of San Diego Security Upgrades for the City of San Diego Design-Build Contract – 5171

BID NO.: K-12-5463-DBA
RFP NO.: 5463

Page 445-Contractors Certification of Pending Actions

Siemens Industry, Inc., Building Technologies Division, formerly Siemens Building Technologies, Inc. (SBT), a subsidiary member of Siemens Corporation, is a multi-billion dollar company involved in wide ranging construction projects. As such Siemens Industry, Inc. has been involved in miscellaneous litigation (e.g., collection of fees, workers' compensation, etc.) arising out of its business, none of which are of a material nature, individually or collectively, as to adversely impact its ability to completely and satisfactorily perform any of its projects.

Page 472-Work Force Report- Type of Contractor:

The Siemens Industry Sector is the worldwide leading supplier of production, transportation, lighting and building technologies. With integrated hardware and software technologies as well as comprehensive Industry-specific solutions.

Page 472-Work Force Report- AKA/DBA (List of subsidiaries)

On 10/01/2009 Siemens Building Technologies, inc. (SBT) changed its name to Siemens Industry, Inc. and simultaneously SBT's direct parent, Siemens Industry holdings, Inc., was merged into Siemens Industry, Inc., which is wholly owned by Siemens Corporation. Therefore, through the internal mergers, Siemens Corporation remains the owner of Siemens Industry, Inc. f/k/a Siemens Building Technologies, Inc.

Subsidiaries:

Name	Affiliation	% of Own.
ADB Airfield Solutions LLC	Subsidiary	100
Winergy Drive Systems Corp.	Subsidiary	100
Morgan Construction Company	Subsidiary	100
Osram Sylvania Inc	Subsidiary	100
Siemens Electronics Assembly Systems, LLC	Subsidiary	100
Siemens Prod. Lifecycle Mgmt. Software, Inc.	Subsidiary	100
Schlesinger-Siemens Electrical, LLC	Subsidiary	51
Siemens Government Services, Inc.	Subsidiary	100
Steel Related Technology	Subsidiary	100
Republic ITS	Subsidiary	100
Industria de Trabajos Electricos S.A. de C.V	Subsidiary	>99
Westinghouse Saudi Arabia Ltd.	Subsidiary	10

Siemens Industry, Inc. – 1000 Deerfield Parkway, Buffalo Grove, IL 60089
100% owned by Siemens Corporation
Siemens Corporation – 527 Madison Avenue, 8th Floor, New York, NY 10022
100% owned by Siemens USA Holdings, Inc.
Siemens Beteiligungen UAA GmbH-Wittelsbacherplatz 2, 80333 Munich, Germany
100% owned by Siemens AG.
Siemens AG – Wittelsbacherplatz 2, 80333 Munich, Germany

BIDDING DOCUMENTS

NON-COLLUSION AFFIDAVIT TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID UNDER 23 USC 112 AND PCC 7106

State of California)
County of San Diego) ss.

DAVE MISNER, being first duly sworn, deposes and says that he or she is Area Sales Manager of the party making the foregoing bid that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

Signed: [Signature]

Title: Area Sales Mgr

Subscribed and sworn to before me this 22nd day of November 2011

See Attached Notary Public

(SEAL)

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

CIVIL CODE § 1189

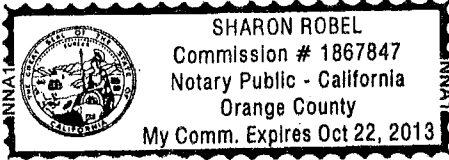
State of California

County of Orange

On 11/22/11 before me, Sharon Robel, Notary Public

personally appeared Dave Misner

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.



I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature: Sharon Robel

Place Notary Seal Above OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

Description of Attached Document

Title or Type of Document: non-collusion

Document Date: 11/22/11 Number of Pages: 474

Signer(s) Other Than Named Above:

Capacity(ies) Claimed by Signer(s)

Signer's Name:

- Corporate Officer - Title(s)
Individual
Partner - Limited General
Attorney in Fact
Trustee
Guardian or Conservator
Other:

RIGHT THUMBPRINT OF SIGNER Top of thumb here

RIGHT THUMBPRINT OF SIGNER Top of thumb here

Signer Is Representing:

Signer Is Representing:

BIDDING DOCUMENTS

PRICE PROPOSAL FORMS

The Bidder agrees to the design and construction of **Water Department Security Upgrade Design-Build Contract**, for the city of San Diego, in accordance with these contract documents for the prices listed below. The Bidder guarantees the Contract Price for a period of 120 days (90 days for federally funded contracts and contracts valued at \$500,000 or less) from the date of Bid opening to Award of the Contract. The duration of the Contract Price guarantee shall be extended by the number of days required for the City to obtain all items necessary to fulfill all conditions precedent e.g., bond and insurance.

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
PROPOSAL							
1	238210	Bonds (Payment and Performance)	1		LS	 	\$ 95294.12
2		City Contingency	1		AL	 	\$300,000.00
3	541330	Storm Water Pollution Prevention	1		LS	 	\$ 11764.71
4	541330	65th & Herrick Pump Station (including Repeater) Communications Design Services	1	D	LS	 	\$ 6559.73
5	238210	65th & Herrick Pump Station (including Repeater) Communications Construction Services	1		LS	 	\$ 27297.84
6	541330	Bayview Reservoir & Pump Station Communications Design Services	1	D	LS	 	\$ 2549.18
7	238210	Bayview Reservoir & Pump Station Communications Construction Services	1		LS	 	\$ 13074.75
8	541330	Black Mountain Reservoir & Pump Station Communications Design Services	1	D	LS	 	\$ 5073.13
9	238210	Black Mountain Reservoir & Pump Station Communications Construction Services	1		LS	 	\$ 16739.38
10	541330	Cabrillo Palisades Pump Station Security Design Services	1	D	LS	 	\$ 8411.50
11	238210	Cabrillo Palisades Pump Station Security Construction Services	1		LS	 	\$ 111943.40
12	541330	Cabrillo Palisades Pump Station Communications Design Services	1	D	LS	 	\$ 2700.62
13	238210	Cabrillo Palisades Pump Station Communications Construction Services	1		LS	 	\$ 12057.46
14	541330	Carmel Mountain High Pump Station Communications Design Services	1	D	LS	 	\$ 2271.55

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
15	238210	Carmel Mountain High Pump Station Communications Construction Services	1		LS	 	\$ 12057.46
16	541330	Carmel Mountain High Reservoir Communications Design Services	1	D	LS	 	\$ 221.07
17	238210	Carmel Mountain High Reservoir Communications Construction Services	1		LS	 	\$ 8156.39
18	541330	Carmel Mountain Industrial Pump Station Communications Design Services	1	D	LS	 	\$ 2309.41
19	238210	Carmel Mountain Industrial Pump Station Communications Construction Services	1		LS	 	\$ 6597.98
20	541330	Carmel Mountain Mall Pump Station Communications Design Services	1	D	LS	 	\$ 2322.07
21	238210	Carmel Mountain Mall Pump Station Communications Construction Services	1		LS	 	\$ 7062.25
22	541330	Chollas Heights Pump Station Security Design Services	1	D	LS	 	\$ 2954.86
23	238210	Chollas Heights Pump Station Security Construction Services	1		LS	 	\$ 48625.28
24	541330	Chollas Heights Pump Station Communications Design Services	1	D	LS	 	\$ 2347.27
25	238210	Chollas Heights Pump Station Communications Construction Services	1		LS	 	\$ 9079.20
26	541330	Cielo and Woodman Pump Station Security Design Services	1	D	LS	 	\$ 6416.69
27	238210	Cielo and Woodman Pump Station Security Construction Services	1		LS	 	\$ 99057.34
28	541330	Cielo and Woodman Pump Station Communications Design Services	1	D	LS	 	\$ 4914.12
29	238210	Cielo and Woodman Pump Station Communications Construction Services	1		LS	 	\$ 30382.50
30	541330	Climax Pump Station Communications Design Services	1	D	LS	 	\$ 5840.41
31	238210	Climax Pump Station Communications Construction Services	1		LS	 	\$ 27018.63
32	541330	Deerfield Pump Station Communications Design Services	1	D	LS	 	\$ 2498.71
33	238210	Deerfield Pump Station Communications Construction Services	1		LS	 	\$ 9830.25
34	541330	Del Cerro Highlands Pump Station Communications Design Services	1	D	LS	 	\$ 2675.38

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
35	238210	Del Cerro Highlands Pump Station Communications Construction Services	1		LS	 	\$ 7062.25
36	541330	Del Cerro Pump Station Communications Design Services	1	D	LS	 	\$ 2372.51
37	238210	Del Cerro Pump Station Communications Construction Services	1		LS	 	\$ 7339.88
38	541330	Del Cerro Reservoir Communications Design Services	1	D	LS	 	\$ 2486.09
39	238210	Del Cerro Reservoir Communications Construction Services	1		LS	 	\$ 7784.24
40	541330	Eagle Ridge Pump Station Communications Design Services	1	D	LS	 	\$ 2675.38
41	238210	Eagle Ridge Pump Station Communications Construction Services	1		LS	 	\$ 7062.25
42	541330	East Gate Mall Regulator Security Design Services	1	D	LS	 	\$ 1918.16
43	238210	East Gate Mall Regulator Security Construction Services	1		LS	 	\$ 43896.63
44	541330	East Gate Mall Regulator Communications Design Services	1	D	LS	 	\$ 5815.17
45	238210	East Gate Mall Regulator Communications Construction Services	1		LS	 	\$ 29038.31
46	541330	Elliot Pipeline Regulator Security Design Services	1	D	LS	 	\$ 1842.14
47	238210	Elliot Pipeline Regulator Security Construction Services	1		LS	 	\$ 40658.85
48	541330	Elliot Pipeline Regulator Communications Design Services	1	D	LS	 	\$ 5764.69
49	238210	Elliot Pipeline Regulator Communications Construction Services	1		LS	 	\$ 28757.11
50	541330	Friars Road Regulator Security Design Services	1	D	LS	 	\$ 4903.53
51	238210	Friars Road Regulator Security Construction Services	1		LS	 	\$ 55468.00
52	541330	Friars Road Regulator Communications Design Services	1	D	LS	 	\$ 2334.65
53	238210	Friars Road Regulator Communications Construction Services	1		LS	 	\$ 9243.26
54	541330	La Jolla View Standpipe Security Design Services	1	D	LS	 	\$ 11160.58
55	238210	La Jolla View Standpipe Security Construction Services	1		LS	 	\$ 127040.33
56	541330	La Jolla View Standpipe (including La Jolla Country Club Reservoir Repeater) Communications Design Services	1	D	LS	 	\$ 8260.87
57	238210	La Jolla View Standpipe (including La Jolla Country Club Reservoir Repeater) Communications Construction Services	1		LS	 	\$ 51314.45
58	541330	Los Penasquitos Pump Station Communications Design Services	1	D	LS	 	\$ 5789.93

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
59	238210	Los Penasquitos Pump Station Communications Construction Services	1		LS	 	\$ 27,641.52
60	541330	Los Penasquitos Reservoir Communications Design Services	1	D	LS	 	\$ 6004.47
61	238210	Los Penasquitos Reservoir Communications Construction Services	1		LS	 	\$ 32,818.32
62	541330	Mercy Mira Mesa High Pump Station Communications Design Services	1	D	LS	 	\$ 5,903.51
63	238210	Mercy Mira Mesa High Pump Station Communications Construction Services	1		LS	 	\$ 37,103.62
64	541330	Miramar Ranch North Reservoir & Pump Station Communications Design Services	1	D	LS	 	\$ 2,599.66
65	238210	Miramar Ranch North Reservoir & Pump Station Communications Construction Services	1		LS	 	\$ 10,473.86
66	541330	Montezuma Pump Station Communications Design Services	1	D	LS	 	\$ 5,827.79
67	238210	Montezuma Pump Station Communications Construction Services	1		LS	 	\$ 29,047.36
68	541330	Muirlands Pump Station Security Design Services	1	D	LS	 	\$ 4,969.91
69	238210	Muirlands Pump Station Security Construction Services	1		LS	 	\$ 150,589.83
70	541330	Muirlands Pump Station Communications Design Services	1	D	LS	 	\$ 2,688.00
71	238210	Muirlands Pump Station Communications Construction Services	1		LS	 	\$ 9,651.95
72	541330	Ocean View Hills Pump Station Security Design Services	1	D	LS	 	\$ 9,694.82
73	238210	Ocean View Hills Pump Station Security Construction Services	1		LS	 	\$ 87,524.33
74	541330	Ocean View Hills Pump Station Communications Design Services	1	D	LS	 	\$ 29,277.78
75	238210	Ocean View Hills Pump Station Communications Construction Services	1		LS	 	\$ 147,812.26
76	541330	Otay Mesa Pump Station Security Design Services	1	D	LS	 	\$ 8144.31
77	238210	Otay Mesa Pump Station Security Construction Services	1		LS	 	\$ 109,358.83
78	541330	Otay Mesa Pump Station Communications Design Services	1	D	LS	 	\$ 5,078.18
79	238210	Otay Mesa Pump Station Communications Construction Services	1		LS	 	\$ 33,165.64
80	541330	Paradise Hills #2 Pump Station Security Design Services	1	D	LS	 	\$ 7,163.32
81	238210	Paradise Hills #2 Pump Station Security Construction Services	1		LS	 	\$ 84,012.89

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
82	541330	Paradise Hills #2 Pump Station Communications Design Services	1	D	LS	 	\$ 5280.09
83	238210	Paradise Hills #2 Pump Station Communications Construction Services	1		LS	 	\$ 37581.15
84	541330	Paradise Mesa #1 Pump Station Security Design Services	1	D	LS	 	\$28335.08
85	238210	Paradise Mesa #1 Pump Station Security Construction Services	1		LS	 	\$ 257079.66
86	541330	Paradise Mesa #1 Pump Station Communications Design Services	1	D	LS	 	\$ 4764.60
87	238210	Paradise Mesa #1 Pump Station Communications Construction Services	1		LS	 	\$ 30362.44
88	541330	Paradise Mesa #2 Pump Station Security Design Services	1	D	LS	 	\$ 5408.25
89	238210	Paradise Mesa #2 Pump Station Security Construction Services	1		LS	 	\$ 78526.76
90	541330	Paradise Mesa #2 Pump Station Communications Design Services	1	D	LS	 	\$ 4914.12
91	238210	Paradise Mesa #2 Pump Station Communications Construction Services	1		LS	 	\$ 29215.62
92	541330	Paradise Mesa Standpipe Security Design Services	1	D	LS	 	\$ 11540.03
93	238210	Paradise Mesa Standpipe Security Construction Services	1		LS	 	\$ 140648.11
94	541330	Paradise Mesa Standpipe Communications Design Services	1	D	LS	 	\$ 5272.52
95	238210	Paradise Mesa Standpipe Communications Construction Services	1		LS	 	\$ 36115.71
96	541330	Penasquitos Bluffs #8 Pump Station Communications Design Services	1	D	LS	 	\$ 2511.33
97	238210	Penasquitos Bluffs #8 Pump Station Communications Construction Services	1		LS	 	\$ 4880.73
98	541330	Point Loma Reservoir & Catalina Pump Station Communications Design Services	1	D	LS	 	\$ 2523.95
99	238210	Point Loma Reservoir & Catalina Pump Station Communications Construction Services	1		LS	 	\$ 10911.79
100	541330	Pomerado Park Reservoir & Bernardo Heights Pump Station Communications Design Services	1	D	LS	 	\$ 5840.41
101	238210	Pomerado Park Reservoir & Bernardo Heights Pump Station Communications Construction Services	1		LS	 	\$ 35235.20
102	541330	Pomerado Pump Station Security Design Services	1	D	LS	 	\$9141.59

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
103	238210	Pomerado Pump Station Security Construction Services	1		LS	 	\$ 116738.01
104	541330	Pomerado Pump Station (including Repeater) Communications Design Services	1	D	LS	 	\$ 6812.13
105	238210	Pomerado Pump Station (including Repeater) Communications Construction Services	1		LS	 	\$ 33909.93
106	541330	Princess Park Pump Station Security Design Services	1	D	LS	 	\$ 10240.25
107	238210	Princess Park Pump Station Security Construction Services	1		LS	 	\$ 104172.40
108	541330	Princess Park Pump Station Communications Design Services	1	D	LS	 	\$ 3066.59
109	238210	Princess Park Pump Station Communications Construction Services	1		LS	 	\$ 13515.21
110	541330	Rancho Bernardo Reservoir & Rancho Bernardo Industrial Pump Station Communications Design Services	1	D	LS	 	\$ 4644.06
111	238210	Rancho Bernardo Reservoir & Rancho Bernardo Industrial Pump Station Communications Construction Services	1		LS	 	\$ 19741.43
112	541330	Rancho Penasquitos Pump Station Communications Design Services	1	D	LS	 	\$ 2662.76
113	238210	Rancho Penasquitos Pump Station Communications Construction Services	1		LS	 	\$ 10852.45
114	541330	Redwood Village Standpipe Security Design Services	1	D	LS	 	\$ 9221.80
115	238210	Redwood Village Standpipe Security Construction Services	1		LS	 	\$ 122921.74
116	541330	Redwood Village Standpipe Communications Design Services	1	D	LS	 	\$ 5007.51
117	238210	Redwood Village Standpipe Communications Construction Services	1		LS	 	\$ 30697.35
118	541330	San Andreas Pump Station Security Design Services	1	D	LS	 	\$ 2224.76
119	238210	San Andreas Pump Station Security Construction Services	1		LS	 	\$ 33916.90
120	541330	San Andreas Pump Station (including Sewer Pump Station 78 Repeater) Communications Design Services	1	D	LS	 	\$ 5714.21
121	238210	San Andreas Pump Station (including Sewer Pump Station 78 Repeater) Communications Construction Services	1		LS	 	\$ 28488.09
122	541330	San Carlos Reservoir Communications Design Services	1	D	LS	 	\$ 2460.85

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
123	238210	San Carlos Reservoir Communications Construction Services	1		LS	 	\$ 7977.53
124	541330	Scripps Ranch Reservoir & Scripps McMillan Pump Station Communications Design Services	1	D	LS	 	\$ 5777.31
125	238210	Scripps Ranch Reservoir & Scripps McMillan Pump Station Communications Construction Services	1		LS	 	\$ 38062.09
126	541330	Scripps Woods #2 Pump Station Security Design Services	1	D	LS	 	\$ 6918.50
127	238210	Scripps Woods #2 Pump Station Security Construction Services	1		LS	 	\$ 102635.99
128	541330	Scripps Woods #2 Pump Station Communications Design Services	1	D	LS	 	\$ 5216.99
129	238210	Scripps Woods #2 Pump Station Communications Construction Services	1		LS	 	\$ 33905.43
130	541330	Security Operations Center (SOC) Communications Design Services	1	D	LS	 	\$ 2359.89
131	238210	Security Operations Center (SOC) Communications Construction Services	1		LS	 	\$ 75080.41
132	541330	Soledad Reservoir & Pump Station Communications Design Services	1	D	LS	 	\$ 2561.80
133	238210	Soledad Reservoir & Pump Station Communications Construction Services	1		LS	 	\$ 7090.15
134	541330	South Creek Pump Station Security Design Services	1	D	LS	 	\$ 9872.31
135	238210	South Creek Pump Station Security Construction Services	1		LS	 	\$ 28488.09
136	541330	South Creek Pump Station (including Repeater) Communications Design Services	1	D	LS	 	\$ 3419.95
137	238210	South Creek Pump Station (including Repeater) Communications Construction Services	1		LS	 	\$ 13633.13
138	541330	South San Diego Reservoir Communications Design Services	1	D	LS	 	\$ 8869.14
139	238210	South San Diego Reservoir Communications Construction Services	1		LS	 	\$ 75043.17
140	541330	Stonebridge Pump Station #1 Security Design Services	1	D	LS	 	\$ 7570.90
141	238210	Stonebridge Pump Station #1 Security Construction Services	1		LS	 	\$ 28488.09
142	541330	Stonebridge Pump Station #1 Communications Design Services	1	D	LS	 	\$ 5355.81

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
143	238210	Stonebridge Pump Station #1 Communications Construction Services	1		LS	 	\$ 36000.66
144	541330	Stonebridge Pump Station #2 Security Design Services	1	D	LS	 	\$ 4424.13
145	238210	Stonebridge Pump Station #2 Security Construction Services	1		LS	 	\$ 63069.46
146	541330	Stonebridge Pump Station #2 Communications Design Services	1	D	LS	 	\$ 2624.90
147	238210	Stonebridge Pump Station #2 Communications Construction Services	1		LS	 	\$ 13129.09
148	541330	Texas Street Regulator Security Design Services	1	D	LS	 	\$ 6258.39
149	238210	Texas Street Regulator Security Construction Services	1		LS	 	\$ 56606.20
150	541330	Texas Street Regulator Communications Design Services	1	D	LS	 	\$ 2599.66
151	238210	Texas Street Regulator Communications Construction Services	1		LS	 	\$ 9033.59
152	541330	Thorn Street Regulator Security Design Services	1	D	LS	 	\$ 2089.83
153	238210	Thorn Street Regulator Security Construction Services	1		LS	 	\$ 19016.70
154	541330	Thorn Street Regulator Communications Design Services	1	D	LS	 	\$ 2536.57
155	238210	Thorn Street Regulator Communications Construction Services	1		LS	 	\$ 10044.79
156	541330	University Heights Pump Station & Reservoir Communications Design Services	1	D	LS	 	\$ 3306.37
157	238210	University Heights Pump Station & Reservoir Communications Construction Services	1		LS	 	\$ 16316.79
158	541330	Waring Rd Pump Station Communications Design Services	1	D	LS	 	\$ 2435.61
159	238210	Waring Rd Pump Station Communications Construction Services	1		LS	 	\$ 9338.08
160	541330	Black Mtn High Level Site Security Design Services	1	D	LS	 	\$ 5759.39
161	238210	Black Mtn High Level Site Security Construction Services	1		LS	 	\$ 39473.18
162	541330	Black Mtn High Level Site Communications Design Services	1	D	LS	 	\$ 4391.66
163	238210	Black Mtn High Level Site Communications Construction Services	1		LS	 	\$ 54372.97
164	541330	Cowles High Level Site Security Design Services	1	D	LS	 	\$ 5746.77
165	238210	Cowles High Level Site Security Construction Services	1		LS	 	\$ 39410.08
166	541330	Cowles High Level Site Communications Design Services	1	D	LS	 	\$ 4391.66

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
167	238210	Cowles High Level Site Communications Construction Services	1		LS	XXXXXX	\$ 41864.18
168	541330	Encanto High Level Site Security Design Services	1	D	LS	XXXXXX	\$ 6630.15
169	238210	Encanto High Level Site Security Construction Services	1		LS	XXXXXX	\$ 45602.48
170	541330	Encanto High Level Site Communications Design Services	1	D	LS	XXXXXX	\$ 4391.66
171	238210	Encanto High Level Site Communications Construction Services	1		LS	XXXXXX	\$ 38464.29
172	541330	Lyons Peak High Level Site Security Design Services	1	D	LS	XXXXXX	\$ 5898.21
173	238210	Lyons Peak High Level Site Security Construction Services	1		LS	XXXXXX	\$ 40435.08
174	541330	Lyons Peak High Level Site Communications Design Services	1	D	LS	XXXXXX	\$ 4391.66
175	238210	Lyons Peak High Level Site Communications Construction Services	1		LS	XXXXXX	\$ 59136.80
176	541330	Mt Woodson High Level Site Security Design Services	1	D	LS	XXXXXX	\$ 8964.80
177	238210	Mt Woodson High Level Site Security Construction Services	1		LS	XXXXXX	\$ 49540.71
178	541330	Mt Woodson High Level Site Communications Design Services	1	D	LS	XXXXXX	\$ 4391.66
179	238210	Mt Woodson High Level Site Communications Construction Services	1		LS	XXXXXX	\$ 28724.04
180	541330	San Ysidro High Level Site Security Design Services	1	D	LS	XXXXXX	\$ 9860.35
181	238210	San Ysidro High Level Site Security Construction Services	1		LS	XXXXXX	\$ 41042.64
182	541330	San Ysidro High Level Site Communications Design Services	1	D	LS	XXXXXX	\$ 4596.45
183	238210	San Ysidro High Level Site Communications Construction Services	1		LS	XXXXXX	\$ 31634.24
184	541330	Security Operations Center (SOC) Headend Upgrades Design Services	1	D	LS	XXXXXX	\$ 50482.35
185	238210	Security Operations Center (SOC) Headend Upgrades Construction Services	1		LS	XXXXXX	\$ 454341.18
ESTIMATED TOTAL PROPOSAL (1 THROUGH 185):							\$ 5185455.44
ADDITIVE ALTERNATE 'A'							5195455.43
1	541330	Security Operations Center (SOC) Design Services for Situation Management System	1	D	LS	XXXXXX	\$ 69296.02

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
2	238210	Security Operations Center (SOC) Construction Services for Situation Management System	1		LS	 	\$ 673669.56
3	541330	Access Control System Upgrades Design Services	1	D	LS	 	\$ 3823.53
4	238210	Access Control System Upgrades Construction Services	1		LS	 	\$ 147908.82
ESTIMATED TOTAL ADDITIVE ALTERNATE 'A' (1 THROUGH 4):							\$ 844698.53
ADDITIVE ALTERNATE 'B'							
1	541330	Security Operations Center (SOC) Design Services for Operator Console Upgrades	1	D	LS	 	\$ 2600.00
2	238210	Security Operations Center (SOC) Construction Services for Operator Console Upgrades	1		LS	 	\$ 46060.00
3	541330	Chollas Operations Yard Security Upgrades Design Services	1	D	LS	 	\$ 4814.15
4	238210	Chollas Operations Yard Security Upgrades Construction Services	1		LS	 	\$ 163153.17
5	541330	65th and Herrick Pump Station Security Upgrades Design Services	1	D	LS	 	\$ 3833.03
6	238210	65th and Herrick Pump Station Security Upgrades Construction Services	1		LS	 	\$ 63286.09
7	541330	Bayview Reservoir Security Upgrades Design Services	1	D	LS	 	\$ 9194.21
8	238210	Bayview Reservoir Security Upgrades Construction Services	1		LS	 	\$ 92855.31
9	541330	Bernardo Heights Pump Station Security Upgrades Design Services	1	D	LS	 	\$ 572.55
10	238210	Bernardo Heights Pump Station Security Upgrades Construction Services	1		LS	 	\$ 6969.75
11	541330	Black Mountain Reservoir Security Upgrades Design Services	1	D	LS	 	\$ 25969.63
12	238210	Black Mountain Reservoir Security Upgrades Construction Services	1		LS	 	\$ 219633.45
13	541330	Carmel Mountain High Pump Station Security Upgrades Design Services	1	D	LS	 	\$ 701.40
14	238210	Carmel Mountain High Pump Station Security Upgrades Construction Services	1		LS	 	\$ 6178.76
15	541330	Carmel Mountain High Reservoir Security Upgrades Design Services	1	D	LS	 	\$ 326.09

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
16	238210	Carmel Mountain High Reservoir Security Upgrades Construction Services	1		LS		\$ 2961.89
17	541330	Carmel Mountain Industrial Pump Station Security Upgrades Design Services	1	D	LS		\$ 2880.63
18	238210	Carmel Mountain Industrial Pump Station Security Upgrades Construction Services	1		LS		\$ 36942.00
19	541330	Carmel Mountain Mall Pump Station Security Upgrades Design Services	1	D	LS		\$ 6068.34
20	238210	Carmel Mountain Mall Pump Station Security Upgrades Construction Services	1		LS		\$ 43087.51
21	541330	Catalina Pump Station Security Upgrades Design Services	1	D	LS		\$ 660.11
22	238210	Catalina Pump Station Security Upgrades Construction Services	1		LS		\$ 4043.17
23	541330	Climax Pump Station Security Upgrades Design Services	1	D	LS		\$ 450.67
24	238210	Climax Pump Station Security Upgrades Construction Services	1		LS		\$ 4262.14
25	541330	Deerfield Pump Station Security Upgrades Design Services	1	D	LS		\$ 5354.85
26	238210	Deerfield Pump Station Security Upgrades Construction Services	1		LS		\$ 60507.53
27	541330	Del Cerro Highlands Pump Station Security Upgrades Design Services	1	D	LS		\$ 401.16
28	238210	Del Cerro Highlands Pump Station Security Upgrades Construction Services	1		LS		\$ 3945.13
29	541330	Del Cerro Pump Station Security Upgrades Design Services	1	D	LS		\$ 3340.29
30	238210	Del Cerro Pump Station Security Upgrades Construction Services	1		LS		\$ 42223.59
31	541330	Del Cerro Reservoir Security Upgrades Design Services	1	D	LS		\$ 7667.09
32	238210	Del Cerro Reservoir Security Upgrades Construction Services	1		LS		\$ 76858.33
33	541330	Eagle Ridge Pump Station Security Upgrades Design Services	1	D	LS		\$ 1334.04
34	238210	Eagle Ridge Pump Station Security Upgrades Construction Services	1		LS		\$ 18972.10
35	541330	Los Penasquitos Pump Station Security Upgrades Design Services	1	D	LS		\$ 393.07
36	238210	Los Penasquitos Pump Station Security Upgrades Construction Services	1		LS		\$ 3516.80

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
37	541330	Los Penasquitos Reservoir Security Upgrades Design Services	1	D	LS	 	\$ 850.21
38	238210	Los Penasquitos Reservoir Security Upgrades Construction Services	1		LS	 	\$ 19138.50
39	541330	Mercy Mira Mesa High Pump Station Security Upgrades Design Services	1	D	LS	 	\$ 0.00
40	238210	Mercy Mira Mesa High Pump Station Security Upgrades Construction Services	1		LS	 	\$ 0.00
41	541330	Miramar Ranch North Reservoir Security Upgrades Design Services	1	D	LS	 	\$ 2235.76
42	238210	Miramar Ranch North Reservoir Security Upgrades Construction Services	1		LS	 	\$ 3945.13
43	541330	Montezuma Pump Station Security Upgrades Design Services	1	D	LS	 	\$ 1639.37
44	238210	Montezuma Pump Station Security Upgrades Construction Services	1		LS	 	\$ 16314.59
45	541330	Penasquitos Bluffs #8 Pump Station Security Upgrades Design Services	1	D	LS	 	\$ 0.00
46	238210	Penasquitos Bluffs #8 Pump Station Security Upgrades Construction Services	1		LS	 	\$ 0.00
47	541330	Point Loma Reservoir Security Upgrades Design Services	1	D	LS	 	\$ 4605.01
48	238210	Point Loma Reservoir Security Upgrades Construction Services	1		LS	 	\$ 3945.13
49	541330	Pomerado Park Reservoir Security Upgrades Design Services	1	D	LS	 	\$ 518.90
50	238210	Pomerado Park Reservoir Security Upgrades Construction Services	1		LS	 	\$ 4857.26
51	541330	Rancho Bernardo Industrial Pump Station Security Upgrades Design Services	1	D	LS	 	\$ 3915.69
52	238210	Rancho Bernardo Industrial Pump Station Security Upgrades Construction Services	1		LS	 	\$ 68943.57
53	541330	Rancho Bernardo Reservoir Security Upgrades Design Services	1	D	LS	 	\$ 15822.46
54	238210	Rancho Bernardo Reservoir Security Upgrades Construction Services	1		LS	 	\$ 151338.16
55	541330	Rancho Penasquitos Pump Station Security Upgrades Design Services	1	D	LS	 	\$ 0.00

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
56	238210	Rancho Penasquitos Pump Station Security Upgrades Construction Services	1		LS	 	\$ 0.00
57	541330	San Carlos Reservoir Security Upgrades Design Services	1	D	LS	 	\$ 1453.37
58	238210	San Carlos Reservoir Security Upgrades Construction Services	1		LS	 	\$ 19776.66
59	541330	Scripps Ranch Reservoir Security Upgrades Design Services	1	D	LS	 	\$ 553.16
60	238210	Scripps Ranch Reservoir Security Upgrades Construction Services	1		LS	 	\$ 4918.32
61	541330	Soledad Reservoir Security Upgrades Design Services	1	D	LS	 	\$ 491.12
62	238210	Soledad Reservoir Security Upgrades Construction Services	1		LS	 	\$ 6078.09
63	541330	South San Diego Reservoir Security Upgrades Design Services	1	D	LS	 	\$ 16172.14
64	238210	South San Diego Reservoir Security Upgrades Construction Services	1		LS	 	\$ 231731.48
65	541330	University Heights Pump Station & Reservoir Security Upgrades Design Services	1	D	LS	 	\$ 22001.88
66	238210	University Heights Pump Station & Reservoir Security Upgrades Construction Services	1		LS	 	\$ 210868.75
67	541330	Waring Rd Pump Station Security Upgrades Design Services	1	D	LS	 	\$ 602.67
68	238210	Waring Rd Pump Station Security Upgrades Construction Services	1		LS	 	\$ 9724.96
69		Erosion Control	1		AL	 	\$5,000.00
70	561730	Foliage Control at all Sites	1		LS	 	\$ 17461.54
71	238210	3-Year Maintenance Contract for New Security Sites Only	1		LS	 	\$ 460,000.00
72	238210	3-Year Maintenance Contract for Communications System	1		LS	 	\$ 100,000.00
ESTIMATED TOTAL ADDITIVE ALTERNATE 'B' (1 THROUGH 72):							2374522.91

BIDDING DOCUMENTS

*** Design Element (For City Use)**

Total Bid Price, (Items 1 through 185 inclusive) amount written in words:

Five Million One Hundred Eighty Five Thousand Four Hundred Fifty Five ^{Dollars} & ~~Forty~~ Forty Four cents (44/100's)

Design-Builder: SIEMENS Industry, Inc.

Title: Branch Manager

Signature: Mark Udon

The names of all persons interested in the foregoing proposal as principals are as follows:

Daryl Delaney

Axel Heier

Andreas Schierenbeck

BIDDING DOCUMENTS

IMPORTANT NOTICE: If Bidder or other interested person is a corporation, state secretary, treasurer, and manager thereof; if a co-partnership, state true name of firm, also names of all individual co-partners composing firm; if Bidder or other interested person is an individual, state first and last names in full.

NOTES:

- A. The Contract Price to be used in the selection process as described in Section 5.6 of the RFP will be determined by the City based on the Base Bid alone.
- B. After the selection has been made, the City may award the Contract for the Base Bid alone or if applicable, for the Base Bid plus any combination of alternates selected in the City's sole discretion.
- C. Prices and notations shall be in ink or typewritten. All corrections (which have been initiated by the Bidder using erasures, strike out, line out, or "white-out") shall be typed or written in with ink adjacent thereto, and shall be initialed in ink by the person signing the Proposal.
- D. Failure to initial all corrections made in the bidding documents shall cause the Proposal to be rejected as **non-responsive** and ineligible for further consideration.
- E. Blank spaces must be filled in, using figures. The Design-Builder's failure to submit a price for any Bid item that requires the Design-Builder to submit a price shall render the Proposal **non-responsive** and shall be cause for its rejection.
- F. Unit prices shall be entered for all unit price items. Unit prices shall not exceed two (2) decimal places. If the Unit prices entered exceed two (2) decimal places, the City will only use the first two digits after the decimal points without rounding up or down.
- G. All extensions of the unit prices bid will be subject to verification by the City. In the case of inconsistency or conflict between the product of the Quantity x Unit Price and the Extension, the product shall govern.
- H. In the case of inconsistency or conflict, between the sums of the Extensions with the estimated total Bid, the sum of the Extensions shall govern.
- I. Proposals shall not contain any recapitulation of the Work. Conditional Bids will be rejected as being **non-responsive**. Alternative proposals will not be considered unless called for.
- J. The Proposal shall contain an acknowledgment of receipt of all addenda as specified in the RFP. Failure to acknowledge addenda shall render the Bid **non-responsive** and shall be cause for its rejection.

BIDDING DOCUMENTS

DESIGN-BUILD LIST OF SUBCONTRACTORS TO BE INCLUDED IN THE PRICE PROPOSAL ONLY

In accordance with the requirements provided in the "Subletting and Subcontracting Fair Practices Act", Division 2, Part 1, Chapter 4 of the Public Contract Code, the Design-Builder shall list below the name and address of each Subcontractor who will perform work, labor, render services or specially fabricates and installs a portion [type] of the work or improvement, in an amount in excess of 0.5% of the Design-Builder's total Bid. The Design-Builder shall also list below the portion of the work which will be done by each Subcontractor. The Design-Builder shall list only one Subcontractor for each portion of the Work. The **DOLLAR VALUE** of the total Bid to be performed shall be stated for all Subcontractors listed. Failure to comply with this requirement shall result in the Bid being rejected as non-responsive and ineligible for award. The Design-Builder's attention is directed to the Special Provisions - General; Paragraph 2-3 Subcontracts, which stipulates the percent of the Work to be performed with the Design-Builder's own forces. The Design-Builder shall list all SLBE, ELBE, DBE, DVBE, MBE, WBE, OBE, WoSB, SDB, HUBZone, and SDVOSB Subcontractors that Design-Builder are seeking recognition towards achieving any mandatory, voluntary, or both subcontracting participation percentages.

NAME, ADDRESS AND TELEPHONE NUMBER OF SUBCONTRACTOR	CONSTRUCTOR OR DESIGNER	TYPE OF WORK	DOLLAR VALUE OF SUBCONTRACT	MBE, WBE, DBE, DVBE, OBE, ELBE, SLBE, SDB, WoSB, HUBZone, OR SDVOSB	WHERE CERTIFIED	CHECK IF JOINT VENTURE PARTNERSHIP
Name: <u>Athenx, Inc.</u> Address: <u>7140 Opportunity Rd.</u> City: <u>San Diego</u> State: <u>CA</u> Zip: <u>92111</u> Phone: <u>805-505-8025</u>	Design/ Constructor	General Contractor Wireless Security	\$ <u>1,458,487.26</u>	SLBE 11AX0490	City	
Name: <u>HMT Electric, Inc.</u> Address: <u>9550 WAPLES ST., Ste.</u> City: <u>SAN DIEGO</u> State: <u>CA</u> Zip: <u>92121</u> Phone: <u>(858) 458-9771</u>	Design/ Constructor	Electrical	\$ <u>495,948.00</u>			
Name: <u>Net Logix</u> Address: <u>5425 Oberlin Dr., Ste. 200</u> <u>San Diego CA</u> City: _____ State: _____ Zip: <u>92121</u> Phone: <u>(858) 764-1972</u>	Design/ Constructor	Wireless	\$ <u>408,600.00</u>			

① As appropriate, Design-Builder shall identify Subcontractor as one of the following and shall include a valid proof of certification (except for OBE, SLBE and ELBE):

- | | | | |
|---|--------|--|---------|
| Certified Minority Business Enterprise | MBE | Certified Woman Business Enterprise | WBE |
| Certified Disadvantaged Business Enterprise | DBE | Certified Disabled Veteran Business Enterprise | DVBE |
| Other Business Enterprise | OBE | Certified Emerging Local Business Enterprise | ELBE |
| Certified Small Local Business Enterprise | SLBE | Small Disadvantaged Business | SDB |
| Woman-Owned Small Business | WoSB | HUBZone Business | HUBZone |
| Service-Disabled Veteran Owned Small Business | SDVOSB | | |

② As appropriate, Design-Builder shall indicate if Subcontractor is certified by:

- | | | | |
|--|--------|--|----------|
| City of San Diego | CITY | State of California Department of Transportation | CALTRANS |
| California Public Utilities Commission | CPUC | San Diego Regional Minority Supplier Diversity Council | SRMSDC |
| State of California's Department of General Services | CADoGS | City of Los Angeles | LA |
| State of California | CA | U.S. Small Business Administration | SBA |

The Design-Builder will not receive any subcontracting participation percentages if the Design Builder fails to submit the required proof of certification (except for OBE, SLBE and ELBE).

Form Title: DESIGN-BUILD LIST OF SUBCONTRACTORS TO BE INCLUDED IN THE PRICE PROPOSAL ONLY

(Rev. May 2011)

Form Number: AA05

Project Title:

49.63

BIDDING DOCUMENTS

DESIGN-BUILD LIST OF SUBCONTRACTORS TO BE INCLUDED IN THE PRICE PROPOSAL ONLY

In accordance with the requirements provided in the "Subletting and Subcontracting Fair Practices Act", Division 2, Part 1, Chapter 4 of the Public Contract Code, the Design-Builder shall list below the name and address of each Subcontractor who will perform work, labor, render services or specially fabricates and installs a portion [type] of the work or improvement, in an amount in excess of 0.5% of the Design-Builder's total Bid. The Design-Builder shall also list below the portion of the work which will be done by each Subcontractor. The Design-Builder shall list only one Subcontractor for each portion of the Work. The **DOLLAR VALUE** of the total Bid to be performed shall be stated for all Subcontractors listed. Failure to comply with this requirement shall result in the Bid being rejected as non-responsive and ineligible for award. The Design-Builder's attention is directed to the Special Provisions - General; Paragraph 2-3 Subcontracts, which stipulates the percent of the Work to be performed with the Design-Builder's own forces. The Design-Builder shall list all SLBE, ELBE, DBE, DVBE, MBE, WBE, OBE, WoSB, SDB, HUBZone, and SDVOSB Subcontractors that Design-Builder are seeking recognition towards achieving any mandatory, voluntary, or both subcontracting participation percentages.

NAME, ADDRESS AND TELEPHONE NUMBER OF SUBCONTRACTOR	CONSTRUCTOR OR DESIGNER	TYPE OF WORK	DOLLAR VALUE OF SUBCONTRACT	MBE, WBE, DBE, DVBE, OBE, ELBE, SLBE, SDB, WoSB, HUBZone, OR SDVOSB ^①	WHERE CERTIFIED ^②	CHECK IF JOINT VENTURE PARTNERSHIP
Name: <u>Access Professional Systems</u> Address: <u>3949 Ruffin Road, Ste. C</u> City: <u>San Diego</u> State: <u>CA</u> Zip: <u>92123</u> Phone: <u>(858) 571-4444</u>	Constructor	Gate Automation	\$ <u>207,922.00</u>	SBE	CA	
Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____						
Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____						

① As appropriate, Design-Builder shall identify Subcontractor as one of the following and shall include a valid proof of certification (except for OBE, SLBE and ELBE):

- | | | | |
|---|--------|--|---------|
| Certified Minority Business Enterprise | MBE | Certified Woman Business Enterprise | WBE |
| Certified Disadvantaged Business Enterprise | DBE | Certified Disabled Veteran Business Enterprise | DVBE |
| Other Business Enterprise | OBE | Certified Emerging Local Business Enterprise | ELBE |
| Certified Small Local Business Enterprise | SLBE | Small Disadvantaged Business | SDB |
| Woman-Owned Small Business | WoSB | HUBZone Business | HUBZone |
| Service-Disabled Veteran Owned Small Business | SDVOSB | | |

② As appropriate, Design-Builder shall indicate if Subcontractor is certified by:

- | | | | |
|--|--------|--|----------|
| City of San Diego | CITY | State of California Department of Transportation | CALTRANS |
| California Public Utilities Commission | CPUC | San Diego Regional Minority Supplier Diversity Council | SRMSDC |
| State of California's Department of General Services | CADoGS | City of Los Angeles | LA |
| State of California | CA | U.S. Small Business Administration | SBA |

The Design-Builder will not receive any subcontracting participation percentages if the Design Builder fails to submit the required proof of certification (except for OBE, SLBE and ELBE).

BIDDING DOCUMENTS

DESIGN-BUILD LIST OF SUBCONTRACTORS TO BE INCLUDED IN THE PRICE PROPOSAL ONLY

ADDITIVE/DEDUCTIVE ALTERNATE

(USE ONLY WHEN ADDITIVE ALTERNATES ARE REQUIRED)

The Design-Builder shall list all Subcontractors described in the Design-Builder's Base Bid whose percentage of work will increase or decrease if alternates are selected for award. The Design-Builder shall also list additional Subcontractors not described in the Design-Builder's Base Bid who, as a result of the alternates, will perform work or labor, or render services, or specially fabricate and install a portion [type] of work or improvements in an amount in excess of 0.5%. Failure to comply with this requirement shall result in the Bid being rejected as non-responsive and ineligible for award. The Design-Builder shall list all SLBE, ELBE, DBE, DVBE, MBE, WBE, OBE, SDB, WoSB, HUBZone, and SDVOSB Subcontractors that Design-Builder are seeking recognition towards achieving any mandatory, voluntary, or both subcontracting participation percentages.

ADDITIVE/DEDUCTIVE ALTERNATE	NAME, ADDRESS AND TELEPHONE NUMBER OF SUBCONTRACTOR	CONSTRUCTOR OR DESIGNER	TYPE OF WORK	DOLLAR VALUE OF SUBCONTRACT	MBE, WBE, DBE, DVBE, OBE, ELBE, SLBE, SDB, WoSB, HUBZone, OR SDVOSB	WHERE CERTIFIED	CHECK IF JOINT VENTURE PARTNERSHIP
	Name: <u>Athenx, Inc.</u> Address: <u>7140 Opportunity Rd.</u> City: <u>San Diego</u> State: <u>CA</u> Zip: <u>92111</u> Phone: <u>(805) 505-8025</u>	Design/ Constructor	General Contractor Wireless Security	\$ 298,325.76	SLBE 11AX0490	City	
	Name: <u>HMT Electric, Inc.</u> Address: <u>9550 Waples St., Ste 105</u> City: <u>San Diego</u> State: <u>CA</u> Zip: <u>92121</u> Phone: <u>(760) 744-4124</u>	Design/ Constructor	Electrical	\$ 195,992.00			
	Name: <u>Access Professional Systems</u> Address: <u>3959 Ruffin Rd., Ste. C</u> City: <u>San Diego</u> State: <u>CA</u> Zip: <u>92123</u> Phone: <u>(858) 571-4444</u>	Design/ Constructor	Gate Automation	\$ 47,367.00	SBE	CA	

① As appropriate, Design-Builder shall identify Subcontractor as one of the following and shall include a valid proof of certification (except for OBE, SLBE and ELBE):

- | | | | |
|---|--------|--|---------|
| Certified Minority Business Enterprise | MBE | Certified Woman Business Enterprise | WBE |
| Certified Disadvantaged Business Enterprise | DBE | Certified Disabled Veteran Business Enterprise | DVBE |
| Other Business Enterprise | OBE | Certified Emerging Local Business Enterprise | ELBE |
| Certified Small Local Business Enterprise | SLBE | Small Disadvantaged Business | SDB |
| Woman-Owned Small Business | WoSB | HUBZone Business | HUBZone |
| Service-Disabled Veteran Owned Small Business | SDVOSB | | |

② As appropriate, Design-Builder shall indicate if Subcontractor is certified by:

- | | | | |
|--|--------|--|----------|
| City of San Diego | CITY | State of California Department of Transportation | CALTRANS |
| California Public Utilities Commission | CPUC | San Diego Regional Minority Supplier Diversity Council | SRMSDC |
| State of California's Department of General Services | CADoGS | City of Los Angeles | LA |
| State of California | CA | U.S. Small Business Administration | SBA |

The Design-Builder will not receive any subcontracting participation percentages if the Design-Builder fails to submit the required proof of certification (except for OBE, SLBE and ELBE).

Form Title: DESIGN-BUILD LIST OF SUBCONTRACTORS TO BE INCLUDED IN THE PRICE PROPOSAL ONLY
ADDITIVE/DEDUCTIVE ALTERNATE

(Rev. May 2011)

Form Number: AA10
Project Title:


BIDDING DOCUMENTS

DESIGN-BUILD LIST OF SUBCONTRACTORS TO BE INCLUDED IN THE PRICE PROPOSAL ONLY

ADDITIVE/DEDUCTIVE ALTERNATE

(USE ONLY WHEN ADDITIVE ALTERNATES ARE REQUIRED)

The Design-Builder shall list all Subcontractors described in the Design-Builder's Base Bid whose percentage of work will increase or decrease if alternates are selected for award. The Design-Builder shall also list additional Subcontractors not described in the Design-Builder's Base Bid who, as a result of the alternates, will perform work or labor, or render services, or specially fabricate and install a portion [type] of work or improvements in an amount in excess of 0.5%. Failure to comply with this requirement shall result in the Bid being rejected as non-responsive and ineligible for award. The Design-Builder shall list all SLBE, ELBE, DBE, DVBE, MBE, WBE, OBE, SDB, WoSB, HUBZone, and SDVOSB Subcontractors that Design-Builder are seeking recognition towards achieving any mandatory, voluntary, or both subcontracting participation percentages.

ADDITIVE/DEDUCTIVE ALTERNATE	NAME, ADDRESS AND TELEPHONE NUMBER OF SUBCONTRACTOR	CONSTRUCTOR OR DESIGNER	TYPE OF WORK	DOLLAR VALUE OF SUBCONTRACT	MBE, WBE, DBE, DVBE, OBE, ELBE, SLBE, SDB, WoSB, HUBZone, OR SDVOSB ^①	WHERE CERTIFIED ^②	CHECK IF JOINT VENTURE PARTNERSHIP
	Name: Net Logix Address: 5425 Oberlin Dr., Ste. 200 City: San Diego State: CA Zip: 92121 Phone: (858) 764-1972	Design/Constructor	Wireless				
	Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____						
	Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____						

① As appropriate, Design-Builder shall identify Subcontractor as one of the following and shall include a valid proof of certification (except for OBE, SLBE and ELBE):

Certified Minority Business Enterprise	MBE	Certified Woman Business Enterprise	WBE
Certified Disadvantaged Business Enterprise	DBE	Certified Disabled Veteran Business Enterprise	DVBE
Other Business Enterprise	OBE	Certified Emerging Local Business Enterprise	ELBE
Certified Small Local Business Enterprise	SLBE	Small Disadvantaged Business	SDB
Woman-Owned Small Business	WoSB	HUBZone Business	HUBZone
Service-Disabled Veteran Owned Small Business	SDVOSB		

② As appropriate, Design-Builder shall indicate if Subcontractor is certified by:

City of San Diego	CITY	State of California Department of Transportation	CALTRANS
California Public Utilities Commission	CPUC	San Diego Regional Minority Supplier Diversity Council	SRMSDC
State of California's Department of General Services	CADoGS	City of Los Angeles	LA
State of California	CA	U.S. Small Business Administration	SBA

The Design-Builder will not receive any subcontracting participation percentages if the Design-Builder fails to submit the required proof of certification (except for OBE, SLBE and ELBE).

Form Title: DESIGN-BUILD LIST OF SUBCONTRACTORS TO BE INCLUDED IN THE PRICE PROPOSAL ONLY
ADDITIVE/DEDUCTIVE ALTERNATE

(Rev. May 2011)

Form Number: AA10

Project Title:

BIDDING DOCUMENTS

DESIGN-BUILD NAMED EQUIPMENT/MATERIAL SUPPLIER LIST TO BE INCLUDED IN THE PRICE PROPOSAL ONLY

The Design-Builder seeking the recognition of equipment, materials, or supplies obtained from Suppliers towards achieving any mandatory, voluntary, or both subcontracting participation percentages shall submit with the Bid the Named Equipment/Material Supplier List. The Named Equipment/Material Supplier List, at a minimum, shall have the name, locations (City) and the **DOLLAR VALUE** of the Suppliers. The Design-Builder will be credited up to 60% of the amount to be paid to the Suppliers for such materials/supplies unless vendor manufactures or substantially alters materials/supplies in which case 100% will be credited. The Design-Builder shall indicate (Yes/No) whether listed firm is a supplier or manufacturer. In calculating the subcontractor participation percentages, vendors/suppliers will receive 60% credit of the listed **DOLLAR VALUE**, whereas manufacturers will receive 100% credit. If no indication provided, listed firm will be credited at 60% of the listed **DOLLAR VALUE** for purposes of calculating the subcontractor participation percentages, Suppliers will receive 60% credit of the listed **DOLLAR VALUE**, whereas manufacturers will receive 100% credit. If no indication provided, listed firm will be credited at 60% of the listed **DOLLAR VALUE** for purposes of calculating the subcontractor participation percentages.

NAME, ADDRESS AND TELEPHONE NUMBER OF VENDOR/SUPPLIER	MATERIALS OR SUPPLIES	DOLLAR VALUE OF MATERIAL OR SUPPLIES	SUPPLIER (Yes/No)	MANUFACTURER (Yes/No)	MBE, WBE, DBE, DVBE, OBE, ELBE, SLBE, SDB, WoSB, HUBZone, OR SDVOSB	WHERE CERTIFIED ②
Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____	Not applicable	--	--	--	--	--
Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____	Not applicable	--	--	--	--	--
Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____	Not applicable	--	--	--	--	--

① As appropriate, Design-Builder shall identify Vendor/Supplier as one of the following and shall include a valid proof of certification (except for OBE, SLBE and ELBE):

Certified Minority Business Enterprise	MBE	Certified Woman Business Enterprise	WBE
Certified Disadvantaged Business Enterprise	DBE	Certified Disabled Veteran Business Enterprise	DVBE
Other Business Enterprise	OBE	Certified Emerging Local Business Enterprise	ELBE
Certified Small Local Business Enterprise	SLBE	Small Disadvantaged Business	SDB
Woman-Owned Small Business	WoSB	HUBZone Business	HUBZone
Service-Disabled Veteran Owned Small Business	SDVOSB		

② As appropriate, Design-Builder shall indicate if Vendor/Supplier is certified by:

City of San Diego	CITY	State of California Department of Transportation	CALTRANS
California Public Utilities Commission	CPUC	San Diego Regional Minority Supplier Diversity Council	SRMSDC
State of California's Department of General Services	CADoGS	City of Los Angeles	LA
State of California	CA	U.S. Small Business Administration	SBA

The Design-Builder will not receive any subcontracting participation percentages if the Design-Builder fails to submit the required proof of certification (except for OBE, SLBE and ELBE)

BIDDING DOCUMENTS

**DESIGN-BUILD NAMED EQUIPMENT/MATERIAL SUPPLIER ADDITIVE/DEDUCTIVE ALTERNATE
TO BE INCLUDED IN THE PRICE PROPOSAL ONLY**

(USE ONLY WHEN ADDITIVE ALTERNATES ARE REQUIRED)

The Design-Build shall list all Suppliers described in the Design-Build's Total Proposed Price whose percentage of work will increase or decrease if alternates are selected for award. The Design-Build shall also list additional Suppliers not described in the Design-Build's Total Proposed Price who, as a result of the alternates, will perform work or labor, or render services, or specially fabricate and install a portion [type] of work or improvements in an amount in excess of 0.5%. The Design-Build shall list all SLBE, ELBE, DBE, DVBE, MBE, WBE, OBE, SDB, WoSB, HUBZone, and SDVOSB Suppliers that Design-Builders are seeking recognition towards achieving any mandatory, voluntary, or both subcontracting participation percentages.

ADDITIVE/DEDUCTIVE ALTERNATE	NAME, ADDRESS AND TELEPHONE NUMBER OF VENDOR/SUPPLIER	MATERIALS OR SUPPLIES	DOLLAR VALUE OF MATERIAL OR SUPPLIES	SUPPLIER (Yes/No)	MANUFACTURER (Yes/No)	MBE, WBE, DBE, DVBE, OBE, ELBE, SLBE, SDB, WoSB, HUBZone, OR SDVOSB	WHERE CERTIFIED
	Name: Not applicable Address: _____ City: _____ State: _____ Zip: _____ Phone: _____	--	--	--	--	--	--
	Name: Not applicable Address: _____ City: _____ State: _____ Zip: _____ Phone: _____	--	--	--	--	--	--
	Name: Not applicable Address: _____ City: _____ State: _____ Zip: _____ Phone: _____	--	--	--	--	--	--

① As appropriate, Design-Build shall identify Vendor/Supplier as one of the following and shall include a valid proof of certification (except for OBE, SLBE and ELBE):

- | | | | |
|---|--------|--|---------|
| Certified Minority Business Enterprise | MBE | Certified Woman Business Enterprise | WBE |
| Certified Disadvantaged Business Enterprise | DBE | Certified Disabled Veteran Business Enterprise | DVBE |
| Other Business Enterprise | OBE | Certified Emerging Local Business Enterprise | ELBE |
| Certified Small Local Business Enterprise | SLBE | Small Disadvantaged Business | SDB |
| Woman-Owned Small Business | WoSB | HUBZone Business | HUBZone |
| Service-Disabled Veteran Owned Small Business | SDVOSB | | |

② As appropriate, Design-Build shall indicate if Vendor/Supplier is certified by:

- | | | | |
|--|--------|--|----------|
| City of San Diego | CITY | State of California Department of Transportation | CALTRANS |
| California Public Utilities Commission | CPUC | San Diego Regional Minority Supplier Diversity Council | SRMSDC |
| State of California's Department of General Services | CADoGS | City of Los Angeles | LA |
| State of California | CA | U.S. Small Business Administration | SBA |

The Design-Build will not receive any subcontracting participation percentages if the Design-Build fails to submit the required proof of certification (except for OBE, SLBE and ELBE)

BIDDING DOCUMENTS

**EQUAL BENEFITS ORDINANCE
CERTIFICATION OF COMPLIANCE**



For additional information, contact:
 CITY OF SAN DIEGO
EQUAL BENEFITS PROGRAM
 202 C Street, MS 9A, San Diego, CA 92101
 Phone (619) 533-3948 Fax (619) 533-3220

COMPANY INFORMATION

Company Name: Siemens Industry, Inc.	Contact Name: Mike Dietsch/Eric Ackermann
Company Address: 10100 Willow Creek Road	Contact Phone: (619) 865-7609
San Diego, CA 92121	Contact Email: michael.dietsch@siemens.com

CONTRACT INFORMATION

Contract Title: Water Dept. Security Upgrade Design-Build	Start Date: 01/13/2012
Contract Number (if no number, state location): Bid No.: K-125463-DBA	End Date: 04/30/2013

SUMMARY OF EQUAL BENEFITS ORDINANCE REQUIREMENTS

The Equal Benefits Ordinance [EBO] requires the City to enter into contracts only with contractors who certify they will provide and maintain equal benefits as defined in SDMC §22.4302 for the duration of the contract. To comply:

- Contractor shall offer equal benefits to employees with spouses and employees with domestic partners.
 - Benefits include health, dental, vision insurance; pension/401(k) plans; bereavement, family, parental leave; discounts, child care; travel/relocation expenses; employee assistance programs; credit union membership; or any other benefit.
 - Any benefit not offer an employee with a spouse, is not required to be offered to an employee with a domestic partner.
- Contractor shall post notice of firm's equal benefits policy in the workplace and notify employees at time of hire and during open enrollment periods.
- Contractor shall allow City access to records, when requested, to confirm compliance with EBO requirements.
- Contractor shall submit *EBO Certification of Compliance*, signed under penalty of perjury, prior to award of contract.

NOTE: This summary is provided for convenience. Full text of the EBO and Rules Implementing the EBO are available at www.sandiego.gov/administration.

CONTRACTOR EQUAL BENEFITS ORDINANCE CERTIFICATION

Please indicate your firm's compliance status with the EBO. The City may request supporting documentation.

- I affirm compliance with the EBO because my firm (*contractor must select one reason*):
- Provides equal benefits to spouses and domestic partners.
 - Provides no benefits to spouses or domestic partners.
 - Has no employees.
 - Has collective bargaining agreement(s) in place prior to January 1, 2011, that has not been renewed or expired.
- I request the City's approval to pay affected employees a cash equivalent in lieu of equal benefits and verify my firm made a reasonable effort but is not able to provide equal benefits upon contract award. I agree to notify employees of the availability of a cash equivalent for benefits available to spouses but not domestic partners and to continue to make every reasonable effort to extend all available benefits to domestic partners.

It is unlawful for any contractor to knowingly submit any false information to the City regarding equal benefits or cash equivalent associated with the execution, award, amendment, or administration of any contract. [San Diego Municipal Code §22.4307(a)]

Under penalty of perjury under laws of the State of California, I certify the above information is true and correct. I further certify that my firm understands the requirements of the Equal Benefits Ordinance and will provide and maintain equal benefits for the duration of the contract or pay a cash equivalent if authorized by the City.

Eric Ackermann, Area Sales Manager		11/30/2011
Name/Title of Signatory	Signature	Date

FOR OFFICIAL CITY USE ONLY

Receipt Date: _____ EBO Analyst: _____ Approved Not Approved – Reason: _____

rev 02/15/2011

BIDDING DOCUMENTS

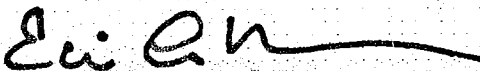
Design-Build Proposal

1. The undersigned Design-Builder proposes and agrees, if this Proposal is accepted, to enter into an agreement with the City in the form included in the Contract Documents to perform the Work as specified or indicated in said Contract Documents entitled **Water Department Security Upgrade Design-Build Contract**.
2. The Design-Builder accepts all of the terms and conditions of the Contract Documents, including without limitation those in the RFP.
3. This Proposal will remain open for the period stated in the RFP unless otherwise required by law. The Design-Builder will enter into an agreement within the time and in the manner required in the RFP and will furnish the insurance certificates, Payment Bond, and Performance Bond required by the Contract Documents.
4. The Design-Builder has examined copies of all the Contract Documents including the following addenda (receipt of all of which is hereby acknowledged):
5. The Design-Builder has familiarized itself with the nature and extent of the Contract Documents, Work, site, locality where the Work is to be performed, the legal requirements (federal, state and local laws, ordinances, rules, and regulations), and the conditions affecting cost, progress or performance of the Work and has made such independent investigations as Design-Builder deems necessary.

To all the foregoing, and including all Proposal schedule(s) and information required of the Design-Builder contained in this Proposal Form, said Design-Builder further agrees to complete the Work and Services required under the Contract Documents within the Contract Time stipulated in said Contract Documents, and to accept in full payment therefore the Contract Price based on the Total Proposal Price(s) named in the aforementioned Proposal schedule(s).

Dated: 11/04/2011

Design-Builder: Siemens Industry, Inc.

By: 
(Signature)

Title: Area Sales Manager, Los Angeles Office

BIDDING DOCUMENTS

PROPOSAL

Bidder's General Information

To the City of San Diego:

Pursuant to "Invitation to Bids", specifications, and requirements on file with the City Clerk, and subject to all provisions of the Charter and Ordinances of the City of San Diego and applicable laws and regulations of the United States and the State of California, the undersigned hereby proposes to furnish to the City of San Diego, complete at the prices stated herein, the items or services hereinafter mentioned. The undersigned further warrants that this bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

The undersigned bidder(s) further warrants that bidder(s) has thoroughly examined and understands the entire Contract Documents (plans and specifications) and the Bidding Documents therefore, and that by submitting said Bidding Documents as its bid proposal, bidder(s) acknowledges and is bound by the entire Contract Documents, including any addenda issued thereto, as such Contract Documents incorporated by reference in the Bidding Documents.

IF A SOLE OWNER OR SOLE CONTRACTOR SIGN HERE:

- (1) Name under which business is conducted _____ N/A
- (2) Signature (Given and surname) of proprietor _____ N/A
- (3) Place of Business (Street & Number) _____ N/A
- (4) City and State _____ N/A Zip Code _____ N/A
- (5) Telephone No. _____ N/A Facsimile No. _____ N/A

IF A PARTNERSHIP, SIGN HERE:

- (1) Name under which business is conducted _____ N/A
- (2) Name of each member of partnership [indicate character of each partner, general or special (limited):
_____ N/A

BIDDING DOCUMENTS

(3) Signature (Note: Signature must be made by a general partner)

N/A

Full Name and Character of partner

N/A

(4) Place of Business (Street & Number) N/A


(5) City and State N/A Zip Code N/A

(6) Telephone No. N/A Facsimile No. N/A

IF A CORPORATION, SIGN HERE:

(1) Name under which business is conducted Siemens Industry, Inc.

(2) Signature, with official title of officer authorized to sign for the corporation:



(Signature)

Eric Ackermann

(Printed Name)

Area Sales Manager, Los Angeles Office

(Title of Officer)

(Impress Corporate Seal Here)

(3) Incorporated under the laws of the State of Delaware

(4) Place of Business (Street & Number) 1000 Deerfield Parkway

(5) City and State Buffalo Grove, IL Zip Code 60089

(6) Telephone No. (847) 215-1000 Facsimile No. (847) 215-1093

THE FOLLOWING SECTIONS MUST BE FILLED IN BY ALL PROPOSERS:

In accordance with the "INVITATION TO BIDS", the bidder holds a California State Contractor's license for the following classification(s) to perform the work described in these specifications:

LICENSE CLASSIFICATION A, B, C10, C16 & C20

LICENSE NO. 758796 EXPIRES February 28, 2013

This license classification must also be shown on the front of the bid envelope. Failure to show license classification on the bid envelope may cause return of the bid unopened.

TAX IDENTIFICATION NUMBER (TIN): ██████████

E-Mail Address: eric.ackermann@siemens.com or michael.dietsch@siemens.com

BIDDING DOCUMENTS

THIS PROPOSAL MUST BE NOTARIZED BELOW:

I certify, under penalty of perjury, that the representations made herein regarding my State Contractor's license number, classification and expiration date are true and correct.

Signature  Title Area Sales Mgr

SUBSCRIBED AND SWORN TO BEFORE ME, THIS 22nd DAY OF November 2011.

Notary Public in and for the County of Orange, State of California

See Attached See attached

(NOTARIAL SEAL)

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

CIVIL CODE § 1189

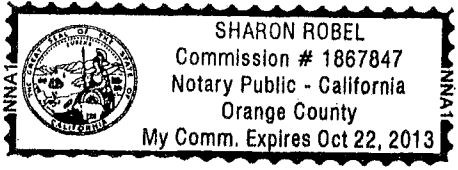
State of California

County of Orange

On 11/22/11 before me, Sharon Robel, Notary Public

personally appeared [Signature]
Name(s) of Signer(s)
Dave Misner

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.



I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature: [Signature]
Signature of Notary Public

Place Notary Seal Above

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

Description of Attached Document

Title or Type of Document: Bedding Document

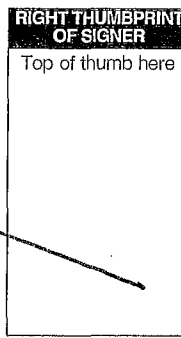
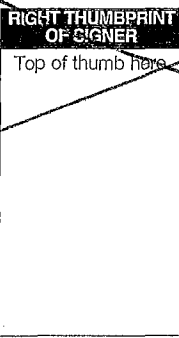
Document Date: 11/22/11 Number of Pages: 474

Signer(s) Other Than Named Above: _____

Capacity(ies) Claimed by Signer(s)

Signer's Name: _____ Signer's Name: _____

- Corporate Officer — Title(s): _____
- Individual
- Partner — Limited General
- Attorney in Fact
- Trustee
- Guardian or Conservator
- Other: _____



Signer Is Representing: _____

SIEMENS

July 5, 2011

Delegation of Signature Authority

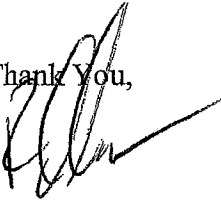
Siemens Industry, Inc.

I, Richard Evans, Southern California El Dorado Area Manager, Siemens Industry, Inc., (the "Corporation") by virtue of the authority vested in me as Area Manager, to sign or countersign and otherwise execute in the name of, or on behalf of the Corporation, customer contracts (excluding Performance/Energy Contracts) in connection therewith for and on behalf of the Corporation, do hereby delegate to and acknowledge that the following persons may exercise such authority for and on my behalf.

Eric Ackermann, Area Sales Manager, Los Angeles Office
Serge Cardinal, FIS National Business Development Manager
Dave Misner, Area Sales Manager, Los Angeles Office
Mitch Sager, Area Sales Manager, Los Angeles Office
Mark E. Warren, Branch Manager, San Diego Office

I further designate and acknowledge that the signature of the persons referred to above, is binding upon the Corporation in the above identified circumstances and shall have the same force and effect as would my signature.

Thank You,



Richard Evans
SoCal - Area Manager
El Dorado Zone

**ACKNOWLEDGEMENT OF APPOINTED SIGNATURE AUTHORITY FROM
PRESIDENT ANDREAS SCHIERENBECK AND VICE PRESIDENT FINANCE AND
BUSINESS ADMINISTRATION JACK WILLIAMS**

SIEMENS INDUSTRY, INC. – BUILDING TECHNOLOGIES DIVISION

- A. We, the undersigned, Andreas Schierenbeck, President and Jack Williams, Vice President Finance and Business Administration of the Building Technologies Division of Siemens Industry, Inc. (the "Corporation") a corporation duly organized and existing under the laws of the State of Delaware, by virtue of the authority vested by the Board of Directors of Siemens Industry, Inc. and in accordance with the By-Laws of the Corporation and the laws of said State, do hereby acknowledge that the following individuals are hereby authorized to sign or countersign and otherwise execute in the name, or on behalf of the Building Technologies Division of the Corporation, any bids, proposals, bonds, releases and waivers of liens, and any certificates, affidavits, or ancillary documents in connection therewith; any licensing qualification or registration filings, returns; any contracts, leases, agreements, guarantees and any certificates, affidavits, or ancillary documents in connection therewith, up to and including a transactional limit of \$10,000,000; and any releases, compromises or settlements in connection with claims or disputes arising out of any such transaction.

AUTHORIZED SIGNATORIES

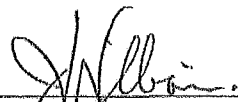
<u>Name</u>	<u>Title</u>
Dave Mangano	Senior Vice President, Field Operations
Mark Houghteling	Senior Director, Finance and Business Administration, Field Operations
Terry Heath	Vice President, Fire Business Unit Head
Jack Mueller	Vice President, Finance and Business Administration, FIS
Dave Hopping	Vice President, BAU Business Unit Head
Peter Kamps	Vice President, Finance and Business Administration, BAU
Carey Boethel	Vice President, Security Business Unit Head
Bernhard Veitl	Director, Finance and Business Administration, SES
Mike Kearney	Sr. Director, Energy & Environmental Solutions
Dan Recupido	Finance and Business Administration Manager BAU-EES
Kevin Yates	Vice President, Low Voltage Business Unit Head
Anton Duval	Sr. Director, Finance and Business Administration, Low Voltage

- B. We do further delegate to all Zone Managers, Area Managers, Branch Managers, ("Managers"), or Zone Finance and Business Administration Manager, Area Financial and Business Administration Manager, ("FBA"), of the Corporation the authorization to execute in the name and on behalf of the Corporation, any and all bids, proposals, requests for proposals, quotations, any certificates, affidavits or ancillary documents in connection therewith, certified payrolls, releases and waivers of liens. Except for Performance/Energy Contracts, the above Managers and FBA's are authorized to execute in the name and on behalf of the Corporation contracts, agreements and bonds including, but not limited to, signature of any certificates, affidavits or ancillary documents in connection therewith, up to and including a transactional limit of \$5,000,000.
- C. We further acknowledge that each of the persons referred to herein is authorized to delegate such person's authority hereunder to additional members of his or her management team up to the limit of such person's delegation of authority, provided that such delegation is in written form signed by the delegator and filed with the Legal Department.
- D. We further acknowledge that each of the signatures of the persons referred to in paragraph A are binding upon the Corporation.
- E. We further acknowledge that any document executed for an amount greater than \$10,000,000 shall require the signature of two of the Officers, one business representative and one finance representative, of whom shall have the requisite signature authority to be legally binding upon the Corporation.
- F. We further acknowledge that the Secretary or an Assistant Secretary of the Corporation is authorized to issue certifications attesting to the incumbency, authority and status of any of the persons referred to in this resolution.

IN WITNESS WHEREOF, we have hereunto subscribed our names and affixed the corporate seal of the said Corporation, as of the 23rd day of August, 2010.

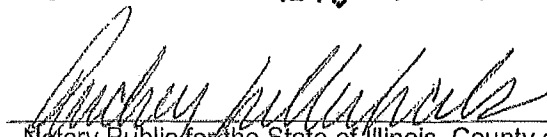


 Andreas Schiorenbeck
 President
 Siemens Industry, Inc.
 Building Technologies Division

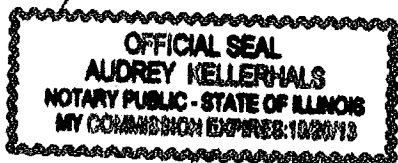


 Jack Williams
 Vice President, Finance and
 Business Administration
 Siemens Industry, Inc.
 Building Technologies Division

Signed before me this 23rd day of August, 2010



 Notary Public for the State of Illinois, County of Lake



City of San Diego



ADDENDUM "1"

REQUEST FOR PROPOSAL (RFP)

FOR WATER DEPARTMENT SECURITY UPGRADE DESIGN-BUILD CONTRACT

RFQ NO.: Security Upgrades for the City of San Diego Design-Build Contract 5171
BID NO.: K-12-5463-DBA
RFP NO.: 5463
TASK ORDER NO.: 1
WBS NO.: S-11105, S-11107
CLIENT DEPARTMENT: 2013
COUNCIL DISTRICT: CITYWIDE
PROJECT TYPE: BL, BJ

REQUEST FOR PROPOSAL (RFP) DUE:

12:00 Noon

NOVEMBER 7, 2011

CITY OF SAN DIEGO

Public Works Contracting Group

1200 Third Avenue, Suite 200, MS 56P

San Diego, CA 92101

CHANGES TO CONTRACT DOCUMENTS

The following changes to the RFP are hereby made effective as though originally issued with the bid package.

THE SUBMITTAL DATE FOR THIS PROJECT HAS BEEN **EXTENDED AS STATED ABOVE.**

A. INTRODUCTION

A.1 The following changes are hereby incorporated into the Request for Proposal for the *Water Department Security Upgrade Design – Build Contract*

A.2 All prospective bidders are reminded that they are required to acknowledge receipt of this addendum in their submittal in accordance with ATTACHMENT B, Item 1 of the Request for Proposals.

B. QUESTIONS AND ANSWERS

Q1 Is the City looking for voluntary 20% SLBE/ELBE participation? Or is the City looking for 10% mandatory SLBE/ELBE participation plus another 10% general subcontractor participation? The 10% mandatory SLBE/ELBE participation goal is clear.

A1. The City has determined a 10% mandatory SLBE-ELBE subcontracting participation, and a voluntary subcontractor participation of 10%, equating to 20% in total subcontractor participation. The voluntary subcontracting participation consists of DBE, DVBE, WBE, and MBE certified Subcontractors.

Q2. Is the City seeking an additional 10% voluntary subcontractor participation (note: not necessarily SLBE/ELBE) above and beyond the mandatory 10% subcontractor participation, including a mandatory 5% SLBE/ELBE participation requirement? Or is the City seeking an additional 10% SLBE /ELBE participation above and beyond the initial 10% goal? Or is the City seeking an additional 5% voluntary subcontractor participation plus an additional 5% SLBE/ELBE subcontractor participation for an additional 10% voluntary participation?

A2. See answer A1.

Q3. Should the bidders rely on direction provided by Page 4, or by Page 394?

A3. See revisions as part of this addendum.

Q4. What will the City accept as proof of DBE and DVBE status; federal and/or state requirements? Or does the City have its own separate registration / proof process?

A4. See forms in attachment D, Front End Volume 2.

Q5. Assuming we receive clarification on issues # 1 and #2 above based on the City's response to our questions, how will the correct interpretation of 5% SLBE/ELBE (Page 394) participation goal vs. 10% SLBE/ELBE (Page 4) participation goal impact the 25% SLBE/ELBE/DBE/DVBE participation goal identified on Page 380? Are we to assume the City is looking for an additional 5% participation (20% to 25%) from DBE and DVBE firms? If not, what does the City expect in terms of the breakdown of the 25% participation goal among the SLBE/ELBE/DBE/DVBE firms required to earn maximum scoring points?

A5. See answer to A1 and revisions as part of this addendum.

C. CHANGES TO THE REQUEST FOR PROPOSALS

- C1. To Section 2.0, Equal Opportunity, Subsection 2.4, first paragraph, page 4, **DELETE** in its entirety and **SUBSTITUTE** with the following:

The City has determined a **10% mandatory SLBE-ELBE** subcontracting participation. The City has also determined a **voluntary subcontractor participation of 10%**, equating to **20% in total subcontractor participation**, to enhance competition and maximize subcontracting opportunities. Percentages are based on the Contract Price, less Field Orders, Additive, Deductive and Allowance Bid items

- C2. To Section 8.0, Selection and Award Schedule, Page 9, Subsection 8.3 through 8.8, **DELETE** in their entirety and **SUBSTITUTE** with the following:

8.3	Proposal Due Date	November 7, 2011
8.4	Technical Presentations	November 17, 2011
8.5	Closed Ranking Meeting	November 29, 2011
8.6	Selection and Notification	December 2, 2011
8.7	Receipt of Bonds and Insurance Certificates	December 16, 2011
8.8	Notice to Proceed	January 13, 2012

- C3. To Attachment B Proposal Submittal Requirements and Selection Criteria, item 8 Equal Employment and Contracting Opportunity, Pages 378 through 380, **DELETE** in its entirety and **SUBSTITUTE** with the following:

8. Equal Employment and Contracting Opportunity (25 Points Max)

Failure to submit the required EOCP information will result in Proposal being determined as non-responsive.

Subcontractor Documentation

The Design-Builder shall, at a minimum, provide with its Technical Proposal a listing of at least 3 of the largest Subcontractors (constructors only) for the Project and all other Subcontractors (design professionals, etc.) that are known at the time it submits its Proposal, using Form AA15 and AA30. Note: Subcontractors include design professionals, as well.

Any changes to the listing of the proposed Subcontractors that have occurred in the information, required data or documentation submitted in the SOQ shall be submitted in accordance this section, and shall be included in an attachment, which shall be entitled "Subcontractor Documentation" using forms AA15 and AA30...

Work which requires Subcontractors that are not listed by Design-Builder at time of Award shall be let by Design-Builder in accordance with a competitive bidding process performed solely at Design-Builder's expense. Design-Builder shall provide public notice of the availability of the Work to be subcontracted, obtain competitive bids, and provide a fixed date and time on which the subcontracted Work will be awarded. Subcontractors bidding on subcontracts pursuant to this provision shall be afforded the protection of all applicable laws, including Public Contract Code sections 4100 through 4114, inclusive.

The Design-Builder may select Subcontractors and Suppliers in one of 3 competitive ways i.e., lowest responsible bidder, best value for price and qualifications, or highest qualifications. Prior to construction NTP, the Design-Builder shall do the following:

- a. Submit the selection method used to the City in accordance with 2-5.3, "Submittals."
- b. Pre-qualify Subcontractors and Suppliers, in a manner at least as stringent as the City's pre-qualification standards.
- c. Review the Subcontractors and Suppliers ultimately chosen to verify that that they have not been debarred and are in good standing as a licensed contractor in California.

Open all Subcontract bids and provide to the City one copy without reservation or redaction. All records relevant to the award and performance of Subcontractors and Suppliers shall be public and provided to the City upon request and without redaction.

The City may administer bidding itself for Subcontractors and Suppliers, or to direct the bidding procedures to be used by the Design-Builder.

The Design-Builder may use its corporate-generated subcontractor agreement to retain Subcontractors or Suppliers, provided the subcontractor agreement contains the terms required to be included in Subcontracts by this Contract.

The points will be awarded in only one of the possible outcomes as follows:

	OUTCOME	Maximum Possible Point
1	5% - 9% participation SLBE, ELBE, DVBE, or DBE	5
2	10%-14% participation SLBE, ELBE, DVBE or DBE	10
3	15%-19% participation SLBE, ELBE, DVBE or DBE	15
4	20%-24% participation SLBE, ELBE, DVBE or DBE	20
5	25% participation SLBE, ELBE, DVBE or DBE	25

In no case the points shall exceed 25.

- C4. To Attachment C, Contract Front End Volume 1, Required Documents, Pages 385 through 387, **DELETE** in their entirety and **SUBSTITUTE** with pages 6 of 15 through 8 of 15 of this Addendum.

- C5. To Attachment C, Contract Front End Volume 1, Recent Changes, Pages 388, **DELETE** in its entirety.
- C6. To Attachment C, Contract Front End Volume 1, Special Notices, Pages 389 through 394, **DELETE** in their entirety and **SUBSTITUTE** with pages 9 of 15 through 15 of 15 of this Addendum.

Tony Heinrichs, Director
Public Works Department

Dated: October 13, 2011
San Diego, California

TH/bd/rir

REQUIRED DOCUMENTS SCHEDULE

This table is intended to serve as a convenient tool for listing forms and documents required at different times. It is neither exhaustive nor must be considered a Contract Document by itself. Therefore, the users must review the entire Contract Documents and become familiar with the required documentation and the submittal schedule associated with each document.

Bidder's attention is directed to the City's Municipal Code §22.0807(e), (3)-(5) for important information regarding required documentation.

The specified EOC forms are all available for download from the EOC Program's web site at:

<http://www.sandiego.gov/eoc/forms/index.shtml>

ITEM	WHEN	BY	WHAT	FORMS ARE DUE WITH:	
				TECHNICAL PROPOSAL	PRICE PROPOSAL
1.	BID DUE DATE/TIME	ALL BIDDERS	Price Proposal Form		√
2.	BID DUE DATE/TIME	ALL BIDDERS	Non-collusion Affidavit to be Executed By Bidder and Submitted with Bid under 23 USC 112 and PCC 7106		√
3.	BID DUE DATE/TIME	ALL BIDDERS	Contractors Certification of Pending Actions		√
4.	BID DUE DATE/TIME	ALL BIDDERS	Equal Benefits Ordinance Certification of Compliance		√
5.	BID DUE DATE/TIME	ALL BIDDERS	Form AA05 – Design-Build List of Subcontractors		√
6.	BID DUE DATE/TIME	ALL BIDDERS	Form AA10 - Design-Build List of Subcontractors Additive/Deductive Alternate		√
7.	BID DUE DATE/TIME	ALL BIDDERS	Form AA15 - Design-Build List of Subcontractors	√	
8.	BID DUE DATE/TIME	ALL BIDDERS	Form AA20 - Design-Build List of Subcontractors Additive/Deductive Alternate	√	
9.	BID DUE DATE/TIME	ALL BIDDERS	Form AA25 - Design-Build Named Equipment/Material Supplier List		√
10.	BID DUE DATE/TIME	ALL BIDDERS	Form AA26 - Design-Build Named Equipment/Material Supplier Additive/Deductive Alternate		√

REQUIRED DOCUMENTS SCHEDULE

ITEM	WHEN	BY	WHAT	FORMS ARE DUE WITH:	
				TECHNICAL PROPOSAL	PRICE PROPOSAL
11.	BID DUE DATE/TIME	ALL BIDDERS	Form AA30 - Design-Build Named Equipment/Material Supplier List	√	
12.	BID DUE DATE/TIME	ALL BIDDERS	Form AA31 - Design-Build Named Equipment/Material Supplier Additive/Deductive Alternate	√	
13.	WITHIN 1 WORKING DAY OF CLOSED RANKING MEETING	ALL BIDDERS	Proof of Valid DBE-MBE-WBE-DVBE Certification Status e.g., Certs.	√ (If submitted with the Proposal)	
14.	WITHIN 1 WORKING DAY OF CLOSED RANKING MEETING	ALL BIDDERS	Form AA60 – List of Work Made Available	√ (If submitted with the Proposal)	
15.	WITHIN 1 WORKING DAY OF CLOSED RANKING MEETING	ALL BIDDERS	SLBE-ELBE Good Faith Documentations	√ (If submitted with the Proposal)	
16.	WITHIN 10 WORKING DAYS OF BID OPENING	APPARENT LOW BIDDER	Names of the principle individual owners of the Apparent Low Bidder - In the event the firm is employee owned or publicly held, then the fact should be stated and the names of the firm's principals and officers shall be provided.		
17.	WITHIN 10 WORKING DAYS OF BID OPENING	APPARENT LOW BIDDER	If the Contractor is a Joint Venture, the following information must be submitted: o Joint Venture Agreement o Joint Venture License		
18.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	APPARENT LOW BIDDER	Contract Forms - Agreement		
19.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	APPARENT LOW BIDDER	Contract Forms – Performance Bonds and Labor and Materialmen's Bond		

REQUIRED DOCUMENTS SCHEDULE

ITEM	WHEN	BY	WHAT	FORMS ARE DUE WITH:	
				TECHNICAL PROPOSAL	PRICE PROPOSAL
20.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	APPARENT LOW BIDDER	Certificates of Insurance and Endorsements		
21.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	ALL BIDDERS	Contractor/Vendor Registration Form		
22.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	APPARENT LOW BIDDER	Contractor Certification - Drug-Free Workplace		
23.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	APPARENT LOW BIDDER	Contractor Certification - American with Disabilities Act		
24.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	APPARENT LOW BIDDER	Contractors Standards - Pledge of Compliance		
25.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	APPARENT LOW BIDDER	Form BB05 – Work Force Report		
26.	BY 5th OF EACH MONTH	CONTRACTOR	CC20 - Monthly Employment Report		
27.	BY 5th OF EACH MONTH	CONTRACTOR	CC25 - Monthly Invoicing Report		
28.	PRIOR TO ACCEPTANCE	CONTRACTOR	CC10 - Contract Change Order (CCO)		
29.	PRIOR TO ACCEPTANCE	CONTRACTOR	CC15 - Final Summary Report		
30.	PRIOR TO ACCEPTANCE	CONTRACTOR	Affidavit of Disposal		

SPECIAL NOTICE
SMALL LOCAL BUSINESS ENTERPRISES (SLBE)
AND
EMERGING LOCAL BUSINESS ENTERPRISES (ELBE)
PROGRAM

This contract is subject to the requirements of the SLBE Program as specified in the SLBE-ELBE section of the City's EOC Requirements included in The WHITEBOOK. The Bidders are required to review The WHITEBOOK and become familiar with the detailed specifications including the required documentation and the submittal schedule as related to SLBE-ELBE program.

To the WHITEBOOK, GENERAL EQUAL OPPORTUNITY CONTRACTING PROGRAM REQUIREMENTS CONSTRUCTION CONTRACTOR REQUIREMENTS, Equal Employment Opportunity Outreach Program (A), **DELETE** in its entirety and **SUBSTITUTE** with the following:

- A. Competitive Bids. If a contract is competitively solicited, the Apparent Low Bidder shall submit a Work Force Report (Form BB05) or an Equal Employment Opportunity (EEO) Plan, within 10 Working Days after receipt by the Bidder of Contract forms to the City for approval as specified in the Notice of Intent to Award letter from the City.

To the WHITEBOOK, SLBE-ELBE PROGRAM REQUIREMENTS, Section VIII(2)(b), "What Are The Six Good Faith Efforts?", **DELETE** in its entirety and **SUBSTITUTE** with the following:

"Make information of forthcoming opportunities available to SLBE-ELBE firms and arrange time for contracts and establish delivery schedules, where requirements permit, in a way that encourages and facilitates participation by SLBE-ELBE firms in the competitive process. This includes posting solicitations for bids or proposals for a minimum of 10 days before the Bid or Proposal due date."

To The WHITEBOOK, SLBE-ELBE PROGRAM REQUIREMENTS, Section VIII (3) and (4), **DELETE** in their entirety and **SUBSTITUTE** with the following:

3. Good Faith Effort Documentation Requirements

If the stated SLBE-ELBE subcontractor participation percentages are not met, the Bidder shall submit, within 1 day of the Bid opening, information necessary to establish adequate good faith efforts were taken to meet the contract subcontractor participation percentage. The required documentation includes the following:

A. ADVERTISEMENT REQUIREMENTS

Advertisements for subcontract work must comply with the following requirements:

1. Advertisements must be placed at least 10 Working Days prior to

proposal due date. Provide the names and dates of each publication of where the advertisement was published.

Note: The advertisement is not required to be placed everyday for the 10 Working Days prior to proposal due date.

2. There must be at least 2 advertisements published, 1 advertisement in a trade publication and 1 in a focus group publication. Additional advertising for SLBE-ELBE participation may be placed in newspapers, trade papers and on the Internet. For a listing of publications accepting advertisements, please visit the City's EOC home page at <http://www.sandiego.gov/eoc/>
 - 2.1 Newspaper advertisements must be in the Bids Wanted, Legal Notices section of the Classified Ads, Subcontracting Opportunities or Business Opportunities **NOT** the Employment Opportunities Section.
3. Advertisements must state which items or portions of work the Bidder is requesting subcontractor pricing.
 - 3.1. It is the Bidder's responsibility to demonstrate that enough work sufficient to meet the SLBE-ELBE subcontractor participation percentage was made available to SLBE-ELBE firms. The Bidder shall make as many items of the Work available as possible to meet the subcontractor participation percentage, and at a minimum an amount of work equal to the subcontractor participation percentage amount. If necessary to reach the subcontractor participation percentage, the Work shall include those items normally performed by the Bidder with its own forces, supplies, and even items with a dollar value below 1/2 of 1% of the total Bid. Bidders shall utilize Form AA60 to demonstrate compliance with this requirement and submit the completed form with Good Faith Effort documentation.
4. Advertisements must state that Plans and Specifications are available at no cost to interested SLBE-ELBE firms and how to obtain them.
5. Advertisements must state that assistance is available from the Bidder for SLBE-ELBE subcontractors in obtaining necessary equipment, supplies, or materials.
6. Advertisements must state that assistance is available from the Bidder for SLBE-ELBE firms in obtaining bonding, lines of credit or insurance.

7. Bidders **MUST** provide proof of publication of each advertisement by providing the publication affidavit which must include a legible copy of the entire advertisement and the original **ENTIRE** page of the publication in which the advertisement appears.

B. SLBE-ELBE WRITTEN SOLICITATION REQUIREMENTS

Bidders must directly solicit SLBE-ELBE firms on the City's approved SLBE-ELBE list. Solicitations for Subcontractor or Supplier work must comply with the following requirements:

1. The solicitation must be dated and list the name of the SLBE-ELBE firm. Solicitations must be made to the SLBE-ELBE firms at least 10 Working Days prior to proposal due date.
2. Solicitation must state which items or portions of work the Bidder is requesting subcontractor pricing.
 - 2.1. It is the Bidder's responsibility to demonstrate that enough work sufficient to meet the SLBE-ELBE subcontractor participation percentage was made available to SLBE-ELBE firms. The Bidder shall make as many items of work available as possible to meet the subcontractor participation percentage, and at a minimum an amount of work equal to the subcontractor participation amount. If necessary to reach the subcontractor participation percentage, the Work shall include those items normally performed by the Bidder with its own forces, supplies and even items with a dollar value below 1/2 of 1% of the total bid. Bidders shall utilize Form AA60 to demonstrate compliance with this requirement and submit the completed form with Good Faith Effort documentation.
3. Solicitation must state that Plans and Specifications are available at no cost to interested SLBE-ELBE firms and how to obtain them.
4. Solicitations must state that assistance is available from the Bidder for SLBE-ELBE subcontractors in obtaining necessary equipment, supplies, or materials.
5. Solicitations must state that assistance is available from the Bidder for SLBE-ELBE firms in obtaining bonding, lines of credit or insurance.
6. Bidder must solicit **ALL** SLBE-ELBE firms on the City's approved list, who have the NAICS code for the subcontract work sought by

the general contractor.

7. Bidders must provide copies of **ALL** solicitations with 1 of the following forms of verification that the solicitations were sent:

a) If mailed: provide copies of the metered envelopes or certified mail receipts.

b) If faxed: provide copies of the fax transmittal confirmation sheet(s).

c) If emailed: provide copies of the email delivery confirmation sheet(s).

No credit shall be given for error messages, busy, cancelled, undeliverable, etc.

C. SLBE-ELBE WRITTEN SOLICITATION FOLLOW UP REQUIREMENTS

Bidders must follow-up with all SLBE – ELBE firms that were notified of the subcontracting opportunities to determine their level of interest and commitment to bid the project. When following up with the SLBE – ELBE firms, the Bidder must do the following:

1. Follow up communications must start no less than 5 Working Days prior to proposal due date.

2. Bidders must follow up with all SLBE-ELBE firms in writing. Bidders must provide copies of **ALL** written follow up notices with one of the following forms of verification that the follow up notices were sent:

a) If mailed: provide copies of the metered envelopes or certified mail receipts.

b) If faxed: provide copies of the fax transmittal confirmation sheet(s).

c) If emailed: provide copies of the email delivery confirmation sheet(s).

No credit shall be given for error messages, busy, cancelled, undeliverable, etc.

3. Bidders must make at least 3 follow-up telephone calls to each SLBE – ELBE firm at least 5 days prior to bid opening date.

Bidders must submit a telephone log as identified below.

- 3.1. Submit a telephone log, as proof of telephone call, with the following requirements: project name, name of person making the phone call, name of firm contacted, contact person's name, date of call, time of call, and details of conversation.

D. SUBCONTRACT AWARD SUMMARY

Bidders must act in good faith with interested SLBE-ELBE firms and may only reject bids for legitimate business reasons. The Bidder must submit the following documentation:

1. A **DETAILED** summary sheet which includes Bid item number, scope of work, Subcontractor or Supplier name, bid amount, certification type, Subcontractor or Supplier selection and reason for selection or non-selection of all the Subcontractors or Suppliers that responded.
2. Copies of all Subcontractors or Suppliers bids received including bids for areas of work that were not included in the outreach and quotes from both certified and non-certified Subcontractors or Suppliers. Subcontractor bid amounts **MUST** match the bid-listed dollar amounts on form AA35 and AA40 submitted with Bidders sealed bid and the summary sheet dollar amounts **MUST** also match these amounts. If the Bidder decides to self-perform a scope of work, the Bidder **MUST** submit a detailed quote to show that the Bidder's price is competitive to the price of the subcontractors that responded to outreach efforts. All dollar amounts and scopes of work on the Subcontractor or Supplier bid must not be altered by the prime Bidder. If a revision is necessary, a revised quote must be obtained and provided. All verbal quotes **MUST** be substantiated by corresponding written quote from the Subcontractor or Supplier

E. OUTREACH ASSISTANCE REQUIREMENTS

Written notice of subcontractor opportunities must be forwarded to local organizations or groups to assist with outreach efforts. When contacting local organizations or groups, the Bidder **must do** the following:

1. Contact a minimum of 5 local organizations or groups to provide assistance in contacting, recruiting and using SLBE-ELBE firms by written notice. For a listing of organizations or groups offering assistance, please visit the City's EOC home page at <http://www.sandiego.gov/eoc/>

2. Written notice must indicate the date of the notice and name of the local organization or group. Written notices must be forwarded to the organizations or groups at least 10 Working Days prior to bid opening.
3. Written notice must state which items or portions of work the Bidder is requesting subcontractor pricing.
 - 3.1. It is the Bidder's responsibility to demonstrate that enough work sufficient to meet the SLBE-ELBE subcontractor participation percentage was made available to SLBE-ELBE firms. The Bidder shall make as many items of the Work available as possible to meet the subcontractor participation percentage, and at a minimum an amount of work equal to the subcontractor participation amount. If necessary to reach the subcontractor participation percentage, the work should include those items normally performed by the Bidder with its own forces, supplies and even items with a dollar value below 1/2 of 1% of the total bid. Bidders shall utilize Form AA60 to demonstrate compliance with this requirement and submit the completed form with Good Faith Effort documentation.
4. Written notice must state that Plans and Specifications are available at no cost to interested SLBE-ELBE firms and how to obtain them.
5. Written notice must state that assistance is available from the Bidder for SLBE-ELBE subcontractors in obtaining necessary equipment, supplies, or materials.
6. Written notice must state that assistance is available from the Bidder for SLBE-ELBE firms in obtaining bonding, lines of credit or insurance.
7. Bidders must provide copies of **ALL** notices with one of the following forms of verification that the notices were sent:
 - a) If mailed: provide copies of the metered envelopes or certified mail receipts.
 - b) If faxed: provide copies of the fax transmittal confirmation sheet(s).
 - c) If emailed: provide copies of the email delivery confirmation sheet(s). No credit shall be given for error messages, busy, cancelled, undeliverable, etc.

Subcontractor Participation. The City has determined a **10% mandatory SLBE-ELBE** subcontracting participation. The City has also determined a **voluntary subcontractor participation of 10%**, equating to **20% in total subcontractor participation**, to enhance competition and maximize subcontracting opportunities. Percentages are based on the Contract Price, less Field Orders, Additive, Deductive and Allowance Bid items

Pre-Proposal Meeting: A Pre-Proposal Meeting is scheduled for this contract as specified in the RFP. The purpose of this meeting is to inform prospective Bidders of the submittal requirements and provisions relative to the SLBE Program. Bidders are strongly encouraged to attend the Pre- Proposal Meeting to better understand the Good Faith Effort requirements of this contract.

Mandatory Conditions: Bid will be declared **non-responsive** if the Bidder fails the following mandatory conditions.

1. Bidder's inclusion of SLBE-ELBE certified subcontractors at the overall mandatory participation percentage identified in this document; **OR**
2. Bidder's submission of Good Faith Effort documentation demonstrating the Bidder made a good faith effort to outreach to and include SLBE-ELBE Subcontractors required in this document within 1 Working Day of the Closed Ranking meeting if the overall mandatory participation percentage is not met.

Bid Discount: This contract **is not** subject to the Bid Discount program as described in The WHITEBOOK, SLBE-ELBE Program Requirements, Section IV(2).

Resources: The current list of certified SLBE-ELBE firms can be found on the Equal Opportunity Contracting Program Department website.

City of San Diego



ADDENDUM "2"

REQUEST FOR PROPOSAL (RFP)

FOR WATER DEPARTMENT SECURITY UPGRADE DESIGN-BUILD CONTRACT

RFQ NO.: Security Upgrades for the City of San Diego Design-Build Contract 5171
BID NO.: K-12-5463-DBA
RFP NO.: 5463
TASK ORDER NO.: 1
WBS NO.: S-11105, S-11107
CLIENT DEPARTMENT: 2013
COUNCIL DISTRICT: CITYWIDE
PROJECT TYPE: BL, BJ

REQUEST FOR PROPOSAL (RFP) DUE:

12:00 Noon

NOVEMBER 17, 2011

CITY OF SAN DIEGO

Public Works Contracting Group

1200 Third Avenue, Suite 200, MS 56P

San Diego, CA 92101

CHANGES TO CONTRACT DOCUMENTS

The following changes to the RFP are hereby made effective as though originally issued with the bid package.

THE SUBMITTAL DATE FOR THIS PROJECT HAS BEEN **EXTENDED AS STATED ABOVE.**

A. INTRODUCTION

A.1 The following changes are hereby incorporated into the Request for Proposal for the *Water Department Security Upgrade Design – Build Contract*.

A.2 All prospective bidders are reminded that they are required to acknowledge receipt of this addendum in their submittal in accordance with ATTACHMENT B, Item 1 of the Request for Proposals.

B. CHANGES TO THE REQUEST FOR PROPOSALS

B.1 To ADDENDUM 1, Item C.2, Section 8.0, Selection and Award Schedule, Subsection 8.3 through 8.8, page 3, **DELETE** in their entirety and **SUBSTITUTE** with the following:

8.3	Proposal Due Date	November 17, 2011
8.4	Technical Presentations	November 17, 2011
8.5	Closed Ranking Meeting	November 29, 2011
8.6	Selection and Notification	December 2, 2011
8.7	Receipt of Bonds and Insurance Certificates	December 16, 2011
8.8	Notice to Proceed	January 13, 2012

Tony Heinrichs, Director
Public Works Department

Dated: October 28, 2011
San Diego, California

TH/bd/ds/rir/les

City of San Diego



ADDENDUM "3"

REQUEST FOR PROPOSAL (RFP)

FOR WATER DEPARTMENT SECURITY UPGRADE DESIGN-BUILD CONTRACT

RFQ NO.: Security Upgrades for the City of San Diego Design-Build Contract 5171
BID NO.: K-12-5463-DBA
RFP NO.: 5463
TASK ORDER NO.: 1
WBS NO.: S-11105, S-11107
CLIENT DEPARTMENT: 2013
COUNCIL DISTRICT: CITYWIDE
PROJECT TYPE: BL, BJ

REQUEST FOR PROPOSAL (RFP) DUE:

**12:00 Noon
NOVEMBER 17, 2011
CITY OF SAN DIEGO
Public Works Contracting Group
1200 Third Avenue, Suite 200, MS 56P
San Diego, CA 92101**

CHANGES TO CONTRACT DOCUMENTS

The following changes to the RFP are hereby made effective as though originally issued with the bid package.

A. INTRODUCTION

- A.1 The following changes are hereby incorporated into the Request for Proposal for the **Water Department Security Upgrade Design Build Project**
- A.2 All prospective bidders are reminded that they are required to acknowledge receipt of this addendum in their submittal in accordance with ATTACHMENT B, Item 1 of the Request for Proposals.

B. QUESTIONS AND ANSWERS

- Q1. Page 24 of 472, 2.2.4.1, item e: Will San Diego accept Motorola PTP800 licensed microwave products instead of Aviat Eclipse or IRU6000?
- A1. Yes, the use of Motorola products is acceptable.
- Q2. Page 24 of 472, 2.2.4.1, item e: Will San Diego accept Motorola unlicensed microwave products instead of Firetide Hotport 7020?
- A2. Yes, the use of Motorola products is acceptable.
- Q3. Page 25 of 474, 2.2.4.2, item a: The list of licensed frequencies does not include 23 GHz. Is 23 GHz acceptable to the City? (Licensed 23 GHz radios can use 1 foot antennas.)
- A3. The City wants to stay away from the 23 GHz range on this project with the understanding that a larger antenna will be required for 23 GHz.
- Q4. How many sites can be worked on concurrently/ simultaneously? Are there limits due to escorts?
- A4. Yes, the City will allow concurrent/simultaneous work within reason, for which the City's manpower allows.
- Q5. Page 16 of 474: 2.1.1 "Use of Thermal IR Cameras is required with video detection to cover perimeter boundary." Please confirm that Thermal Imaging Cameras are intended and not IR illuminators.
- A5. See Project Drawings. Wherever Thermal Imaging Cameras are recommended there is no need for IR illuminators.
- Q6. Section 2.2.2 Specifies SC fiber interfaces. What type of fiber interface (single mode, multimode) and wavelength (850nm, 1310nm) is required?

- A6. The SC fiber interfaces are in reference to those located at the Chollas SOC facility. As part of the design process the successful contractor will make this determination at that time. The preference is for SC connectors regardless of media type and wavelength.
- Q7. Section 2.2.4.11 Specifies clocking. Our microwave equipment doesn't require external clocking but can distribute timing both in T1 and IEEE1588v2 formats. Is clocking required for any other components in the network?
- A7. Clocking is not required for any other components in the network.
- Q8. Section 2.2.4.12: Who provides DC power?
- A8. The Design-Builders shall assume DC power is available at all High sites from existing power sources. The Design-Builders shall assume that AC power is available at all Low sites from existing power sources. The Design-Builders shall also assume power is available at the few repeater sites via the existing light poles. The Design-Builder is required to determine power levels required and then work with the City to ensure there is adequate existing power to support the new equipment.
- Q9. 2.2.4.13 Specifies 100Mph wind loading. Is the specification for survival or operational?
- A9. Survival: 100 mph wind loading applies to the loading on the tower only. Each antenna and its associated mounts are specified by the antenna manufacturer and if mounted as specified will meet the wind twist limits for each specific antenna.
- Q10. 2.2.4.18 specifies an order wire. Is an IP order wire sufficient or is a traditional order wire with multipoint operation required?
- A10. IP order wire is sufficient.
- Q11. Page 82: Paradise Mesa #1 PS latitude is listed as 37.69135, in the site list but shows as 32.69135 in the link budgets. Please confirm the correct coordinates.
- A11. The correct Latitude is 32.69135 for Paradise Mesa #1 PS. It is located in a ravine just west of Parkland Way.
- Q12. Page 82: Sites 46 Mira Mesa Mercy High and 47 Miramar Ranch North Reservoir have same coordinates but the map included with the file titled "Handouts" indicates that these are two different sites and Miramar North Ranch should have the same coordinates as Miramar Ranch North PS. Please confirm the correct coordinates.

- A12. The Lat longs for Mira Mesa Mercy High are correct as listed throughout the documents (32.93642 -117.123). The sites named Miramar Ranch North PS and Miramar Ranch North Res are collocated. The same communication link should be able to link in both sites, but from a security perspective each of these sites needs to be addressed individually. The correct lat long listed for these two collocated sites is 32.92791 117.10117.
- Q13. Chollas SOC to University Heights Reservoir & PS seems to be missing from the link budgets.
- A13. The link budget for this site has been added to the Figures in Exhibit C (see attached Table C-65 and Figure C-65 as part of this Addendum).
- Q14. The RFP mentions HP Open view. Is it acceptable for the vendor to propose its own SNMP based NMS.
- A14. The Design-Builders may propose an alternate NMS as long as it meets the requirements in the RFP and is a well recognized COTS product.
- Q15. Is secure login authentication to network elements and NMS servers (for example, RADIUS) a requirement?
- A15. Yes.
- Q16. Can the City provide the CADD files for all RFP plan sheets (T-1, G-1 through G-4, and C-1 through C-24)?
- A16. CAD files will be provided to the successful Design-Builder after contract award.
- Q17. Please confirm what percentage of work is required to be performed by the general contractor, if any.
- A17. See attachment C, Supplementary Special Provisions; subsection 2-3.2 on page 415 of the RFP.
- Q18. Would the City consider extending the proposal due date to November 18th to allow sufficient time for our subcontractors and design professionals to provide a detailed approach for each of the sites once the job walks have concluded?
- A18. The bid date has been extended to November 17, 2011

- Q19. Please confirm the City's preferred response for RFP, page 377, Proposal Submittal Requirements and Selection Criteria Section, number 5. Technical Approach and Design Concept: Describe in detail the proposed design concept for this project. Include detailed descriptions, conceptual drawings schematics, a list of major equipment, etc... Is it the City's desire to have this information broken out by site or a general description of all sites combined.
- A19. Different site types may require different Approaches. The Design-Build team should decide how to best present a thorough "Technical Approach and Design Concept"
- Q20. Per the RFP page 21 item c., can the City provide a detailed list of any known devices, systems or other issues not presently operational including cameras, DVR's, display monitors in the SOC, motion sensors, IR illuminators, card readers, mag-locks, door contacts and any other know system issues.
- A20. See Section C "Changes to the RFP" of this Addendum 3. Existing system maintenance is eliminated from this RFP.
- Q21. Please confirm if it is the City's desire for the Contractor to hold informational meetings for the communities that may be impacted on the project.
- A21. No, but the contractor will be required to provide informational door hangers for residences that may be impacted by construction operations.
- Q22. Please confirm the City's preferred response for RFP, page 377, Proposal Submittal Requirements and Selection Criteria Section, number 10 Reference Checks. Is it the City's desire for the Contractor to provide additional references that can be contacted or is the references that were provided with the Prequalification portion sufficient?
- A22. The design-build teams must provide sufficient references for this RFP.
- Q23. We wish to confirm that the device quantities listed by site are approximations, and that it will be the responsibility of the successful design-builder to determine final quantities.
- A23. Yes the device quantities are approximations. The successful Design-Builder shall determine the final quantities with City's approval.

- Q24. Can the City provide any additional performance criteria or rationale that was used by AECOM to determine the current security configuration and related quantities by site? As we are going to be responsible for the actual design, regardless of the recommended quantities specified by AECOM in the bridging documents, then it would be helpful to understand what specific security performance specifications the City provided, AECOM, if any, to develop their ~30% design.
- A24. The specific security standards that pertain to a particular type of site (pump station, etc.) is documented in the RFP and the specifications provided as part of this RFP address any performance requirements questions.
- Q25. RFP has conflicting requirements for IP audio: Section 1.0 requires 2-way, Section 2.1.6.g requires 1-way, and section 2.1.12 requires 2-way yet only refers to speaker/horns. Please confirm whether the audio is to be one or two-way, and what each stream of audio is to contain.
- A25. The audio is to be one-way from the SOC operator. The purpose of the audio is for the SOC security staff to directly contact potential trespassers and to instruct them to leave the area or other such direction deemed appropriate at that time.
- Q26. In section 3.18 no requirements are given for the generation of audio at the SOC. Please provide the requirements or specify that the design-builder will be responsible for developing these requirements.
- A26. Refer to Attachment A page 57 under "Security Operations Center (SOC) as that includes the requirement for an IP Network Zone Extender for connecting to the IP Speakers. It is also mentioned under 3.18.A Audio System.
- Q27. Section 2.1.15 requires the bidder to provide maintenance costs that will the cover repair/replacement of existing system or devices within 60 days of contract award. The City is to provide a detailed list of these issues. Will the contractor be responsible for this list only or for any other issues that are discovered in just those 60 days? Only four (4) sites are mentioned to investigate why the system is not working (15, 20, 24 & 57). A related issue is that once these costs are determined and agreed upon, we are presuming that these costs will be incorporated into a change order. Please confirm.
- A27. See Section C "Changes to the RFP" of this Addendum 3. Existing system maintenance is eliminated from this RFP.

- Q28. Will Nice support sending surveillance video to a Windows CE handheld device?
- A28. Windows CE is no longer supported. However, the following mobile devices are now supported per NICE engineering and replace the Windows CE requirement:
- iPad devices
 - iPhone devices (3G and above)
 - Android devices (v2.x and above)
 - Blackberry devices (v4.30 and above)
 - Nokia Symbian operating system devices (S60 3rd edition and above).
- Q29. Section 3.12.1 requires the ACS system to be C-Cure 800/8000 series. Yet the C-Cure 9000 system seems to be a much better fit for the project and is the most technologically up to date. We recommend that the ACS specification for this project to be updated to require C-Cure 9000. Does this recommendation fall into the “or approved equal category?” If so, what is the process for submitting an “or approved equal” substitute? Must this “or equal” substitute be approved before the proposal is submitted?
- A29. See attachment C, Supplementary Special Provisions section 4-1.6 on page 418 and 419 of the RFP.
- Q30. What Line Item(s) does the City expect to see the pricing for all fencing and gates?
- A30. When fencing and gates are required for a site, the cost shall be included in the line item for site security construction services.

C. CHANGES TO THE REQUEST FOR PROPOSALS

- C1. To Attachment A Bridging Documents (Project Description, Scope of work, Technical Specifications, and Drawings) Section 2.0 Scope of Work, Subsection 2.1.1 Security Standard for Above Ground/Underground Tank/Standpipe Reservoirs, page 16, **DELETE** in its entirety and **SUBSTITUTE** with the following:
- a. CCTV: Use of PTZ/fixed and/or thermal IR cameras is required with video detection to cover the perimeter boundary. Install new video recorder in air-cooled outdoor cabinet if no standalone structure is available to house the equipment. Install one camera at each corner of the property with view angles down the fence lines. Accommodate changes in elevation by adding additional cameras as necessary.

- b. Access Control: Provide dual technology proximity card reader on post at main gate. Install automatic gate opener and ground loops at main gate where appropriate. Provide contact sensors at all doors and hatch door with padlock. Provide proximity card reader at all primary door entrances and add maglocks. Provide dual technology motion detector inside vaults and structures with detection angle towards doors and windows. Install controllers and interfaces inside security cabinet.
 - c. Intrusion Detection: Provide video detection to detect human size movement along perimeter fence lines.
- C2. To Attachment A Bridging Documents (Project Description, Scope of work, Technical Specifications, and Drawings) Section 2.0 Scope of Work, Subsection 2.1.15 Maintenance Standards, page 21 through 22, **DELETE** in their entirety and **SUBSTITUTE** with the following:
- a. The BIDDER shall offer an optional maintenance contract to cover the new security systems and equipment in their response to this RFP inclusive of the SOC equipment and systems.
 - b. The BIDDER shall provide a single maintenance cost for the proposed security monitoring devices and systems for the remote sites with no existing security monitoring presently and any new equipment and systems installed at the SOC. The maintenance contract shall take effect immediately following the expiration of the warranty period, and be renewable on a yearly basis.
 - c. This system maintenance contract shall be based on the initial system configuration for equipment. The maintenance contract shall include preventive and demand maintenance for the infrastructure and the repair and/or replacement of defective units. Costs for successive annual renewable contract services to provide (in combination with the warranty) a total of three years of maintenance services shall be considered when determining this cost of coverage.
 - d. The approach to maintenance of this system shall be preventive in nature.
 - e. In addition to preventive maintenance, it is expected, following cutover to the City, that some system optimization and adjustment will be required. This work shall be coordinated through and with the City's Project Manager or other designated representative.
 - f. Equipment shall be maintained in clean condition. Oil, dust and other foreign substances shall be removed on a routine basis.

- g. Equipment and system performance shall be maintained at the level initially described in these equipment and systems specifications. The service organization shall maintain records to confirm that this has been performed.
- h. Records shall be available for City's inspection upon request. Records shall be maintained by the BIDDER'S throughout the initial maintenance and warranty periods (and any subsequent maintenance contract period), and shall revert to the City upon termination of the warranty (or maintenance contract).
- i. Routine maintenance procedures recommended by the equipment manufacturer shall be followed.
- j. The BIDDER shall provide 24/7/365 technical support by only factory trained and authorized maintenance personnel and shall be locally based with the ability to provide on-site technical support within forty-eight (48) hours as required at no additional cost. The City will allow reasonable access to City locations for the purpose of installing, repairing and removing equipment.
- k. The BIDDER or authorized service organization(s) shall maintain comprehensive installation and instruction manuals for all system equipment. These manuals shall be the property of the City, and shall revert to the City at such time as they assume the maintenance responsibility for the system.

C3. To Attachment A Bridging Documents (Project Description, Scope of work, Technical Specifications, and Drawings) Section 5.0 Reference Standards, page 80, **DELETE** in its entirety and **SUBSTITUTE** with the following:

5.0 Reference Standards:

1. STANDARD SPECIFICATIONS

Document No.	Filed	Description
PITS0504091	05-04-09	Standard Specifications for Public Works Construction (The GREENBOOK), 2009 Edition
PITS090110-1	09-01-10	City of San Diego Standard Specifications for Public Works Construction (The WHITEBOOK), 2010 Update *
AEC1231064	12-31-06	California Department of Transportation, Manual of Uniform Traffic Control Devices (MUTCD 2006)
769023	09-11-84	Standard Federal Equal Employment Opportunity Construction Contract Specifications and the Equal Opportunity Clause

NOTE: The City of San Diego Supplement, 2010 Update now consolidates various City Public Works Construction Standard Specifications which in the past were included in the Supplementary Special Provisions. The Bidders' attention is directed to this edition of the City Supplement for a close review to ensure no important information is missed for the preparation of the Bids.

2. STANDARD DRAWINGS

Document No.	Filed	Description
AEC1230163	12-31-06	City of San Diego Standard Drawings *
N/A	Varies	City Standard Drawings - Updates Approved For Use (when specified)*
AEC0925061	09-25-06	Caltrans 2006 U.S. Customary Unit Standard Plans

NOTE: * Available online under Engineering Documents and References at: <http://www.sandiego.gov/engineering-cip>.

C4. To Attachment A Bridging Documents (Project Description, Scope of work, Technical Specifications, and Drawings) Exhibit C –Link Budgets and Calculations, **ADD** as page 14 of 15 through 15 of 15 of this Addendum.

C5. To Attachment C Contract Front End Volume 1, Invitation to Bids, Item 3 Contract Time, page 395, **DELETE** in its entirety and **SUBSTITUTE** with the following:

3. CONTRACT TIME: The Contract Time for completion of the Work shall be **175 Working Days**

C6. To Attachment C Contract Front End Volume 1, Supplementary Special Provisions (SSP), Part 1 – General Provisions, Section 1 – Terms, Definitions, Abbreviations, Units of Measure, and Symbol, Subsection 1-2 Terms and Definitions, page 413 through 414, **DELETE** in their entirety and **SUBSTITUTE** with the following:

1-2 TERMS AND DEFINITIONS.

Agency – ADD the following:

Regulatory activities handled by the City of San Diego Developmental Services, Fire and Planning Departments, or any other City Department are not subject to the responsibilities of the City under this contract.

Construction Phase – To the City Supplement, **DELETE** in its entirety.

Contract Documents – To the City Supplement, DELETE in its entirety and SUBSTITUTE with the following:

The Agreement, Addendum, Invitation to Bid, Instructions to Bidders, special notice page, funding agency provisions, Bid and documentation accompanying the Bid and any post-bid documentation submitted prior to the Notice of Award when attached as an exhibit to the Contract, Bonds, permits from jurisdictional regulatory agencies, Supplementary Special Provisions (SSP), City's EOCP Requirements, City Supplement, Plans, Standard Plans, Construction Documents, Reference Specifications listed in the Invitation to Bid or the RFP for Design-Build contracts, Request for Qualifications (RFQ), Statement of Qualifications (SOQ), Request for Proposals (RFP), modifications issued after the execution of the Contract e.g., Change Orders, Construction Manager At Risk's Guaranteed Maximum Price including written qualifications, assumptions and conditions thereto and Pre-construction Services Agreement.

Notice of Completion (NOC) – ADD the following:

See California Civil Code section 3093.

Limited Notice To Proceed – A written notice given from the City to the Contractor that authorizes the Contractor to start a limited amount of work that is not Construction Work, such as finalizing subcontract agreements, ordering materials, mobilization, furnishing a field office, and any other preliminary work done prior to performing Construction Work.

Samples - Physical examples which illustrate materials, equipment or workmanship and establish standards by which the Work will be evaluated.

Normal Working Hours. To the City Supplement, ADD the following:

The Normal Working Hours shall be 8:00 AM to 4:00 PM.

Certificate of Compliance – To the City Supplement, DELETE in its entirety and SUBSTITUTE with the following:

Certificate of Compliance – A written document signed and submitted by a supplier or manufacturer that certifies that the material or assembled material supplied to the Work site complies with the requirements of the Contract Documents.

Task – See Task Order.

DELETE the following definitions in their entirety and SUBSTITUTE with the following:

Task Order – For or As-Needed contracts, a project assigned to a specific As-Needed contract which will be constructed by the Contractor in accordance with the terms of the As-Needed contract to which it is assigned.

Task Order Authorization - For As-Needed contracts, the documents transmitted by the City to the Contractor which indicate the work instructions, scope of work, and time duration allotted for a particular As-Needed Task or Project.

Task Order Proposal - For As-Needed contracts, the Contractor's irrevocable offer to perform Work associated with a Task Order and refers to the Contractor's quote for a firm fixed-price and schedule for the completion of specified Scope of Work. The Contractor's Proposal shall be on electronic forms provided by the City and in an electronic version compatible with the City's systems. The Proposal Submittal may also require a work schedule, EOC forms, or other such documentation as the City might require for a specific Task Order.

- C7. To Attachment C Contract Front End Volume 1, Supplementary Special Provisions (SSP), Part 1 – General Provisions, Section 6 – Prosecution, Progress and Acceptance of Work, Subsection 6-1.2 Commencement of Work, page 419, **DELETE** in its entirety and **SUBSTITUTE** with the following:

6-1.2 Commencement of Work. To the GREENBOOK and City Supplement, DELETE in its entirety and SUBSTITUTE with the following:

Unless specified otherwise, construction shall start within 5 Working Days after NTP and be diligently prosecuted to completion within the Contract Time. The Contractor shall not start any construction activity at the Site until the Pre-construction Meeting is held and the NTP has been issued by the Engineer.

Upon the Contractor's written request, the City may delay the NTP as follows:

- a) Up to 5 Working Days from the Pre-construction Meeting, or
- b) Up to 40 Working Days from the Limited NTP for the preparation, submittal, obtaining approval for and filing of the PRDs in accordance with 801, "STORM WATER POLLUTION CONTROL," or
- c) Up to 60 Working Days from the Limited NTP for the preparation, submittal, and approval of the TCP on "D-sheets" when specified in 7-10.2, "Traffic Control."

For areas that do not require engineered TCP on D-sheets, the Contractor may at any time after the Pre-construction Meeting obtain a TCP Permit via Working Drawings or the City's over the counter process and start the Work. If the Contractor decides to commence the construction work before the completion of the D-sheet TCPs, the Contractor shall forfeit the 60 Working Days specified here. The D-sheet TCP shall be done concurrently and no additional time will be granted.

For paving Work, the Contractor shall coordinate the Work to facilitate the installation and protection of the new curb ramps and associated concrete work prior to commencing the asphalt overlay operations. The Work at a specific location shall not commence until all layouts and measurements are agreed upon by both the Contractor and the Engineer.

- C8. To Attachment C Contract Front End Volume 1, Supplementary Special Provisions (SSP), Part 1 – General Provisions, Section 6 – Prosecution, Progress and Acceptance of Work, ADD the following:

ADD: 6-1.8 Pre-construction Meeting. Within 20 Working Days from the Limited NTP the Engineer will schedule a mandatory pre-construction meeting (Pre-construction Meeting) with the Contractor. The agenda will include items such as NTP, design services and submittal and review process for Design-Build contracts, critical elements of the work schedule, submittal schedule, cost breakdown of major lump sum items, payment requests and processing, environmental and community concerns, coordination with the involved utility firms, the level of record project documents required and emergency telephone numbers for all representatives involved in the course of construction.

- C9. To Attachment C Contract Front End Volume 1, Supplementary Special Provisions (SSP), Part 1 – General Provisions, Section 7 – Responsibilities of the Contractor, Subsection 7-6.2 Pre-construction Meeting, page 424, **DELETE** in its entirety.

Tony Heinrichs, Director
Public Works Department

Dated: November 4, 2011
San Diego, California

TH/bd/ca/rir

Figure C-65 Security Operations Center (SOC) to University Heights PS & Reservoir

SECURITY OPERATIONS
CENTER (SOC)

32 44 4.99 N
117 04 18.01 W
NAD 83:
Elev: 423.56 ft MSL

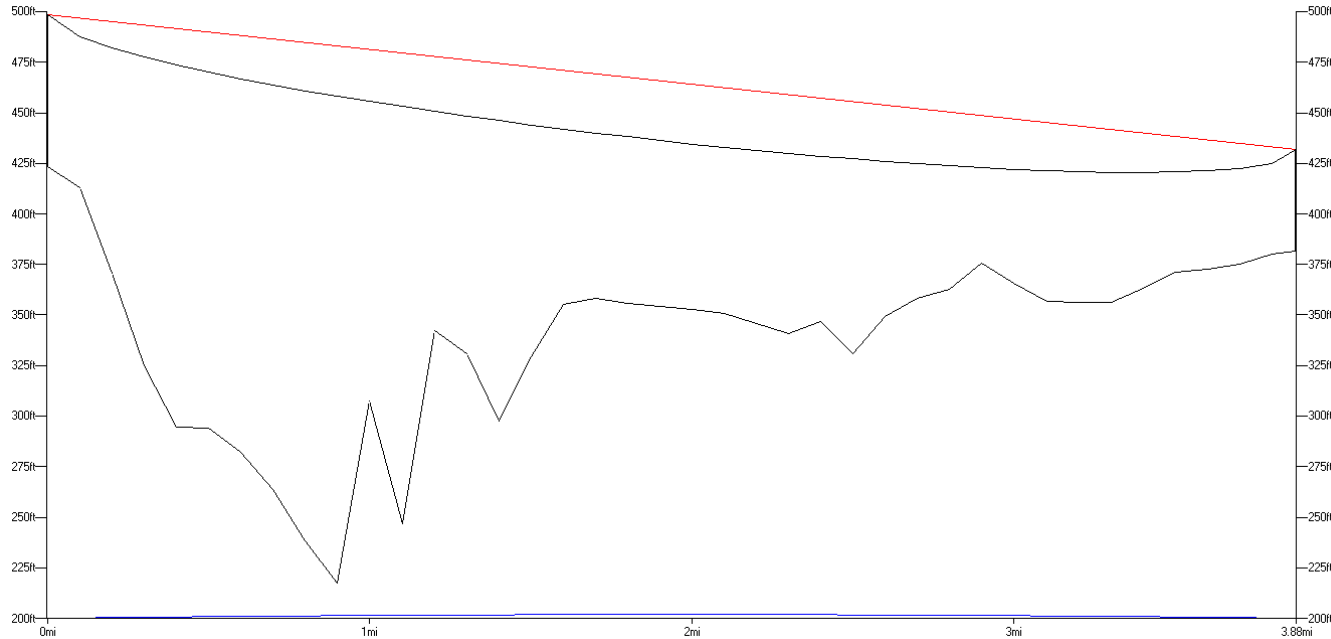
TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 75.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 290.37

RX Antenna (Primary):
ANT HGT: 75.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 290.37

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00



UNIVERSITY HEIGHTS PS
& RESERVOIR

32 45 15.41 N
117 08 2.62 W
NAD 83:
Elev: 381.60 ft MSL

TRANSMITTER:
FREQ: 5800.00 MHz
ERP: 51.54 dBm

TX Antenna:
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 110.34

RX Antenna (Primary):
ANT HGT: 50.00 ft AGL
DESC: FP2-5-28 Vpol
GAIN: 28.20 dBi
ORIENT: 110.34

RECEIVER:
FREQ: 5800.00 MHz
SENS: -73.00 dBm
(50.00 Ohms)

DIGITAL SPECS:
DFM: 46.00

Effective Earth Curvature:
1.333

Fresnel Zone: 1.0 F1 at 5800.00 MHz

Azimuth 290.37°T Reverse 110.34°T

Topo Data Step: 0.10
mi

Topo Data Types:
3s; 30m; 30s; VMB; DTED;
BIL; HGT

Land Use Data:
TIA TR8 (May 20
1997)

Topo Data Interp:
FCC Interpolation (4
points)

Table C-65
Security Operations Center (SOC) to University Heights PS & Reservoir

Site	SECURITY OPERATIONS CENTER (SOC)	UNIVERSITY HEIGHTS PS & RESERVOIR
Latitude	32 44 4.99 N	32 45 15.41 N
Lat (Dec Degrees)	32.73472	32.75428
Longitude	117 04 18.01 W	117 08 2.62 W
Lon (Dec Degrees)	-117.07167	-117.13406
Site Elevation	423.56 ft	381.60 ft
Antenna Center	75.00 ft AGL	50.00 ft AGL
Bearing (T)	290.37	110.34
Antenna Orientation	290.37	110.34
Path Angle	-0.19	0.19
Antenna Tilt		
Freq (MHz)	5800	5800
TX Power	26.990 dBm	
RX Threshold		-73.000 dBm
Antenna (Ant File/ID)	FP2-5-28 Vpol AMXSX0005 X000500017	FP2-5-28 Vpol AMXSX0005 X000500020
Ant Gain (Major Lobe)	28.20 dBi	28.20 dBi
Ant Gain (Along Path)	27.40 dBi	27.40 dBi
Jumper Loss	1.00 dB	1.00 dB
Radome Loss	0.50 dB	0.50 dB
Bearing (T)	290.37	110.34
Distance	3.88 mi	3.88 mi
Absorption Loss		0.03 dB
Rain Loss		0.00 dB
Alignment Loss		0.00 dB
Other Loss		0.00 dB
Free Space Loss		123.63 dB
Total Gains dBm		81.79
Total Loss dB		126.66
Received Signal Level dBm		-44.87
Unfaded Fade Margin dB		28.13
Digital EIFM		0
Digital AIFM		0
Digital DFM		46
Composite Fade Margin		28.06
Terrain Factor (a)	2.853	
Climate Factor (b)	0.325	
Undp (TFM)		1.20E-06
Reliability (%)		99.9998796
Outage (sec/yr)		38



TECHNOLOGY SOLUTIONS
AECOM TECHNICAL SERVICES, INC.
20715 TIMBERLAKE ROAD SUITE 106
LYNCHBURG, VA 24502
(434) 239-9200 www.aecom.com

City of San Diego



ADDENDUM "4"

REQUEST FOR PROPOSAL (RFP)

FOR WATER DEPARTMENT SECURITY UPGRADE DESIGN-BUILD CONTRACT

RFQ NO.: Security Upgrades for the City of San Diego Design-Build Contract 5171
BID NO.: K-12-5463-DBA
RFP NO.: 5463
TASK ORDER NO.: 1
WBS NO.: S-11105, S-11107
CLIENT DEPARTMENT: 2013
COUNCIL DISTRICT: CITYWIDE
PROJECT TYPE: BL, BJ

REQUEST FOR PROPOSAL (RFP) DUE:

12:00 Noon

DECEMBER 1, 2011

CITY OF SAN DIEGO

Public Works Contracting Group

1200 Third Avenue, Suite 200, MS 56P

San Diego, CA 92101

CHANGES TO CONTRACT DOCUMENTS

The following changes to the RFP are hereby made effective as though originally issued with the bid package.

THE SUBMITTAL DATE FOR THIS PROJECT HAS BEEN **EXTENDED AS STATED ABOVE.**

A. INTRODUCTION

- A.1 The following changes are hereby incorporated into the Request for Proposal for the **Water Department Security Upgrade Design-Build Contract**.
- A.2 All prospective bidders are reminded that they are required to acknowledge receipt of this addendum in their submittal in accordance with ATTACHMENT B, Item 1 of the Request for Proposals.

B. QUESTIONS AND ANSWERS

- Q1. Section 3.12.1 Software House CCure 800/8000 does not integrate with Nice net 2.0 software specified. CCure 800 is old model and new software is CCure 9000 works with Nice 2.0. Which one City of San Diego wants?
- A1. The recent change to the latest software version to NICE Net 2.0 has created the requirement to bid the C-Cure 9000 system in place of the 800/800 system.
- Q2. Nice 9200 NVR does not have redundant power supplies. Do you need NVR with redundant power supplies on these remote sites? Then we will have to upgrade to model 9400 or 9600? There is substantial cost difference between these models.
- A2. No redundant power supply is required.
- Q3. Which Software house model CCure800 do you need? What is max limit of reader capacity should the software have or is it unlimited readers?
- A3. See response to Q1 above. The Design-Builder should propose a design that will accomplish the objectives of this project.
- Q4. As per Attachment A page 50. ACS system upgrade is alternate. How can the software house software be part of add alternate where as access panel for new sites be part of base bid? If the new sites have to work on software house panel then Server software should be part of base bid.
- A4. The City is currently using WinPakPro as their access control software solution with Northern NexWatch access control panels. The City has asked for this pricing option to replace the existing software with new ACS software with the potential capability to roll it out City-wide in the future. If the pricing is cost prohibitive, then the existing WinPakPro system will need to be used as part of this implementation.

- Q5. Are there enough open ports available on Pelco DVR to integrate new cameras?
- A5. While the Pelco 8100 is capable of incorporating up to (2) IP based cameras, the Bidder should plan to provide a new NVR where these conditions exist for future considerations and include in your pricing accordingly.
- Q6. If all the new cameras are IP cameras how does city plan to integrate new IP cameras on existing sites to integrate with old Pelco DVR? Or can we put new analog cameras for Pelco DVR on existing sites.
- A6. The Bidder shall provide a new NVR for these conditions in your pricing. The use of analog cameras as a solution will not be acceptable.
- Q7. For Existing sites with access devices like card readers and motion, are there enough open ports on old Northern panel?
- A7. The requested information is not available. Based on the number/types of devices shown, the Bidder should be able to estimate the size of the panel used and make certain assertions and assumptions accordingly to make a reasonable determination. Please include this deduction in the technical response.
- Q8. For Existing sites with access devices like card readers and motion are there enough open ports on old power supplies or we to provide new access power supply and lock power supply for these device?
- A8. See Answer #7.
- Q9. In order for us to quote the right price for Nice situator software quote. What is City capacity requirement for following- cameras, alarm points, access panel, client seats, and connector libraries?
- A9. For existing site, assume the following quantities each: (4) CCTV cameras; (4) exterior Motion Sensors; (2) Internal Motion Sensors; (2) door contact locations. For new sites use the values shown on the drawings.
- Q10. Do we have to integrate the IP speaker phone into Nice situator software?
- A10. There are no IP speaker phones included as part of this project. The question is interpreted to mean the IP Speaker Horn and the answer to that question would be YES.
- Q11. Are there any RFI questions asked by other integrators?
- A11. Yes. All questions submitted to the City are being disseminated to all other Bidders in the addenda.

- Q12. Page 460 of 474 - Line Item 71 and 72: Access Control System Upgrades. Can the City provide a printout of the existing READERS and MONITORING points for the existing City Water Access Control and Security Management Platform (Nexwatch)?
- A12. See Answer #7.
- Q13. Page C-23 of Drawings "Communication Logic Diagram" The riser clearly indicates that at each remote site all new cameras (additions) are to be included in a new system, inclusive of a new DVR. Since NICE no longer manufactures a DVR, can it be assumed that an NVR solution is what is intended? Please clarify that all new cameras (IP per spec's) are to be connected to the new system and not connected to existing systems (Pelco DVR's)?
- A13. The specific model shown on C-23 should have been a generic DVR (for existing) or NVR (for new). While the Pelco 8100 is capable of incorporating up to (2) IP based cameras, the Bidder should provide a new NVR where these conditions exist for future considerations and include in your pricing accordingly.
- Q14. Page 28 of 474 2.2.4.14. Microwave Antenna Mounting; Sub paragraph A. This paragraph seems to indicate that NO NEW POLES are to be constructed at any reservoir, regulator, pumping station or communication sites. Does the mention of monopoles in this paragraph refer to new monopole?
- A14. New monopoles will be required. The Design-Builders should propose a solution that will accomplish the objectives of this contract and will be responsible for their design.
- Q15. Page 50 of 474 3.12-3.12.1 Please confirm that all NEW card readers are to be connected to new ACS platform (Software House CCURE)? Please confirm that all new security peripheral equipment (motion detectors, door position switches, card readers, etc.) shall be connected to this new platform at each remote site?
- A15. Please review the response given in Answer #4 first. If it is fiscally feasible to implement the new ACS, then the approach would be to first implement the new sites with the C-Cure 9000 system, keeping all the existing sites (including those with new devices) on the WinPakPro system; and secondly add the existing sites to the C-Cure 9000 system. Otherwise, all sites will connect to the WinPakPro system if the new ACS is cost prohibitive.

- Q16. Page 23 of 474 2.2.1 General Connectivity Requirements; Sub paragraph F states that for preliminary Link Budget Figures and Calculations, an antenna height of 50 feet AGL was assumed for most links. Can we assume that we will be allowed to install poles (of 55 feet or taller if necessary) at each location that will allow us to achieve whatever height is necessary to achieve wireless connectivity?
- A16. No, Bidder should not assume that a height of 50 (or 55) feet can be used at all sites. See Answer #14. Bidder is responsible for completing their own Link Budget analysis after the completion of a terrain walk. Existing vegetation, building structures and other features that affect line of sight were not factored into the 30% design-build documentation. A careful review of the included link budget analysis should show that in most cases (if not all), a height of 20 feet is acceptable. However, the Bidder is responsible for their design. For those locations where a terrain walk and site survey indicates the need for a taller antenna structure, the Bidder will have to coordinate with the City to discuss the options on a case by case basis.
- Q17. Page 23 of 474 Can we assume that new poles on City property is a permitted use and there are no zoning hearings required?
- A17. For those security poles that will be constructed within the boundaries of each of the water sites listed in this RFP, coordination with the City can easily be accomplished. For construction of new security/antenna mounting poles at locations outside of the water sites (at a repeater site on City property, but not at a water site, for example) additional coordination will be required and zone hearings may be required.
- Q18. Page 23 of 474 2.2.1 General Connectivity Requirements, Sub paragraph D Can we assume that existing high sites currently meet R56 grounding standards and guideline or is additional testing required?
- A18. Yes, Bidder can assume that all high sites meet R56 grounding standards.
- Q19. Page 24 of 474 2.2.4.1 System Configuration; Sub paragraph f. different bucket trucks go to different heights - what is the maximum bucket truck height acceptable?
- A19. Whatever is operationally feasible at any given site depending on the Bidder's final design.
- Q20. Page 26 of 474 2.2.4.8 Non-Ring Configured Equipment; sub paragraph A. The paragraph states Spur Links of more than 2 hops must be fully protected with MHSB. This is not a common configuration for unlicensed wireless technology. In addition the representative product referenced does not appear to meet this requirement. Does the city want to use licensed technology for this?

- A20. The goal is to have a balance between cost and reliability. Where cost effective, the City desires to have a fully protected network, however given the topography and location of the sites, there are several locations where this is not possible. Note that the Connectivity Diagram contains several locations that are more than 2 hops, but are not loop protected due to topography constraints.
- Q21. Page 28 of 474, 2.2.4.14 Microwave Antenna Mounting; sub paragraph b. Can we assume that the existing towers will require no structural review to determine whether they can support additional antennas?
- A21. No, Bidder must complete a Tower Analysis prior to mounting any antenna at a tower on a high level site and submit the findings to the City for further review and approval.
- Q22. Page 54 of 474 Black Mountain Reservoir: Indicates 4 Thermal Fixed, but drawings indicate two per pole. To clarify, 8 thermals will be required for this location?
- A22. Drawing C-2 Detail 6 Note 1 indicates two thermal cameras per pole
- Q23. Section 4 specs mention upgrading all existing cameras to D/N. We would like to confirm that this is the case. It doesn't seem like it is based on the AECOM assessment and the Section 4 quantities though. Please clarify.
- A23. That is not the intent, and there is no wholesale swapping of old/new cameras at all sites. There are, however, select locations at specific sites where this is required and is clearly delineated in the drawings.
- Q24. Section 4 requires a camera at each corner of the pump station property with a view down the fence line. Yet in all of the three documents there are several locations where apparently this requirement was not followed and just the cameras on the building were used. Do we include the added cameras as specified in Section 4, or just provide for the cameras on the buildings? Or is this just a requirement for sites where a new NVR and cameras are being added. Please confirm / clarify which document takes precedence or which sites this applies to.
- A24. The general intent at most sites is to provide perimeter coverage with four cameras and an additional camera for viewing the main gate at all new sites. Cameras may be installed on buildings at new sites for convenience or cost effectiveness, as the location is best suited for a particular viewing angle. They are generally only located in that manner at existing sites and will not be changed under this project.

- Q25. Will the city require external IR's and motion detectors where day/night cameras (PTZ and fixed) are being added? Or will the day/night and video motion detection capabilities integral to the specified cameras be sufficient to meet the requirements of the RFP?
- A25. The intent is to provide for motion detection and suitable illumination capabilities to support the image quality requirements at night. If the proposed camera has these capabilities integral to the single unit (rather than using separate devices) then the Bidder should indicate this in their technical response.
- Q26. Section 4 requires automatic gate operator at each main gate of all site types except regulators. Is this just for sites with new security or is this requirement for sites with existing security as well? Please clarify which types of sites these recommendations apply to.
- A26. Automatic gate openers are relegated to only those sites indicated on the drawings.
- Q27. We were not able to find any specifications for the network switches and routers required in the Section 4 list of quantities. Does the City have a preference for these pieces of equipment? Please provide model numbers or cut sheets for equipment desired.
- A27. This 30% design did not delve into that level of detail. The Bidder will specify the proposed switches and routers to be used as part of this project in their technical response.
- Q28. Most of the reservoir sites listed in the documents does not show new NVR's as being required, yet in order for video analytics on the thermal cameras to be employed they will be required. Please confirm that new NVR's are to be furnished at reservoirs with new thermal cameras.
- A28. The Bidder will need to provide a new NVR for these conditions in your pricing.
- Q29. 2.2.4.26 Network Management System – Is the NMS requirement in this section just for the microwave equipment only and not the security equipment?
- A29. The NMS will be required to perform discovery of all network capable devices system wide including the communications backbone (microwave) and all associated IP cameras, DVR's, NVR's found on the security network.

- Q30. As we review the RFP, we find that some existing sites will require communications only and some new sites will require communications & security. The panels for different locations require different parts and devices. How do we approach a site that is deficient in products for an upgrade in the future?
- A30. The question isn't quite clear. The "panels" are assumed to mean the access control panels. With that assumption the existing sites have existing panels. The new sites will have new panels. There isn't a requirement in the RFP to provision for an upgrade in the future at the existing sites. If the interpretation of this question is not what the Bidder is asking then rephrase the question.
- Q31. We understand that we need to provide a demonstration of the communications solution. Could the City provide a single site in San Diego County for us to achieve a live demo for the City? Can you verify that FAT test is for the communications only and not needed for the security portion?
- A31. The Bidder is to perform Microwave Factory or Staging Tests as stipulated in Section 2.2.4.18. Please re-read this section for these requirements.
- Q32. Please confirm that cushion supports Hangars are required for the microwave guide?
- A32. Specific hangar types were not uniquely identified, however all mounting hardware must support functional and technical requirements in the RFP.
- Q33. Please confirm that the "technical support" that is required, for a determined period after the completion of the project, can be performed by a company located out of state, as long as the company operates 24/7.
- A33. See Addendum 3 Section C.2.
- Q34. Page 7 of 474, 5.6 Is the Adjusted Low Bid being determined by the base proposal (items 1 to 183) or is it the total proposal inclusive of the additive alternate.
- A34. The Contract Price to be used in the selection process as described in Section 5.6 of the RFP will be determined by the City based on the Base Bid alone.
- Q35. Section B: Proposal and award schedule. It appears that November 17th is both the due date and the technical presentation date. Can we assume that this will be changed and that the presentation will follow the due date of the RFP response?
- A35. See Section C.1 of this Addendum 4.

C. CHANGES TO THE REQUEST FOR PROPOSALS

C.1 To ADDENDUM 2, Item B.1, Section 8.0, Selection and Award Schedule, Subsection 8.3 through 8.8, page 2, **DELETE** in its entirety and **SUBSTITUTE** with the following:

8.3	Proposal Due Date	December 1, 2011
8.4	Technical Presentations	December 15, 2011
8.5	Ranking Meeting	December 22, 2011
8.6	Selection and Notification	December 28, 2011
8.7	Receipt of Bonds and Insurance Certificates	January 11, 2011
8.8	Notice to Proceed	February 14, 2012

C.2 To Attachment D, Contract Front End Volume 2, Bidding Documents (PRICE PROPOSAL FORMS), page 448 through 462, **DELETE** in their entirety and **SUBSTITUTE** with page 10 of 29 through 29 of 29 of this Addendum.

Tony Heinrichs, Director
Public Works Department

Dated: November 17, 2011
San Diego, California

TH/bd/cg/rir

BIDDING DOCUMENTS

PRICE PROPOSAL FORMS

The Bidder agrees to the design and construction of **Water Department Security Upgrade Design-Build Contract**, for the city of San Diego, in accordance with these contract documents for the prices listed below. The Bidder guarantees the Contract Price for a period of 120 days (90 days for federally funded contracts and contracts valued at \$500,000 or less) from the date of Bid opening to Award of the Contract. The duration of the Contract Price guarantee shall be extended by the number of days required for the City to obtain all items necessary to fulfill all conditions precedent e.g., bond and insurance.

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
BASE BID							
1	238210	Bonds (Payment and Performance)	1		LS	 	\$
2		City Contingency	1		AL	 	\$300,000.00
3	541330	Storm Water Pollution Prevention	1		LS	 	\$
4	541330	65th & Herrick Pump Station (including Repeater) Communications Design Services	1	D	LS	 	\$
5	238210	65th & Herrick Pump Station (including Repeater) Communications Construction Services	1		LS	 	\$
6	541330	Bayview Reservoir & Pump Station Communications Design Services	1	D	LS	 	\$
7	238210	Bayview Reservoir & Pump Station Communications Construction Services	1		LS	 	\$
8	541330	Black Mountain Reservoir & Pump Station Communications Design Services	1	D	LS	 	\$
9	238210	Black Mountain Reservoir & Pump Station Communications Construction Services	1		LS	 	\$
10	541330	Cabrillo Palisades Pump Station Security Design Services	1	D	LS	 	\$
11	238210	Cabrillo Palisades Pump Station Security Construction Services	1		LS	 	\$

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
12	541330	Cabrillo Palisades Pump Station Communications Design Services	1	D	LS	 	\$
13	238210	Cabrillo Palisades Pump Station Communications Construction Services	1		LS	 	\$
14	541330	Carmel Mountain High Pump Station Communications Design Services	1	D	LS	 	\$
15	238210	Carmel Mountain High Pump Station Communications Construction Services	1		LS	 	\$
16	541330	Carmel Mountain High Reservoir Communications Design Services	1	D	LS	 	\$
17	238210	Carmel Mountain High Reservoir Communications Construction Services	1		LS	 	\$
18	541330	Carmel Mountain Industrial Pump Station Communications Design Services	1	D	LS	 	\$
19	238210	Carmel Mountain Industrial Pump Station Communications Construction Services	1		LS	 	\$
20	541330	Carmel Mountain Mall Pump Station Communications Design Services	1	D	LS	 	\$
21	238210	Carmel Mountain Mall Pump Station Communications Construction Services	1		LS	 	\$
22	541330	Chollas Heights Pump Station Security Design Services	1	D	LS	 	\$
23	238210	Chollas Heights Pump Station Security Construction Services	1		LS	 	\$
24	541330	Chollas Heights Pump Station Communications Design Services	1	D	LS	 	\$
25	238210	Chollas Heights Pump Station Communications Construction Services	1		LS	 	\$
26	541330	Cielo and Woodman Pump Station Security Design Services	1	D	LS	 	\$

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
27	238210	Cielo and Woodman Pump Station Security Construction Services	1		LS	 	\$
28	541330	Cielo and Woodman Pump Station Communications Design Services	1	D	LS	 	\$
29	238210	Cielo and Woodman Pump Station Communications Construction Services	1		LS	 	\$
30	541330	Climax Pump Station Communications Design Services	1	D	LS	 	\$
31	238210	Climax Pump Station Communications Construction Services	1		LS	 	\$
32	541330	Deerfield Pump Station Communications Design Services	1	D	LS	 	\$
33	238210	Deerfield Pump Station Communications Construction Services	1		LS	 	\$
34	541330	Del Cerro Highlands Pump Station Communications Design Services	1	D	LS	 	\$
35	238210	Del Cerro Highlands Pump Station Communications Construction Services	1		LS	 	\$
36	541330	Del Cerro Pump Station Communications Design Services	1	D	LS	 	\$
37	238210	Del Cerro Pump Station Communications Construction Services	1		LS	 	\$
38	541330	Del Cerro Reservoir Communications Design Services	1	D	LS	 	\$
39	238210	Del Cerro Reservoir Communications Construction Services	1		LS	 	\$
40	541330	Eagle Ridge Pump Station Communications Design Services	1	D	LS	 	\$
41	238210	Eagle Ridge Pump Station Communications Construction Services	1		LS	 	\$

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
42	541330	East Gate Mall Regulator Security Design Services	1	D	LS	 	\$
43	238210	East Gate Mall Regulator Security Construction Services	1		LS	 	\$
44	541330	East Gate Mall Regulator Communications Design Services	1	D	LS	 	\$
45	238210	East Gate Mall Regulator Communications Construction Services	1		LS	 	\$
46	541330	Elliot Pipeline Regulator Security Design Services	1	D	LS	 	\$
47	238210	Elliot Pipeline Regulator Security Construction Services	1		LS	 	\$
48	541330	Elliot Pipeline Regulator Communications Design Services	1	D	LS	 	\$
49	238210	Elliot Pipeline Regulator Communications Construction Services	1		LS	 	\$
50	541330	Friars Road Regulator Security Design Services	1	D	LS	 	\$
51	238210	Friars Road Regulator Security Construction Services	1		LS	 	\$
52	541330	Friars Road Regulator Communications Design Services	1	D	LS	 	\$
53	238210	Friars Road Regulator Communications Construction Services	1		LS	 	\$
54	541330	La Jolla View Standpipe Security Design Services	1	D	LS	 	\$
55	238210	La Jolla View Standpipe Security Construction Services	1		LS	 	\$
56	541330	La Jolla View Standpipe (including La Jolla Country Club Reservoir Repeater) Communications Design Services	1	D	LS	 	\$

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
57	238210	La Jolla View Standpipe (including La Jolla Country Club Reservoir Repeater) Communications Construction Services	1		LS	 	\$
58	541330	Los Penasquitos Pump Station Communications Design Services	1	D	LS	 	\$
59	238210	Los Penasquitos Pump Station Communications Construction Services	1		LS	 	\$
60	541330	Los Penasquitos Reservoir Communications Design Services	1	D	LS	 	\$
61	238210	Los Penasquitos Reservoir Communications Construction Services	1		LS	 	\$
62	541330	Mercy Mira Mesa High Pump Station Communications Design Services	1	D	LS	 	\$
63	238210	Mercy Mira Mesa High Pump Station Communications Construction Services	1		LS	 	\$
64	541330	Miramar Ranch North Reservoir & Pump Station Communications Design Services	1	D	LS	 	\$
65	238210	Miramar Ranch North Reservoir & Pump Station Communications Construction Services	1		LS	 	\$
66	541330	Montezuma Pump Station Communications Design Services	1	D	LS	 	\$
67	238210	Montezuma Pump Station Communications Construction Services	1		LS	 	\$
68	541330	Muirlands Pump Station Security Design Services	1	D	LS	 	\$
69	238210	Muirlands Pump Station Security Construction Services	1		LS	 	\$
70	541330	Muirlands Pump Station Communications Design Services	1	D	LS	 	\$
71	238210	Muirlands Pump Station Communications Construction Services	1		LS	 	\$

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
72	541330	Ocean View Hills Pump Station Security Design Services	1	D	LS	 	\$
73	238210	Ocean View Hills Pump Station Security Construction Services	1		LS	 	\$
74	541330	Ocean View Hills Pump Station Communications Design Services	1	D	LS	 	\$
75	238210	Ocean View Hills Pump Station Communications Construction Services	1		LS	 	\$
76	541330	Otay Mesa Pump Station Security Design Services	1	D	LS	 	\$
77	238210	Otay Mesa Pump Station Security Construction Services	1		LS	 	\$
78	541330	Otay Mesa Pump Station Communications Design Services	1	D	LS	 	\$
79	238210	Otay Mesa Pump Station Communications Construction Services	1		LS	 	\$
80	541330	Paradise Hills #2 Pump Station Security Design Services	1	D	LS	 	\$
81	238210	Paradise Hills #2 Pump Station Security Construction Services	1		LS	 	\$
82	541330	Paradise Hills #2 Pump Station Communications Design Services	1	D	LS	 	\$
83	238210	Paradise Hills #2 Pump Station Communications Construction Services	1		LS	 	\$
84	541330	Paradise Mesa #1 Pump Station Security Design Services	1	D	LS	 	\$
85	238210	Paradise Mesa #1 Pump Station Security Construction Services	1		LS	 	\$
86	541330	Paradise Mesa #1 Pump Station Communications Design Services	1	D	LS	 	\$

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
87	238210	Paradise Mesa #1 Pump Station Communications Construction Services	1		LS		\$
88	541330	Paradise Mesa #2 Pump Station Security Design Services	1	D	LS		\$
89	238210	Paradise Mesa #2 Pump Station Security Construction Services	1		LS		\$
90	541330	Paradise Mesa #2 Pump Station Communications Design Services	1	D	LS		\$
91	238210	Paradise Mesa #2 Pump Station Communications Construction Services	1		LS		\$
92	541330	Paradise Mesa Standpipe Security Design Services	1	D	LS		\$
93	238210	Paradise Mesa Standpipe Security Construction Services	1		LS		\$
94	541330	Paradise Mesa Standpipe Communications Design Services	1	D	LS		\$
95	238210	Paradise Mesa Standpipe Communications Construction Services	1		LS		\$
96	541330	Penasquitos Bluffs #8 Pump Station Communications Design Services	1	D	LS		\$
97	238210	Penasquitos Bluffs #8 Pump Station Communications Construction Services	1		LS		\$
98	541330	Point Loma Reservoir & Catalina Pump Station Communications Design Services	1	D	LS		\$
99	238210	Point Loma Reservoir & Catalina Pump Station Communications Construction Services	1		LS		\$
100	541330	Pomerado Park Reservoir & Bernardo Heights Pump Station Communications Design Services	1	D	LS		\$

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
101	238210	Pomerado Park Reservoir & Bernardo Heights Pump Station Communications Construction Services	1		LS	 	\$
102	541330	Pomerado Pump Station Security Design Services	1	D	LS	 	\$
103	238210	Pomerado Pump Station Security Construction Services	1		LS	 	\$
104	541330	Pomerado Pump Station (including Repeater) Communications Design Services	1	D	LS	 	\$
105	238210	Pomerado Pump Station (including Repeater) Communications Construction Services	1		LS	 	\$
106	541330	Princess Park Pump Station Security Design Services	1	D	LS	 	\$
107	238210	Princess Park Pump Station Security Construction Services	1		LS	 	\$
108	541330	Princess Park Pump Station Communications Design Services	1	D	LS	 	\$
109	238210	Princess Park Pump Station Communications Construction Services	1		LS	 	\$
110	541330	Rancho Bernardo Reservoir & Rancho Bernardo Industrial Pump Station Communications Design Services	1	D	LS	 	\$
111	238210	Rancho Bernardo Reservoir & Rancho Bernardo Industrial Pump Station Communications Construction Services	1		LS	 	\$
112	541330	Rancho Penasquitos Pump Station Communications Design Services	1	D	LS	 	\$
113	238210	Rancho Penasquitos Pump Station Communications Construction Services	1		LS	 	\$
114	541330	Redwood Village Standpipe Security Design Services	1	D	LS	 	\$

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
115	238210	Redwood Village Standpipe Security Construction Services	1		LS	 	\$
116	541330	Redwood Village Standpipe Communications Design Services	1	D	LS	 	\$
117	238210	Redwood Village Standpipe Communications Construction Services	1		LS	 	\$
118	541330	San Andreas Pump Station Security Design Services	1	D	LS	 	\$
119	238210	San Andreas Pump Station Security Construction Services	1		LS	 	\$
120	541330	San Andreas Pump Station (including Sewer Pump Station 78 Repeater) Communications Design Services	1	D	LS	 	\$
121	238210	San Andreas Pump Station (including Sewer Pump Station 78 Repeater) Communications Construction Services	1		LS	 	\$
122	541330	San Carlos Reservoir Communications Design Services	1	D	LS	 	\$
123	238210	San Carlos Reservoir Communications Construction Services	1		LS	 	\$
124	541330	Scripps Ranch Reservoir & Scripps McMillan Pump Station Communications Design Services	1	D	LS	 	\$
125	238210	Scripps Ranch Reservoir & Scripps McMillan Pump Station Communications Construction Services	1		LS	 	\$
126	541330	Scripps Woods #2 Pump Station Security Design Services	1	D	LS	 	\$
127	238210	Scripps Woods #2 Pump Station Security Construction Services	1		LS	 	\$

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
128	541330	Scripps Woods #2 Pump Station Communications Design Services	1	D	LS	 	\$
129	238210	Scripps Woods #2 Pump Station Communications Construction Services	1		LS	 	\$
130	541330	Security Operations Center (SOC) Communications Design Services	1	D	LS	 	\$
131	238210	Security Operations Center (SOC) Communications Construction Services	1		LS	 	\$
132	541330	Soledad Reservoir & Pump Station Communications Design Services	1	D	LS	 	\$
133	238210	Soledad Reservoir & Pump Station Communications Construction Services	1		LS	 	\$
134	541330	South Creek Pump Station Security Design Services	1	D	LS	 	\$
135	238210	South Creek Pump Station Security Construction Services	1		LS	 	\$
136	541330	South Creek Pump Station (including Repeater) Communications Design Services	1	D	LS	 	\$
137	238210	South Creek Pump Station (including Repeater) Communications Construction Services	1		LS	 	\$
138	541330	South San Diego Reservoir Communications Design Services	1	D	LS	 	\$
139	238210	South San Diego Reservoir Communications Construction Services	1		LS	 	\$
140	541330	Stonebridge Pump Station #1 Security Design Services	1	D	LS	 	\$
141	238210	Stonebridge Pump Station #1 Security Construction Services	1		LS	 	\$
142	541330	Stonebridge Pump Station #1 Communications Design Services	1	D	LS	 	\$

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
143	238210	Stonebridge Pump Station #1 Communications Construction Services	1		LS	 	\$
144	541330	Stonebridge Pump Station #2 Security Design Services	1	D	LS	 	\$
145	238210	Stonebridge Pump Station #2 Security Construction Services	1		LS	 	\$
146	541330	Stonebridge Pump Station #2 Communications Design Services	1	D	LS	 	\$
147	238210	Stonebridge Pump Station #2 Communications Construction Services	1		LS	 	\$
148	541330	Texas Street Regulator Security Design Services	1	D	LS	 	\$
149	238210	Texas Street Regulator Security Construction Services	1		LS	 	\$
150	541330	Texas Street Regulator Communications Design Services	1	D	LS	 	\$
151	238210	Texas Street Regulator Communications Construction Services	1		LS	 	\$
152	541330	Thorn Street Regulator Security Design Services	1	D	LS	 	\$
153	238210	Thorn Street Regulator Security Construction Services	1		LS	 	\$
154	541330	Thorn Street Regulator Communications Design Services	1	D	LS	 	\$
155	238210	Thorn Street Regulator Communications Construction Services	1		LS	 	\$
156	541330	University Heights Pump Station & Reservoir Communications Design Services	1	D	LS	 	\$
157	238210	University Heights Pump Station & Reservoir Communications Construction Services	1		LS	 	\$

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
158	541330	Waring Rd Pump Station Communications Design Services	1	D	LS	 	\$
159	238210	Waring Rd Pump Station Communications Construction Services	1		LS	 	\$
160	541330	Black Mtn High Level Site Security Design Services	1	D	LS	 	\$
161	238210	Black Mtn High Level Site Security Construction Services	1		LS	 	\$
162	541330	Black Mtn High Level Site Communications Design Services	1	D	LS	 	\$
163	238210	Black Mtn High Level Site Communications Construction Services	1		LS	 	\$
164	541330	Cowles High Level Site Security Design Services	1	D	LS	 	\$
165	238210	Cowles High Level Site Security Construction Services	1		LS	 	\$
166	541330	Cowles High Level Site Communications Design Services	1	D	LS	 	\$
167	238210	Cowles High Level Site Communications Construction Services	1		LS	 	\$
168	541330	Encanto High Level Site Security Design Services	1	D	LS	 	\$
169	238210	Encanto High Level Site Security Construction Services	1		LS	 	\$
170	541330	Encanto High Level Site Communications Design Services	1	D	LS	 	\$
171	238210	Encanto High Level Site Communications Construction Services	1		LS	 	\$
172	541330	Lyons Peak High Level Site Security Design Services	1	D	LS	 	\$

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
173	238210	Lyons Peak High Level Site Security Construction Services	1		LS	 	\$
174	541330	Lyons Peak High Level Site Communications Design Services	1	D	LS	 	\$
175	238210	Lyons Peak High Level Site Communications Construction Services	1		LS	 	\$
176	541330	Mt Woodson High Level Site Security Design Services	1	D	LS	 	\$
177	238210	Mt Woodson High Level Site Security Construction Services	1		LS	 	\$
178	541330	Mt Woodson High Level Site Communications Design Services	1	D	LS	 	\$
179	238210	Mt Woodson High Level Site Communications Construction Services	1		LS	 	\$
180	541330	San Ysidro High Level Site Security Design Services	1	D	LS	 	\$
181	238210	San Ysidro High Level Site Security Construction Services	1		LS	 	\$
182	541330	San Ysidro High Level Site Communications Design Services	1	D	LS	 	\$
183	238210	San Ysidro High Level Site Communications Construction Services	1		LS	 	\$
ESTIMATED TOTAL BASE BID (1 THROUGH 183)							\$
ADDITIVE ALTERNATE 'A'							
1	541330	Security Operations Center (SOC) Design Services for Situation Management System	1	D	LS	 	\$
2	238210	Security Operations Center (SOC) Construction Services for Situation Management System	1		LS	 	\$
3	541330	Access Control System Upgrades Design Services	1	D	LS	 	\$

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
4	238210	Access Control System Upgrades Construction Services	1		LS	 	\$
ESTIMATED TOTAL ADDITIVE ALTERNATE 'A' (1 THROUGH 4)							\$
ADDITIVE ALTERNATE 'B'							
1	541330	Security Operations Center (SOC) Design Services for Operator Console Upgrades	1		LS	 	\$
2	238210	Security Operations Center (SOC) Construction Services for Operator Console Upgrades	1		LS	 	\$
3	541330	Security Operations Center (SOC) Security Upgrades Design Services	1	D	LS	 	\$
4	238210	Security Operations Center (SOC) Security Upgrades Construction Services	1		LS	 	\$
5	541330	65th and Herrick Pump Station Security Upgrades Design Services	1	D	LS	 	\$
6	238210	65th and Herrick Pump Station Security Upgrades Construction Services	1		LS	 	\$
7	541330	Bayview Reservoir Security Upgrades Design Services	1	D	LS	 	\$
8	238210	Bayview Reservoir Security Upgrades Construction Services	1		LS	 	\$
9	541330	Bernardo Heights Pump Station Security Upgrades Design Services	1	D	LS	 	\$
10	238210	Bernardo Heights Pump Station Security Upgrades Construction Services	1		LS	 	\$
11	541330	Black Mountain Reservoir Security Upgrades Design Services	1	D	LS	 	\$
12	238210	Black Mountain Reservoir Security Upgrades Construction Services	1		LS	 	\$

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
13	541330	Carmel Mountain High Pump Station Security Upgrades Design Services	1	D	LS	 	\$
14	238210	Carmel Mountain High Pump Station Security Upgrades Construction Services	1		LS	 	\$
15	541330	Carmel Mountain High Reservoir Security Upgrades Design Services	1	D	LS	 	\$
16	238210	Carmel Mountain High Reservoir Security Upgrades Construction Services	1		LS	 	\$
17	541330	Carmel Mountain Industrial Pump Station Security Upgrades Design Services	1	D	LS	 	\$
18	238210	Carmel Mountain Industrial Pump Station Security Upgrades Construction Services	1		LS	 	\$
19	541330	Carmel Mountain Mall Pump Station Security Upgrades Design Services	1	D	LS	 	\$
20	238210	Carmel Mountain Mall Pump Station Security Upgrades Construction Services	1		LS	 	\$
21	541330	Catalina Pump Station Security Upgrades Design Services	1	D	LS	 	\$
22	238210	Catalina Pump Station Security Upgrades Construction Services	1		LS	 	\$
23	541330	Climax Pump Station Security Upgrades Design Services	1	D	LS	 	\$
24	238210	Climax Pump Station Security Upgrades Construction Services	1		LS	 	\$
25	541330	Deerfield Pump Station Security Upgrades Design Services	1	D	LS	 	\$
26	238210	Deerfield Pump Station Security Upgrades Construction Services	1		LS	 	\$
27	541330	Del Cerro Highlands Pump Station Security Upgrades Design Services	1	D	LS	 	\$

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
28	238210	Del Cerro Highlands Pump Station Security Upgrades Construction Services	1		LS	 	\$
29	541330	Del Cerro Pump Station Security Upgrades Design Services	1	D	LS	 	\$
30	238210	Del Cerro Pump Station Security Upgrades Construction Services	1		LS	 	\$
31	541330	Del Cerro Reservoir Security Upgrades Design Services	1	D	LS	 	\$
32	238210	Del Cerro Reservoir Security Upgrades Construction Services	1		LS	 	\$
33	541330	Eagle Ridge Pump Station Security Upgrades Design Services	1	D	LS	 	\$
34	238210	Eagle Ridge Pump Station Security Upgrades Construction Services	1		LS	 	\$
35	541330	Los Penasquitos Pump Station Security Upgrades Design Services	1	D	LS	 	\$
36	238210	Los Penasquitos Pump Station Security Upgrades Construction Services	1		LS	 	\$
37	541330	Los Penasquitos Reservoir Security Upgrades Design Services	1	D	LS	 	\$
38	238210	Los Penasquitos Reservoir Security Upgrades Construction Services	1		LS	 	\$
39	541330	Mercy Mira Mesa High Pump Station Security Upgrades Design Services	1	D	LS	 	\$
40	238210	Mercy Mira Mesa High Pump Station Security Upgrades Construction Services	1		LS	 	\$
41	541330	Miramar Ranch North Reservoir Security Upgrades Design Services	1	D	LS	 	\$
42	238210	Miramar Ranch North Reservoir Security Upgrades Construction Services	1		LS	 	\$

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
43	541330	Montezuma Pump Station Security Upgrades Design Services	1	D	LS	 	\$
44	238210	Montezuma Pump Station Security Upgrades Construction Services	1		LS	 	\$
45	541330	Penasquitos Bluffs #8 Pump Station Security Upgrades Design Services	1	D	LS	 	\$
46	238210	Penasquitos Bluffs #8 Pump Station Security Upgrades Construction Services	1		LS	 	\$
47	541330	Point Loma Reservoir Security Upgrades Design Services	1	D	LS	 	\$
48	238210	Point Loma Reservoir Security Upgrades Construction Services	1		LS	 	\$
49	541330	Pomerado Park Reservoir Security Upgrades Design Services	1	D	LS	 	\$
50	238210	Pomerado Park Reservoir Security Upgrades Construction Services	1		LS	 	\$
51	541330	Rancho Bernardo Industrial Pump Station Security Upgrades Design Services	1	D	LS	 	\$
52	238210	Rancho Bernardo Industrial Pump Station Security Upgrades Construction Services	1		LS	 	\$
53	541330	Rancho Bernardo Reservoir Security Upgrades Design Services	1	D	LS	 	\$
54	238210	Rancho Bernardo Reservoir Security Upgrades Construction Services	1		LS	 	\$
55	541330	Rancho Penasquitos Pump Station Security Upgrades Design Services	1	D	LS	 	\$

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
56	238210	Rancho Penasquitos Pump Station Security Upgrades Construction Services	1		LS	 	\$
57	541330	San Carlos Reservoir Security Upgrades Design Services	1	D	LS	 	\$
58	238210	San Carlos Reservoir Security Upgrades Construction Services	1		LS	 	\$
59	541330	Scripps Ranch Reservoir Security Upgrades Design Services	1	D	LS	 	\$
60	238210	Scripps Ranch Reservoir Security Upgrades Construction Services	1		LS	 	\$
61	541330	Soledad Reservoir Security Upgrades Design Services	1	D	LS	 	\$
62	238210	Soledad Reservoir Security Upgrades Construction Services	1		LS	 	\$
63	541330	South San Diego Reservoir Security Upgrades Design Services	1	D	LS	 	\$
64	238210	South San Diego Reservoir Security Upgrades Construction Services	1		LS	 	\$
65	541330	University Heights Pump Station & Reservoir Security Upgrades Design Services	1	D	LS	 	\$
66	238210	University Heights Pump Station & Reservoir Security Upgrades Construction Services	1		LS	 	\$
67	541330	Waring Rd Pump Station Security Upgrades Design Services	1	D	LS	 	\$
68	238210	Waring Rd Pump Station Security Upgrades Construction Services	1		LS	 	\$
69		Erosion Control	1		AL	 	\$5,000.00
70		Foliage Control at all Sites	1		LS	 	\$

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
71		3-Year Maintenance Contract for New Security Sites Only	1		LS	 	\$
72		3-Year Maintenance Contract for Communications System	1		LS	 	\$
ESTIMATED TOTAL ADDITIVE ALTERNATE 'B' (1 THROUGH 72)							\$

*** Design Element (For City Use)**

Total Bid Price, (Items 1 through 183 inclusive) amount written in words:

Design-Builder: _____

Title: _____

Signature: _____

The names of all persons interested in the foregoing proposal as principals are as follows:

BIDDING DOCUMENTS

IMPORTANT NOTICE: If Bidder or other interested person is a corporation, state secretary, treasurer, and manager thereof; if a co-partnership, state true name of firm, also names of all individual co-partners composing firm; if Bidder or other interested person is an individual, state first and last names in full.

NOTES:

- A. The Contract Price to be used in the selection process as described in Section 5.6 of the RFP will be determined the City based on the Base Bid alone.
- B. After the selection has been made, the City may award the Contract for the Base Bid alone or if applicable, for the Base Bid plus any combination of alternates selected in the City's sole discretion.
- C. Prices and notations shall be in ink or typewritten. All corrections (which have been initiated by the Bidder using erasures, strike out, line out, or "white-out") shall be typed or written in with ink adjacent thereto, and shall be initialed in ink by the person signing the Proposal.
- D. Failure to initial all corrections made in the bidding documents shall cause the Proposal to be rejected as **non-responsive** and ineligible for further consideration.
- E. Blank spaces must be filled in, using figures. The Design-Builder's failure to submit a price for any Bid item that requires the Design-Builder to submit a price shall render the Proposal **non-responsive** and shall be cause for its rejection.
- F. Unit prices shall be entered for all unit price items. Unit prices shall not exceed two (2) decimal places. If the Unit prices entered exceed two (2) decimal places, the City will only use the first two digits after the decimal points without rounding up or down.
- G. All extensions of the unit prices bid will be subject to verification by the City. In the case of inconsistency or conflict between the product of the Quantity x Unit Price and the Extension, the product shall govern.
- H. In the case of inconsistency or conflict, between the sums of the Extensions with the estimated total Bid, the sum of the Extensions shall govern.
- I. Proposals shall not contain any recapitulation of the Work. Conditional Bids will be rejected as being **non-responsive**. Alternative proposals will not be considered unless called for.
- J. The Proposal shall contain an acknowledgment of receipt of all addenda as specified in the RFP. Failure to acknowledge addenda shall render the Bid **non-responsive** and shall be cause for its rejection.

City of San Diego



ADDENDUM "5"

REQUEST FOR PROPOSAL (RFP)

FOR WATER DEPARTMENT SECURITY UPGRADE DESIGN-BUILD CONTRACT

RFQ NO.: Security Upgrades for the City of San Diego Design-Build Contract 5171
BID NO.: K-12-5463-DBA
RFP NO.: 5463
TASK ORDER NO.: 1
WBS NO.: S-11105, S-11107
CLIENT DEPARTMENT: 2013
COUNCIL DISTRICT: CITYWIDE
PROJECT TYPE: BL, BJ

REQUEST FOR PROPOSAL (RFP) DUE:

12:00 Noon

DECEMBER 1, 2011

CITY OF SAN DIEGO

Public Works Contracting Group

1200 Third Avenue, Suite 200, MS 56P

San Diego, CA 92101

CHANGES TO CONTRACT DOCUMENTS

The following changes to the RFP are hereby made effective as though originally issued with the bid package. All prospective bidders are reminded that they are required to acknowledge receipt of this addendum in their submittal in accordance with ATTACHMENT B, Item 1 of the Request for Proposals.

A. QUESTIONS AND ANSWERS

Q1. Addendum 3, Page 10 of 15, C5. Contract Time is identified as 175 working days. The RFP also lists a “certificate of completion ~ April 2013”. This would indicate an estimate of roughly 1 year for construction services. 175 days seems aggressive considering the design and construction at over 60 sites with testing and City approvals. Please confirm/ clarify what is the intended duration for both Design processes and Construction phasing of the project.

A1. See Section B of this addendum.

B. CHANGES TO THE REQUEST FOR PROPOSALS

B1. To Addendum 3, Item C5 Contract Time, Page 10 of 15, DELETE in its entirety and SUBSTITUTE with the following:

3. CONTRACT TIME: The Contract Time for completion of the Work (Design & Construction) shall be **336 Working Days**

B2. To Section 10.0 Special Conditions, Page 11, subsection 10.10 Project Schedule, 10.10.1, DELETE in its entirety and SUBSTITUTE with the following:

10.10.1 The City has established the following tentative milestones for the Project:

a. Design Notice to Proceed	April 2012
b. Construction Notice to Proceed	August 2012
c. Issue Notice of Completion	August 2013

For the Contract Time refer to Contract Front End Volume 1, Invitation to Bids (see Attachments).

Tony Heinrichs, Director
Public Works Department

Dated: November 28, 2011
San Diego, California

TH/cg/bd/rir/egz

City of San Diego



ADDENDUM "6"

REQUEST FOR PROPOSAL (RFP)

FOR WATER DEPARTMENT SECURITY UPGRADE DESIGN-BUILD CONTRACT

RFQ NO.: Security Upgrades for the City of San Diego Design-Build Contract 5171
BID NO.: K-12-5463-DBA
RFP NO.: 5463
TASK ORDER NO.: 1
WBS NO.: S-11105, S-11107
CLIENT DEPARTMENT: 2013
COUNCIL DISTRICT: CITYWIDE
PROJECT TYPE: BL, BJ

REQUEST FOR PROPOSAL (RFP) DUE:

12:00 Noon

DECEMBER 12, 2011

CITY OF SAN DIEGO

Public Works Contracting Group

1200 Third Avenue, Suite 200, MS 56P

San Diego, CA 92101

CHANGES TO CONTRACT DOCUMENTS

The following changes to the RFP are hereby made effective as though originally issued with the bid package. All prospective bidders are reminded that they are required to acknowledge receipt of this addendum in their submittal in accordance with ATTACHMENT B, Item 1 of the Request for Proposals.

THE SUBMITTAL DATE FOR THIS PROJECT HAS BEEN EXTENDED AS STATED ABOVE.

A. CHANGES TO ADDENDUM

A.1 To ADDENDUM 4, Item C.1, Section 8.0, Selection and Award Schedule, Subsection 8.3 page 9, **DELETE** in its entirety and **SUBSTITUTE** with the following:

8.3 Proposal Due Date

December 12, 2011

Tony Heinrichs, Director
Public Works Department

Dated: November 30, 2011
San Diego, California

TH/cg/bd/rir

City of San Diego



ADDENDUM "7"

REQUEST FOR PROPOSAL (RFP)

FOR WATER DEPARTMENT SECURITY UPGRADE DESIGN-BUILD CONTRACT

RFQ NO.: Security Upgrades for the City of San Diego Design-Build Contract 5171
BID NO.: K-12-5463-DBA
RFP NO.: 5463
TASK ORDER NO.: 1
WBS NO.: S-11105, S-11107
CLIENT DEPARTMENT: 2013
COUNCIL DISTRICT: CITYWIDE
PROJECT TYPE: BL, BJ

REQUEST FOR PROPOSAL (RFP) DUE:

12:00 Noon

DECEMBER 15, 2011

CITY OF SAN DIEGO

Public Works Contracting Group

1200 Third Avenue, Suite 200, MS 56P

San Diego, CA 92101

CHANGES TO CONTRACT DOCUMENTS

The following changes to the RFP are hereby made effective as though originally issued with the bid package. All prospective bidders are reminded that they are required to acknowledge receipt of this addendum in their submittal in accordance with ATTACHMENT B, Item 1 of the Request for Proposals.

THE SUBMITTAL DATE FOR THIS PROJECT HAS BEEN EXTENDED AS STATED ABOVE.

A. QUESTIONS AND ANSWERS

- Q1. “As a result of Addendum 4 page 29 “NOTE A,” the base bids, items 1-183 are to be the sole determining factor of award in this project. With this true, should the SOC Security Design and Construction be included in the BASE? Items 3&4 of Alt B is the anticipated location for all security integration services and products, inclusive of head-end software and hardware that will operate the new peripheral recording systems.”
- A1. The Bidder’s are reminded that the Base Bid cost proposal shall provide for a complete and functional system including all security headend equipment, software, security operator workstations, security client software, joysticks, KVM’s, etc. to comprise a fully functional and operational system as outlined in the RFP. As a measure to make this clear:
- a. The City has added Items 184 and 185 to the Base Bid to reflect the specific SOC Headend Upgrades that includes, at a minimum, those items listed above plus the core headend equipment for the CCTV and access control systems. The system shall be complete and fully operational without the need for Change Orders.
 - b. Items 1 and 2 of Alt B for the SOC Operator Console Upgrades will now be limited to furniture only.
 - c. Items 3 and 4 of Alt B are now aptly renamed to “Chollas Operations Yard” to reflect the site work requirements only and are not related to the SOC Headend.

B. CLARIFICATIONS

- a. Extensive design changes that require additional and significant funding to implement will not be considered. It the City’s goal to achieve the best solution fiscally possible within the funding available for this project.
- b. The City has determined that the following additional information may be beneficial to the Bidder’s to ensure the City obtains specific functionality expectations and meets the desired performance metrics provided below. For the locations specified in the RFP documents and attachments specifically mentioning video analytics the expectation is for the Bidder to provide a licensed server based video analytics system versus a camera based analytic solution. Detailed specific performance criteria for the Video Analytics are provided below to assist in the Bidder’s response. The City also requires a single vendor VA/VMS turnkey solution that ensures all associated software/hardware has been certified and vetted for integration and interoperability through extensive vendor testing.

Video Analytics Requirements

- **Supporting variety of edge devices** – the Video Analytics shall support any edge device such as analog fixed or PTZ cameras connected via video encoder, IP

cameras including Standard Definition, High Definition or Mega Pixel, using MPEG4 or H.264 compression.

- **Server based Video Analytics** – the Video Analytics shall support analytics on VMS server for video analytics and recording of specific events or the whole video, *with no need for dedicated video analytics servers*
- **VMS Recorder Performance** - The VMS Recorder Server shall have the ability to record all cameras at full H.264 resolution 4CIF @ 30 FPS at high video quality (2Mb/sec per camera), and simultaneously perform video analytics analysis on the same recorder.
- **Multi-VA** - The VMS Video Analytics shall allow running several VA applications simultaneously on each camera including Intrusion detection application. In addition the VA application could be enabled in sequence by using scheduler during both operating hours and non operating hours
- **Redundancy** – Video Analytics and recording redundancy will be supported by redundant server in SOC Headend
- **Camera Tampering** –VMS shall support Camera Tampering Detection on the VMS recorder server
- **Image Optimization** - The VMS shall be able to automatically improve the video quality of the cameras in real time. The system shall automatically adjust the edge device visual parameters (brightness and contrast) by utilizing a repetitive algorithm optimizing the image clarity and dynamic range of the cameras
- **VA licensing mechanism** - The VMS analytics shall allow ‘on the fly’ allocating of analytics licenses to different cameras. The licensing mechanism shall not tie the analytics license to a specific camera

VA application – Intrusion Detection

- **Instant Playback** - The VMS analytics shall be integrated with the proposed VMS solution to allow advanced capabilities such as the ability to select an object and instantly playback the video from the moment the object was first detected.
- **Environmental robustness** - The VMS analytics shall include a variety of filters to minimize the effects of snow, rain, lights, and camera shake to extend the effectiveness of operation in adverse weather conditions.
- **Classifier** – The analytics shall include a classifying filter which will be able to separate humans from clutter, thus reduce false alarms and increase detection rate.

VA application – PTZ Tracking

- **General support** - The VMS analytics shall support automatic PTZ tracking
- **Fixed camera handover** - The fixed camera shall detect the object and shall hand over the object coordinate to the PTZ camera, that shall start an automatic tracking
- **Fixed camera association** - PTZ camera shall support up to 8 fixed cameras running the intrusion detection application
- **Out of FOV tracking** - The tracking shall continue even if the object is going out of the FOV of the fixed camera
- **Continuous tracking** - The automatic PTZ tracker shall be continuous and smooth

- **Zoom level** - Tracked object shall occupy 30%-40% of the FOV height, to provide ability for clear identification for both real time monitoring and for investigation

Services

- The VMS analytics vendor shall provide professional services to assure optimal analytics results. The services shall include consulting during the system’s design, handling installation and setup and fine tune the system’s performance in on-going improvement cycles.
- The vendor shall review the planned camera placement and submit a report with recommendations for camera type, camera placement and field of view, illumination to optimize the performance of the Video Analytic system.

Video Recorder Operating Temperatures

The video recorders shall be installed either in a wall mount rack within a structure or in a NEMA enclosure equipped with and external blower for outside applications. The video recorders shall be capable of operating between 50o – 113oF in the outdoor NEMA enclosures with external fan blower and between 50o – 95oF in enclosed spaces inside wall mount racks with blower units. In locations where the number of VA cameras exceeds two in an outdoor environment then a self contained environmentally controlled equipment cabinet shall be proposed.

C. CHANGES TO ADDENDUM

C.1 To ADDENDUM 4, Item C.1, Section 8.0, Selection and Award Schedule, Subsection 8.4 through 8.8, page 9, **DELETE** in its entirety and **SUBSTITUTE** with the following:

8.4	Technical Presentations	January 10, 2012
8.5	Closed Ranking Meeting	January 17, 2012
8.6	Selection and Notification	January 19, 2012
8.7	Receipt of Bonds and Insurance Certificates	February 6, 2012
8.8	Notice to Proceed	February 22, 2012

C.2 To ADDENDUM 4, Item C.2, Attachment D, Contract Front End Volume 2, Bidding Documents (PRICE PROPOSAL FORMS), page 10 through 29, **DELETE** in their entirety and **SUBSTITUTE** with page 6 of 20 through 20 of 20 of this Addendum.

C.3 To ADDENDUM 6, Item A.1, Section 8.0, Selection and Award Schedule, Subsection 8.3 page 2, **DELETE** in its entirety and **SUBSTITUTE** with the following:

8.3 Proposal Due Date

December 15, 2011

Tony Heinrichs, Director
Public Works Department

Dated: December 6, 2011
San Diego, California

TH//bd/cg/rir

BIDDING DOCUMENTS

PRICE PROPOSAL FORMS

The Bidder agrees to the design and construction of **Water Department Security Upgrade Design-Build Contract**, for the city of San Diego, in accordance with these contract documents for the prices listed below. The Bidder guarantees the Contract Price for a period of 120 days (90 days for federally funded contracts and contracts valued at \$500,000 or less) from the date of Bid opening to Award of the Contract. The duration of the Contract Price guarantee shall be extended by the number of days required for the City to obtain all items necessary to fulfill all conditions precedent e.g., bond and insurance.

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
PROPOSAL							
1	238210	Bonds (Payment and Performance)	1		LS	 	\$
2		City Contingency	1		AL	 	\$300,000.00
3	541330	Storm Water Pollution Prevention	1		LS	 	\$
4	541330	65th & Herrick Pump Station (including Repeater) Communications Design Services	1	D	LS	 	\$
5	238210	65th & Herrick Pump Station (including Repeater) Communications Construction Services	1		LS	 	\$
6	541330	Bayview Reservoir & Pump Station Communications Design Services	1	D	LS	 	\$
7	238210	Bayview Reservoir & Pump Station Communications Construction Services	1		LS	 	\$
8	541330	Black Mountain Reservoir & Pump Station Communications Design Services	1	D	LS	 	\$
9	238210	Black Mountain Reservoir & Pump Station Communications Construction Services	1		LS	 	\$
10	541330	Cabrillo Palisades Pump Station Security Design Services	1	D	LS	 	\$
11	238210	Cabrillo Palisades Pump Station Security Construction Services	1		LS	 	\$
12	541330	Cabrillo Palisades Pump Station Communications Design Services	1	D	LS	 	\$
13	238210	Cabrillo Palisades Pump Station Communications Construction Services	1		LS	 	\$
14	541330	Carmel Mountain High Pump Station Communications Design Services	1	D	LS	 	\$

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
15	238210	Carmel Mountain High Pump Station Communications Construction Services	1		LS	 	\$
16	541330	Carmel Mountain High Reservoir Communications Design Services	1	D	LS	 	\$
17	238210	Carmel Mountain High Reservoir Communications Construction Services	1		LS	 	\$
18	541330	Carmel Mountain Industrial Pump Station Communications Design Services	1	D	LS	 	\$
19	238210	Carmel Mountain Industrial Pump Station Communications Construction Services	1		LS	 	\$
20	541330	Carmel Mountain Mall Pump Station Communications Design Services	1	D	LS	 	\$
21	238210	Carmel Mountain Mall Pump Station Communications Construction Services	1		LS	 	\$
22	541330	Chollas Heights Pump Station Security Design Services	1	D	LS	 	\$
23	238210	Chollas Heights Pump Station Security Construction Services	1		LS	 	\$
24	541330	Chollas Heights Pump Station Communications Design Services	1	D	LS	 	\$
25	238210	Chollas Heights Pump Station Communications Construction Services	1		LS	 	\$
26	541330	Cielo and Woodman Pump Station Security Design Services	1	D	LS	 	\$
27	238210	Cielo and Woodman Pump Station Security Construction Services	1		LS	 	\$
28	541330	Cielo and Woodman Pump Station Communications Design Services	1	D	LS	 	\$
29	238210	Cielo and Woodman Pump Station Communications Construction Services	1		LS	 	\$
30	541330	Climax Pump Station Communications Design Services	1	D	LS	 	\$
31	238210	Climax Pump Station Communications Construction Services	1		LS	 	\$
32	541330	Deerfield Pump Station Communications Design Services	1	D	LS	 	\$
33	238210	Deerfield Pump Station Communications Construction Services	1		LS	 	\$
34	541330	Del Cerro Highlands Pump Station Communications Design Services	1	D	LS	 	\$

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
35	238210	Del Cerro Highlands Pump Station Communications Construction Services	1		LS		\$
36	541330	Del Cerro Pump Station Communications Design Services	1	D	LS		\$
37	238210	Del Cerro Pump Station Communications Construction Services	1		LS		\$
38	541330	Del Cerro Reservoir Communications Design Services	1	D	LS		\$
39	238210	Del Cerro Reservoir Communications Construction Services	1		LS		\$
40	541330	Eagle Ridge Pump Station Communications Design Services	1	D	LS		\$
41	238210	Eagle Ridge Pump Station Communications Construction Services	1		LS		\$
42	541330	East Gate Mall Regulator Security Design Services	1	D	LS		\$
43	238210	East Gate Mall Regulator Security Construction Services	1		LS		\$
44	541330	East Gate Mall Regulator Communications Design Services	1	D	LS		\$
45	238210	East Gate Mall Regulator Communications Construction Services	1		LS		\$
46	541330	Elliot Pipeline Regulator Security Design Services	1	D	LS		\$
47	238210	Elliot Pipeline Regulator Security Construction Services	1		LS		\$
48	541330	Elliot Pipeline Regulator Communications Design Services	1	D	LS		\$
49	238210	Elliot Pipeline Regulator Communications Construction Services	1		LS		\$
50	541330	Friars Road Regulator Security Design Services	1	D	LS		\$
51	238210	Friars Road Regulator Security Construction Services	1		LS		\$
52	541330	Friars Road Regulator Communications Design Services	1	D	LS		\$
53	238210	Friars Road Regulator Communications Construction Services	1		LS		\$
54	541330	La Jolla View Standpipe Security Design Services	1	D	LS		\$
55	238210	La Jolla View Standpipe Security Construction Services	1		LS		\$
56	541330	La Jolla View Standpipe (including La Jolla Country Club Reservoir Repeater) Communications Design Services	1	D	LS		\$
57	238210	La Jolla View Standpipe (including La Jolla Country Club Reservoir Repeater) Communications Construction Services	1		LS		\$
58	541330	Los Penasquitos Pump Station Communications Design Services	1	D	LS		\$

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
59	238210	Los Penasquitos Pump Station Communications Construction Services	1		LS	 	\$
60	541330	Los Penasquitos Reservoir Communications Design Services	1	D	LS	 	\$
61	238210	Los Penasquitos Reservoir Communications Construction Services	1		LS	 	\$
62	541330	Mercy Mira Mesa High Pump Station Communications Design Services	1	D	LS	 	\$
63	238210	Mercy Mira Mesa High Pump Station Communications Construction Services	1		LS	 	\$
64	541330	Miramar Ranch North Reservoir & Pump Station Communications Design Services	1	D	LS	 	\$
65	238210	Miramar Ranch North Reservoir & Pump Station Communications Construction Services	1		LS	 	\$
66	541330	Montezuma Pump Station Communications Design Services	1	D	LS	 	\$
67	238210	Montezuma Pump Station Communications Construction Services	1		LS	 	\$
68	541330	Muirlands Pump Station Security Design Services	1	D	LS	 	\$
69	238210	Muirlands Pump Station Security Construction Services	1		LS	 	\$
70	541330	Muirlands Pump Station Communications Design Services	1	D	LS	 	\$
71	238210	Muirlands Pump Station Communications Construction Services	1		LS	 	\$
72	541330	Ocean View Hills Pump Station Security Design Services	1	D	LS	 	\$
73	238210	Ocean View Hills Pump Station Security Construction Services	1		LS	 	\$
74	541330	Ocean View Hills Pump Station Communications Design Services	1	D	LS	 	\$
75	238210	Ocean View Hills Pump Station Communications Construction Services	1		LS	 	\$
76	541330	Otay Mesa Pump Station Security Design Services	1	D	LS	 	\$
77	238210	Otay Mesa Pump Station Security Construction Services	1		LS	 	\$
78	541330	Otay Mesa Pump Station Communications Design Services	1	D	LS	 	\$
79	238210	Otay Mesa Pump Station Communications Construction Services	1		LS	 	\$
80	541330	Paradise Hills #2 Pump Station Security Design Services	1	D	LS	 	\$
81	238210	Paradise Hills #2 Pump Station Security Construction Services	1		LS	 	\$

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
82	541330	Paradise Hills #2 Pump Station Communications Design Services	1	D	LS	 	\$
83	238210	Paradise Hills #2 Pump Station Communications Construction Services	1		LS	 	\$
84	541330	Paradise Mesa #1 Pump Station Security Design Services	1	D	LS	 	\$
85	238210	Paradise Mesa #1 Pump Station Security Construction Services	1		LS	 	\$
86	541330	Paradise Mesa #1 Pump Station Communications Design Services	1	D	LS	 	\$
87	238210	Paradise Mesa #1 Pump Station Communications Construction Services	1		LS	 	\$
88	541330	Paradise Mesa #2 Pump Station Security Design Services	1	D	LS	 	\$
89	238210	Paradise Mesa #2 Pump Station Security Construction Services	1		LS	 	\$
90	541330	Paradise Mesa #2 Pump Station Communications Design Services	1	D	LS	 	\$
91	238210	Paradise Mesa #2 Pump Station Communications Construction Services	1		LS	 	\$
92	541330	Paradise Mesa Standpipe Security Design Services	1	D	LS	 	\$
93	238210	Paradise Mesa Standpipe Security Construction Services	1		LS	 	\$
94	541330	Paradise Mesa Standpipe Communications Design Services	1	D	LS	 	\$
95	238210	Paradise Mesa Standpipe Communications Construction Services	1		LS	 	\$
96	541330	Penasquitos Bluffs #8 Pump Station Communications Design Services	1	D	LS	 	\$
97	238210	Penasquitos Bluffs #8 Pump Station Communications Construction Services	1		LS	 	\$
98	541330	Point Loma Reservoir & Catalina Pump Station Communications Design Services	1	D	LS	 	\$
99	238210	Point Loma Reservoir & Catalina Pump Station Communications Construction Services	1		LS	 	\$
100	541330	Pomerado Park Reservoir & Bernardo Heights Pump Station Communications Design Services	1	D	LS	 	\$
101	238210	Pomerado Park Reservoir & Bernardo Heights Pump Station Communications Construction Services	1		LS	 	\$
102	541330	Pomerado Pump Station Security Design Services	1	D	LS	 	\$

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
103	238210	Pomerado Pump Station Security Construction Services	1		LS	 	\$
104	541330	Pomerado Pump Station (including Repeater) Communications Design Services	1	D	LS	 	\$
105	238210	Pomerado Pump Station (including Repeater) Communications Construction Services	1		LS	 	\$
106	541330	Princess Park Pump Station Security Design Services	1	D	LS	 	\$
107	238210	Princess Park Pump Station Security Construction Services	1		LS	 	\$
108	541330	Princess Park Pump Station Communications Design Services	1	D	LS	 	\$
109	238210	Princess Park Pump Station Communications Construction Services	1		LS	 	\$
110	541330	Rancho Bernardo Reservoir & Rancho Bernardo Industrial Pump Station Communications Design Services	1	D	LS	 	\$
111	238210	Rancho Bernardo Reservoir & Rancho Bernardo Industrial Pump Station Communications Construction Services	1		LS	 	\$
112	541330	Rancho Penasquitos Pump Station Communications Design Services	1	D	LS	 	\$
113	238210	Rancho Penasquitos Pump Station Communications Construction Services	1		LS	 	\$
114	541330	Redwood Village Standpipe Security Design Services	1	D	LS	 	\$
115	238210	Redwood Village Standpipe Security Construction Services	1		LS	 	\$
116	541330	Redwood Village Standpipe Communications Design Services	1	D	LS	 	\$
117	238210	Redwood Village Standpipe Communications Construction Services	1		LS	 	\$
118	541330	San Andreas Pump Station Security Design Services	1	D	LS	 	\$
119	238210	San Andreas Pump Station Security Construction Services	1		LS	 	\$
120	541330	San Andreas Pump Station (including Sewer Pump Station 78 Repeater) Communications Design Services	1	D	LS	 	\$
121	238210	San Andreas Pump Station (including Sewer Pump Station 78 Repeater) Communications Construction Services	1		LS	 	\$
122	541330	San Carlos Reservoir Communications Design Services	1	D	LS	 	\$

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
123	238210	San Carlos Reservoir Communications Construction Services	1		LS	 	\$
124	541330	Scripps Ranch Reservoir & Scripps McMillan Pump Station Communications Design Services	1	D	LS	 	\$
125	238210	Scripps Ranch Reservoir & Scripps McMillan Pump Station Communications Construction Services	1		LS	 	\$
126	541330	Scripps Woods #2 Pump Station Security Design Services	1	D	LS	 	\$
127	238210	Scripps Woods #2 Pump Station Security Construction Services	1		LS	 	\$
128	541330	Scripps Woods #2 Pump Station Communications Design Services	1	D	LS	 	\$
129	238210	Scripps Woods #2 Pump Station Communications Construction Services	1		LS	 	\$
130	541330	Security Operations Center (SOC) Communications Design Services	1	D	LS	 	\$
131	238210	Security Operations Center (SOC) Communications Construction Services	1		LS	 	\$
132	541330	Soledad Reservoir & Pump Station Communications Design Services	1	D	LS	 	\$
133	238210	Soledad Reservoir & Pump Station Communications Construction Services	1		LS	 	\$
134	541330	South Creek Pump Station Security Design Services	1	D	LS	 	\$
135	238210	South Creek Pump Station Security Construction Services	1		LS	 	\$
136	541330	South Creek Pump Station (including Repeater) Communications Design Services	1	D	LS	 	\$
137	238210	South Creek Pump Station (including Repeater) Communications Construction Services	1		LS	 	\$
138	541330	South San Diego Reservoir Communications Design Services	1	D	LS	 	\$
139	238210	South San Diego Reservoir Communications Construction Services	1		LS	 	\$
140	541330	Stonebridge Pump Station #1 Security Design Services	1	D	LS	 	\$
141	238210	Stonebridge Pump Station #1 Security Construction Services	1		LS	 	\$
142	541330	Stonebridge Pump Station #1 Communications Design Services	1	D	LS	 	\$

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
143	238210	Stonebridge Pump Station #1 Communications Construction Services	1		LS	 	\$
144	541330	Stonebridge Pump Station #2 Security Design Services	1	D	LS	 	\$
145	238210	Stonebridge Pump Station #2 Security Construction Services	1		LS	 	\$
146	541330	Stonebridge Pump Station #2 Communications Design Services	1	D	LS	 	\$
147	238210	Stonebridge Pump Station #2 Communications Construction Services	1		LS	 	\$
148	541330	Texas Street Regulator Security Design Services	1	D	LS	 	\$
149	238210	Texas Street Regulator Security Construction Services	1		LS	 	\$
150	541330	Texas Street Regulator Communications Design Services	1	D	LS	 	\$
151	238210	Texas Street Regulator Communications Construction Services	1		LS	 	\$
152	541330	Thorn Street Regulator Security Design Services	1	D	LS	 	\$
153	238210	Thorn Street Regulator Security Construction Services	1		LS	 	\$
154	541330	Thorn Street Regulator Communications Design Services	1	D	LS	 	\$
155	238210	Thorn Street Regulator Communications Construction Services	1		LS	 	\$
156	541330	University Heights Pump Station & Reservoir Communications Design Services	1	D	LS	 	\$
157	238210	University Heights Pump Station & Reservoir Communications Construction Services	1		LS	 	\$
158	541330	Waring Rd Pump Station Communications Design Services	1	D	LS	 	\$
159	238210	Waring Rd Pump Station Communications Construction Services	1		LS	 	\$
160	541330	Black Mtn High Level Site Security Design Services	1	D	LS	 	\$
161	238210	Black Mtn High Level Site Security Construction Services	1		LS	 	\$
162	541330	Black Mtn High Level Site Communications Design Services	1	D	LS	 	\$
163	238210	Black Mtn High Level Site Communications Construction Services	1		LS	 	\$
164	541330	Cowles High Level Site Security Design Services	1	D	LS	 	\$
165	238210	Cowles High Level Site Security Construction Services	1		LS	 	\$
166	541330	Cowles High Level Site Communications Design Services	1	D	LS	 	\$

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
167	238210	Cowles High Level Site Communications Construction Services	1		LS	 	\$
168	541330	Encanto High Level Site Security Design Services	1	D	LS	 	\$
169	238210	Encanto High Level Site Security Construction Services	1		LS	 	\$
170	541330	Encanto High Level Site Communications Design Services	1	D	LS	 	\$
171	238210	Encanto High Level Site Communications Construction Services	1		LS	 	\$
172	541330	Lyons Peak High Level Site Security Design Services	1	D	LS	 	\$
173	238210	Lyons Peak High Level Site Security Construction Services	1		LS	 	\$
174	541330	Lyons Peak High Level Site Communications Design Services	1	D	LS	 	\$
175	238210	Lyons Peak High Level Site Communications Construction Services	1		LS	 	\$
176	541330	Mt Woodson High Level Site Security Design Services	1	D	LS	 	\$
177	238210	Mt Woodson High Level Site Security Construction Services	1		LS	 	\$
178	541330	Mt Woodson High Level Site Communications Design Services	1	D	LS	 	\$
179	238210	Mt Woodson High Level Site Communications Construction Services	1		LS	 	\$
180	541330	San Ysidro High Level Site Security Design Services	1	D	LS	 	\$
181	238210	San Ysidro High Level Site Security Construction Services	1		LS	 	\$
182	541330	San Ysidro High Level Site Communications Design Services	1	D	LS	 	\$
183	238210	San Ysidro High Level Site Communications Construction Services	1		LS	 	\$
184	541330	Security Operations Center (SOC) Headend Upgrades Design Services	1	D	LS	 	\$
185	238210	Security Operations Center (SOC) Headend Upgrades Construction Services	1		LS	 	\$
ESTIMATED TOTAL PROPOSAL (1 THROUGH 185):							\$
ADDITIVE ALTERNATE 'A'							
1	541330	Security Operations Center (SOC) Design Services for Situation Management System	1	D	LS	 	\$

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
2	238210	Security Operations Center (SOC) Construction Services for Situation Management System	1		LS	 	\$
3	541330	Access Control System Upgrades Design Services	1	D	LS	 	\$
4	238210	Access Control System Upgrades Construction Services	1		LS	 	\$
ESTIMATED TOTAL ADDITIVE ALTERNATE 'A' (1 THROUGH 4):							\$
ADDITIVE ALTERNATE 'B'							
1	541330	Security Operations Center (SOC) Design Services for Operator Console Upgrades	1	D	LS	 	\$
2	238210	Security Operations Center (SOC) Construction Services for Operator Console Upgrades	1		LS	 	\$
3	541330	Chollas Operations Yard Security Upgrades Design Services	1	D	LS	 	\$
4	238210	Chollas Operations Yard Security Upgrades Construction Services	1		LS	 	\$
5	541330	65th and Herrick Pump Station Security Upgrades Design Services	1	D	LS	 	\$
6	238210	65th and Herrick Pump Station Security Upgrades Construction Services	1		LS	 	\$
7	541330	Bayview Reservoir Security Upgrades Design Services	1	D	LS	 	\$
8	238210	Bayview Reservoir Security Upgrades Construction Services	1		LS	 	\$
9	541330	Bernardo Heights Pump Station Security Upgrades Design Services	1	D	LS	 	\$
10	238210	Bernardo Heights Pump Station Security Upgrades Construction Services	1		LS	 	\$
11	541330	Black Mountain Reservoir Security Upgrades Design Services	1	D	LS	 	\$
12	238210	Black Mountain Reservoir Security Upgrades Construction Services	1		LS	 	\$
13	541330	Carmel Mountain High Pump Station Security Upgrades Design Services	1	D	LS	 	\$
14	238210	Carmel Mountain High Pump Station Security Upgrades Construction Services	1		LS	 	\$
15	541330	Carmel Mountain High Reservoir Security Upgrades Design Services	1	D	LS	 	\$

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
16	238210	Carmel Mountain High Reservoir Security Upgrades Construction Services	1		LS		\$
17	541330	Carmel Mountain Industrial Pump Station Security Upgrades Design Services	1	D	LS		\$
18	238210	Carmel Mountain Industrial Pump Station Security Upgrades Construction Services	1		LS		\$
19	541330	Carmel Mountain Mall Pump Station Security Upgrades Design Services	1	D	LS		\$
20	238210	Carmel Mountain Mall Pump Station Security Upgrades Construction Services	1		LS		\$
21	541330	Catalina Pump Station Security Upgrades Design Services	1	D	LS		\$
22	238210	Catalina Pump Station Security Upgrades Construction Services	1		LS		\$
23	541330	Climax Pump Station Security Upgrades Design Services	1	D	LS		\$
24	238210	Climax Pump Station Security Upgrades Construction Services	1		LS		\$
25	541330	Deerfield Pump Station Security Upgrades Design Services	1	D	LS		\$
26	238210	Deerfield Pump Station Security Upgrades Construction Services	1		LS		\$
27	541330	Del Cerro Highlands Pump Station Security Upgrades Design Services	1	D	LS		\$
28	238210	Del Cerro Highlands Pump Station Security Upgrades Construction Services	1		LS		\$
29	541330	Del Cerro Pump Station Security Upgrades Design Services	1	D	LS		\$
30	238210	Del Cerro Pump Station Security Upgrades Construction Services	1		LS		\$
31	541330	Del Cerro Reservoir Security Upgrades Design Services	1	D	LS		\$
32	238210	Del Cerro Reservoir Security Upgrades Construction Services	1		LS		\$
33	541330	Eagle Ridge Pump Station Security Upgrades Design Services	1	D	LS		\$
34	238210	Eagle Ridge Pump Station Security Upgrades Construction Services	1		LS		\$
35	541330	Los Penasquitos Pump Station Security Upgrades Design Services	1	D	LS		\$
36	238210	Los Penasquitos Pump Station Security Upgrades Construction Services	1		LS		\$

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
37	541330	Los Penasquitos Reservoir Security Upgrades Design Services	1	D	LS	 	\$
38	238210	Los Penasquitos Reservoir Security Upgrades Construction Services	1		LS	 	\$
39	541330	Mercy Mira Mesa High Pump Station Security Upgrades Design Services	1	D	LS	 	\$
40	238210	Mercy Mira Mesa High Pump Station Security Upgrades Construction Services	1		LS	 	\$
41	541330	Miramar Ranch North Reservoir Security Upgrades Design Services	1	D	LS	 	\$
42	238210	Miramar Ranch North Reservoir Security Upgrades Construction Services	1		LS	 	\$
43	541330	Montezuma Pump Station Security Upgrades Design Services	1	D	LS	 	\$
44	238210	Montezuma Pump Station Security Upgrades Construction Services	1		LS	 	\$
45	541330	Penasquitos Bluffs #8 Pump Station Security Upgrades Design Services	1	D	LS	 	\$
46	238210	Penasquitos Bluffs #8 Pump Station Security Upgrades Construction Services	1		LS	 	\$
47	541330	Point Loma Reservoir Security Upgrades Design Services	1	D	LS	 	\$
48	238210	Point Loma Reservoir Security Upgrades Construction Services	1		LS	 	\$
49	541330	Pomerado Park Reservoir Security Upgrades Design Services	1	D	LS	 	\$
50	238210	Pomerado Park Reservoir Security Upgrades Construction Services	1		LS	 	\$
51	541330	Rancho Bernardo Industrial Pump Station Security Upgrades Design Services	1	D	LS	 	\$
52	238210	Rancho Bernardo Industrial Pump Station Security Upgrades Construction Services	1		LS	 	\$
53	541330	Rancho Bernardo Reservoir Security Upgrades Design Services	1	D	LS	 	\$
54	238210	Rancho Bernardo Reservoir Security Upgrades Construction Services	1		LS	 	\$
55	541330	Rancho Penasquitos Pump Station Security Upgrades Design Services	1	D	LS	 	\$

BIDDING DOCUMENTS

Item No.	NAICS CODE	Description	Quantity	D*	Unit	Unit Price	Amount
56	238210	Rancho Penasquitos Pump Station Security Upgrades Construction Services	1		LS	 	\$
57	541330	San Carlos Reservoir Security Upgrades Design Services	1	D	LS	 	\$
58	238210	San Carlos Reservoir Security Upgrades Construction Services	1		LS	 	\$
59	541330	Scripps Ranch Reservoir Security Upgrades Design Services	1	D	LS	 	\$
60	238210	Scripps Ranch Reservoir Security Upgrades Construction Services	1		LS	 	\$
61	541330	Soledad Reservoir Security Upgrades Design Services	1	D	LS	 	\$
62	238210	Soledad Reservoir Security Upgrades Construction Services	1		LS	 	\$
63	541330	South San Diego Reservoir Security Upgrades Design Services	1	D	LS	 	\$
64	238210	South San Diego Reservoir Security Upgrades Construction Services	1		LS	 	\$
65	541330	University Heights Pump Station & Reservoir Security Upgrades Design Services	1	D	LS	 	\$
66	238210	University Heights Pump Station & Reservoir Security Upgrades Construction Services	1		LS	 	\$
67	541330	Waring Rd Pump Station Security Upgrades Design Services	1	D	LS	 	\$
68	238210	Waring Rd Pump Station Security Upgrades Construction Services	1		LS	 	\$
69		Erosion Control	1		AL	 	\$5,000.00
70	561730	Foliage Control at all Sites	1		LS	 	\$
71	238210	3-Year Maintenance Contract for New Security Sites Only	1		LS	 	\$
72	238210	3-Year Maintenance Contract for Communications System	1		LS	 	\$
ESTIMATED TOTAL ADDITIVE ALTERNATE 'B' (1 THROUGH 72):							

BIDDING DOCUMENTS

*** Design Element (For City Use)**

Total Bid Price, (Items 1 through 185 inclusive) amount written in words:

Design-Builder: _____

Title: _____

Signature: _____

The names of all persons interested in the foregoing proposal as principals are as follows:

BIDDING DOCUMENTS

IMPORTANT NOTICE: If Bidder or other interested person is a corporation, state secretary, treasurer, and manager thereof; if a co-partnership, state true name of firm, also names of all individual co-partners composing firm; if Bidder or other interested person is an individual, state first and last names in full.

NOTES:

- A. The Contract Price to be used in the selection process as described in Section 5.6 of the RFP will be determined by the City based on the Base Bid alone.
- B. After the selection has been made, the City may award the Contract for the Base Bid alone or if applicable, for the Base Bid plus any combination of alternates selected in the City's sole discretion.
- C. Prices and notations shall be in ink or typewritten. All corrections (which have been initiated by the Bidder using erasures, strike out, line out, or "white-out") shall be typed or written in with ink adjacent thereto, and shall be initialed in ink by the person signing the Proposal.
- D. Failure to initial all corrections made in the bidding documents shall cause the Proposal to be rejected as **non-responsive** and ineligible for further consideration.
- E. Blank spaces must be filled in, using figures. The Design-Builder's failure to submit a price for any Bid item that requires the Design-Builder to submit a price shall render the Proposal **non-responsive** and shall be cause for its rejection.
- F. Unit prices shall be entered for all unit price items. Unit prices shall not exceed two (2) decimal places. If the Unit prices entered exceed two (2) decimal places, the City will only use the first two digits after the decimal points without rounding up or down.
- G. All extensions of the unit prices bid will be subject to verification by the City. In the case of inconsistency or conflict between the product of the Quantity x Unit Price and the Extension, the product shall govern.
- H. In the case of inconsistency or conflict, between the sums of the Extensions with the estimated total Bid, the sum of the Extensions shall govern.
- I. Proposals shall not contain any recapitulation of the Work. Conditional Bids will be rejected as being **non-responsive**. Alternative proposals will not be considered unless called for.
- J. The Proposal shall contain an acknowledgment of receipt of all addenda as specified in the RFP. Failure to acknowledge addenda shall render the Bid **non-responsive** and shall be cause for its rejection.

City of San Diego



ADDENDUM "8"

REQUEST FOR PROPOSAL (RFP)

FOR WATER DEPARTMENT SECURITY UPGRADE DESIGN-BUILD CONTRACT

RFQ NO.: Security Upgrades for the City of San Diego Design-Build Contract 5171
BID NO.: K-12-5463-DBA
RFP NO.: 5463
TASK ORDER NO.: 1
WBS NO.: S-11105, S-11107
CLIENT DEPARTMENT: 2013
COUNCIL DISTRICT: CITYWIDE
PROJECT TYPE: BL, BJ

REQUEST FOR PROPOSAL (RFP) DUE:

12:00 Noon

DECEMBER 15, 2011

CITY OF SAN DIEGO

Public Works Contracting Group

1200 Third Avenue, Suite 200, MS 56P

San Diego, CA 92101

CHANGES TO CONTRACT DOCUMENTS

The following changes to the RFP are hereby made effective as though originally issued with the bid package. All prospective bidders are reminded that they are required to acknowledge receipt of this addendum in their submittal in accordance with ATTACHMENT B, Item 1 of the Request for Proposals.

A. QUESTIONS AND ANSWERS

Q1. I have a quick question regarding the bid documentation. On Page 392 of the RFP as well as page 13 of addendum 1, under Subcontract Award Summary item # 2 refers to Forms AA35 and AA40 that need to be submitted as part of the bid. I could not locate either of these forms within in the documentation provided. Can you please tell me where these are located?

A1. The call out for form AA35 should be for form AA15. The call out for form AA40 should be for form AA30. These documents are located on page 465 and 469 of the RFP, and are listed in the *Table of Contents* on page 436 of the RFP.

B. CHANGES TO THE REQUEST FOR PROPOSALS

1. To Addendum 1, Item C6, Contract Front End Volume 1, Special Notice, Section D Subcontract Award Summary, Subsection 2, page 13 of 15, **DELETE** in its entirety and **SUBSTITUTE** with the following:

2. Copies of all Subcontractors or Suppliers bids received including bids for areas of work that were not included in the outreach and quotes from both certified and non-certified Subcontractors or Suppliers. Subcontractor bid amounts **MUST** match the bid-listed dollar amounts on form AA15 and AA30 submitted with Bidders sealed bid and the summary sheet dollar amounts **MUST** also match these amounts. If the Bidder decides to self-perform a scope of work, the Bidder **MUST** submit a detailed quote to show that the Bidder's price is competitive to the price of the subcontractors that responded to outreach efforts. All dollar amounts and scopes of work on the Subcontractor or Supplier bid must not be altered by the prime Bidder. If a revision is necessary, a revised quote must be obtained and provided. All verbal quotes **MUST** be substantiated by corresponding written quote from the Subcontractor or Supplier.

Tony Heinrichs, Director
Public Works Department

Dated: December 13, 2011
San Diego, California

TH/cg/bd/rir



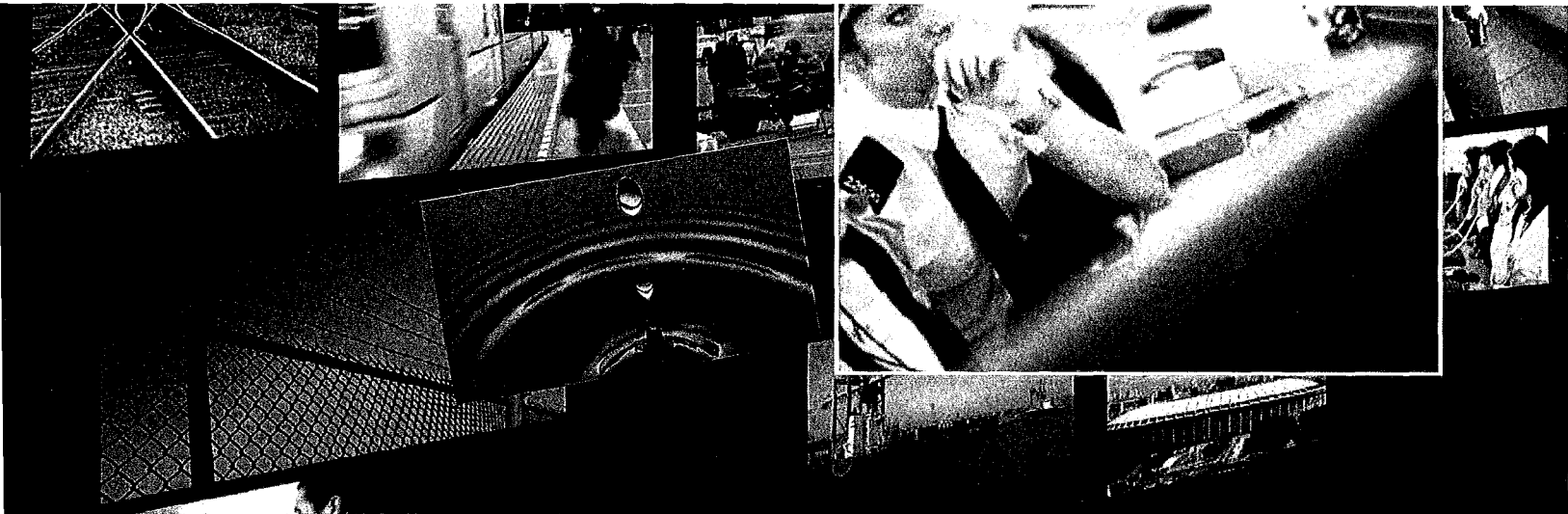
ORIGINAL
Technical Proposal 1 of 7

SIEMENS

Siemens Industry, Inc.

The City of San Diego: Water Department Security Upgrades

Design-Build Contract



TECHNICAL PROPOSAL

CONFIDENTIAL

SIEMENS

TECHNICAL PROPOSAL:
CONFIDENTIAL

Siemens Industry, Inc.

City of San Diego: Water Department Security Upgrades

Design-Build Contract

Presented To:



THE CITY OF SAN DIEGO

RFQ NO.: Security Upgrades for The City of San Diego Design-Build Contract 5171
BID NO.: K-12-5463-DBA
RFP NO.: 5463

SIEMENS

City of San Diego Water Department
Security Upgrades Design Build Contract

December 15, 2011

John Stohr
City of San Diego
600 B Street, Ste 800
San Diego, CA 921001 MS No.908A

Mr. Stohr:


Thank you for the opportunity to respond to the City of San Diego's "Request for Proposal: Water Department Security Upgrades Design Build Contract." Siemens Industry, Inc. is committed to providing organizations like the City of San Diego with professional products, services and people to meet your most pressing business objectives.

The following response document presents our detailed program qualifications, systems solution and the Siemens approach. Our team of qualified professionals includes our San Diego based staff, as well as local business partners that will assist in meeting City EOCP objectives, and contribute to the quality of the program's delivery. We look forward to further discussing your expectations and presenting our solution approach during the presentation phase and we remain confident that you and your team will find Siemens the smart business choice and an exceptional partner for this program.

Should you have any questions or comments, please contact your local Siemens representative, Michael Dietsch at 619-865-7609 or michael.dietsch@siemens.com.

Siemens respectfully submits our proposal and supporting information, of which we believe to be accurate and truthful. The following response and our pricing proposal shall remain valid for the duration of the program and we look forward to all future discussions and opportunities with you and your team.

Respectfully,



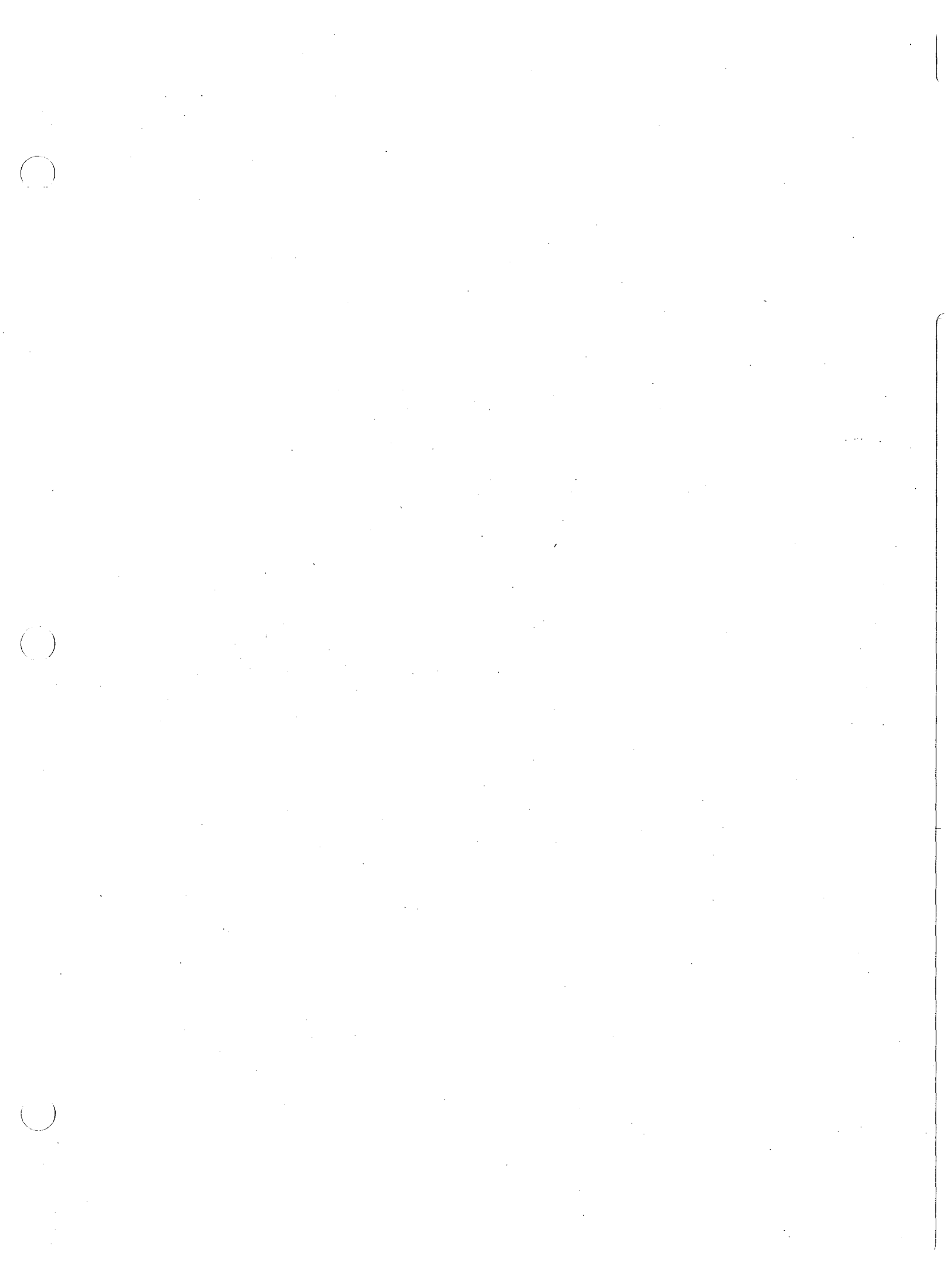
Eric Ackermann 12/15/2011

Area Sales Manager
Southern California
Siemens Industry, Inc.
Building Technologies

Legal Form of Company: Siemens Industry, Inc. is a corporation. Siemens was incorporated in the state of Delaware on November 28, 1972 under the name of Amerogy, Inc. Siemens Industry, Inc. has been in business in North America for over 100 years. We are pleased to advise you that we are a wholly owned subsidiary of Siemens Corporation. Siemens is licensed to do work in all 50 states. Siemens' contracting license for the State of California is #758796, Dun & Bradstreet is 01-094-4650 and our Federal Tax ID is 13-2762488.

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ADDENDA TO THIS RFP

Siemens Industry, Inc acknowledges all addenda:

- Addendum One: October 13, 2011
- Addendum Two: October 28, 2011
- Addendum Three: November 4, 2011
- Addendum Four: November 17, 2011
- Addendum Five: November 28, 2011
- Addendum Six: November 30, 2011
- Addendum Seven: December 6, 2011
- Addendum Eight: December 13, 2011

EXCEPTIONS TO THIS RFP

EXCEPTIONS TO THIS RFP

Siemens has no exceptions to the RFP documentation. Siemens' technical proposal and detailed response shall outline all assumptions, clarifications and limits of work, as interpreted by the RFP documents, addenda and existing City of San Diego Water Department working environment.

EXECUTIVE SUMMARY

The Siemens solution significantly improves the security posture of The City of San Diego Water Department by incorporating a layered security design of physical fence enhancements, advanced detection technologies and aggregating software platforms. The systems utilize a wireless infrastructure for communicating to the Water Department's Security Operations Center. Operator efficiency, increased detection capabilities and reduced response and resolution times will be realized through the implementation of NICE's Situater (Situational Management Software) and will provide a scalable, technical baseline for future city-wide security enhancements. The Siemens team is comprised of best-in-class wireless and security integration, design and integration professionals experienced in each specified subsystem, including NICE Vision, NICE Situater, Software House CCURE9000, and the Motorola PTP and PMP microwave solutions.

The Siemens technical approach and design concept provides the City of San Diego with a complete and comprehensive end to end solution for management and administration of security for the Water Department facilities. This proposal is 100% compliant with the requirements set forth in the request for proposal and addendums. Our qualifications as a systems integrator for this intricate design-build, software and security program are irrefutable as seen through our project references and project team resumes. We understand this program is not a construction project, rather an information technology deployment of sophisticated interdependent communications infrastructure and software based security platforms that require the highest of technical skill and integration experience. We are confident you will find the Siemens team to be the most qualified, the most skilled and holding the most experience; ready to successfully complete this extremely fluid design-build program.

Leadership and Experience: Siemens' Program Manager will be Bruce Becker, PMP. Bruce brings over 20 years of complex integration project management, including the Design-Build "Security Technology Enhancement Program (STEP)" at the San Diego International Airport in 2009. The program included the design and deployment of a NICE Vision video management system and a Situational Management System (Proximex). Bruce's team includes Jason Knox, Solutions Architect, Eric Pearson, Project Manager, and Daron Moody, Technical Lead, all part of the San Diego Airport project and each NICE certified and intimate with the products and

Bruce Becker led the Siemens design-build program at San Diego Airport, delivering an integrated NICE VMS and SMS.

specific details for successfully deploying them. Siemens has augmented its internal team with local business enterprises that bring unique and significant value to the team, including meeting the City's EOCP contracting goal of 25%. Netlogix, for instance, provides in-depth and specialized knowledge in wireless design and IP video over wireless, a significant detail in this program. Netlogix successfully worked with the City's Communications Department under Project NOMAD. Bruce and his entire team have the know-how and experience to lead the project to successful completion, on time and on budget.

Design-Build Approach: The Siemens technical approach centers on the design build delivery process and the life cycle needs of the final system. As a technology integrator and not a general contractor, our internal team of experts will openly provide input to the City's management team to achieve the best results, now and for the systems future. Locally based, Siemens engineer's

and program manager's, as subject matter experts, eliminate the typical delays and communications gaps experienced in traditional design-bid-build programs where the contractors must communicate between design engineers, end users, project management and then

Siemens' technical approach ensures a collaborative process and accelerated delivery schedule that eliminates changes and lowers costs.

their subcontractors. It is our expectation that Siemens' design build approach will provide for a 30% reduced delivery schedule for this project over a traditional contractor's approach and our collaborative methodology will eliminate the costly overages and changes that traditional general contractors attempt to capitalize on.

Our design incorporates AECOM recommendations, project budget, environmental conditions, functional and non-functional requirements, as well as the Water Department's current operations and need for lifecycle support. We have provided an innovative solution that incorporates both protection technology and operational readiness requirements. Furthermore, and uniquely, Siemens is manufacturer certified on each subsystem (Motorola P2P, PMP Microwave radio systems; NICE Vision 2.5 (VMS); Bosch and Pelco video camera sensors; NICE Situator (SMS); Software House CCURE 9000 Access Control System (ACS)). With no subordinate contractor to coordinate through, the Water Department will have a single point of contact for all system support, training, maintenance, repair and expansion, long after the initial project delivery. Our team will provide a dedicated local team of factory trained engineers and technicians in support of this program.

IP Video over Wireless Expertise: IP video over wireless networks demands expertise in IT, RF AND Surveillance. Failure to understand and anticipate the implications of video over wireless has been and will continue to be the weak link in wide area surveillance deployments, like this project. Siemens will partner with Netlogix and Athenx for the design, testing and deployment of the wired and wireless network. Integration of the wireless communications with the NICE video management solution

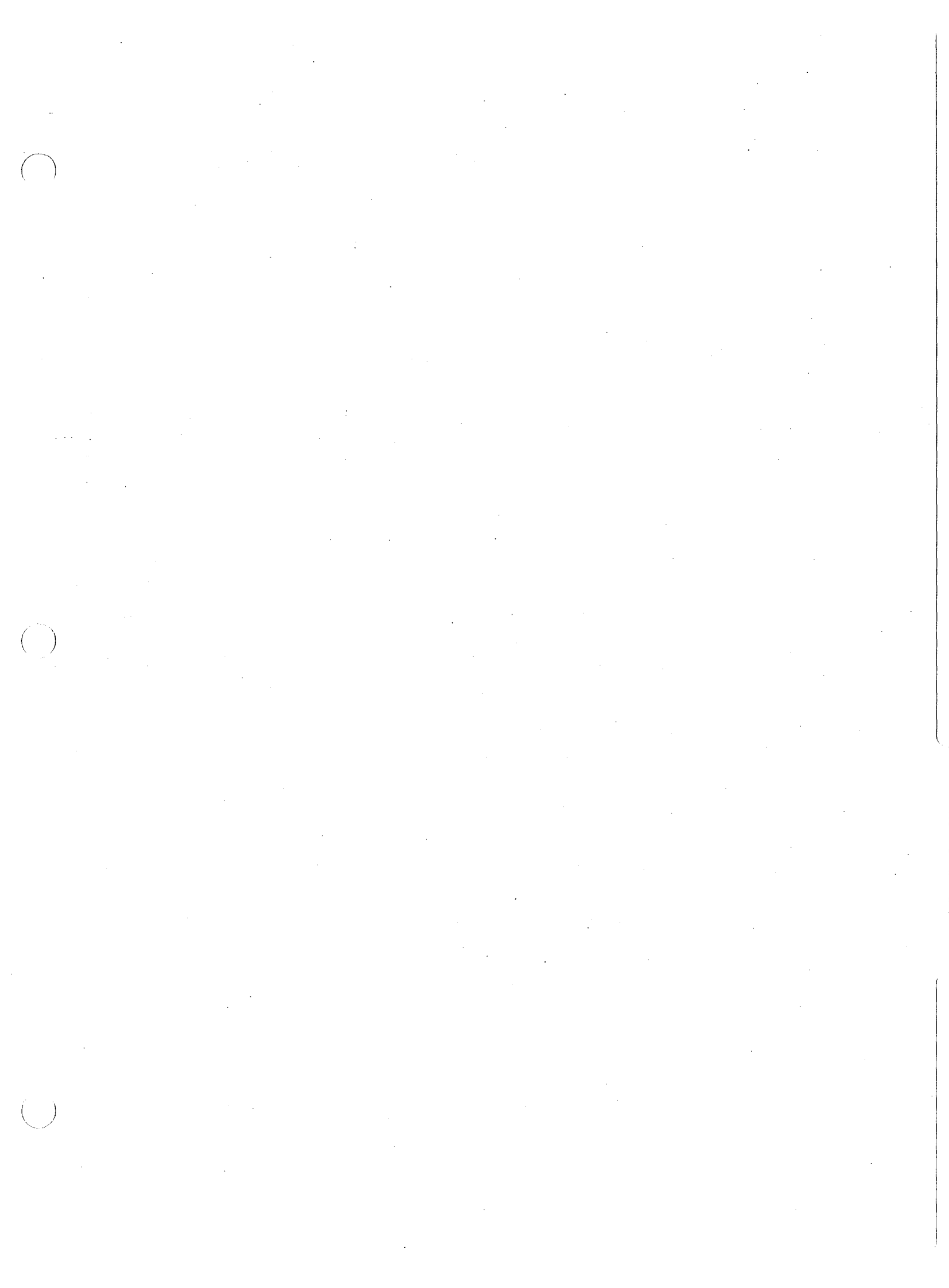
“(Wireless) deployments are especially hard because they demand expertise in surveillance, IT and RF... have problems in any one of these areas and the likelihood that your system fails increase greatly.” -IPVideoMarket.info (January 2011)

is the lynchpin for this projects success and the Siemens team, as a design build team, is solely qualified to successfully complete this project.

Extended Performance/ Lifecycle Program:

The Siemens lifecycle program provides the Water Department with a single communication mechanism for operational and maintenance support for the post acceptance contract period. Our program will provide same day service for all emergency repair requests and will include a preventative maintenance program that will extend the lifespan of the installed technologies, thus protecting the investment of the City in this program. Siemens' "Advantage Services" will reduce equipment downtimes and a program for on-going training, support and systems maintenance.

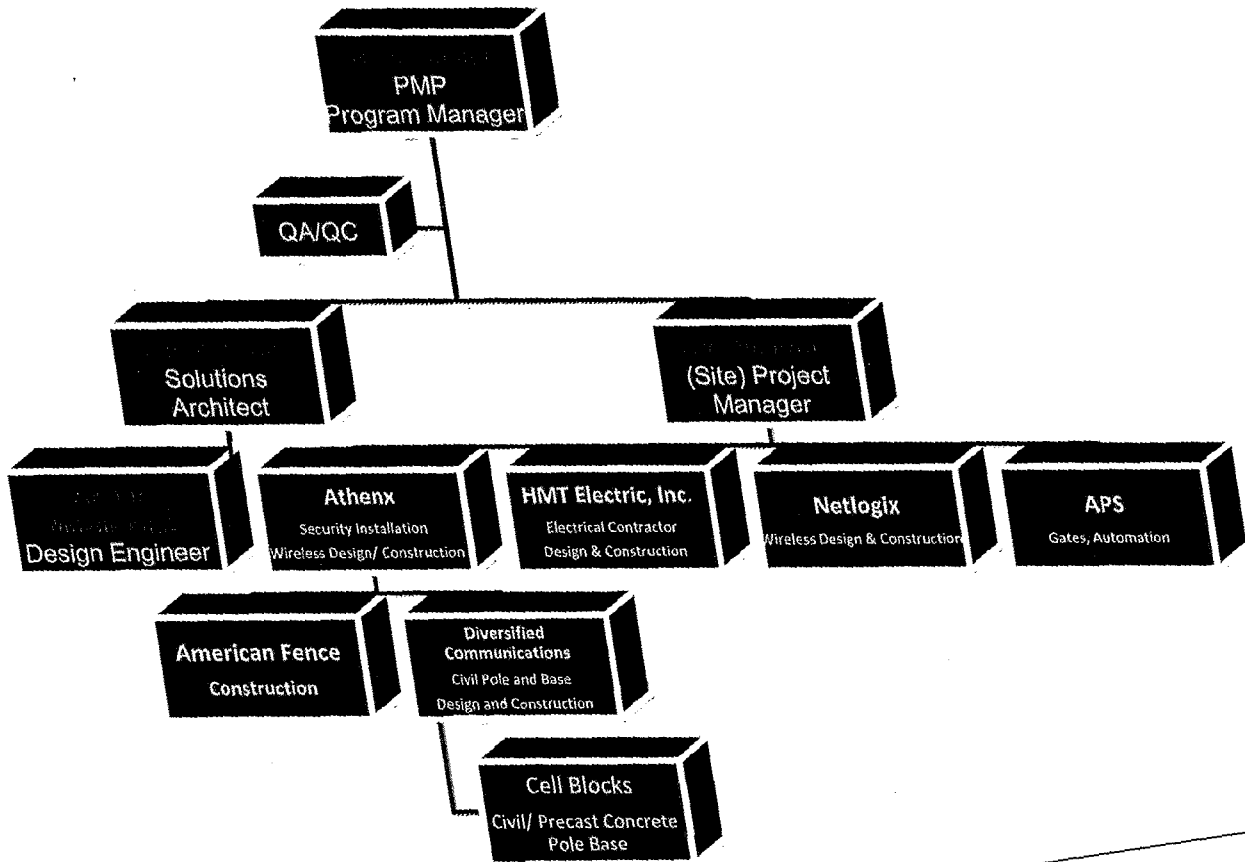
Siemens has the resources, the processes and the innovation to solve The City of San Diego most pressing security and business challenges. Our team is assembled and prepared to mobilize to meet the city's scheduling requirements and we are confident you will find Siemens Industry, Inc. a strong partner and a smart business choice.



SIEMENS

PROJECT TEAM

The Siemens team is experienced, trained and knowledgeable in the deployment of both wireless communications infrastructure and advanced security system software. Siemens is a world class integration and engineering company and is supported by a 200 person local San Diego Branch Office in Scripps Ranch, San Diego. Our local team is manufacturer certified and has experience in deploying these systems at multiple facilities.



Siemens' Project Management Approach is based on years of sophisticated integrated systems Design Build experience- project management, design, planning, integration, construction, commissioning and maintaining. For this project, Siemens will rely on our proven project delivery model and ensure a successful project, within budget, on time and meeting the business objectives of the city.

Siemens invests significantly in the development of their program managers (as well as account engineers and project managers), and to this end, Siemens worldwide has implemented a program, PM@Siemens, which is designed to enhance these skills through certification and training. Project Management is the process of conceiving, initiating, planning, scheduling, and controlling activities and resources to meet an objective or deliver a solution. Program managers

are responsible for implementing best practices through the lifetime of the project and overall project quality. By providing a highly trained and skilled service organization representative to our clients, we are able to translate larger business and program goals for the entire enterprise, while managing the minutia and operational business at a building or facility level.

Program Manager: Bruce Becker, PMP, is the Siemens Program Manager (PgM), reporting to the City's John Stohr and will institute the policies and features of the Siemens Management Program. Bruce is responsible for all aspects of the coordinated support for the program and will lead the Siemens team by utilizing a proactive management approach, utilizing the standards, processes and techniques that are developed as part of the extensive Siemens global project management process. He is responsible for all aspects of the program, from QA/QC, to all planning (scheduling), infrastructure design (administrative and technical), governance of the roles and responsibilities and financial management. Most importantly, he is responsible for the management of the overall program, design through construction, including the individual projects (site by site). For these individual scopes, Siemens utilizes project managers, responsible for the financial and performance results of these particular projects, such as individual reservoirs, pump station locations and regulators. This is extremely important to the design build process, where some sites may require differing designs, lagging schedule or coordinated in a different manner due to stakeholders (high sites, for instance).

Solutions Architect (Design and Application Engineering): Jason Knox is the Siemens Solutions Architect for this project. Jason will provide several important functions, managing all aspects of the programs design, documentation and records management. Siemens' engineers are highly trained technical resources for all systems. Many are part of the professional services group that assists large installations, complicated software support, IT network support and custom programming development. More importantly, though, Design Engineers are the applications engineering support for all new programs. For this program, Jason is tasked with the development of the best solution, considering technologies, infrastructure, equipment and installation costs and will manage all aspects of the design process, including all subject matter experts, applications engineers, software engineers and network engineers. The solutions architect participates in the preparation and presentation of technical proposals, including product demonstrations and product prototypes and is responsible for detailed system architecture and equipment location schematics for acceptance by our clients. Utilizing in-house engineers, Siemens will prepare all designs and proposals utilizing CAD formatted drawings and submitted for approval, as appropriate during the program.



For this project, Siemens will utilize the same project management and technical team that successfully designed and deployed the San Diego International Airport's NICE Vision system and Situational Management Platform (completed in 2009).

Project Manager (PM): Eric Pearson is the Project Manager for this program and will be responsible to Bruce Becker, PgM. Unlike the PgM who will be responsible for all projects, parallel and linear, the project manager is responsible for a finite scope of work, defined over time and by a precise deliverable. The project is an integral part of the overall "Program" and therefore, the PM is responsible to the PgM for all reporting and communication purposes, but provides the expertise and knowhow of the individual project at hand. All subcontractors, Siemens installation team and manufacturing partners will coordinate and report through the individual project manager for a given reservoir, pump station or regulator facility. Siemens has identified Eric Pearson as a project manager for the program. Eric brings the expertise and local knowledge for executing this program and has worked with the Siemens project team (Bruce Becker, Jason Knox) multiple times on projects of similar scope, size and complexity, including the San Diego Airport. At San Diego, Eric provided detailed installation support, programming and commissioning services in the implementation of a NICE Vision video management system. Eric understands the complexities of this system, its deployment requirements and the processes to maintain the schedule and deliver a solution on time and within the budget.

Installation Technicians: The installation technicians will take direction from the Project Manager and are responsible for all field activities, testing, skilled installation tasks and level one programming. Siemens Installation Technicians are skilled in performing the required services necessary in turn-key design build security integration programs and are factory trained to perform diagnostic testing on all equipment specified for this project. Technicians also provide post acceptance support for the program. This is a tremendous value, as Siemens technicians become familiar with City processes, personnel and systems, reducing risk and downtime during service. Siemens will provide installation technician labor, as required for this project, utilizing the deep pool of resources from the Southern California Regional Offices (over 20+ factory trained technicians), but have assigned Daron Moody as the Technical Lead. Daron is NICE certified, trained and skilled. He has successfully supported multiple large video and situational management platform projects in San Diego, including:

San Diego Airport: All programming, commissioning, testing, training and maintenance of the NICE Vision video management system. Daron provided design support, installation and programming of the Airport Security LAN.

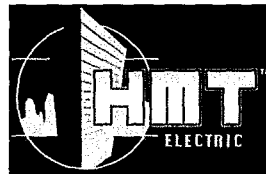
Port of San Diego: Provided on-going maintenance of the wireless network, camera systems and head-end workstation and analytics platform for the three year program.

Technician tasks may include:

- › Site Assessments, investigation, photo's and surveys
- › Wireless testing and modeling
- › Design schematic modeling
- › Camera installation and terminations
- › Camera adjustments, focusing, optimization
- › Network switch installation
- › Server installation
- › Software programming
- › Database configuration
- › Acceptance Testing
- › Power supply installation, terminations
- › UPS installation, testing
- › Testing, training, support and servicing
- › Emergency response and maintenance services

Features of Siemens Program Management Methodology:	City of San Diego Benefits:
Distinct Lines of Communication: Streamlined organization with communication up and down the corporate structure; easy and rapid access to high-level corporate support when required	Personnel and resources needed to accomplish work are readily available and issues are resolved efficiently
Distinct Lines of Authority: Flat project organization. Project Manager has authority to commit corporate resources as required to support the The City's program.	Rapid application of resources across multiple tasks Direct and immediate problem resolution and resources to maintain schedule.
Progress Reporting: Project milestones established to help monitor and report progress. Task leads report progress to the PM, who provides consolidated project status reports to Project Management Team Weekly status reports Monthly monitoring of program status via In-Progress Reviews presented to the the city management team	Project proceeds on schedule, quality is assured, and deliverables are on time Keeps The City of San Diego Project Team fully informed
Subcontractor Management: Comprehensive procedures seamlessly integrate each subcontractor into the task organization, and track the quality of performance.	Consistent accountability for contract performance. Minimal pass-through costs for significant cost savings.
Risk Management and Problem Escalation: Fully documented policies, methods, and procedures with established escalation procedures and levels of authority.	Early risk identification and mitigation reduce project risk. Problems are resolved at the lowest level possible.
Program Management Plan (PMP): A documented and audited methodology follows our ISO 9001:2000-compliant standard operating procedures.	Quality, reliability, and successful completion of solutions and deliverables across multiple complex tasks. Continuous process improvement refines approaches based on "lessons learned" and specific program needs.
Focus on Quality: A "Quality Management System" based on established corporate-level metrics (Balanced Scorecard), personal accountability of each team member for quality management, and oversight at the project and task level in addition to independent quality reviews by our QA Manager.	Services consistently exceed requirements, delivered on time and within budget. Program quality metrics implemented and achieved; consistent senior management oversight and support. Continuous quality loop to improve performance and customer satisfaction.

The Siemens Team:



Wireless Microwave Communications System Supplier:

NetLogix has designed and implemented wireless broadband networks and application-rich solutions for some of the largest telecommunications carriers, systems integrators, and government agencies in the world. By leveraging NetLogix' expertise in providing advanced solutions over wireless Networks, and Siemens expertise in security systems integration, we are confident we can supply the network and public safety applications the City of San Diego requires.

The team at NetLogix has been a part of the Public Safety & Municipal Wireless industry since Citywide WiFi & WiMAX networks were first deployed. These projects helped NetLogix quickly develop a reputation in the Municipal Broadband industry as the leader in wireless broadband "know how".

The major components necessary for successful wireless broadband network implementation are a carefully structured implementation plan, a well architected network, detailed channel planning, and a properly developed network management system. NetLogix's primary focus is to provide client services which address each of those network layers to the end of monitoring and maintaining the health of the client's network(s).

The core of NetLogix's expertise is based upon a foundation of global telecommunications and cellular experience earned while working with top-tier carriers and government agencies. Our intimate involvement with the implementation of carrier-class infrastructures provides us with a foundation that cannot be attained without hands-on participation. Our in-depth knowledge of existing and emerging telecommunications systems dramatically sets us apart from other carrier outsource service companies.

In partnership with the City's Communications Department , as part of Project NOMAD, Netlogix built a specialized wireless relay trailer so that San Diego Police department Nomadic Command Vehicles would have remote broadband access to the 3Cs network.

Most notably, the company directors at

NetLogix have decades of experience working in mission critical environments where constant uptime is mandatory. Possessing rare proficiency in the blend of RF and IP networks, the NetLogix Team has played senior roles in the following wireless industry achievements:

NetLogix Team Achievements

- ▶ Deployed 1st CDMA network in the world (AirTouch, Korea)
- ▶ Deployed 1st GSM network in the world (AirTouch, Germany)
- ▶ Deployed 1st PCS market domestically (SprintPCS, USA)
- ▶ Deployed one of the 1st national licensed wireless broadband networks (Clearwire)
- ▶ Deployed one of the 1st unlicensed wireless broadband networks (SkyRiver Communications)
- ▶ Deployed one of the 1st citywide WiFi mesh networks in the world (Cerritos, CA)
- ▶ Deployed 1st mobile WiFi network in the world (Cerritos, CA)

NetLogix' approach is unique in that they offer "Complete Lifecycle Management Services". This means that they have the ability to provide services that cover the entire lifecycle of a

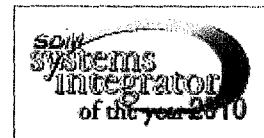
wireless broadband and application-based project. Their functions span all aspects of both network engineering – including initial design and technology selection – and network implementation and management – including system deployment and optimization, applications integration, and the ongoing operations and maintenance. Netlogix uniquely provides end to end solutions that are unequalled in this industry.

Siemens has partnered with NetLogix as its communications partner because integration of video over wireless is not trivial. Not only does the communications network need to be properly installed commissioned and tested, but it needs to be properly optimized to handle video transmission; and NetLogix has experience in doing exactly that. The NetLogix model centers on cost-justifiable applications over wireless broadband networks: video surveillance integration, gunshot detection systems, and state-of-the-art sensor recognition products. As a vendor agnostic company, NetLogix is completely unbiased to a specific vendor's technology. NetLogix believes in complimenting their experience with just about every wireless broadband technology platform available today, assuring their clients have the best solution possible.

Security Integrator:

Siemens will provide primary design and integration responsibility of the security systems utilizing in-house engineering and support staff. Siemens will supply all equipment for installation and will partner with Athenx, Inc. for the installation and field testing of designed systems. Athenx will provide installation of Cameras, Card Readers, Panels, Power Supplies, Racking/ Enclosures, Solar Arrays, Motion Detectors and IR Illuminators. Siemens will furnish and install all software and head-end equipment.

Siemens Industry, Inc. winner of the SDM Security Systems Integrator of the Year award, with over 69,000 employees positioned in 90 locations throughout North America, is able to provide customers with a range of technologies and service solutions. Siemens has become a leader in public safety systems integration by selecting the best technologies and service solutions to help our clients succeed in a very challenging business environment.



Siemens provides world-class research and innovation to help solve our customer's biggest challenges. Our innovations are produced by over 32,000 research and developers, who are working on new solutions for industry, energy and healthcare – and by over 1,000 new research partnerships which Siemens enters into every year. These innovations lead the way for next generation technologies to enhance existing security infrastructures and improve performance at highly secured facilities.

Siemens commitment to its customers is underscored by its current number one ranking in the 2010 Dow Jones Sustainability Index. The Company received an extremely rare maximum rating of 100 percent for "Risk & Crisis Management" and in 2009 improved its year-over-year rating from 0 to 93 percent for "Codes of Conduct/Compliance." For over 162 years, Siemens has built a solid foundation and industry reputation for leading-edge technology innovation and the quality of its products and services.

Athenx is a San Diego based Small Local Business Enterprise, Surveillance and Incident Management provider. They specialize in engineering and integration of disparate sensor technologies and Incident Management Systems to support the Department of Defense,

Department of Homeland Security, Anti-Terrorism Force Protection, Law Enforcement and Public Safety Agencies.

Civil Design and Construction:

Siemens has partnered with multiple partners for site and civil engineering and construction. The following companies are responsible for differing aspects of the Siemens solution.

Diversified Communications Service (DCS) has served the wireless community for over 25 years and brings the knowhow and experience to complete the monopole design and installation services required for this project. DCS will be responsible for all base design, site improvements and installation of Cell Blocks and Monopoles, per Siemens design. DCS brings a fleet of support, including 43 vehicles, including bucket trucks, hoists, cranes and flatbeds for delivery of site infrastructure equipment. DCS maintains industry certifications in the following products: Alcatel Lucent, Agilent, Motorola, Harris Microwave. Diversified shall be contracted with Athenx, Inc.

Hope Engineering, Inc. is a professional structural consulting engineering firm that will assist in all structural design and architecture. Hope is a locally based engineering firm serving San Diego for over 70 years.

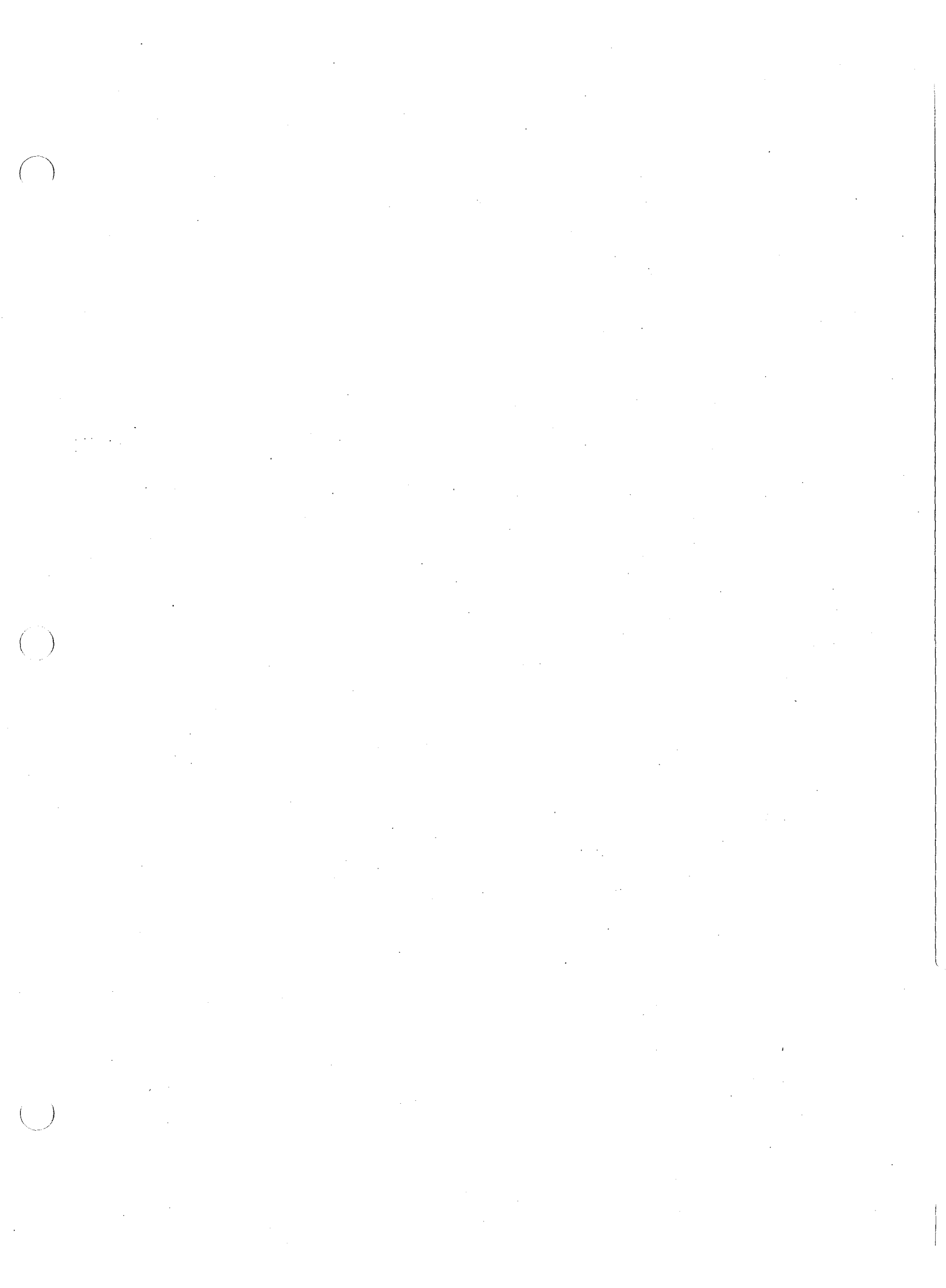
Cell Blocks, Inc. engineers and manufacturers Cell Blocks, a foundation system made from individual precast concrete blocks that are assembled in various configurations and post-tensioned providing a foundation for a monopole and equipment. Cell Blocks provides a solution that will eliminate time and costs for site preparation, inspection, digging and concrete pouring to accommodate monopole installation (at select sites). Siemens has identified that Cell Blocks will provide a significant schedule reduction due to the fact that multiple poles and sites can be erected in a single day. Cell blocks shall be contracted with Athenx, Inc.

American Fence has been professionally installing fences for over 60 years. American Fence will provide all mesh and wrought iron fence design, installation and hauling of old materials for this project. American Fence shall be contracted with Athenx.

Access Professional Systems is a security, gate and parking automation company specializing in gate operator and control integration. APS will provide installation services for all automated gates, locking hardware at gates and card reader pedestal installation.

Electrical Design and Construction:

HMT Electric, Inc. will provide all electrical contracting services for the program. Siemens and HMT have a long history of collaboration and partnership. In partnership with HMT's founder and President, Brian Hudak, we have completed over 12 high rise buildings in Southern California. HMT will provide all lighting upgrades, conduit, power connectivity, cabling, terminations, trenching and backfilling. HMT will be responsible for all engineering and permitting costs for their scope of work.



TECHNICAL APPROACH AND DESIGN CONCEPT

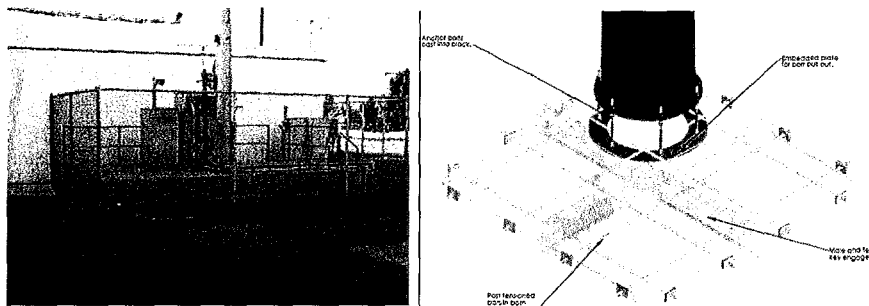
The Siemens design is cost effective, repeatable and dependable and is based on four primary technology platforms, NICE Vision VMS, NICE Situater, Software House CCURE 9000 and Motorola wireless systems. Our design provides state of the art technology that will detect human sized intrusion within the perimeter barriers of the facilities, specifically fence lines and provide a wireless network that brings connectivity to all facilities, thus relieving the city of costly leased line services. Our team has inspected each site with RF engineers, security engineers, our electrical contractor and civil contracting partners. Our solution is customized for the environment of each facility and our design is based on our experience in designing and executing projects of similar requirements and technologies.

Overview:

The Siemens technical approach and design concept centers on Innovation, Process and Collaboration. We have used this methodology to design a COTS solution that meets the city's functional requirements and limits the risk to the schedule. These principles have made Siemens a successful design-build partner for municipalities and cities including Chicago, San Diego International Airport, The Port of San Diego, John Wayne Airport and the City of Los Angeles.

As with other highly technical IT implementations, our approach will center on strong technical design, testing and experienced deployment professionals. The Siemens approach includes in house engineering and design resources from our San Diego branch office. Each design engineer, project manager and technical resource is certified by the manufacturer in support of the products. Upon completion of design and approval by the City's project team, Siemens will conduct all unit and systems testing at our San Diego Logistics, Testing and Training facility. The testing process will ensure a streamlined and predictable installation process, as well as provide the end user and its operators a chance to be familiarized and trained with the equipment in the test environment.

The installation of the systems and supporting infrastructure will be executed by experienced civil contractors and electricians. Siemens has provided an innovative mounting solution for some locations. Cell Blocks are site specific engineered pre-cast concrete base structures for use with monopoles. The advantage of the cell blocks solution is that no penetrations in the asphalt, concrete or soils is required. Cell block installation provides for a quicker installation, flexible design and location of poles, as well as reduces the risk of redesign due to potential utility disruption at the preferred pole location. Cell blocks are engineered to specific pole, sail and weight requirements during the design phase of work and Siemens has identified several locations where they are appropriate.



Cell Blocks

NICE®

NICE Vision Video Management System: The Siemens team has based our design on the NICE Vision video management platform, version 2.5. The Water Department has already invested substantial monies in the purchase of NICE network video recorders at Miramar and Alvarado Reservoirs. NICE provides a best in class product suite and end to end solutions for enterprise video management. Siemens is a preferred vendor and has completed some of the most complicated NICE installations around the world, recently including the San Diego Airport, Dallas Fort Worth Airport, DeLoitte Universtity, Federal Reserve Bank, to name a few. Our design will include nice software enabled Network Video Recorders (NVR) at each secured facility (new installs) and a redundant server at the SOC. A client workstation will be provided for view, programming and monitoring of facilities at the SOC.

BOSCH

Bosch security cameras have been specified for most applications at the facilities. Bosch brings a best in class product portfolio and is already been significantly deployed at City Water Department Facilities (Miramar and Alvarado have recently purchased ~30 fixed high definition domes and ~10 high definition PTZ cameras). For this reason, Siemens has standardized our design around these products. Furthermore, Nice integration was considered and Bosch provides the best product suite with existing integration to the VMS, including edge analytics support, if desired, in the future. Pelco Sarix Thermal Cameras have been specified for the reservoir sites. Pelco Sarix TI is extremely cost effective and will meet all detection requirements, per Siemens testing of the product and our design requirements.

NICE Situator will be utilized at the SOC. Siemens has developed, designed and deployed Situational Management Software across the globe. Our teams experience at San Diego Airport will provide significant value to the City and the Water Department, as our team provides first-hand working experience in the intricate design process of Command and Control, Operations Center Design and Concept of Operations development. Siemens will utilize Situator trained technicians and engineers for set-up, programming and training of city personnel for this project.

SOFTWARE HOUSE

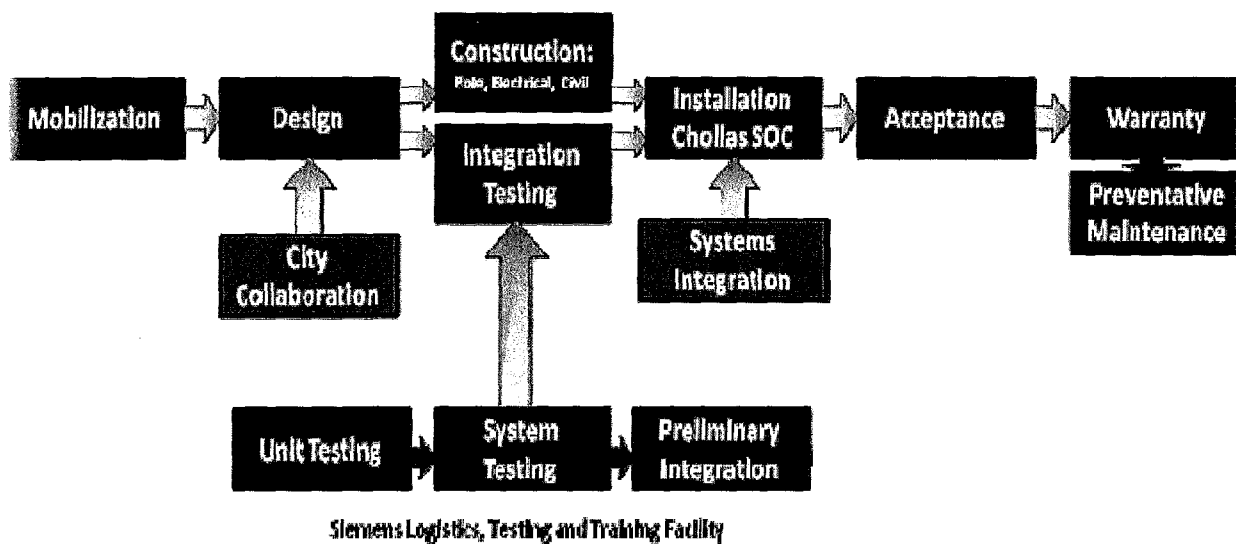
A Tyco International Company

Software House is the leading access control and security software monitoring manufacturer in the world. The CCURE 9000 platform is the latest product version and is developed with Microsoft .NETv3.5 Framework, SQL Server 2005 and other standard IT tools such as XML and Web Services. CCURE 9000 delivers the best of access control while empowering users to converge their physical and logical security systems. Siemens is the single largest CCURE distributor and provides the largest engineering, installation and servicing technician resources in the world. Locally, Siemens has supported the Software House platform for over 20 years and has achieved Enterprise Integrator status from the factory.



Wireless Network: The Siemens team, headed by Netlogix and supported by Siemens and Athenx, completed a site by site facility inspection and analysis. Our preliminary design considers both connectivity and resiliency, but also the community impact of supporting poles and infrastructure. Wherever possible, poles have been reduced and mounting of antennas and radios secured to existing shelters and structures. The wireless design and product determination was based on the need for a proven and dependable wireless solution. Siemens considered Aviat, Motorola and Firetide radio solutions, but it was determined that Motorola provided the best combination of licensed and unlicensed connectivity, cost and dependability. While Aviat was clearly a logical choice for the licensed links, our experience and field testing found Firetide's mesh solution presented great risk to this project due to frequency congestion and interference, and therefore was eliminated from consideration.

End to End Solution Methodology



Mobilization

From the Notice to Proceed, the Siemens team will engage in a detailed mobilization process. Internally, we will work swiftly to build out our existing testing and training facility to accommodate this program. Our Energy Star rated Scripps Ranch facility provides over 30,000ft² of secured and environmentally controlled office, training, testing and secured warehouse facilities. This space will be used for the integration testing of the systems and will offer a location for classroom training on the systems, prior to acceptance and City operation of the final system.

Bruce Becker, PgM, will work with the City PM to schedule the kickoff meetings and begin design development, incorporating stakeholders and the Siemens engineering and design team.

Design

The design approach will incorporate the Water Department, Communications Department and be coordinated through the Project Managers for the City (Engineers). It is anticipated that AECOM, as the consulting engineer for this program will be intimately involved and assist in all aspects of planning and design prior to construction. Design processes will include 60/100/Final Design review and the Siemens project schedule, included in this proposal, shall reflect these dates. Siemens will include a complete CSI Master Format Specification, drawings by site and type, as well as a rolling riser diagram, representing the non-functional relationship of the systems on the new network. Site surveys and findings will be reflected in design process.

Construction

Upon approvals of design and prior to site security installation, construction activities will commence. Cell Blocks and pole construction, high site tower surveys and antennae installs, as well as all fencing, gate automation and lock work, electrical requirements, conduit and lighting installation. Construction will begin in parallel with systems integration testing at the Siemens Logistics, Testing and Training facility.

Integration Testing

Upon 60% design review and acceptance, Siemens will begin integration and equipment testing at our San Diego Branch Office, in Scripps Ranch. All testing will be executed by Siemens' manufacturer certified technicians and include unit testing of all cameras, motion detectors, wireless radios, servers, network video recorders, access control panels, UPS devices, network switches and client stations. System testing will then ensure connectivity and will lead to preliminary integration tasks, such as communications with wireless network, wired network and City provided LAN, etc. Integration testing is in parallel with construction on site, but precedes installation of any sensors at the site. Demonstration of systems, operation and training is available utilizing equipment in the test environment. Siemens has found this to accelerate the learning of new systems and limits risk of day one live operation of the systems.

Installation

Site installation and Security Operations Center integration will be phased, running in parallel with both some design tasks. Siemens' concept will be center on the development and deployment of the wireless and wired networks, first at Chollas and then at designated high sites. Installation will include all device mounting, commissioning and site testing.

Acceptance and Warranty

Acceptance testing will be provided in parallel with completion of individual sites. Upon acceptance, warranty program will begin and Siemens will provide post acceptance services, including preventative maintenance per the proposed program. Warranty and maintenance programs are to be for 36 months from acceptance.

Security Upgrade Technical Approach

The Siemens solution is based on detailed analysis of each facility, the environment of these sites and the recommended technology solution, as prescribed by the RFP. Our design reflects an in-depth understanding of both physical security design theory- the concept of "Deter, Delay, Detect, Respond and Resolve" and the need for technology and systems integration to correlate data and present actionable intelligence to the security systems operator, in real time. We have provided a detailed schedule of protection, for each facility, in this technical proposal package.

This project is not a construction project; rather, this is a complex IT integration program that will involve a series of independent site systems presented in a cohesive and singular user interface. The Siemens security upgrades can be highlighted as follows (does not delineate between base bid and alternate A and B offerings):

- Ensure that Water Department facilities (per this scope) are provided with a physical fence or perimeter barrier.
- Provide virtual detection zones utilizing video sensors (various) and passive infrared technologies to detect intrusion of the barriers.
- Provide a secured, redundant, Wireless Network for all security systems and disparate platforms communicating to the SOC.
- Provide access control and monitoring system for enforcement of security policy at remote facilities.
- Provide a new video management system capable of IP video camera integration and recording (30 days, min), utilizing NICE Vision 2.5.
- Provide an integrated platform for correlating information, stove-piped systems into a single user operating picture utilizing NICE Situater.
- Provide a video analytics platform that is server based and provides integration with the edge recording servers (network video recorders).

Access Control System:

Siemens highly recommends the replacement of the existing access control and our proposed solution is based on this improvement. A goal of this project is to improve the security posture of the Water Department and elevating awareness beyond the status quo. Adding to or expanding the existing systems would be a lateral move in policy and significantly undermine the goals of the security program. For this reason, the Siemens technical design provides the City with a new enterprise class access control system as a baseline for the future. Siemens proposes the deployment of Software House's CCURE 9000. The existing systems are largely inoperable, having suffered from extremely poor installations, lack of upkeep and antiquated technology components. CCURE 9000 will replace the existing NexWatch system. The CCURE 9000 offers a significantly lower cost of ownership to the City in the future (including maintenance cost reductions by up to 25% in Siemens' experience) and is a standards based, open architecture, solution.

The Siemens Access Control solution includes:

- Smart Card ready Multi-technology card readers installed at each gate entry and at a single pump house door entry location

- Gate entry readers are provided with pedestal mounts and will control gate automation operators, at the appropriate locations (see gate installation schedule of protection). Locations without operators will provide for authorization of entry and disable maglocks on gate. Maglocks are provided at each location, per RFP recommendations.
- Pump House entry doors will receive 1200lb maglocks. 1200lb holding force is most suitable for these types of doors.
- Pump House protection will also include door position switches at each auxiliary door location and will include interior motion detectors.
- Panels will be enclosed in suitable cabinets and integrated with Network Switches at each location.
- Replacement of existing panels is included in Alternate A pricing.
- The Head-end software/ hardware will provide a minimum of 256 online readers, a complete SQL Server license and a badging client, camera and printer for creation of badges. The head-end equipment will be located at the Chollas SOC. No redundancy solution has been provided.
- Cards (smart/ prox) have been provided in Alt A.
- Integration with NICE Situator is provided and programming will include all Software House points onto Situator GUI.
- Power supplies and battery backup are provided.
- Vault Doors shall receive switches and/ or motion detection via cameras or outdoor PIR (if applicable).
- Protech Outdoor Motions and Bosch Interior Motion Detectors (Dual Technology).
- Training and three years of software support has been provided.

Siemens is the leading reseller and maintainer of the CCURE platform (by sales volume, number of installations and by quantity of certified technicians/ engineers). We are Software House Enterprise Certified, signifying our commitment to proper design, integration and maintenance of the system. Locally, all technicians, engineers and project managers are CCURE trained and certified in installation and maintenance of the system.

iStar intelligent control panels shall be utilized for each new security installation site. These are Ethernet based panels (no separate web server, like the Nexwatch equipment means fewer points of failure) that provide up to two reader ports for control of both the gate and pump station door entrances. iStar panels are capable of up to 16 readers per panel and come in rack mounted versions for the appropriate application. iStar Edge is POE ready, though Siemens has utilized a separate power supply to properly secure the Maglocks on both gates and doors and to properly power all peripheral devices in times of temporary power loss.

Alternate Pricing “Alternate A: Access Control System Upgrades”

For conversion of existing sites, Siemens assumed the following in estimating our pricing solution (per RFI/ Addenda 4):

Two (2)	Readers per Site
One (1)	Panel
Eight (6-8)	Peripheral Sensors (Door sensors, motion sensors)
1000	Smart Cards

Siemens has assumed a total of 34 panels and 68 readers for replacement in ALT A, as a result of Addendum 4's RFI response. All software is scaled to meet expansion/replacement of system.

Surveillance System Components and On-site Video Storage:

Siemens has provided a complete and operable NICE Vision 2.5 video management solution. The Siemens video surveillance and video intrusion detection design can be summarized as follows:

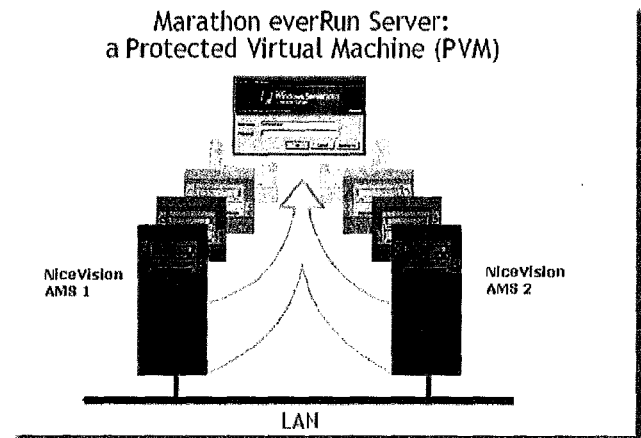
- Upgrade of existing NICE Vision 2.5 Enterprise AMS Server (from 2.0 to 2.5).
- Redundant AMS imaging solution by Marathon (NICE recommended).
- Hardware includes: New AMS Server, Client Computer for VMS.
- NICE NVR Software Solution for all new cameras with inherent video analytics capability.
- IP Cameras (Thermal, Fixed, PTZ and IR Units-Codecs).
- 4CIF recording at 7fps- 15fps on alarm.
- Bosch Fixed Cameras.
- Bosch Fixed IR Illuminators.
- Bosch PTZ Cameras.
- Pelco Thermal Fixed Cameras.
- Protech PIR for additional intrusion detection within perimeter.
- NICE Video Analytics.
- Integrate with NICE Situater.
- Three Year Licensing with NICE on all software.

Chollas, Security Operations Center:

Siemens video management and surveillance design includes the upgrade of the existing City Water Department AMS Server (NICE Vision 2.0) to the 2.5 Enterprise platform. Per the AECOM bridging documents, we have provided a redundant solution, incorporating Marathon Technologies everRun MX software (imaging) solution. The two server, hot stand-by solution provides a strong disaster recovery solution and protects the video management database.

The NICE Vision platform will include all licenses for video management and the required Software Support Agreements for three years. The software will be protected and supported for all upgrades, revisions and technical support during this period.

Siemens assumes the existing AMS and client licenses will be provided by the City for inclusion in this project. Siemens is currently programming and deploying the NICE Vision AMS and two remote site systems, including Smart Video Recorders (SVR), NICE's network video recorder. Siemens assumes the use of existing client stations for NICE VMS programming at the SOC head-end.



Pump Stations, Regulators and Reservoirs:

After careful inspection of each facility and a comprehensive review of the AECOM bridging documents, recommended site improvements and current conditions report, the Siemens design considers the following environmental, technical, functional and non-functional requirements of this project:

Lighting is provided at each AECOM recommended location (per drawings), however all cameras for use as detection sensors will receive or utilize existing IR illumination. All existing illumination is assumed in good working order and no additional repairs are included. New IR illuminators are appropriately sized for intended focal arrangement. Thermal Imaging will be utilized as required and will not require IR illumination or supporting site lighting.

Four different types of cameras are utilized: Fixed Minidome, Fixed Box w/ Integrated IR system, Day Night PTZ, an Integrated IR PTZ and Uncooled Microbolometer Thermal Imaging Camera. Each supports SD card recording that will redundantly support recording in time of crisis (connectivity failure with recorder, recorder failure).

Careful considerations of recording options were investigated prior to finalizing our design. Our resulting design includes network video recording at 40 different facilities (all options). Siemens conducted software testing on NICE SVR recorders and on non-Nice certified recorders. The testing provided proof that the NICE software is operable on non-NICE supplied hardware and provides the City with cost effective options for the future without sacrificing functionality or capabilities (like analytics).

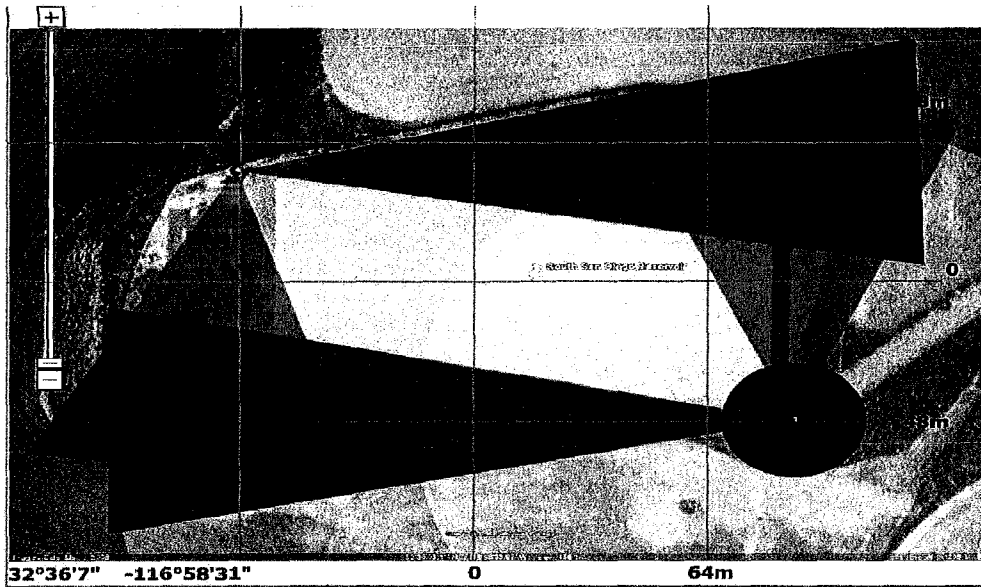
For the remote sites, the following storage calculation was developed in support of this project. This assumes 7fps, 15fps event recording and a resolution of 4CIF. Siemens will utilize the advanced motion detection software of the NICE software to identify and alarm interior security events and alarms. Upon alarm, the recorder will archive video at the increased data rate, simultaneously initiating a call up and alarm condition with the SOC. When integrated with the NICE Situator platform, these alarms will be correlated with other potential events, and will provide an integrated rule based response plan, based on Water Department Standard Operating Procedures.

Siemens will deploy 40 NVR's with adequate power backup, etc. Camera coverage for most sites will range between one camera and seven cameras. Siemens has specified Bosch cameras for all fixed dome, fixed box style w/ enclosures and PTZ's. For the high site locations, as well as several others, we have specified an integrated Thermal Illuminated PTZ camera. This will provide high level views of the City, as recommended by AECOM documentation. These thermals are analog cameras with internal encoders, meeting IP requirement.

Thermal Cameras are used at numerous reservoir sites. A total of 25 have been specified. Siemens recommends Pelco's Sarix TI thermal imager. This is an IP based uncooled

microbolometer camera but is feature rich with internal video analytics for detection of a human sized object, if determined an appropriate option to NICE's server based analytics.

Siemens' used the following criteria for determining Thermal camera requirements at the reservoirs:



South San Diego Reservoir: This diagram illustrates the four thermal imaging cameras, field of view and PIR coverage at one location (one of two at this site).

Siemens design accounts for shadowed zone (blue ring) by incorporating Motion Detection (PIR) units at poles, thus eliminating the need for four pole installations, power and connectivity. As this site (South San Diego Reservoir), two poles with four thermal cameras are sufficient, when combined with motion detection (2), to maintain interior intrusion detection. PTZ w/ IR Integrated Head was included for day/night interrogation and identification, providing coverage of the vehicle gate entry and surrounding terrain.

Siemens' storage requirements have been based on the following assumptions (model):

Qty	Compression	Resolution	Frames Per Second	Frames Size	Hrs	% of Motion	Days	Estimated Bandwidth	Storage Requirement at 100% 7fps (GB)	70% of storage 7FPS (GB)	100% of storage 15FPS (GB)	30% of storage 15FPS (GB)	Total storage required (GB)
1	H.264	640 x 480	7	1024 Kbits	24	30%	30	1.0 Mbit	99.00	69.30	99.50	29.85	99.15
2	H.264	640 x 480	7	1024 Kbits	24	30%	30	2.0 Mbit	199.00	139.30	199.00	59.70	199.00
3	H.264	640 x 480	7	1024 Kbits	24	30%	30	3.0 Mbit	298.00	208.60	298.50	89.55	298.15
4	H.264	640 x 480	7	1024 Kbits	24	30%	30	4.0 Mbit	398.00	278.60	398.10	119.43	398.03
5	H.264	640 x 480	7	1024 Kbits	24	30%	30	5.1 Mbit	497.00	347.90	497.60	149.28	497.18
6	H.264	640 x 480	7	1024 Kbits	24	30%	30	6.1 Mbit	597.00	417.90	597.10	179.13	597.03
7	H.264	640 x 480	7	1024 Kbits	24	30%	30	7.1 Mbit	696.00	487.20	696.70	209.01	696.21

Siemens has provided a complete redesign of pole and mounting locations, yet we have maintained the functional requirement that video camera sensors shall provide detection of human sized intruder within the fence line of the facilities. Our pole and mounting design reduces the number of poles required on a per site basis, thus lowering installation timelines and reducing costs (*Pole locations have been identified with heights, in the communications technical approach section*). Wireless mounting assets are combined with camera locations, wherever possible. Pump house and other structures are utilized whenever possible.

For instance, at Ocean View Hills Pump Station:

Pole locations have been eliminated, though detection of intrusion is accomplished with three cameras mounted to the existing pump house structure. One 30ft pole will be required for the wireless radio antenna and is utilized for camera mounting.

The site schedule of protection includes four IR illuminated IP cameras, One PTZ and one card reader at the door. The gate is equipped with an automatic operator and card reader. NVR is located within pump house in the appropriate enclosure.



Stand-by Power:

Siemens has provided UPS backup for all equipment per the bridging documents and recommendations. All card readers and gate operators will utilize battery backup and NVR units will be connected to rack mounted UPS units, for all new installations. Siemens does not warrant that existing UPS units are operable, therefore, no connections to existing equipment have been provided.

Fencing, Lighting and Perimeter Protection:

Fencing: Per the AECOM guidelines and per Siemens' professional assessments, Siemens proposes the addition of physical fence barriers at all facilities that do not currently employ these measures. This includes the following:

- New mesh per City standard (black)
- New razor wire/ barbed wire per standard
- New gates where required
- New Ornamental iron fencing where required
- Signage for all new fence lines

Siemens provided fencing per the following schedule:

Site Name	Qty	Measurement	Type of Work
65th & Herrick PS	40	Linear Ft (lf)	Match existing Ornamental Iron
Bayview PS	0	n/a	No Work
Bayview Reservoir	0	n/a	No Work
Bernardo Heights PS	1	Each (ea)	Adjust existing Gate

Black Mtn PS	0	n/a	No Work
Black Mtn Reservoir	3	ea	Adjust existing Gate
Cabrillo Palisades PS	525	If	New 8' Chain Link w/ BW
	1	ea	DD Gate
Carmel Mtn High PS	0	n/a	No Work
Carmel Mtn High Reservoir	0	n/a	No Work
Carmel Mtn Industrial PS	10	If	Install Razor Ribbon at corner
Carmel Mtn Mall PS	1	ea	Repair Chain Link at corner
Catalina PS	0	n/a	No Work
Security Operations Center (Chollas)	2150	If	New 8' Chain Link w/ BW
	1	ea	DD Gate
Chollas Heights PS	175	If	New 8' Chain Link w/ BW
	1	ea	DD Gate
Cielo & Woodman PS	560	If	New 8' Chain Link w/ BW
	2	ea	DD Gate
Climax PS	0	n/a	No Work
Deerfield PS	425	If	Install Barbed Wire to existing CL
Del Cerro Highlands PS	0	n/a	No Work
Del Cerro PS	0	n/a	No Work
Del Cerro Reservoir	0	n/a	No Work
Eagle Ridge PS	0	n/a	No Work
Eastgate Mall Regulator	185	If	New 8' Chain Link w/ BW
	1	ea	DD Gate
El Capitan Dam	0	n/a	No Work
Elliot Pipeline Regulator	130	If	New 8' Chain Link w/ BW
	1	ea	DD Gate
Friars Rd Regulator	110	If	New 8' Chain Link w/ BW
	1	ea	DD Gate
LJ Country Club Reservoir	0	n/a	No Work
LJ View Standpipe	520	If	Chain Link
	1	ea	DD Gate
Los Penasquitos PS	0	n/a	No Work
Los Penasquitos Reservoir	900	If	Repair existing CL
Mercy Mira Mesa High PS	0	n/a	No Work
Miramar Ranch North PS	0	n/a	No Work
Miramar Ranch North Reservoir	40	If	New 8' Chain Link w/ BW
	1	ea	SS Gate
Montezuma PS	0	n/a	No Work
Muirlands PS	1050	If	New 8' Chain Link w/ BW
	1	ea	DD Gate
Ocean View Hills PS	0	If	No changes have been made to this fence
	0	ea	No alterations
Otay Mesa PS	400	If	New 8' Chain Link w/ BW
	1	ea	DD Gate
Paradise Mesa #1 PS	220	If	New 8' Chain Link w/ BW
	1	ea	DD Gate
Paradise Mesa #2 PS	300	If	New 8' Chain Link w/ BW

	1	ea	DD Gate
Paradise Mesa Hills #2 PS	500	lf	New 8' Chain Link w/ BW
	1	ea	DD Gate
Paradise Mesa Standpipe	450	lf	New 8' Chain Link w/ BW
	1	ea	DD Gate
Penasquitos Bluffs #8 PS	0	n/a	No Work
Point Loma Reservoir	0	n/a	No Work
Pomerado Park Reservoir	0	n/a	No Work
Pomerado PS	445	lf	New 8' Chain Link w/ BW
	3	ea	DD Gate
Princess Park PS	460	lf	Install Barbed Wire to existing CL
RB Industrial PS	1	ea	DD Gate
RB Reservoir	1400	lf	Repair existing CL
Rancho Penasquitos PS	0	n/a	No Work
Redwood Village Standpipe	500	lf	New 8' Chain Link w/ BW
	1	ea	DD Gate
San Andreas	65	lf	New Ornamental Iron
San Carlos Reservoir	1	ea	Repair Damaged Gate
Scripps McMillan PS	0	n/a	No Work
Scripps Ranch	0	n/a	No Work
Scripps Woods #2 PS	450	lf	New 6' chain Link w/ BW
	1	ea	DD Gate
Soledad Reservoir & PS	30	lf	New 8' Chain Link w/ BW
South Creek PS	0	n/a	No Work
South SD Reservoir	0	n/a	No Work
Stonebridge PS #1	160	lf	Install Barbed Wire to existing CL
	0	lf	No Work
	1	ea	DD Gate
Stonebridge PS #2	0	lf	No Work
	1	ea	DD Gate
Texas St Regulator	160	lf	Chain Link
	1	ea	DD Gate
Thom St Regulator	0	n/a	No Work
University Heights PS & Reservoir	775	lf	Repair existing CL
Waring Rd PS	0	n/a	No Work

Siemens' excluded fence alterations:

Ocean View Hills, Stonebridge #1 and Stonebridge #2- sites are adequately fenced/walled, though lower than recommended standard. With the addition of internal motion detection and adequate video coverage, these sites will meet same standards as other pump station locations without the need to replace or enhance physical barrier. Siemens excludes costs for wrought iron enhancements on these sites.

Lighting: Siemens and partners have provided lighting per drawing recommendations and bridging documentation.

Gates, Maglocks and Automation additions have been provided per the following Installation Schedule:

Slide gate operator system, including all cutting, safety loops automation, pedestal for card readers, concrete pads, etc.: ***Chollas Security Operations Center.***

Swing Gate operator system, including all cutting, safety loops, automation, pedestal for reader, concrete, etc.: ***65th and Herrick PS, Cabrillo Palisades PS, Cielo and Woodman Pump Station, East Gate Mall Regulator, Elliot Pipeline Regulator, Friars Road, Muirlands, Ocean Hills Pump Station, Otay Mesa PS, Paradise Mesa #1 and #2, Mesa Hills #2, Paradise Mesa Standpipe, Point Loma Res., Pomerado Standpipe, Princess Park PS, RB industrial PS, Redwood Village, Scripps Woods 2, South Creek, South San Diego Res. Stone bridge #1, Stongebridge #2.***

Maglock and Pedestal Gooseneck, only: ***Carmel Mountain Industrial, Chollas Heights, Miramar North Reservoir, Rancho Bernardo Reservoir, San Andreas PS, Texas St. Regulator.***

Electrical and Video Analytics:

All electrical work shall be completed in accordance with RFP documentations and per the requirements of the security and communications design. All exposed conduits are provided with EMT and appropriately installed code. No rigid steel has been provided in this proposal. Electrical will be connected to existing dedicated circuits. All electrical design and construction costing includes permits and engineering fees. Utility fees have been excluded.

Siemens has provided a turnkey VMS and Analytics solution for this program, per the RFP requirements. Nice's Video Analytics will provide intrusion detection within the perimeters of the Water Department facilities and will utilize the dual streaming capabilities of the specified cameras. Dual streaming allows for efficient analysis of the video stream. 4CIF video can be recorded at designated rates, while a 1CIF stream is used for video analysis by the server. Siemens has specified Nice's SVR appropriately, based on the number of video channels, storage requirements and computing requirements of the analytic channels for each site. Siemens has experience with Nice Video Analytics, having designed and deployed the system at the San Diego International Airport.

Communications Systems Technical Approach

An often overlooked aspect of wireless network design and critical to video surveillance and management over wireless, is the traffic model. In order to maintain requisite throughput and frame rate to support a streaming application like video, the network must be properly engineered and managed. To this end, the ideal architecture must give the owner the ability to develop a predictable traffic model. While many applications, including voice, lend themselves to oversubscription, video does not. It is a streaming application.

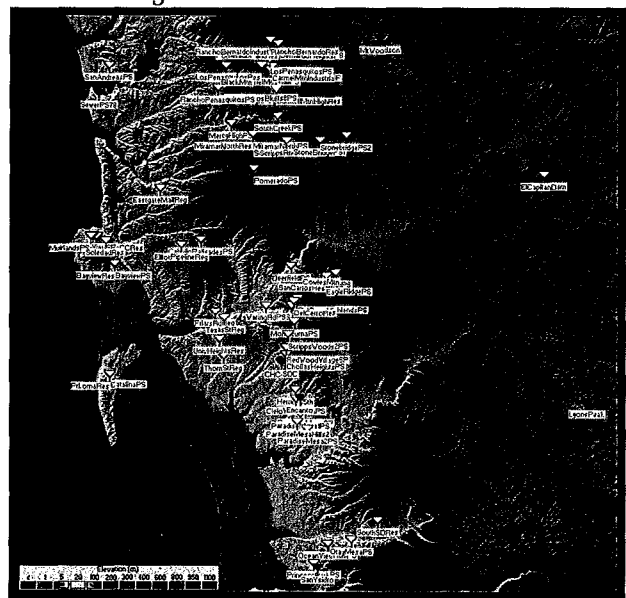
There are three technologies that were reviewed during our preliminary analysis:

- Point to Point
- Point to Multipoint
- Mesh

The backhaul layer of the network is to be Point to Point technology, but for the outlying, low spot spur links, Siemens and Netlogix conducted in depth analysis in determining a technology approach. Our investigation, testing and analysis included a review of terrain, LoS and the traffic model. Point to Point technology, due to its predictable nature and one to one relationship between radios, is a strong fit for wireless video transmission. Unlike mesh radios, there is no ad hoc rerouting of traffic. Point to Multipoint technology is also excellent for deploying video and is a fit for some link, providing a flexible architecture at low site locations. However, due to the terrain environment of this project, narrow line of site, and the low number of spur sites that can see more than one other spur site our analysis showed that directional point to point technology is the appropriate solution from both a performance and frequency reuse perspective.

While Mesh radios simplify the design of many networks they do not support deliberate predictable traffic models. The impact is that when traffic gets rerouted over radios and links for which it was not planned, it increases the throughput required over that link. In the event that the additional required aggregate throughput is not available over these links or radios, in order to adjust, the cameras will reduce their frames per second that they are transmitting. In this scenario, the City's performance requirement would be violated. For this reason, as well as the terrain and line of site issues, we feel that point to point technology is a better solution. In addition, in order to achieve the link budgets that yield 99.999% reliability, a mesh radio would need to be equipped with a highly directional antenna. This essentially converts it into a point to point or point to multipoint technology.

Traffic modeling – a robust video network does not have the luxury of supporting ad hoc



Wireless Scenario against a Terrain Background

traffic rerouting. Doing so can potentially degrade the quality of all video on the network. We currently find ourselves in a situation where, as networks grow for other clients, we are removing mesh equipment installed by previous system integrators as the equipment does not predictably route and handle video traffic as the network grows and often degrades a significant amount of video on the network.

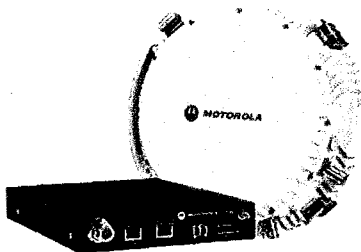
Terrain – The nature of the terrain and the locations is such that there are only a few locations where a location that could utilize unlicensed spectrum can see more than one other location within 180 degrees. The result is that mesh radios would have to use antennas with lower gain and, as a result, reduce modulation and throughput while at the same time using a larger channel that in turn reduces frequency reuse and would increase the critical 5.8 GHz noise floor (self-interference). When you put a highly directional antenna on a mesh radio, you essentially make it function as a point-to-point radio or point-to-multipoint radio. This is a purpose-built network that should use purpose-built architecture with purpose-built radios.

After our analysis, it became clear that purpose-built point-to-point radios are the appropriate solution for this project and will provide:

- Predictable traffic modeling
- Scalability
- Performance
- More efficient unlicensed channel reuse

Licensed Microwave Technology

Motorola (Cambium) PTP 800



For the licensed technology, we have selected the Motorola (Cambium) PTP 800 Licensed Ethernet Microwave solution, which is part of Cambium's industry-leading Point-to-Point (PTP) portfolio. Ideal for today's evolving networks, the IP-optimized PTP 800 radio platform gives government agencies, corporate enterprises and service providers the licensed exclusivity, high-bandwidth, scalability and affordability you want to meet your unique bandwidth demands.

Whether connecting locations, backhauling video or providing last-mile access, the PTP 800 has the capabilities and features to meet today's IP requirements and tomorrow's Next Generation Network needs.

Operating in the 6 to 38 GHz RF bands* at up to 368 Mbps throughput (full duplex) and with user-configured channel bandwidths from 7 to 56 MHz, the Motorola (Cambium) PTP 800 Series of Licensed Ethernet Microwave solutions offers operators a highly reliable licensed band solution. With upgradeable capacity from 10 Mbps to full capacity via a software key, the systems offer exceptional cost efficiency and scalability. In addition, comprehensive FCC licensing coordination services through Comsearch.

1+1 (HSB availability): Includes 1+1 Hot Standby links, 2+0 redundant links in a ring or mesh configuration plus non-redundant links. Hot Standby links are designed to provide

full redundancy in the event of a single Compact Modem Unit (CMU) or an Outdoor Unit (ODU) failure at one or both ends of the link.

Effective system design: With the smallest Compact Modem Unit (CMU) in the industry, the small form factor design helps remove customer dependency on rack space.

Capacity as you grow throughput: Flexible stepping options allow operators to purchase a standard 10 Mbps factory set cap and then increase capacity as needed based on throughput demands ensuring exceptional scalability.

Asymmetric control: Where users download more information than they upload, operators can assign different throughput capacities for the up and down links.

No surprises link planning: Optimize licensed link performance prior to purchase and gain a complete view of your network via Google Earth with the PTP LINKPlanner. This tool also provides a complete Bill of Materials (BOM) that lists all equipment required for the deployment simplifying the order process and providing important link information needed for FCC and other regulatory bodies. QPSK to 256 QAM

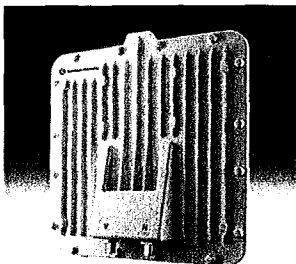
Security Options: FIPS-197 128/256-bit AES encryption

Low Latency: < 115us @ full capacity with 64 bytes

Flexible network management: Remote management via web browser. Optional Cambium Wireless Manager or other third party tools are available for management purposes. "Zero-Downtime" Adaptive Modulation

Automatic shifting of modulation and/or coding rate as radio path conditions change enable transmitters and receivers to negotiate highest mutually sustainable data rate. * The 6 to 38 GHz frequencies will be available in a series of product releases. Local regulatory requirements should be confirmed prior to system purchase.

Motorola (Cambium) PTP 500



We have also specified the PTP 500 Series to deliver high-speed, robust wireless backhaul. Connect buildings in a campus setting. Extend video surveillance beyond the wired infrastructure. Support bandwidth-intensive applications such as Voice-over-IP, telemedicine, IP gaming and multimedia. The PTP 500 bridges can deliver up to 99.999% availability in virtually any environment, including non-line-of-sight, long-distance line-of-sight, over water or open terrain, even through extreme weather conditions.

PTP 500 Series bridges come in Integrated and Connectorized models, both available in 5.4 and 5.8 GHz RF bands and operating at data rates up to 105 Mbps.

More Range to Anywhere: PTP 500 Series links have class-leading sensitivity and power output, which enable the links to go farther than comparable systems – up to 155 miles (250 km).

More Channels: Motorola combines MIMO, i-OFDM and our advanced signal-processing algorithms to create four simultaneous channels between pairs of transceivers at each end of the link, without losing spectrum efficiency.

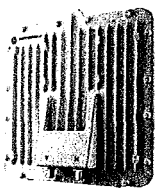
Choice and Flexibility: PTP 500 Series bridges are available in several models to meet your individual requirements:

- 5.4 and 5.8 GHz Integrated: These operate at Ethernet data rates up to 105 Mbps with dual built-in antennas, for obstructed and high-interference environments where high throughput is a major requirement.
- 5.4 and 5.8 GHz Integrated Lite: With the same robust technology of the full-speed version, the PTP 500 Integrated Lite delivers up to 52 Mbps and is an excellent option where budgets are tight, yet high throughput and availability are key to supporting the applications. The Lite model is software upgradeable as throughput requirements increase.
- 5.4 and 5.8 GHz Connectorized: These models combine the technology of the Integrated versions with the high-gain advantage of external antennas. Over long distances and in extremely adverse environments, including deep non-line-of sight, these solutions let you connect over greater distance and at a higher level of reliability and speed than comparable wireless bridges.
- 5.4 and 5.8 GHz Connectorized Lite: These solutions offer all the functionality and reach of the Connectorized models and deliver up to 52 Mbps throughput at less cost than the full-speed versions. As throughput requirements increase, you can easily upgrade to 105 Mbps throughput.
- A single T1/E1 port capability enabled through the PTP Power Indoor Unit (PIDU Plus) via simple splitter or Y cable.
- Extends Intelligent DFS (i-DFS) to regions where radar detection is enabled

Integrated Lightning Protection: No external lightning protection device is needed at the top of the tower adjacent to the radio. An external PTP Lightning Protection Unit (PTP-LPU) is required at the cable entrance point leading to the indoor network equipment. (Please note, 100 percent protection is neither implied nor possible.)

Unlicensed Microwave Technology

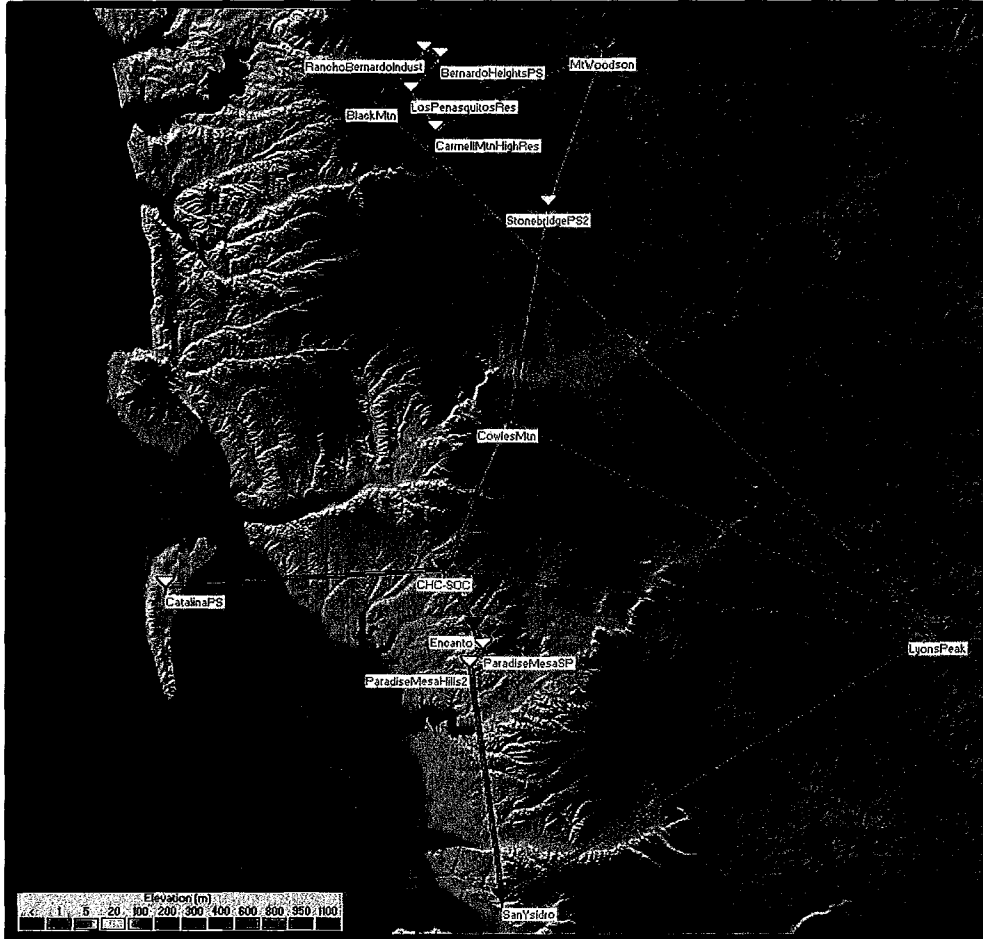
Motorola (Cambium) PTP 200 Series



For the unlicensed technology, we have selected the Motorola (Cambium) PTP200 series (230s and 250s). Designed to securely transport data, voice and video in both near line-of-sight (nLOS) and line-of-sight (LOS) environments, the PTP200 series offers affordable, accelerated throughput at a time when network owners are challenged with increasing bandwidth capacities to support additional applications. With up to 220 Mbps, of aggregate throughput available, the MIMO based PTP 250 operates at 5.8 Ghz and will be adding 5.4 Ghz capability upon approval of its current FCC application. This will give San Diego Water the ability to achieve even greater frequency reuse. The PTP 230 is also an OFDM radio and will provide excellent performance on the shorter, lower throughput spurs. These OFDM based systems are built from the same PTP and PMP platforms that customers trust and depend on for reliable connectivity all over the world. Their ruggedness, field durability and MTBF are recognized throughout the industry and contribute to their exceptional performance while achieving a low cost of ownership.

Chollas Integration

Integration at Chollas will be simplified using ethernet via Cat6 jumper cables between the IDUs from the PTP 800s and the City of San Diego Switches.



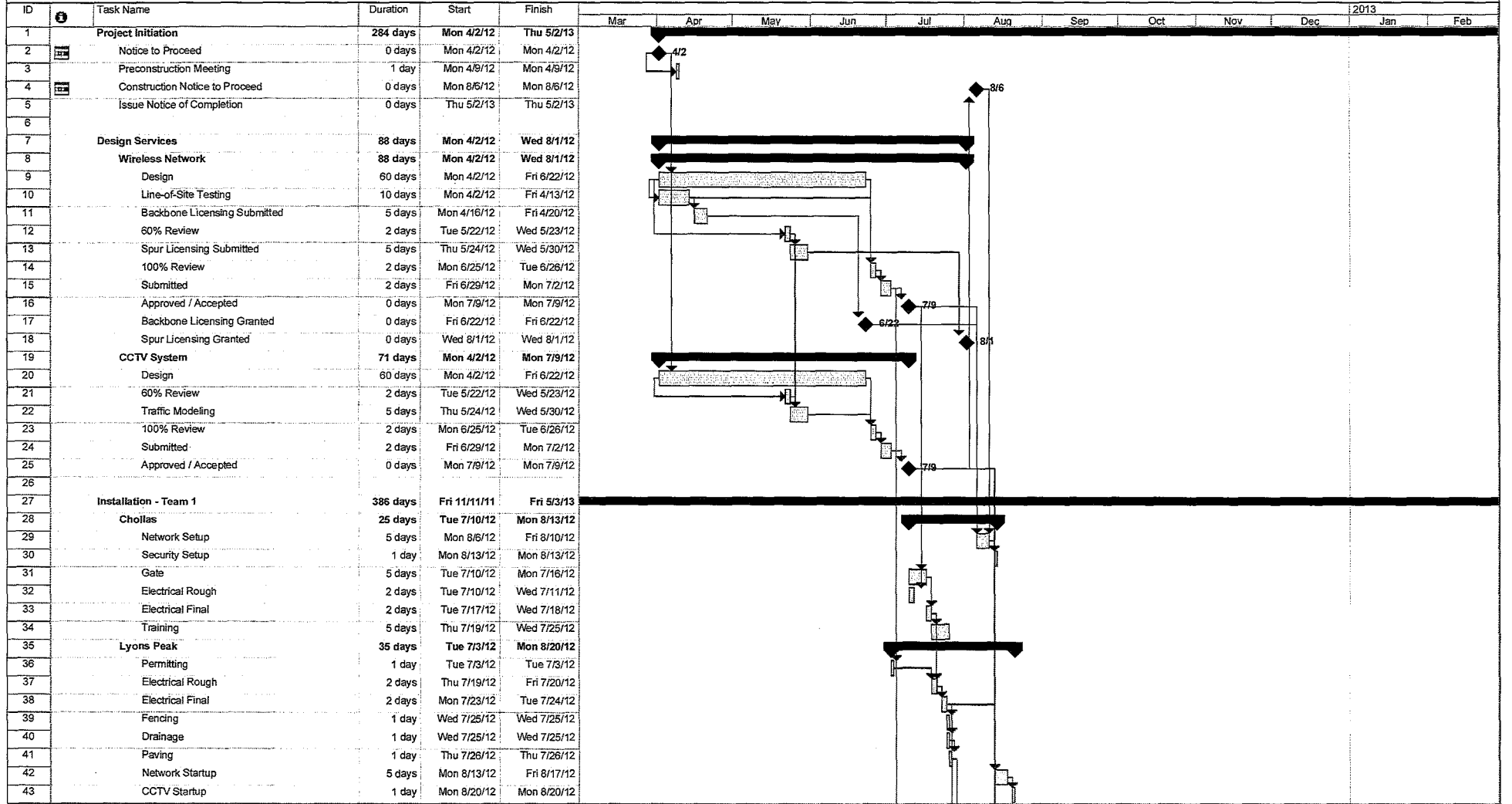
Backhaul Loops: A single failure at almost any particular link will be compensated for through rerouting of data along the backhaul. Catalina PS presents a unique situation, though, as failure of this link could result in additional spur connectivity failure.

Pole Mounting Requirements Matrix:

Site	Antenna Height (ft)	Minimum Mounting Asset Height (ft)	Comment
65th and Herrick	10	10	No Pole Needed - Existing Structure
Bayview PS	10	10	No Pole Needed - Existing Structure
Black Mtn Res	10	10	No Pole Needed - Existing Structure
Cabrillo Palisades PS	10	10	No Pole Needed - Existing Structure
Carmel Mtn High Res	15	15	No Pole Needed - Existing Structure
Carmel Mtn High PS	10	10	No Pole Needed - Existing Structure
Carmel Mtn Industrial PS	10	10	No Pole Needed - Existing Structure
Carmel Mtn Mall PS	20	20	Pole needed
Catalina PS	10	10	No Pole Needed - Existing Structure
Chollas Heights PS	10	10	No Pole Needed - Existing Structure
Deerfield PS	10	10	No Pole Needed - Existing Structure
Del Cerro PS	10	10	No Pole Needed - Existing Structure
Del Cerro Res	10	10	No Pole Needed - Existing Structure
Eagle Ridge PS	10	10	No Pole Needed - Existing Structure
Friars Road Reg	10	10	No Pole Needed - Existing Structure
Miramar Ranch North PS	10	10	No Pole Needed - Existing Structure
Muirlands PS	10	10	No Pole Needed - Existing Structure
Pomerado PS	10	10	No Pole Needed - Existing Structure
Pomerado PS Rptr	10	10	Need pole
Princess Park PS	10	10	No Pole Needed - Existing Structure
Rancho Bernardo Industrial PS (& Res)	10	10	No Pole Needed - Existing Structure
Rancho Penasquitos PS	10	10	No Pole Needed - Existing Structure
San Andreas PS	10	10	No Pole Needed - Existing Structure
San Carlos Res	10	10	No Pole Needed - Existing Structure
Soledad PS	10	10	No Pole Needed - Existing Structure
South Creek PS	10	10	No Pole Needed - Existing Structure
South San Diego Res	10	10	No Pole Needed - Existing Structure
Stonebridge PS 2	10	10	No Pole Needed - Existing Structure
Texas Street Reg	10	10	No Pole Needed - Existing Structure
Thorn Street Reg	10	10	No Pole Needed - Existing Structure
University Heights PS (& Res)	10	10	No Pole Needed - Existing Structure
Waring Road PS	10	10	No Pole Needed - Existing Structure
Carmel Mtn High Res	15	15	No Pole Needed - Existing Structure
Los Penasquitos PS	15	15	Need pole
Paradise Mesa SP	15	15	No pole needed - existing 15 foot pole
Penasquitos Bluffs & PS	15	15	No Pole Needed - mount to existing Building
Montezuma PS	20	25	needs new pole
65th & Herrick Rptr	25	30	needs new pole
Del Cerro Highlands PS	30	35	Need new Pole
Elliot Pipeline Reg	30	35	Need new Pole
Ocean View Hills PS	25	30	Need new pole
Climax PS	30	35	Need new pole
Eastgate Mall Reg	35	40	Need new pole
Los Penasquitos Res	30	35	Need new pole
Sewer PS 78	30	35	Need new pole
Pomerado Park Res (& Bernardo Heights PS)	35	35	Need new pole
Cielo & Woodman PS	35	40	Need New pole
La Jolla View SP	36	40	Need pole
South Creek Rptr	36	40	Need pole
La Jolla Country Club Res	40	45	Need pole
Paradise Mesa 2 PS	40	45	Need pole
Redwood Village SP	50	55	Need Pole
Mercy Mira Mesa High PS	50	55	needs new pole
Otay Mesa PS	50	55	Need pole
Paradise Hills 2 PS	50	55	Need pole
Paradise Mesa 1 PS	50	55	Need pole
Scripps Ranch Res (& Scripps McMillan PS)	50	55	Need Pole
Scripps Woods PS 2	50	55	Need Pole
Stonebridge PS 1	50	55	Need Pole

**City of San Diego
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Siemens



Project: Project Schedule
Date: Wed 12/14/11

Task: [Progress Bar] Progress
Split: [Split Bar] Milestone

Summary: [Summary Bar] Summary
Project Summary: [Project Summary Bar] Project Summary

External Tasks: [External Tasks Bar] External Tasks
External Milestone: [External Milestone Bar] External Milestone

Deadline: [Down Arrow]

**City of San Diego
Security Upgrades Design Build Contract 5171**

Siemens

ID	Task Name	Duration	Start	Finish	2013												
					Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	
44	Foliage	2 days	Fri 7/27/12	Mon 7/30/12													
45	Acceptance	1 day	Tue 7/31/12	Tue 7/31/12													
46	San Ysidro	26 days	Tue 7/31/12	Tue 8/7/12													
47	Permitting	1 day	Tue 7/31/12	Tue 7/31/12													
48	Electrical Rough	2 days	Wed 7/25/12	Thu 7/26/12													
49	Electrical Final	2 days	Fri 7/27/12	Mon 7/30/12													
50	Fencing	1 day	Tue 7/31/12	Tue 7/31/12													
51	Drainage	1 day	Tue 7/31/12	Tue 7/31/12													
52	Paving	1 day	Wed 8/1/12	Wed 8/1/12													
53	Network Startup	5 days	Tue 7/31/12	Mon 8/6/12													
54	CCTV Startup	1 day	Tue 8/7/12	Tue 8/7/12													
55	Foliage	2 days	Thu 8/2/12	Fri 8/3/12													
56	Acceptance	1 day	Mon 8/6/12	Mon 8/6/12													
57	Encanto	29 days	Tue 7/31/12	Fri 8/10/12													
58	Permitting	1 day	Tue 7/31/12	Tue 7/31/12													
59	Electrical Rough	2 days	Tue 7/31/12	Wed 8/1/12													
60	Electrical Final	2 days	Thu 8/2/12	Fri 8/3/12													
61	Fencing	1 day	Mon 8/6/12	Mon 8/6/12													
62	Drainage	1 day	Mon 8/6/12	Mon 8/6/12													
63	Paving	1 day	Tue 8/7/12	Tue 8/7/12													
64	Network Startup	3 days	Mon 8/6/12	Wed 8/8/12													
65	CCTV Startup	1 day	Thu 8/9/12	Thu 8/9/12													
66	Foliage	2 days	Wed 8/8/12	Thu 8/9/12													
67	Acceptance	1 day	Fri 8/10/12	Fri 8/10/12													
68	Ocean View Hills PS	20 days	Tue 7/31/12	Mon 7/30/12													
69	Permitting	1 day	Tue 7/31/12	Tue 7/31/12													
70	CCTV / RF Poles	10 days	Wed 7/4/12	Tue 7/17/12													
71	Electrical Rough	2 days	Wed 7/4/12	Thu 7/5/12													
72	Electrical Final	2 days	Wed 7/18/12	Thu 7/19/12													
73	Fencing	1 day	Fri 7/20/12	Fri 7/20/12													
74	Drainage	1 day	Fri 7/20/12	Fri 7/20/12													
75	Paving	1 day	Mon 7/23/12	Mon 7/23/12													
76	Gate	2 days	Tue 7/24/12	Wed 7/25/12													
77	Network Startup	1 day	Thu 7/26/12	Thu 7/26/12													
78	CCTV Startup	1 day	Fri 7/27/12	Fri 7/27/12													
79	Foliage	2 days	Thu 7/26/12	Fri 7/27/12													
80	Acceptance	1 day	Mon 7/30/12	Mon 7/30/12													
81	S San Diego Reservoir	187 days	Tue 7/31/12	Wed 3/20/13													
82	Permitting	1 day	Tue 7/31/12	Tue 7/31/12													
83	Electrical Rough	2 days	Fri 3/1/13	Mon 3/4/13													
84	Electrical Final	2 days	Tue 3/5/13	Wed 3/6/13													
85	Fencing	1 day	Thu 3/7/13	Thu 3/7/13													
86	Drainage	1 day	Thu 3/7/13	Thu 3/7/13													

Project: Project Schedule Date: Wed 12/14/11

Task: [Progress bar] Progress Summary: [Summary bar] External Tasks: [External Tasks bar] Deadline: [Down arrow]

Split: [Split bar] Milestone: [Milestone diamond] Project Summary: [Project Summary bar] External Milestone: [External Milestone diamond]

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Siemens

ID	Task Name	Duration	Start	Finish	2013												
					Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	
87	Paving	1 day	Fri 3/8/13	Fri 3/8/13													
88	Gate	5 days	Mon 3/11/13	Fri 3/15/13													
89	Network Startup	1 day	Mon 3/18/13	Mon 3/18/13													
90	CCTV Startup	1 day	Tue 3/19/13	Tue 3/19/13													
91	Foliage	2 days	Mon 3/18/13	Tue 3/19/13													
92	Acceptance	1 day	Wed 3/20/13	Wed 3/20/13													
93	Otay Mesa PS	33 days	Tue 7/3/12	Thu 8/16/12													
94	Permitting	1 day	Tue 7/3/12	Tue 7/3/12													
95	CCTV / RF Poles	10 days	Wed 7/18/12	Tue 7/31/12													
96	Electrical Rough	2 days	Wed 7/18/12	Thu 7/19/12													
97	Electrical Final	2 days	Wed 8/1/12	Thu 8/2/12													
98	Fencing	1 day	Fri 8/3/12	Fri 8/3/12													
99	Drainage	1 day	Fri 8/3/12	Fri 8/3/12													
100	Paving	1 day	Mon 8/6/12	Mon 8/6/12													
101	Gate	5 days	Tue 8/7/12	Mon 8/13/12													
102	Network Startup	1 day	Tue 8/14/12	Tue 8/14/12													
103	CCTV Startup	1 day	Wed 8/15/12	Wed 8/15/12													
104	Foliage	2 days	Tue 8/14/12	Wed 8/15/12													
105	Acceptance	1 day	Thu 8/16/12	Thu 8/16/12													
106	Princess Park PS	191 days	Tue 7/3/12	Tue 3/26/13													
107	Permitting	1 day	Tue 7/3/12	Tue 7/3/12													
108	Electrical Rough	2 days	Thu 3/7/13	Fri 3/8/13													
109	Electrical Final	2 days	Mon 3/11/13	Tue 3/12/13													
110	Fencing	1 day	Wed 3/13/13	Wed 3/13/13													
111	Drainage	1 day	Wed 3/13/13	Wed 3/13/13													
112	Paving	1 day	Thu 3/14/13	Thu 3/14/13													
113	Gate	5 days	Fri 3/15/13	Thu 3/21/13													
114	Network Startup	1 day	Fri 3/22/13	Fri 3/22/13													
115	CCTV Startup	1 day	Mon 3/25/13	Mon 3/25/13													
116	Foliage	2 days	Fri 3/22/13	Mon 3/25/13													
117	Acceptance	1 day	Tue 3/26/13	Tue 3/26/13													
118	Paradise Mesa 2 PS	43 days	Tue 7/3/12	Thu 8/30/12													
119	Permitting	1 day	Tue 7/3/12	Tue 7/3/12													
120	CCTV / RF Poles	10 days	Wed 8/1/12	Tue 8/14/12													
121	Electrical Rough	2 days	Wed 8/1/12	Thu 8/2/12													
122	Electrical Final	2 days	Wed 8/15/12	Thu 8/16/12													
123	Fencing	1 day	Fri 8/17/12	Fri 8/17/12													
124	Drainage	1 day	Fri 8/17/12	Fri 8/17/12													
125	Paving	1 day	Mon 8/20/12	Mon 8/20/12													
126	Gate	5 days	Tue 8/21/12	Mon 8/27/12													
127	Network Startup	1 day	Tue 8/28/12	Tue 8/28/12													
128	CCTV Startup	1 day	Wed 8/29/12	Wed 8/29/12													
129	Foliage	2 days	Tue 8/28/12	Wed 8/29/12													

Project: Project Schedule
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ID	Task Name	Duration	Start	Finish	2013															
					Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb				
130	Acceptance	1 day	Thu 8/30/12	Thu 8/30/12																
131	Paradise Mesa 1 PS	54 days	Tue 7/3/12	Fri 9/14/12																
132	Permitting	1 day	Tue 7/3/12	Tue 7/3/12																
133	CCTV / RF Poles	10 days	Wed 8/15/12	Tue 8/28/12																
134	Electrical Rough	2 days	Wed 8/15/12	Thu 8/16/12																
135	Electrical Final	2 days	Wed 8/29/12	Thu 8/30/12																
136	Fencing	1 day	Fri 8/31/12	Fri 8/31/12																
137	Drainage	1 day	Fri 8/31/12	Fri 8/31/12																
138	Paving	1 day	Mon 9/3/12	Mon 9/3/12																
139	Gate	5 days	Tue 9/4/12	Mon 9/10/12																
140	Network Startup	3 days	Tue 9/11/12	Thu 9/13/12																
141	CCTV Startup	1 day	Fri 9/14/12	Fri 9/14/12																
142	Foliage	2 days	Tue 9/11/12	Wed 9/12/12																
143	Acceptance	1 day	Thu 9/13/12	Thu 9/13/12																
144	Paradise Hills 2 PS	58 days	Tue 7/3/12	Thu 9/20/12																
145	Permitting	1 day	Tue 7/3/12	Tue 7/3/12																
146	CCTV / RF Poles	10 days	Wed 8/29/12	Tue 9/11/12																
147	Electrical Rough	2 days	Wed 8/29/12	Thu 8/30/12																
148	Electrical Final	2 days	Wed 9/12/12	Thu 9/13/12																
149	Fencing	1 day	Fri 9/14/12	Fri 9/14/12																
150	Drainage	1 day	Fri 9/14/12	Fri 9/14/12																
151	Paving	1 day	Mon 9/17/12	Mon 9/17/12																
152	Network Startup	1 day	Fri 9/14/12	Fri 9/14/12																
153	CCTV Startup	1 day	Mon 9/17/12	Mon 9/17/12																
154	Foliage	2 days	Tue 9/18/12	Wed 9/19/12																
155	Acceptance	1 day	Thu 9/20/12	Thu 9/20/12																
156	Paradise Mesa Standpipe	73 days	Tue 7/3/12	Thu 10/11/12																
157	Permitting	1 day	Tue 7/3/12	Tue 7/3/12																
158	CCTV / RF Poles	10 days	Wed 9/12/12	Tue 9/25/12																
159	Electrical Rough	2 days	Wed 9/12/12	Thu 9/13/12																
160	Electrical Final	2 days	Wed 9/26/12	Thu 9/27/12																
161	Fencing	1 day	Fri 9/28/12	Fri 9/28/12																
162	Drainage	1 day	Fri 9/28/12	Fri 9/28/12																
163	Paving	1 day	Mon 10/1/12	Mon 10/1/12																
164	Gate	5 days	Tue 10/2/12	Mon 10/8/12																
165	Network Startup	1 day	Tue 10/9/12	Tue 10/9/12																
166	CCTV Startup	1 day	Wed 10/10/12	Wed 10/10/12																
167	Foliage	2 days	Tue 10/9/12	Wed 10/10/12																
168	Acceptance	1 day	Thu 10/11/12	Thu 10/11/12																
169	Cielo & Woodman PS	83 days	Tue 7/3/12	Thu 10/25/12																
170	Permitting	1 day	Tue 7/3/12	Tue 7/3/12																
171	CCTV / RF Poles	10 days	Wed 9/26/12	Tue 10/9/12																
172	Electrical Rough	2 days	Wed 9/26/12	Thu 9/27/12																

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ID	Task Name	Duration	Start	Finish	2013												
					Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	
173	Electrical Final	2 days	Wed 10/10/12	Thu 10/11/12													
174	Fencing	1 day	Fri 10/12/12	Fri 10/12/12													
175	Drainage	1 day	Fri 10/12/12	Fri 10/12/12													
176	Paving	1 day	Mon 10/15/12	Mon 10/15/12													
177	Gate	5 days	Tue 10/16/12	Mon 10/22/12													
178	Network Startup	1 day	Tue 10/23/12	Tue 10/23/12													
179	CCTV Startup	1 day	Wed 10/24/12	Wed 10/24/12													
180	Foliage	2 days	Tue 10/23/12	Wed 10/24/12													
181	Acceptance	1 day	Thu 10/25/12	Thu 10/25/12													
182	65th & Herrick Rpt	353 days	Fri 11/11/11	Tue 3/19/13													
183	Permitting	1 day	Tue 7/3/12	Tue 7/3/12													
184	Electrical Rough	2 days	Wed 3/13/13	Thu 3/14/13													
185	Electrical Final	2 days	Fri 3/15/13	Mon 3/18/13													
186	Network Startup	1 day	Tue 3/19/13	Tue 3/19/13													
187	Acceptance	1 day	Fri 11/11/11	Fri 11/11/11													
188	65th & Herrick	194 days	Tue 7/3/12	Fri 3/29/13													
189	Permitting	1 day	Tue 7/3/12	Tue 7/3/12													
190	Electrical Rough	2 days	Tue 3/19/13	Wed 3/20/13													
191	Electrical Final	2 days	Thu 3/21/13	Fri 3/22/13													
192	Fencing	1 day	Mon 3/25/13	Mon 3/25/13													
193	Drainage	1 day	Mon 3/25/13	Mon 3/25/13													
194	Paving	1 day	Tue 3/26/13	Tue 3/26/13													
195	Network Startup	1 day	Mon 3/25/13	Mon 3/25/13													
196	CCTV Startup	1 day	Tue 3/26/13	Tue 3/26/13													
197	Foliage	2 days	Wed 3/27/13	Thu 3/28/13													
198	Acceptance	1 day	Fri 3/29/13	Fri 3/29/13													
199	Thorn St. Regulator	198 days	Tue 7/3/12	Thu 4/4/13													
200	Permitting	1 day	Tue 7/3/12	Tue 7/3/12													
201	Electrical Rough	2 days	Mon 3/25/13	Tue 3/26/13													
202	Electrical Final	2 days	Wed 3/27/13	Thu 3/28/13													
203	Fencing	1 day	Fri 3/29/13	Fri 3/29/13													
204	Drainage	1 day	Fri 3/29/13	Fri 3/29/13													
205	Paving	1 day	Mon 4/1/13	Mon 4/1/13													
206	Network Startup	1 day	Fri 3/29/13	Fri 3/29/13													
207	CCTV Startup	1 day	Mon 4/1/13	Mon 4/1/13													
208	Foliage	2 days	Tue 4/2/13	Wed 4/3/13													
209	Acceptance	1 day	Thu 4/4/13	Thu 4/4/13													
210	University Heights PS & Res	202 days	Tue 7/3/12	Wed 4/10/13													
211	Permitting	1 day	Tue 7/3/12	Tue 7/3/12													
212	Electrical Rough	2 days	Fri 3/29/13	Mon 4/1/13													
213	Electrical Final	2 days	Tue 4/2/13	Wed 4/3/13													
214	Fencing	1 day	Thu 4/4/13	Thu 4/4/13													
215	Drainage	1 day	Thu 4/4/13	Thu 4/4/13													

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ID	Task Name	Duration	Start	Finish	2013												
					Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	
216	Paving	1 day	Fri 4/5/13	Fri 4/5/13													
217	Network Startup	1 day	Thu 4/4/13	Thu 4/4/13													
218	CCTV Startup	1 day	Fri 4/5/13	Fri 4/5/13													
219	Foliage	2 days	Mon 4/8/13	Tue 4/9/13													
220	Acceptance	1 day	Wed 4/10/13	Wed 4/10/13													
221	Chollas Heights PS	93 days	Tue 7/3/12	Thu 11/8/12													
222	Permitting	1 day	Tue 7/3/12	Tue 7/3/12													
223	CCTV / RF Poles	10 days	Wed 10/10/12	Tue 10/23/12													
224	Electrical Rough	2 days	Wed 10/10/12	Thu 10/11/12													
225	Electrical Final	2 days	Wed 10/24/12	Thu 10/25/12													
226	Fencing	1 day	Fri 10/26/12	Fri 10/26/12													
227	Drainage	1 day	Fri 10/26/12	Fri 10/26/12													
228	Paving	1 day	Mon 10/29/12	Mon 10/29/12													
229	Gate	5 days	Tue 10/30/12	Mon 11/5/12													
230	Network Startup	1 day	Tue 11/6/12	Tue 11/6/12													
231	CCTV Startup	1 day	Wed 11/7/12	Wed 11/7/12													
232	Foliage	2 days	Tue 11/6/12	Wed 11/7/12													
233	Acceptance	1 day	Thu 11/8/12	Thu 11/8/12													
234	Redwood Village Standpipe	103 days	Tue 7/3/12	Thu 11/22/12													
235	Permitting	1 day	Tue 7/3/12	Tue 7/3/12													
236	CCTV / RF Poles	10 days	Wed 10/24/12	Tue 11/6/12													
237	Electrical Rough	2 days	Wed 10/24/12	Thu 10/25/12													
238	Electrical Final	2 days	Wed 11/7/12	Thu 11/8/12													
239	Fencing	1 day	Fri 11/9/12	Fri 11/9/12													
240	Drainage	1 day	Fri 11/9/12	Fri 11/9/12													
241	Paving	1 day	Mon 11/12/12	Mon 11/12/12													
242	Gate	5 days	Tue 11/13/12	Mon 11/19/12													
243	Network Startup	1 day	Tue 11/20/12	Tue 11/20/12													
244	CCTV Startup	1 day	Wed 11/21/12	Wed 11/21/12													
245	Foliage	2 days	Tue 11/20/12	Wed 11/21/12													
246	Acceptance	1 day	Thu 11/22/12	Thu 11/22/12													
247	Montezuma	108 days	Tue 7/3/12	Thu 11/29/12													
248	Permitting	1 day	Tue 7/3/12	Tue 7/3/12													
249	CCTV / RF Poles	10 days	Wed 11/7/12	Tue 11/20/12													
250	Electrical Rough	2 days	Wed 11/7/12	Thu 11/8/12													
251	Electrical Final	2 days	Wed 11/21/12	Thu 11/22/12													
252	Fencing	1 day	Fri 11/23/12	Fri 11/23/12													
253	Drainage	1 day	Fri 11/23/12	Fri 11/23/12													
254	Paving	1 day	Mon 11/26/12	Mon 11/26/12													
255	Network Startup	1 day	Fri 11/23/12	Fri 11/23/12													
256	CCTV Startup	1 day	Mon 11/26/12	Mon 11/26/12													
257	Foliage	2 days	Tue 11/27/12	Wed 11/28/12													
258	Acceptance	1 day	Thu 11/29/12	Thu 11/29/12													

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ID	Task Name	Duration	Start	Finish	2013														
					Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb			
259	Del Cerro PS	118 days	Tue 7/3/12	Thu 12/13/12															
260	Permitting	1 day	Tue 7/3/12	Tue 7/3/12															
261	CCTV / RF Poles	10 days	Wed 11/21/12	Tue 12/4/12															
262	Electrical Rough	2 days	Wed 11/21/12	Thu 11/22/12															
263	Electrical Final	2 days	Wed 12/5/12	Thu 12/6/12															
264	Fencing	1 day	Fri 12/7/12	Fri 12/7/12															
265	Drainage	1 day	Fri 12/7/12	Fri 12/7/12															
266	Paving	1 day	Mon 12/10/12	Mon 12/10/12															
267	Network Startup	1 day	Fri 12/7/12	Fri 12/7/12															
268	CCTV Startup	1 day	Mon 12/10/12	Mon 12/10/12															
269	Foliage	2 days	Tue 12/11/12	Wed 12/12/12															
270	Acceptance	1 day	Thu 12/13/12	Thu 12/13/12															
271	Del Cerro Res	133 days	Tue 7/3/12	Thu 1/3/13															
272	Permitting	1 day	Tue 7/3/12	Tue 7/3/12															
273	CCTV / RF Poles	10 days	Wed 12/5/12	Tue 12/18/12															
274	Electrical Rough	2 days	Wed 12/5/12	Thu 12/6/12															
275	Electrical Final	2 days	Wed 12/19/12	Thu 12/20/12															
276	Fencing	1 day	Fri 12/21/12	Fri 12/21/12															
277	Drainage	1 day	Fri 12/21/12	Fri 12/21/12															
278	Paving	1 day	Mon 12/24/12	Mon 12/24/12															
279	Gate	5 days	Tue 12/25/12	Mon 12/31/12															
280	Network Startup	1 day	Tue 1/1/13	Tue 1/1/13															
281	CCTV Startup	1 day	Wed 1/2/13	Wed 1/2/13															
282	Foliage	2 days	Tue 1/1/13	Wed 1/2/13															
283	Acceptance	1 day	Thu 1/3/13	Thu 1/3/13															
284	Catalina PS & Pt Loma Res	205 days	Tue 7/3/12	Mon 4/15/13															
285	Permitting	1 day	Tue 7/3/12	Tue 7/3/12															
286	Electrical Rough	2 days	Thu 4/4/13	Fri 4/5/13															
287	Electrical Final	2 days	Mon 4/8/13	Tue 4/9/13															
288	Network Startup	3 days	Wed 4/10/13	Fri 4/12/13															
289	Acceptance	1 day	Mon 4/15/13	Mon 4/15/13															
290	La Jolla Country Club Res	138 days	Tue 7/3/12	Thu 1/10/13															
291	Permitting	1 day	Tue 7/3/12	Tue 7/3/12															
292	CCTV / RF Poles	10 days	Wed 12/19/12	Tue 1/1/13															
293	Electrical Rough	2 days	Wed 12/19/12	Thu 12/20/12															
294	Electrical Final	2 days	Wed 1/2/13	Thu 1/3/13															
295	Fencing	1 day	Fri 1/4/13	Fri 1/4/13															
296	Drainage	1 day	Fri 1/4/13	Fri 1/4/13															
297	Paving	1 day	Mon 1/7/13	Mon 1/7/13															
298	Network Startup	1 day	Fri 1/4/13	Fri 1/4/13															
299	CCTV Startup	1 day	Mon 1/7/13	Mon 1/7/13															
300	Foliage	2 days	Tue 1/8/13	Wed 1/9/13															
301	Acceptance	1 day	Thu 1/10/13	Thu 1/10/13															

Project: Project Schedule
 Date: Wed 12/14/11

Task		Progress		Summary		External Tasks		Deadline	
Split		Milestone		Project Summary		External Milestone			

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ID	Task Name	Duration	Start	Finish	2013													
					Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb		
302	Bayview PS & Res	374 days	Fri 11/11/11	Wed 4/17/13														
303	Permitting	1 day	Tue 7/3/12	Tue 7/3/12														
304	Electrical Rough	2 days	Wed 4/10/13	Thu 4/11/13														
305	Electrical Final	2 days	Fri 4/12/13	Mon 4/15/13														
306	Network Startup	1 day	Tue 4/16/13	Tue 4/16/13														
307	CCTV Startup	1 day	Wed 4/17/13	Wed 4/17/13														
308	Acceptance	1 day	Fri 11/11/11	Fri 11/11/11														
309	Elliot Pipeline Regulator	153 days	Tue 7/3/12	Thu 1/31/13														
310	Permitting	1 day	Tue 7/3/12	Tue 7/3/12														
311	CCTV / RF Poles	10 days	Wed 1/2/13	Tue 1/15/13														
312	Electrical Rough	2 days	Wed 1/2/13	Thu 1/3/13														
313	Electrical Final	2 days	Wed 1/16/13	Thu 1/17/13														
314	Fencing	1 day	Fri 1/18/13	Fri 1/18/13														
315	Drainage	1 day	Fri 1/18/13	Fri 1/18/13														
316	Paving	1 day	Mon 1/21/13	Mon 1/21/13														
317	Gate	5 days	Tue 1/22/13	Mon 1/28/13														
318	Network Startup	1 day	Tue 1/29/13	Tue 1/29/13														
319	CCTV Startup	1 day	Wed 1/30/13	Wed 1/30/13														
320	Foliage	2 days	Tue 1/29/13	Wed 1/30/13														
321	Acceptance	1 day	Thu 1/31/13	Thu 1/31/13														
322	Eastgate Mall Regulator	163 days	Tue 7/3/12	Thu 2/14/13														
323	Permitting	1 day	Tue 7/3/12	Tue 7/3/12														
324	CCTV / RF Poles	10 days	Wed 1/16/13	Tue 1/29/13														
325	Electrical Rough	2 days	Wed 1/16/13	Thu 1/17/13														
326	Electrical Final	2 days	Wed 1/30/13	Thu 1/31/13														
327	Fencing	1 day	Fri 2/1/13	Fri 2/1/13														
328	Drainage	1 day	Fri 2/1/13	Fri 2/1/13														
329	Paving	1 day	Mon 2/4/13	Mon 2/4/13														
330	Gate	5 days	Tue 2/5/13	Mon 2/11/13														
331	Network Startup	1 day	Tue 2/12/13	Tue 2/12/13														
332	CCTV Startup	1 day	Wed 2/13/13	Wed 2/13/13														
333	Foliage	2 days	Tue 2/12/13	Wed 2/13/13														
334	Acceptance	1 day	Thu 2/14/13	Thu 2/14/13														
335	La Jolla View Standpipe	168 days	Tue 7/3/12	Thu 2/21/13														
336	Permitting	1 day	Tue 7/3/12	Tue 7/3/12														
337	CCTV / RF Poles	10 days	Wed 1/30/13	Tue 2/12/13														
338	Electrical Rough	2 days	Wed 1/30/13	Thu 1/31/13														
339	Electrical Final	2 days	Wed 2/13/13	Thu 2/14/13														
340	Fencing	1 day	Fri 2/15/13	Fri 2/15/13														
341	Drainage	1 day	Fri 2/15/13	Fri 2/15/13														
342	Paving	1 day	Mon 2/18/13	Mon 2/18/13														
343	Network Startup	1 day	Fri 2/15/13	Fri 2/15/13														
344	CCTV Startup	1 day	Mon 2/18/13	Mon 2/18/13														

Project: Project Schedule
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Task: Progress: Summary: External Tasks: Deadline:

Split: Milestone: Project Summary: External Milestone:

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ID	Task Name	Duration	Start	Finish	2013															
					Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb				
345	Foliage	2 days	Tue 2/19/13	Wed 2/20/13																
346	Acceptance	1 day	Thu 2/21/13	Thu 2/21/13																
347	Muirlands PS	219 days	Tue 7/3/12	Fri 5/3/13																
348	Permitting	1 day	Tue 7/3/12	Tue 7/3/12																
349	Electrical Rough	2 days	Tue 4/16/13	Wed 4/17/13																
350	Electrical Final	2 days	Thu 4/18/13	Fri 4/19/13																
351	Fencing	1 day	Mon 4/22/13	Mon 4/22/13																
352	Drainage	1 day	Mon 4/22/13	Mon 4/22/13																
353	Paving	1 day	Tue 4/23/13	Tue 4/23/13																
354	Gate	5 days	Wed 4/24/13	Tue 4/30/13																
355	Network Startup	1 day	Wed 5/1/13	Wed 5/1/13																
356	CCTV Startup	1 day	Thu 5/2/13	Thu 5/2/13																
357	Foliage	2 days	Wed 5/1/13	Thu 5/2/13																
358	Acceptance	1 day	Fri 5/3/13	Fri 5/3/13																
359	San Carlos Res	183 days	Tue 7/3/12	Thu 3/14/13																
360	Permitting	1 day	Tue 7/3/12	Tue 7/3/12																
361	CCTV / RF Poles	10 days	Wed 2/13/13	Tue 2/28/13																
362	Electrical Rough	2 days	Wed 2/13/13	Thu 2/14/13																
363	Electrical Final	2 days	Wed 2/27/13	Thu 2/28/13																
364	Fencing	1 day	Fri 3/1/13	Fri 3/1/13																
365	Drainage	1 day	Fri 3/1/13	Fri 3/1/13																
366	Paving	1 day	Mon 3/4/13	Mon 3/4/13																
367	Gate	5 days	Tue 3/5/13	Mon 3/11/13																
368	Network Startup	1 day	Tue 3/12/13	Tue 3/12/13																
369	CCTV Startup	1 day	Wed 3/13/13	Wed 3/13/13																
370	Foliage	2 days	Tue 3/12/13	Wed 3/13/13																
371	Acceptance	1 day	Thu 3/14/13	Thu 3/14/13																
372	Eagle Ridge	218 days	Tue 7/3/12	Thu 5/2/13																
373	Permitting	1 day	Tue 7/3/12	Tue 7/3/12																
374	Electrical Rough	2 days	Mon 4/22/13	Tue 4/23/13																
375	Electrical Final	2 days	Wed 4/24/13	Thu 4/25/13																
376	Fencing	1 day	Fri 4/26/13	Fri 4/26/13																
377	Drainage	1 day	Fri 4/26/13	Fri 4/26/13																
378	Paving	1 day	Mon 4/29/13	Mon 4/29/13																
379	Network Startup	1 day	Fri 4/26/13	Fri 4/26/13																
380	CCTV Startup	1 day	Mon 4/29/13	Mon 4/29/13																
381	Foliage	2 days	Tue 4/30/13	Wed 5/1/13																
382	Acceptance	1 day	Thu 5/2/13	Thu 5/2/13																
383																				
384	Installation - Team 2	204 days	Tue 7/3/12	Fri 4/12/13																
385	Cowles Mtn	35 days	Tue 7/3/12	Mon 8/20/12																
386	Permitting	1 day	Tue 7/3/12	Tue 7/3/12																
387	Electrical Rough	2 days	Thu 8/2/12	Fri 8/3/12																

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Task: Progress: Summary: External Tasks: Deadline:

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Siemens

ID	Task Name	Duration	Start	Finish	2013												
					Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	
388	Electrical Final	2 days	Mon 8/6/12	Tue 8/7/12													
389	Fencing	1 day	Wed 8/8/12	Wed 8/8/12													
390	Drainage	1 day	Wed 8/8/12	Wed 8/8/12													
391	Paving	1 day	Thu 8/9/12	Thu 8/9/12													
392	Network Startup	5 days	Mon 8/13/12	Fri 8/17/12													
393	CCTV Startup	1 day	Mon 8/20/12	Mon 8/20/12													
394	Foliage	2 days	Fri 8/10/12	Mon 8/13/12													
395	Acceptance	1 day	Tue 8/14/12	Tue 8/14/12													
396	Black Mtn	36 days	Tue 7/3/12	Tue 8/21/12													
397	Permitting	1 day	Tue 7/3/12	Tue 7/3/12													
398	Electrical Rough	2 days	Wed 8/8/12	Thu 8/9/12													
399	Electrical Final	2 days	Fri 8/10/12	Mon 8/13/12													
400	Fencing	1 day	Tue 8/14/12	Tue 8/14/12													
401	Drainage	1 day	Tue 8/14/12	Tue 8/14/12													
402	Paving	1 day	Wed 8/15/12	Wed 8/15/12													
403	Network Startup	5 days	Tue 8/14/12	Mon 8/20/12													
404	CCTV Startup	1 day	Tue 8/21/12	Tue 8/21/12													
405	Foliage	2 days	Thu 8/16/12	Fri 8/17/12													
406	Acceptance	1 day	Mon 8/20/12	Mon 8/20/12													
407	Mt. Woodson	40 days	Tue 7/3/12	Mon 8/27/12													
408	Permitting	1 day	Tue 7/3/12	Tue 7/3/12													
409	Electrical Rough	2 days	Tue 8/14/12	Wed 8/15/12													
410	Electrical Final	2 days	Thu 8/16/12	Fri 8/17/12													
411	Fencing	1 day	Mon 8/20/12	Mon 8/20/12													
412	Drainage	1 day	Mon 8/20/12	Mon 8/20/12													
413	Paving	1 day	Tue 8/21/12	Tue 8/21/12													
414	Network Startup	5 days	Mon 8/20/12	Fri 8/24/12													
415	CCTV Startup	1 day	Mon 8/27/12	Mon 8/27/12													
416	Foliage	2 days	Wed 8/22/12	Thu 8/23/12													
417	Acceptance	1 day	Fri 8/24/12	Fri 8/24/12													
418	Del Cerro Highlands PS	140 days	Tue 7/3/12	Mon 1/14/13													
419	Permitting	1 day	Tue 7/3/12	Tue 7/3/12													
420	Electrical Rough	2 days	Wed 1/2/13	Thu 1/3/13													
421	Electrical Final	2 days	Fri 1/4/13	Mon 1/7/13													
422	Fencing	1 day	Tue 1/8/13	Tue 1/8/13													
423	Drainage	1 day	Tue 1/8/13	Tue 1/8/13													
424	Paving	1 day	Wed 1/9/13	Wed 1/9/13													
425	Network Startup	1 day	Tue 1/8/13	Tue 1/8/13													
426	CCTV Startup	1 day	Wed 1/9/13	Wed 1/9/13													
427	Foliage	2 days	Thu 1/10/13	Fri 1/11/13													
428	Acceptance	1 day	Mon 1/14/13	Mon 1/14/13													
429	Climax	18 days	Tue 7/3/12	Thu 7/26/12													
430	Permitting	1 day	Tue 7/3/12	Tue 7/3/12													

Project: Project Schedule Date: Wed 12/14/11	Task	Progress	Summary	External Tasks	Deadline
	Split	Milestone	Project Summary	External Milestone	

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Siemens

ID	Task Name	Duration	Start	Finish	2013														
					Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb			
431	CCTV / RF Poles	10 days	Wed 7/4/12	Tue 7/17/12															
432	Electrical Rough	2 days	Wed 7/4/12	Thu 7/5/12															
433	Electrical Final	2 days	Wed 7/18/12	Thu 7/19/12															
434	Fencing	1 day	Fri 7/20/12	Fri 7/20/12															
435	Drainage	1 day	Fri 7/20/12	Fri 7/20/12															
436	Paving	1 day	Mon 7/23/12	Mon 7/23/12															
437	Network Startup	1 day	Fri 7/20/12	Fri 7/20/12															
438	CCTV Startup	1 day	Mon 7/23/12	Mon 7/23/12															
439	Foliage	2 days	Tue 7/24/12	Wed 7/25/12															
440	Acceptance	1 day	Thu 7/26/12	Thu 7/26/12															
441	Waring Rd	141 days	Tue 7/3/12	Tue 1/15/13															
442	Permitting	1 day	Tue 7/3/12	Tue 7/3/12															
443	Electrical Rough	2 days	Tue 1/8/13	Wed 1/9/13															
444	Electrical Final	2 days	Thu 1/10/13	Fri 1/11/13															
445	Network Startup	1 day	Mon 1/14/13	Mon 1/14/13															
446	Acceptance	1 day	Tue 1/15/13	Tue 1/15/13															
447	Deerfield PS	148 days	Tue 7/3/12	Thu 1/24/13															
448	Permitting	1 day	Tue 7/3/12	Tue 7/3/12															
449	Electrical Rough	2 days	Mon 1/14/13	Tue 1/15/13															
450	Electrical Final	2 days	Wed 1/16/13	Thu 1/17/13															
451	Fencing	1 day	Fri 1/18/13	Fri 1/18/13															
452	Drainage	1 day	Fri 1/18/13	Fri 1/18/13															
453	Paving	1 day	Mon 1/21/13	Mon 1/21/13															
454	Network Startup	1 day	Fri 1/18/13	Fri 1/18/13															
455	CCTV Startup	1 day	Mon 1/21/13	Mon 1/21/13															
456	Foliage	2 days	Tue 1/22/13	Wed 1/23/13															
457	Acceptance	1 day	Thu 1/24/13	Thu 1/24/13															
458	Friars Rd Regulator	157 days	Tue 7/3/12	Wed 2/6/13															
459	Permitting	1 day	Tue 7/3/12	Tue 7/3/12															
460	Electrical Rough	2 days	Fri 1/18/13	Mon 1/21/13															
461	Electrical Final	2 days	Tue 1/22/13	Wed 1/23/13															
462	Fencing	1 day	Thu 1/24/13	Thu 1/24/13															
463	Drainage	1 day	Thu 1/24/13	Thu 1/24/13															
464	Paving	1 day	Fri 1/25/13	Fri 1/25/13															
465	Gate	5 days	Mon 1/28/13	Fri 2/1/13															
466	Network Startup	1 day	Mon 2/4/13	Mon 2/4/13															
467	CCTV Startup	1 day	Tue 2/5/13	Tue 2/5/13															
468	Foliage	2 days	Mon 2/4/13	Tue 2/5/13															
469	Acceptance	1 day	Wed 2/6/13	Wed 2/6/13															
470	Texas St. Regulator	161 days	Tue 7/3/12	Tue 2/12/13															
471	Permitting	1 day	Tue 7/3/12	Tue 7/3/12															
472	Electrical Rough	2 days	Thu 1/24/13	Fri 1/25/13															
473	Electrical Final	2 days	Mon 1/28/13	Tue 1/29/13															

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ID	Task Name	Duration	Start	Finish	2013													
					Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb		
474	Fencing	1 day	Wed 1/30/13	Wed 1/30/13														
475	Drainage	1 day	Wed 1/30/13	Wed 1/30/13														
476	Paving	1 day	Thu 1/31/13	Thu 1/31/13														
477	Gate	5 days	Fri 2/1/13	Thu 2/7/13														
478	Network Startup	1 day	Fri 2/8/13	Fri 2/8/13														
479	CCTV Startup	1 day	Mon 2/11/13	Mon 2/11/13														
480	Foliage	2 days	Fri 2/8/13	Mon 2/11/13														
481	Acceptance	1 day	Tue 2/12/13	Tue 2/12/13														
482	Cabrillo Palisades PS	165 days	Tue 7/3/12	Mon 2/18/13														
483	Permitting	1 day	Tue 7/3/12	Tue 7/3/12														
484	Electrical Rough	2 days	Wed 1/30/13	Thu 1/31/13														
485	Electrical Final	2 days	Fri 2/1/13	Mon 2/4/13														
486	Fencing	1 day	Tue 2/5/13	Tue 2/5/13														
487	Drainage	1 day	Tue 2/5/13	Tue 2/5/13														
488	Paving	1 day	Wed 2/6/13	Wed 2/6/13														
489	Gate	5 days	Thu 2/7/13	Wed 2/13/13														
490	Network Startup	1 day	Thu 2/14/13	Thu 2/14/13														
491	CCTV Startup	1 day	Fri 2/15/13	Fri 2/15/13														
492	Foliage	2 days	Thu 2/14/13	Fri 2/15/13														
493	Acceptance	1 day	Mon 2/18/13	Mon 2/18/13														
494	Soledad PS	161 days	Tue 7/3/12	Tue 2/12/13														
495	Permitting	1 day	Tue 7/3/12	Tue 7/3/12														
496	Electrical Rough	2 days	Tue 2/5/13	Wed 2/6/13														
497	Electrical Final	2 days	Thu 2/7/13	Fri 2/8/13														
498	Network Startup	1 day	Mon 2/11/13	Mon 2/11/13														
499	Acceptance	1 day	Tue 2/12/13	Tue 2/12/13														
500	Stonebridge PS #2	173 days	Tue 7/3/12	Thu 2/28/13														
501	Permitting	1 day	Tue 7/3/12	Tue 7/3/12														
502	Electrical Rough	2 days	Mon 2/11/13	Tue 2/12/13														
503	Electrical Final	2 days	Wed 2/13/13	Thu 2/14/13														
504	Fencing	1 day	Fri 2/15/13	Fri 2/15/13														
505	Drainage	1 day	Fri 2/15/13	Fri 2/15/13														
506	Paving	1 day	Mon 2/18/13	Mon 2/18/13														
507	Gate	5 days	Tue 2/19/13	Mon 2/25/13														
508	Network Startup	1 day	Tue 2/26/13	Tue 2/26/13														
509	CCTV Startup	1 day	Wed 2/27/13	Wed 2/27/13														
510	Foliage	2 days	Tue 2/26/13	Wed 2/27/13														
511	Acceptance	1 day	Thu 2/28/13	Thu 2/28/13														
512	Scripps Ranch Res / McMillan PS	25 days	Tue 7/3/12	Mon 8/6/12														
513	Permitting	1 day	Tue 7/3/12	Tue 7/3/12														
514	RF Poles	10 days	Wed 7/18/12	Tue 7/31/12														
515	Electrical Rough	2 days	Wed 7/18/12	Thu 7/19/12														
516	Electrical Final	2 days	Wed 8/1/12	Thu 8/2/12														

Project: Project Schedule
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Task: Progress: Summary: External Tasks: Deadline:

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ID	Task Name	Duration	Start	Finish	2013													
					Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb		
517	Network Startup	1 day	Fri 8/3/12	Fri 8/3/12														
518	Acceptance	1 day	Mon 8/6/12	Mon 8/6/12														
519	Scrapps Woods PS	38 days	Tue 7/3/12	Thu 8/23/12														
520	Permitting	1 day	Tue 7/3/12	Tue 7/3/12														
521	CCTV / RF Poles	10 days	Wed 8/1/12	Tue 8/14/12														
522	Electrical Rough	2 days	Wed 8/1/12	Thu 8/2/12														
523	Electrical Final	2 days	Wed 8/15/12	Thu 8/16/12														
524	Fencing	1 day	Fri 8/17/12	Fri 8/17/12														
525	Drainage	1 day	Fri 8/17/12	Fri 8/17/12														
526	Paving	1 day	Mon 8/20/12	Mon 8/20/12														
527	Network Startup	1 day	Fri 8/17/12	Fri 8/17/12														
528	CCTV Startup	1 day	Mon 8/20/12	Mon 8/20/12														
529	Foliage	2 days	Tue 8/21/12	Wed 8/22/12														
530	Acceptance	1 day	Thu 8/23/12	Thu 8/23/12														
531	South Creek PS	53 days	Tue 7/3/12	Tue 9/13/12														
532	Permitting	1 day	Tue 7/3/12	Tue 7/3/12														
533	CCTV / RF Poles	10 days	Wed 8/15/12	Tue 8/28/12														
534	Electrical Rough	2 days	Wed 8/15/12	Thu 8/16/12														
535	Electrical Final	2 days	Wed 8/29/12	Thu 8/30/12														
536	Fencing	1 day	Fri 8/31/12	Fri 8/31/12														
537	Drainage	1 day	Fri 8/31/12	Fri 8/31/12														
538	Paving	1 day	Mon 9/3/12	Mon 9/3/12														
539	Gate	5 days	Tue 9/4/12	Mon 9/10/12														
540	Network Startup	1 day	Tue 9/11/12	Tue 9/11/12														
541	CCTV Startup	1 day	Wed 9/12/12	Wed 9/12/12														
542	Foliage	2 days	Tue 9/11/12	Wed 9/12/12														
543	Acceptance	1 day	Thu 9/13/12	Thu 9/13/12														
544	Stonebridge PS #1	63 days	Tue 7/3/12	Thu 9/27/12														
545	Permitting	1 day	Tue 7/3/12	Tue 7/3/12														
546	CCTV / RF Poles	10 days	Wed 8/29/12	Tue 9/11/12														
547	Electrical Rough	2 days	Wed 8/29/12	Thu 8/30/12														
548	Electrical Final	2 days	Wed 9/12/12	Thu 9/13/12														
549	Fencing	1 day	Fri 9/14/12	Fri 9/14/12														
550	Drainage	1 day	Fri 9/14/12	Fri 9/14/12														
551	Paving	1 day	Mon 9/17/12	Mon 9/17/12														
552	Gate	5 days	Tue 9/18/12	Mon 9/24/12														
553	Network Startup	1 day	Tue 9/25/12	Tue 9/25/12														
554	CCTV Startup	1 day	Wed 9/26/12	Wed 9/26/12														
555	Foliage	2 days	Tue 9/25/12	Wed 9/26/12														
556	Acceptance	1 day	Thu 9/27/12	Thu 9/27/12														
557	Pomerado Rpt	65 days	Tue 7/3/12	Mon 10/1/12														
558	Permitting	1 day	Tue 7/3/12	Tue 7/3/12														
559	CCTV / RF Poles	10 days	Wed 9/12/12	Tue 9/25/12														

Project: Project Schedule Date: Wed 12/14/11	Task Split	Progress Milestone	Summary Project Summary	External Tasks External Milestone	Deadline
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**City of San Diego
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ID	Task Name	Duration	Start	Finish	2013													
					Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb		
560	Electrical Rough	2 days	Wed 9/12/12	Thu 9/13/12														
561	Electrical Final	2 days	Wed 9/26/12	Thu 9/27/12														
562	Network Startup	1 day	Fri 9/28/12	Fri 9/28/12														
563	Acceptance	1 day	Mon 10/1/12	Mon 10/1/12														
564	Pomerado PS	177 days	Tue 7/3/12	Wed 3/6/13														
565	Permitting	1 day	Tue 7/3/12	Tue 7/3/12														
566	Electrical Rough	2 days	Fri 2/15/13	Mon 2/18/13														
567	Electrical Final	2 days	Tue 2/19/13	Wed 2/20/13														
568	Fencing	1 day	Thu 2/21/13	Thu 2/21/13														
569	Drainage	1 day	Thu 2/21/13	Thu 2/21/13														
570	Paving	1 day	Fri 2/22/13	Fri 2/22/13														
571	Gate	5 days	Mon 2/25/13	Fri 3/1/13														
572	Network Startup	1 day	Mon 3/4/13	Mon 3/4/13														
573	CCTV Startup	1 day	Tue 3/5/13	Tue 3/5/13														
574	Foliage	2 days	Mon 3/4/13	Tue 3/5/13														
575	Acceptance	1 day	Wed 3/6/13	Wed 3/6/13														
576	Miramar Ranch N PS & Res	181 days	Tue 7/3/12	Tue 3/12/13														
577	Permitting	1 day	Tue 7/3/12	Tue 7/3/12														
578	Electrical Rough	2 days	Thu 2/21/13	Fri 2/22/13														
579	Electrical Final	2 days	Mon 2/25/13	Tue 2/26/13														
580	Fencing	1 day	Wed 2/27/13	Wed 2/27/13														
581	Drainage	1 day	Wed 2/27/13	Wed 2/27/13														
582	Paving	1 day	Thu 2/28/13	Thu 2/28/13														
583	Gate	5 days	Fri 3/1/13	Thu 3/7/13														
584	Network Startup	1 day	Fri 3/8/13	Fri 3/8/13														
585	CCTV Startup	1 day	Mon 3/11/13	Mon 3/11/13														
586	Foliage	2 days	Fri 3/8/13	Mon 3/11/13														
587	Acceptance	1 day	Tue 3/12/13	Tue 3/12/13														
588	Penasquitos Bluffs PS	177 days	Tue 7/3/12	Wed 3/6/13														
589	Permitting	1 day	Tue 7/3/12	Tue 7/3/12														
590	Electrical Rough	2 days	Wed 2/27/13	Thu 2/28/13														
591	Electrical Final	2 days	Fri 3/1/13	Mon 3/4/13														
592	Network Startup	1 day	Tue 3/5/13	Tue 3/5/13														
593	Acceptance	1 day	Wed 3/6/13	Wed 3/6/13														
594	Mercy Mira Mesa High PS	75 days	Tue 7/3/12	Mon 10/15/12														
595	Permitting	1 day	Tue 7/3/12	Tue 7/3/12														
596	CCTV / RF Poles	10 days	Wed 9/26/12	Tue 10/9/12														
597	Electrical Rough	2 days	Wed 9/26/12	Thu 9/27/12														
598	Electrical Final	2 days	Wed 10/10/12	Thu 10/11/12														
599	Network Startup	1 day	Fri 10/12/12	Fri 10/12/12														
600	Acceptance	1 day	Mon 10/15/12	Mon 10/15/12														
601	Sewer Pump St. 78	88 days	Tue 7/3/12	Thu 11/1/12														
602	Permitting	1 day	Tue 7/3/12	Tue 7/3/12														

Project: Project Schedule Date: Wed 12/14/11

Task: Progress: Summary: External Tasks: Deadline:










Split: Milestone: Project Summary: External Milestone:

**City of San Diego
Security Upgrades Design Build Contract 5171**

Siemens

ID	Task Name	Duration	Start	Finish	2013													
					Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb		
603	CCTV / RF Poles	10 days	Wed 10/10/12	Tue 10/23/12														
604	Electrical Rough	2 days	Wed 10/10/12	Thu 10/11/12														
605	Electrical Final	2 days	Wed 10/24/12	Thu 10/25/12														
606	Fencing	1 day	Fri 10/26/12	Fri 10/26/12														
607	Drainage	1 day	Fri 10/26/12	Fri 10/26/12														
608	Paving	1 day	Mon 10/29/12	Mon 10/29/12														
609	Network Startup	1 day	Fri 10/26/12	Fri 10/26/12														
610	CCTV Startup	1 day	Mon 10/29/12	Mon 10/29/12														
611	Foliage	2 days	Tue 10/30/12	Wed 10/31/12														
612	Acceptance	1 day	Thu 11/1/12	Thu 11/1/12														
613	San Andreas PS	189 days	Tue 7/3/12	Fri 3/22/13														
614	Permitting	1 day	Tue 7/3/12	Tue 7/3/12														
615	Electrical Rough	2 days	Tue 3/5/13	Wed 3/6/13														
616	Electrical Final	2 days	Thu 3/7/13	Fri 3/8/13														
617	Fencing	1 day	Mon 3/11/13	Mon 3/11/13														
618	Drainage	1 day	Mon 3/11/13	Mon 3/11/13														
619	Paving	1 day	Tue 3/12/13	Tue 3/12/13														
620	Gate	5 days	Wed 3/13/13	Tue 3/19/13														
621	Network Startup	1 day	Wed 3/20/13	Wed 3/20/13														
622	CCTV Startup	1 day	Thu 3/21/13	Thu 3/21/13														
623	Foliage	2 days	Wed 3/20/13	Thu 3/21/13														
624	Acceptance	1 day	Fri 3/22/13	Fri 3/22/13														
625	Rancho Penasquitos PS	185 days	Tue 7/3/12	Mon 3/18/13														
626	Permitting	1 day	Tue 7/3/12	Tue 7/3/12														
627	Electrical Rough	2 days	Mon 3/11/13	Tue 3/12/13														
628	Electrical Final	2 days	Wed 3/13/13	Thu 3/14/13														
629	Network Startup	1 day	Fri 3/15/13	Fri 3/15/13														
630	Acceptance	1 day	Mon 3/18/13	Mon 3/18/13														
631	Black Mtn Res & PS	191 days	Tue 7/3/12	Tue 3/26/13														
632	Permitting	1 day	Tue 7/3/12	Tue 7/3/12														
633	Electrical Rough	2 days	Fri 3/15/13	Mon 3/18/13														
634	Electrical Final	2 days	Tue 3/19/13	Wed 3/20/13														
635	Network Startup	1 day	Thu 3/21/13	Thu 3/21/13														
636	Foliage	2 days	Fri 3/22/13	Mon 3/25/13														
637	Acceptance	1 day	Tue 3/26/13	Tue 3/26/13														
638	Rancho Bernardo Res & Indus Pk	100 days	Tue 7/3/12	Mon 11/19/12														
639	Permitting	1 day	Tue 7/3/12	Tue 7/3/12														
640	CCTV / RF Poles	10 days	Wed 10/24/12	Tue 11/6/12														
641	Electrical Rough	2 days	Wed 10/24/12	Thu 10/25/12														
642	Electrical Final	2 days	Wed 11/7/12	Thu 11/8/12														
643	Fencing	1 day	Fri 11/9/12	Fri 11/9/12														
644	Drainage	1 day	Fri 11/9/12	Fri 11/9/12														
645	Paving	1 day	Mon 11/12/12	Mon 11/12/12														

Project: Project Schedule
Date: Wed 12/14/11

Task  Progress  Summary  External Tasks  Deadline 
 Split  Milestone  Project Summary  External Milestone 

**City of San Diego
Security Upgrades Design Build Contract 5171**

Siemens

ID	Task Name	Duration	Start	Finish	2013													
					Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb		
646	Gates (2)	2 days	Tue 11/13/12	Wed 11/14/12														
647	Network Startup	1 day	Thu 11/15/12	Thu 11/15/12														
648	CCTV Startup	1 day	Fri 11/16/12	Fri 11/16/12														
649	Foliage	2 days	Thu 11/15/12	Fri 11/16/12														
650	Acceptance	1 day	Mon 11/19/12	Mon 11/19/12														
651	Pomerado Park Res & Bernado Hts PS	105 days	Tue 7/3/12	Mon 11/26/12														
652	Permitting	1 day	Tue 7/3/12	Tue 7/3/12														
653	CCTV / RF Poles	10 days	Wed 11/7/12	Tue 11/20/12														
654	Electrical Rough	2 days	Wed 11/7/12	Thu 11/8/12														
655	Electrical Final	2 days	Wed 11/21/12	Thu 11/22/12														
656	Network Startup	1 day	Fri 11/23/12	Fri 11/23/12														
657	Acceptance	1 day	Mon 11/26/12	Mon 11/26/12														
658	Los Penasquitos Res	115 days	Tue 7/3/12	Mon 12/10/12														
659	Permitting	1 day	Tue 7/3/12	Tue 7/3/12														
660	CCTV / RF Poles	10 days	Wed 11/21/12	Tue 12/4/12														
661	Electrical Rough	2 days	Wed 11/21/12	Thu 11/22/12														
662	Electrical Final	2 days	Wed 12/5/12	Thu 12/6/12														
663	Network Startup	1 day	Fri 12/7/12	Fri 12/7/12														
664	Acceptance	1 day	Mon 12/10/12	Mon 12/10/12														
665	Los Penasquitos PS	128 days	Tue 7/3/12	Thu 12/27/12														
666	Permitting	1 day	Tue 7/3/12	Tue 7/3/12														
667	CCTV / RF Poles	10 days	Wed 12/5/12	Tue 12/18/12														
668	Electrical Rough	2 days	Wed 12/5/12	Thu 12/6/12														
669	Electrical Final	2 days	Wed 12/19/12	Thu 12/20/12														
670	Fencing	1 day	Fri 12/21/12	Fri 12/21/12														
671	Drainage	1 day	Fri 12/21/12	Fri 12/21/12														
672	Paving	1 day	Mon 12/24/12	Mon 12/24/12														
673	Network Startup	1 day	Fri 12/21/12	Fri 12/21/12														
674	CCTV Startup	1 day	Mon 12/24/12	Mon 12/24/12														
675	Foliage	2 days	Tue 12/25/12	Wed 12/26/12														
676	Acceptance	1 day	Thu 12/27/12	Thu 12/27/12														
677	Carmel Mtn Mall PS	196 days	Tue 7/3/12	Tue 4/2/13														
678	Permitting	1 day	Tue 7/3/12	Tue 7/3/12														
679	Electrical Rough	2 days	Thu 3/21/13	Fri 3/22/13														
680	Electrical Final	2 days	Mon 3/25/13	Tue 3/26/13														
681	Fencing	1 day	Wed 3/27/13	Wed 3/27/13														
682	Drainage	1 day	Wed 3/27/13	Wed 3/27/13														
683	Paving	1 day	Thu 3/28/13	Thu 3/28/13														
684	Network Startup	1 day	Wed 3/27/13	Wed 3/27/13														
685	CCTV Startup	1 day	Thu 3/28/13	Thu 3/28/13														
686	Foliage	2 days	Fri 3/29/13	Mon 4/1/13														
687	Acceptance	1 day	Tue 4/2/13	Tue 4/2/13														
688	Carmel Mtn Indus	200 days	Tue 7/3/12	Mon 4/8/13														

Project: Project Schedule
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Task: Progress: Summary: External Tasks: Deadline:

Split: Milestone: Project Summary: External Milestone:

**City of San Diego
Security Upgrades Design Build Contract 5171**

Siemens

ID	Task Name	Duration	Start	Finish	2013												
					Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	
689	Permitting	1 day	Tue 7/3/12	Tue 7/3/12													
690	Electrical Rough	2 days	Wed 3/27/13	Thu 3/28/13													
691	Electrical Final	2 days	Fri 3/29/13	Mon 4/1/13													
692	Fencing	1 day	Tue 4/2/13	Tue 4/2/13													
693	Drainage	1 day	Tue 4/2/13	Tue 4/2/13													
694	Paving	1 day	Wed 4/3/13	Wed 4/3/13													
695	Network Startup	1 day	Tue 4/2/13	Tue 4/2/13													
696	CCTV Startup	1 day	Wed 4/3/13	Wed 4/3/13													
697	Foliage	2 days	Thu 4/4/13	Fri 4/5/13													
698	Acceptance	1 day	Mon 4/8/13	Mon 4/8/13													
699	Carmel Mtn High Res	204 days	Tue 7/3/12	Fri 4/12/13													
700	Permitting	1 day	Tue 7/3/12	Tue 7/3/12													
701	Electrical Rough	2 days	Tue 4/2/13	Wed 4/3/13													
702	Electrical Final	2 days	Thu 4/4/13	Fri 4/5/13													
703	Fencing	1 day	Mon 4/8/13	Mon 4/8/13													
704	Drainage	1 day	Mon 4/8/13	Mon 4/8/13													
705	Paving	1 day	Tue 4/9/13	Tue 4/9/13													
706	Network Startup	1 day	Mon 4/8/13	Mon 4/8/13													
707	CCTV Startup	1 day	Tue 4/9/13	Tue 4/9/13													
708	Foliage	2 days	Wed 4/10/13	Thu 4/11/13													
709	Acceptance	1 day	Fri 4/12/13	Fri 4/12/13													
710	Carmel Mtn PS	138 days	Tue 7/3/12	Thu 1/10/13													
711	Permitting	1 day	Tue 7/3/12	Tue 7/3/12													
712	CCTV / RF Poles	10 days	Wed 12/19/12	Tue 1/1/13													
713	Electrical Rough	2 days	Wed 12/19/12	Thu 12/20/12													
714	Electrical Final	2 days	Wed 1/2/13	Thu 1/3/13													
715	Fencing	1 day	Fri 1/4/13	Fri 1/4/13													
716	Drainage	1 day	Fri 1/4/13	Fri 1/4/13													
717	Paving	1 day	Mon 1/7/13	Mon 1/7/13													
718	Network Startup	1 day	Fri 1/4/13	Fri 1/4/13													
719	CCTV Startup	1 day	Mon 1/7/13	Mon 1/7/13													
720	Foliage	2 days	Tue 1/8/13	Wed 1/8/13													
721	Acceptance	1 day	Thu 1/10/13	Thu 1/10/13													

Project: Project Schedule
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Task: Progress: Summary: External Tasks: Deadline:

Split: Milestone: Project Summary: External Milestone:

Siemens' Notes, Clarifications and Exclusions:

- ▶ All existing equipment is in good working order and assumed operational. Siemens has not provided repair or replacement of existing equipment, except if specifically noted in the Siemens technical approach and design.
- ▶ Siemens has provided a design that meets the functional and non-functional requirements of the bridging documents. Siemens has designed an operational system to meet these requirements.
- ▶ All 110v power is assumed existing and operational, per Addendum 3. The City is to provide dedicated circuits at each location for use in this project.
- ▶ Siemens excludes all hatch replacements as no specifications have been provided for replacement. Hatches are operable, though AECOM has cited multiple locations where replacement is recommended.
- ▶ Siemens has provided fencing per the drawings except at three locations. Siemens excludes Ocean View Hills and Stonebridge #1 and #2 PS.
- ▶ Rock excavation and removal is excluded from this scope of work.
- ▶ As all work shall be on City of San Diego properties, Siemens assumes over the counter permit submittal and review. No planning, zoning or site drawings required. Poles and base will be standard design across all sites. Siemens excludes all other permits or approvals (HOA's, Community approvals, Federal, State, or other local governments).
- ▶ Soils report and/ or documentation is assumed to be existing and is excluded. Siemens assumes the City will provide all reports and surveys to Siemens.
- ▶ Major grading, demolition or excavation for leveling of pole location is excluded. Siemens' design does not require such work.
- ▶ Tree trimming and removal is excluded for non project site locations (non-city owned property where a tree limits LoS, for instance). All foliage control within sites or on fence line, per RFP, are included in scope of work.
- ▶ Siemens excludes all property line surveys from scope of work. It is assumed that the City will provide all documentation for use in project.
- ▶ FAA obstruction lighting is excluded.
- ▶ All high site towers are assumed available for all antenna mounting. Tower assessment shall be provided, however, any additional towers or structural improvements are excluded.
- ▶ All high site grounding requirements are excluded and assumed R56. It is assumed that no additional modifications shall be required.
- ▶ Siemens assumes that mounting to existing structures at sites is acceptable.
- ▶ Siemens excludes the removal and demolition of existing communications infrastructure. All cabling and cellular equipment removal at Paradise Mesa Standpipe is excluded.
- ▶ Siemens has provided analytic ready NVR's with Nice software and licensing included.
- ▶ All equipment and software is warranted for three years from date of site acceptance. Preventative Maintenance Program (ALT B) provides extended warranty and preventive maintenance services, per proposal.
- ▶ Siemens has provided software maintenance (warranty) on new software only. All existing hardware and software is excluded from warranty and software support agreements. This may include existing AMS Server and Licensing.
- ▶ Siemens will train City on programming of database for access control systems, however, database shall be entered by client. All new badge creation and distribution of cards shall be provided by client.

- ▶ Siemens assumes adequate access to all facilities to accommodate concurrent site construction and design.
- ▶ Siemens has provided a functional and non-functional compliant design and has engineered site by site protection schedule based on Siemens experience with the products and experience with deploying outdoor analytics and surveillance systems.



CONSTRUCTION PLAN:

This document represents Siemens Industry Inc's Project Implementation Plan (PIP). Global best practices require execution of the PIP aimed at facilitating excellence in project management, construction management and project delivery to our global customers. The Siemens PIP represents a comprehensive plan including:

- Approach and Methods
- Engineering Approach
- Application Software Development Methodologies
- Testing Procedures (functional testing, system startup testing)
- Quality Plan
- Installation Plans and all project commitments/deliverables.
- Safety Program
- Traffic Control

The Project Implementation Plan is authored and maintained by Bruce G. Becker, the Siemens' Program Manager or Lead Project Manager (LPM). It will be updated by the LPM during the project life cycle on an as needed basis to reflect changing project scope, needs and conditions. The guidelines for the creation, review, approval, implementation and revision of the Project Implementation Plan are documented in the Siemens Quality Management System procedure number 7-611.0209.01.0. Revised copies of the Project Implementation Plan will be available at the job-site.

This Project Implementation Plan applies to the hardware and software engineering design, development, testing, installation, and integration of the Water Department Security Upgrades project, including all civil design and construction, wireless design and construction and IT systems, including security.

This construction plan and the work to be performed are based upon the following project documents as well as Siemens' standard and proven approach to similar projects:

- Request for Proposal (March 2011 rev.)
- Addenda 1 thru 6
- Site visits, evaluations and engineering assessments

Overview

Planning sessions with the project stakeholders will enable us to collaborate and finalize a construction schedule using two teams to complete the project. A Kickoff Meeting will be held after the award of contract to Siemens. The purpose of the meeting will be to introduce the Siemens Project Team as well as meet other project team members and to discuss relevant segments of Siemens' Project Implementation Plan.

Siemens has prepared a preliminary construction schedule, identifying all major tasks based on milestones provided in the RFP. Siemens' plan includes all related tasks required for the timely execution and completion of the following:

- Design Engineering Phase & Collaboration
- Material Procurement

- Construction Activities by our team
- Integration and Testing
- Project Turnover
- Warranty and Maintenance

During project execution, Siemens' Project Management team will continue to collaborate with the Project stakeholders to ensure project continuity and consistent communication on any schedule changes. Siemens will coordinate the installation of systems through regularly scheduled meetings between Siemens' PM team and the Project Team. These meetings should include installation progress updates, pending RFI status, upcoming schedule milestones, anticipated schedule or scope changes, subcontractor coordination, etc.

Engineering

The engineering will be broken into multiple phases to support an aggressive completion project schedule. The phases of design will be executed concurrently based on an initial plan established, reviewed and approved at the preconstruction meeting. The use of poles at any site will be standardized between the wireless and security portions of the project to minimize construction as much as possible. Based on the walkthroughs prior to bidding it was determined that a number of sites will not require poles while few that did not have any will not require them.

Phase 1 will consist of the wireless communications system planned for the project. The engineering will be based on standard off-the-shelf product designed for wireless applications. This engineering portion will be broken into two parts –

- **Part A** – This portion consists of the main backbone between the high points of the wireless system and the network headend at the Security Operations Center. This takes into account the 6 sites with large planned throughput requirements. This part provides the backbone with some redundant pathways and supports the communications from all the sites to the Security Operations Center.

The licensing for this portion of the overall wireless system will be submitted as early as possible once the backbone design completes an internal 60% design review. As you may know, the licensing portion of the project is outside of everyone's control and can take anywhere from 30 to 60 days to complete from the date of the licensing request. This will allow us to bring on this portion of the wireless system early in the project.

The push to 100% design will allow us to submit and obtain a permit for construction on this limited number of sites. The design schedule driver for this part is to have the first couple of sites installed and ready to be energized by the time the licenses are granted for these sites. The startup and testing will certify the equipment is functioning as required and prepare us for the other phase of work.

- **Part B** – This portion consists of the spurs from the main backbone for the remainder of the system. This takes into account the remainder of the sites that are spurs off the backbone part of the system, whether repeaters or actual drops. The design of sites

will be prioritized to bring on the spurs in sequence as they are connected wirelessly to the backbone. This will allow each site that is completed to support the next site in the schedule. As each group of sites reaches 100% design completion they will be submitted and permits obtained to begin the installation as early as possible

The licensing for this portion of the overall wireless system will be submitted as early as possible once the spur design completes an internal 60% design review. Again, the licensing portion of the project is outside of everyone's control and can take anywhere from 30 to 60 days to complete from the date of the licensing request. This will be one of the constraining factors in completing the startup for the early portion of sites.

Phase 2 will consist of the wireless communications system planned for the project. The engineering will be based on standard off-the-shelf product designed for wireless applications. This engineering portion will be broken into two parts –

- **Part A** – This portion consists of the security system design for the Security Operations Center. This provides the overall headend and central monitoring point for the entire project. The intent is to have this system online as early as possible to support the startup of every site for the project as they complete.
- **Part B** – This portion consists of the security system design for each site. The design of sites will be prioritized to match the same order of sites for the wireless system. As each group of sites reaches 100% design completion they will be submitted and permits obtained to begin the installation as early as possible

Installation

During this phase, Siemens' team of Sub-Contractors or local installers will engage in the field installation of pole foundations and pole erection, electrical rough in activities, security and communication devices, assets and wiring. The Project Manager will coordinate daily activities of these installers. Siemens will actively participate in all required coordination meetings with the Project Team to ensure changes are communicated to the installation crew.

Siemens already identified all pertinent tasks by our subcontractors that drive the project. Tracking progress will be done regularly throughout the installation phase with any potential community impact addressed with the Project Stakeholders. Siemens will provide progress updates during construction/coordination meetings or thorough the RFI process.

The installation will be broken into two teams with each team effectively taking on approximately ½ of the sites for the project. The installation at each site will begin once the permits have been issued for the site. The requests for permits will be obtained in groups (i.e. backbone group, spur group 1, spur group 2, etc.).

Phase 1 - The installation priorities will be the backbone portion of the project as defined during the wireless engineering, Phase 1 – Part A. Each team will be provided direction, priorities and a schedule for each of these sites for completion. The plan is to startup each site as quickly as the installation is completed to verify the wireless backbone is online and operational. The security work for these sites will be completed in tandem with the wireless installation while the team is at the site.

Phase 2 - The installation priorities will now be the spurs portion of the project as defined during the wireless engineering, Phase 1 – Part B. Each team will be provided direction, priorities and a schedule for each of these sites for completion. The plan is to startup each site as quickly as the installation is completed to verify the wireless backbone is online and operational. The security work for these sites will be completed in tandem with the wireless installation while the team is at the site.

Startup

The initial startup will focus on the Security Operations Center. The plan is to have this system energized and online as soon as the first site is ready for startup. This will facilitate the testing and startup of each site as the project progresses.

The next set of sites to be undergoing a startup and put online will be the ones defined as supporting the backbone in Engineering Phase 1, Part A. Once these sites have been successfully put online training will be scheduled with the operators. This will allow these completed sites to remain secure while we focus on the remaining sites.

At each site the startup of the wireless system and security system will be also broken into two teams with each team effectively taking on approximately 1/2 of the sites for the project. The startup at each site will begin once the installation of the wireless and security systems have been completed for the site. As each site completes its startup it will be put online with the Security Operations Center. This includes both the wireless and security systems.

The startups will be completed such that each previous site completed will support the wireless communication for the next site on the wireless system. The security system will be completed at the same time to ensure that the site remains secure once the installation and startup at the site is completed. This will allow Siemens to obtain a progressive acceptance of the system as each site completes.

Quality Control

To ensure a high level of installation quality and compliance with Siemens' Electrical Installation Guidelines, Siemens will be utilizing a proven Electrical Sub-Contractor trained by the San Diego branch office specifically for security and other low voltage installations. Installation shall be in accordance with project specifications and all applicable national and local codes. Our communications partner will be engaged based on their experience with projects of similar scope and magnitude.

To ensure quality development of the system from inception through design, execution and completion, Siemens will be utilizing its Quality Management System (QMS). The team members are trained on the QMS through formal documented training and follow up

meetings. Similar meetings during the project life cycle will be held regularly to ensure that all team members are aware of and adhering to this process during the project execution.

While the LPM has the direct responsibility for quality assurance, the rest of the project team members shall be responsible for the quality of their work. The LPM shall ensure that suitable quality standards are maintained and that appropriate documentation is prepared to map the completed the project documents.

All project team members shall undergo a project orientation to review Siemens' QMS procedures. These QMS procedures form the design documentation and software development methodologies, including test methodology, etc., adopted for the project. As part of quality assurance, the lead Project Manager will conduct periodic reviews with the rest of the team to ensure that programming methodologies are being adhered to.

Peer reviews shall be performed for all design documentation and software development. The person performing the peer review will have the same or higher level of expertise as the project team member who performed the work that is being reviewed. Peer review activities shall include the following:

- Verifying the technical approach.
- Documenting that proper and appropriate procedures are followed.
- Providing a technical evaluation that the work product achieves the desired intent.
- Verifying that the work product is complete and that all documentation is attached.

All project electronic documentation, including electronic design documentation and software, shall be stored on the San Diego Branch's network.

Safety

The Siemens Safety Management and Training manual is a detailed living document of over 350 pages. Rather than include the entire manual as a part of this RFP response we have tried to provide a high level outline of the topics covered under this policy. The entire manual can be furnished upon request, but of most importance, Siemens conducts weekly safety meetings, insuring full understanding of risks and maintaining safety and compliance on all job sites.

Injury and Illness prevention Plan

The Injury and Illness Prevention Program (IIP Program) Administrator and Safety Director is Peter Myers.

Peter Myers has the authority and responsibility for implementing the provisions of this program for Siemens Industry, Inc., Cypress and San Diego, CA.

All managers and supervisors are responsible for implementing and maintaining the IIP Program in their work areas and for answering worker questions about the IIP Program. A copy of this IIP Program is available upon request.

Safety and Health Policies & Procedures

SHPP-01 Code of Safe Practices

SHPP-02	Hazard Communications
SHPP-03	Construction Site Safety & Health Plans
SHPP-04	Lockout / Tagout
SHPP-05	Confined Space Entry
SHPP-06	Bloodborne Pathogens
SHPP-07	Fall Protection & Ladder Safety
SHPP-08	Personal Protective Equipment
SHPP-09	Hearing Conservation
SHPP-00	Respiratory Protection
SHPP-01	Emergency Action Plan
SHPP-02	Industrial Trucks
SHPP-03	Laboratory Safety
SHPP-04	Asbestos Safety Policy
SHPP-05	Power and Hand Tools
SHPP-06	Drivers and Vehicle Safety Policy

Supervisor & Employee Relations

The supervisor's task is to produce goods and services according to the company's customer requirements and schedules. However, unless a supervisor can get their employees to work safely and efficiently, schedules fail and customers are unhappy.

The attitudes of a group of employees are directly influenced by their supervisor. If the supervisor is unhappy with the way things are run generally, or feels safety activities are a waste of time, this attitude will be reflected in the performance of their work crews. To run a safe, efficient department or project, the supervisor has to keep a positive attitude and know about the needs of the people working with them.

The first and most important supervisory responsibility is to have the capability to manage other employees to work safely and efficiently. It is essential the supervisor maintains a harmonious relationship with the employees to gain any success. In order to achieve these goals, the supervisor needs to have a good understanding of human behavior in the work environment.

Employee Job Instruction / Training

One of the most important responsibilities of a supervisor is to provide instruction and direction to the employee. Normally, the supervisor is not directly involved in producing a final product, but works through the employee by giving directions that the employee follows. If these directions are good, the employee has a full understanding of what is expected, and the supervisor is assured the work will be done correctly. If the instructions are incorrect, incomplete or unclear, the supervisor should not be surprised to find the job poorly done. (See Section C: *The Supervisor and Employee Relations.*)

Accident Prevention / Hazard Control

The definition of an accident is an event or series of events that are neither planned nor desired. The result is damage or loss to persons, machines, the environment, or property. These events are referred to as a combination of "Accident Factors."

Management must recognize that safety is not a "part-time," "necessary nuisance," or "extra" job, but rather an important part of doing business that must not be separated from other company activities. **Doing a job correctly is doing it safely!** All management personnel will encourage, uphold and support supervisors in this very important job function.

The supervisor is responsible and is held accountable to assure company policies and programs are enforced. The supervisor is the key element to having an effective accident prevention program and can play a major role in the control and reduction of employee accident losses.

A good safety supervisor is knowledgeable about the work being performed, the work environment, the company's safety and health programs and policies, and remains at all times *alert for changing conditions on the job site*. Why is this important?

Job Safety Analysis

A Job Safety Analysis can make a given job as safe as humanly possible by identifying hazards and eliminating or minimizing those hazards before the job is performed and before those hazards have a chance to become accidents. Safe job procedures are developed to assist in the training of employees to work properly to prevent accidents that affect themselves and fellow employees. It may not be possible or practical to remove all physical and environmental hazards from the work place. These situations require planning and established controls and procedures to minimize the risks.

The JSA can be used for hazard awareness, as a guide in new employee training, for periodic contacts and for retraining of senior employees, as a refresher on jobs that run infrequently. The JSA can be used as an accident investigation tool, and for informing employees of specific job hazards and protective measures.

Incident / Accident Investigation

The primary goal for investigation reports is the prevention of recurrent similar incidents through the use of knowledge obtained from the investigations. Additionally, the investigation assists in the preparation of reports required by Federal and State laws.

Employees must be encouraged to report all accidents, including near misses to their immediate supervisor. Accidents resulting in property damage must also be immediately reported. These occurrences are to be investigated as quickly as possible, while facts are still fresh in everyone's mind, and must be completed by the end of the shift.

Cal/OSHA Inspections

Occasionally a California Occupational Safety and Health Administration (CALOSHA) Safety and Health Compliance Officer may visit a job site. Siemens has a policy of cooperating in

all inspections by CAL-OSHA. At the same time, management personnel must be aware of the rights afforded to Siemens under the Occupational Safety and Health Act (OSH Act). This section is provided to guide management in dealing with a CAL-OSHA inspection.

Sexual Harassment

It is Siemens' policy that all employees entitled to a work environment free of all forms of illegal discrimination, including sexual harassment.

Sexual harassment is against the law. Persons who engage in prohibited conduct expose the company and themselves to significant liability under the law. Sexual harassment is bad for business. It shows disrespect for others. It is a form of misconduct that harms the relationship between the company and its employees and the company and its clients. Harassment can create a general atmosphere in which all employees may be uncomfortable.

This policy is not meant to regulate employee's personal morality. However, Siemens is accountable, through its managers and supervisors, for maintaining a work place free of any form of sexual harassment and for creating an environment where employees are encouraged to express their concerns. We have the duty to investigate and stop any form of sexual harassment or discrimination, to investigate complaints about violation of this policy, and to take corrective action as indicated. Siemens' policy applies to everyone. *We will vigorously enforce this policy at all levels within the company, whether on or off company premises.*

Approved Contractor List & Contractor Safety, Health & Environmental Program

The safety of employees, neighbors and the environment is of utmost concern to Siemens Industry. In the Secretary of labor's Report to the President in April 1990, it was reported that OSHA has been concerned for some time about the diffusion of responsibility for worker health and safety when employers contract out for work. The patterns that emerged from the initial John Gray Institute study showed that contract employees receive less safety training, sustain more injuries and had higher turnover rates than site employees.

Siemens Industry requires their contractors to abide by all applicable state, local and federal Safety, Health and Environmental Regulations in the course of the contracted project work. Siemens requires every Contractor who wishes to contract for Siemens to complete a Contractor Safety Assessment. The assessment is intended to identify safety program compliance. Upon successful completion of the assessment, the Contractor will be placed on Siemens' "Approved Contractor List".

Neither the Assessment nor this document are by any means meant to serve as a substitute for the text of the applicable federal, state or local statutes, regulations, or ordinances or good practices, nor is it meant as a detailed description of all safety and health procedures.

The Contractor is responsible for knowing the applicable laws and procedures and for working with Siemens to provide the safest work environment possible.

Safety Meetings

Safety meetings are an important part of Siemens' Injury and Illness Prevention Plan. Meetings provide the setting for two-way communication and can be an educational experience for everyone.

Alcohol & Drug Abuse Policy

This is covered by a Siemens HR policy

Emergency Response Plan

POLICY STATEMENT

Siemens Industry is committed to protecting the community, personal property, and the environment, in the event emergency situations arise from the Project. These situations will be handled through the implementation of an Emergency Response Plan (ERP) in adherence to all applicable local, state, and federal emergency response laws and regulations. The Project will comply with all regulations imposed by the Federal Occupational Safety and Health Administration (OSHA) and the California State Department of Labor regarding the safety of workers on construction sites.

INTRODUCTION

This Plan outlines the general procedures followed for all emergency situations and incidents that could occur as a result of Project construction or operations by natural causes, equipment failure or by human error. Siemens Industry will meet with the local emergency service personnel (fire, police, and EMS) to review and discuss the construction process, including unique construction equipment, the overall construction process, and schedule/phasing. Any hazardous materials that may be present during construction and/or operation will be discussed. Ongoing communication during construction and operation, between town officials and police, fire, and emergency services officials, will help assure adequate levels of protection.

Based on relevant experience and best professional judgment, Siemens Industry believes that the following types of hazards (most of which are potentially incidental to construction activities generally) have the potential to occur at the Project Site:

- Fire
- Worker accidents, including falls and electrocution
- Medical conditions/emergencies
- Lightning strikes
- Excavation cave-ins
- Spills of Hazardous Materials, including:
 - Gasoline
 - Diesel
 - Propane
 - Adhesives
 - Hydraulic oil
 - Lubricating oil and grease
 - Cleaning solvents
 - Paint and paint thinners
 - Concrete form release agents

ON-SITE PERSON IN CHARGE

The Siemens Industry on-site Safety Coordinator or designee is the acting "Emergency Response Coordinator" for emergency situations during construction. They will be

responsible for ensuring that all subcontractors, staff, on-site visitors and others adhere to the appropriate emergency response procedures as stated in this Plan.

The Emergency Response Coordinator must designate one person as a second-in-command Emergency Response Coordinator. The Second-in-Command Emergency Response Coordinator will provide any required assistance to the Emergency Response Coordinator and will assume the role of Emergency Response Coordinator if the Safety Coordinator is unable to perform this role.

COMMUNICATION

The Project will maintain and utilize on-site telephone and/or radio communication at all times to support public safety agencies as discussed below.

If there is no cellular telephone reception on the Project Area, a reliable alternate method of communication will provide maximum safety to life and property through operational coordination during the construction of the Project. Therefore, hard line telephone service and/or two-way radios would be used during construction.

EMERGENCY CONTACT INFORMATION

Siemens Industry personnel will be available to the Project and may be utilized to assist during emergency situations and/or provide first aid as needed.

Contacts

Emergency Services:

Local Emergency Medical Services, Police Services, Fire Services: 9-1-1

City of San Diego Office of Emergency Services:

Siemens Industry Personnel:	24/7 Response Center
Siemens Industry Safety Coordinator:	Fio Valcarcel
Project manager:	Bruce Becker 858-693-8711
Project Executive:	Michael Dietsch 619-865-7609
Office Manager:	Erlynn Sandoc 858-693-8711
Operations Manager:	Peter Myers 858-693-8711

Nearest Hospitals:

To be defined for each site upon award of project

INTERNAL ALERTING

The following procedures will be prescribed for internal reporting of emergencies:

- The Emergency Response Coordinator will notify on-site personnel, including any visitors, of the nature of the emergency via an alarm system such as by telephone, two way radios or sirens.
- The Emergency Response Coordinator will specify the location for the first responders. A designated employee will meet the emergency response personnel at the access road of the emergency.
- The Emergency Response Coordinator will notify Siemens Industry of the emergency using the contact information to be provided.

- The Emergency Response Coordinator will identify any need for security measures at the Project Area during the emergency and will designate one person to implement
- When any person, identifies an emergency situation, or the potential for an emergency situation, and reports it to the Emergency Response Coordinator or his/her designee, the Emergency Response Coordinator will then activate the Emergency Response Plan.

EXTERNAL ALERTING

The following procedures will be prescribed to for external reporting of emergencies:

- If immediate emergency response assistance is required, the Emergency Response Coordinator or his designee will call 9-1-1.
- A member of management or the Emergency Response Coordinator or his/her designee are the only persons authorized to speak on Siemens Industry's behalf to outside agencies (police, fire department, medical services etc.) during an emergency situation.
- In the event of a spill of a hazardous material in excess of reportable limits, the spill must be reported to Siemens Industry.
- In the event of media coverage of an emergency event, members of management from Siemens Industry are the only persons authorized to speak on behalf of Siemens Industry to the media.

EMERGENCY RESPONSE PROCEDURES

Medical Emergency or Personnel Injury:

- Provide First Aid to all injured employees regardless of severity.
- First Aid kits will be maintained in the office trailer and tool van. First Aid kits are to be inspected weekly by the crew foreperson and restocked as needed.
- Call 911 if the injury is serious and needs immediate medical treatment.
- If the medical emergency or injury occurs in the tower, then a Stokes basket attached to the
- Crane will be used for extraction of the employee.
- For local emergency response assistance, a designated employee will meet the emergency responders at the access road of the tower site and direct them to the location of the emergency/injured employee.
- The designated Employee should have a hand held orange safety flag to use to get the attention of the responding emergency services.
- All Project vehicles will be equipped with firefighting equipment (fire extinguishers and shovels) as well as communications equipment for contacting the appropriate emergency response teams.
- Regular inspection of fire extinguishers at all facility locations where they are installed.

Fire

- If a fire exists at a Project facility or within a wind turbine generator, personnel will be instructed to:
- Shutdown the facility and/or wind turbine generator.
- Restrict the area.
- Request assistance of police/fire department, medical services if needed.
- Consult with on-site trained employees regarding required actions by Project personnel.

- Request assistance from fire fighting personnel, if needed, in controlling the fire.
- If local emergency response personnel are required, have an employee go to the access road of incident site, to meet emergency personnel and direct them to the fire.
- Employee should have a hand held orange safety flag to use to get the attention of the responding emergency services.

Gas Leak

- If a gas leak is reported, the area will be restricted and the presence or absence of gas will be confirmed. When necessary, gas detection instruments will be used to conduct a thorough inspection for the presence of gas, personnel will take the following action:
- Shut off the source of gas; notify the utility, if applicable;
- Continue to restrict the area until the origin of the gas is established and it is safe to lift the restriction;
- Initiate repairs to stop leakage; and
- Keep the utility notified of conditions and actions taken.
- Prior to final design Siemens Industry will coordinate with Dig Safe and the respective gas utility companies to determine the locations of all active gas lines and wells within the Project Area (if any). Gas companies will be consulted to establish appropriate setbacks and facilities will be revised as necessary in order to effectively minimize risk of explosion. Where encroachments are necessary, Siemens Industry will follow the National Fuel Gas Supply Corporation's Pipeline Encroachment Policy. During construction no gas line will be crossed without it first being exposed and confirming its depth. In addition to natural gas line and wells, propane and acetylene will be stored and used at the construction site.

Chemical Spill/Release

- The MSDS for all hazardous materials on the Project Area will be on file in the O&M building (during operation), and provided to local fire departments and emergency service providers.
- If storage tanks are required on-site containment system will be used.
- Small spills should be cleaned up immediately by using absorbent materials such as hay, sand, socks or pads.
- If the spill is of such magnitude that it cannot be contained, the Emergency Response
- Coordinator will contact the appropriate authority for assistance.
- Personnel and construction workers will be instructed to report all spills regardless of severity will be reported to the Emergency Response Coordinator.
- There will be spill kits located throughout the construction site.

EVACUATION

Project evacuation may occur due to inclement weather, fire, severe chemical release, or wild land fires. If an evacuation is required to prevent potential injury to human life, Siemens Industry Management, Emergency Response Coordinator or designee will evacuate the Project Area.

- An evacuation point area will be pre-determined.

- The Emergency Response Coordinator will designate a person to conduct a “head-count” at this pre-determined area to ensure that all persons have been safely evacuated.
- Siemens Industry Management or the Emergency Response Coordinator will notify the appropriate local authorities for fire, injury, or hazardous material spills.
- For off-site assistance a designated employee will meet the off-site emergency response at the access road of the emergency.

DISPOSAL OF CONTAMINANTS AND DEBRIS

- During construction, the Project will be maintained in a sanitary condition at all times. Waste materials generated on the Project (e.g., trash, excess construction material, hazardous waste) will be stored in containers at all times and disposed of in an approved disposal site.
- All waste generated during construction will be removed or disposed of in compliance with all Federal, State and local requirements.
- Portable toilets will be available for human waste and will be serviced on a regular basis.
- No open burning of waste materials will be allowed.
- Any materials used to clean up a chemical spill will be treated as hazardous waste and disposed of appropriately.
- Concrete trucks will wash out into waste management containers.

SITE RESTORATION/REMEDIATION

- If any accident or incident at the Project Area necessitates site restoration or remediation, the restoration/remediation will be conducted according to applicable Federal, State and local requirements.

INCIDENT REPORT

- After every accident or incident, the Emergency Response Coordinator or designee will conduct a post incident evaluation to determine the following:
- Suitability of the organization’s structure, equipment, communication plans/system, adequacy of training, alarm systems, security, spill containment and recovery procedures, monitoring, etc.
- If any of the above are found to be inadequate, then the Emergency Response Coordinator will make necessary changes.
- The Supervisor will fill out A First Report of Injury form and a Supervisor’s Investigation Report before the end of the shift.

SAFETY TRAINING

- On-site training will be given by the Emergency Response Coordinator or their designees regarding the content, requirements, and appropriate actions to comply with the provisions of the Emergency Response Plan. The training will occur:
- At orientation;
- Annually;
- When there are changes to the plan;
- When Emergency Response Coordinator determines; and
- Site maps with all access roads and cross streets have been given to all local emergency services.
- On-site training sessions relating to specific activities of this project include:

- Fall protection use and rescue
- Basic rigging inspection and use
- Pinch points
- Tower rescue on the wind towers

SAFETY PRACTICE DRILLS

Practice drills involving emergency response simulation exercises will be incorporated into the training program when determined to be necessary by the Emergency Response Coordinator.

EMPLOYEE SIGN-IN

› _____	7. _____
› _____	8. _____
› _____	9. _____
› _____	10. _____
› _____	11. _____
› _____	12. _____

Traffic Control Plan

OVERVIEW

The basic objective of Siemens' traffic control plan is to provide the guidance and approval for work within the public right of way efficiently and effectively while maintaining a safe, uniform flow of traffic. The construction work and the public traveling through the work zone in vehicles, bicycles or as pedestrians must be given equal consideration when developing a traffic control plan.

A traffic control plan will be required for all work performed within the public right-of-way. Each traffic control plan will be developed consistent with the Manual on Uniform Traffic Control Devices, as specified in the Guidelines below. The information included on a traffic control plan will vary depending upon the complexity of the project, the volume of traffic affected and the roadway geometrics where the construction is being performed. The traffic control plan must clearly depict the exact sequence of the construction operations, the construction to be performed, and the traveled way that will be utilized by

all movements of traffic during each phase of construction. Multiple phases of construction will require a separate traffic control plan for each different construction phase or operation

The purpose of our Guidelines is to ensure that all of the basic elements of traffic control are included on the plan and are clear to the reviewers and implementers in the field and to facilitate processing and archiving of the documents. This will help expedite the traffic control program process.

Traffic control plans will be submitted in a timely manner to allow for the specified review period. It is important to note that each traffic control plan will be developed specific to the actual construction work zone location.

GUIDELINES

1. The traffic control plan will be in accordance with the
 - a. City of San Diego Standard Drawings
 - b. California Manual on Uniform Traffic Control Devices
 - c. Standard Specifications for Public Works Construction, including Regional Supplemental Amendments and City of San Diego Supplemental Amendments.
2. The traffic control plan will include the following information.
 - a. Work start/end dates with a minimum of 2 days notice prior to starting the work
 - b. Show the name of street where the work is being performed
 - c. Show all nearby streets with street names and Thomas Brothers map coordinates to assure proper orientation
 - d. Posted speed limits
3. The traffic control plan will indicate contractor's name, address, and telephone number. Include name and telephone number of the 24-hour contact person representing the contractor.
 - Work hours shall be restricted to the period between 8:30 a.m. and 3:30 p.m., Monday through Friday, unless approved otherwise.
4. The traffic control plan will include a plan view of the project that includes –
 - a. The street segment / intersection containing the location of the project work area.
 - b. Dimensions to the nearest cross streets on either side of the work area if the project is located in a mid-block street segment
 - c. A north arrow
 - d. Location of parking
 - e. The location and dimensions for special curb zones, such as red, yellow, white, green and blue. Also show and dimension any Bus Stop zones and driveway is serving.
 - f. Existing dimensions for street widths, lane widths and sidewalk widths.
 - g. Provide the following construction information
 - i. Type of work
 - ii. The size of the work area
 - iii. Construction signs (type and spacing)

- iv. Flashing arrow boards (as required)
 - v. Delineator patterns for transition area, buffer space, work area and termination area.
 - vi. Advance warning sign spacing and length of transition area
 - vii. Detour plan (if required)
 - h. Handling of pedestrians (including disabled) and bicycle routes / paths
5. The contractor will notify all of the following applicable agencies five working days prior to starting any work
 - a. Police Dept Dispatch
 - b. Fire Dept Dispatch
 - c. Waste Mgmt – Refuse Collection
 - d. San Diego Transit
 - e. Communications and Electrical – Traffic Signals and Underground Service Alert
6. The contractor will post Tow-Away / No Parking signs twenty four hours prior to starting any work and will deactivate any parking meters.
 - Any work that disturbs normal traffic signal operations shall be coordinated with the City of San Diego’s Traffic Division, 48 hours prior to beginning construction. The City’s Traffic Division can be contacted at (619) 446 -5150.

Community Impact

Siemens’ design is extremely considerate of the communal impact to neighborhoods, views, traffic and security. Siemens will coordinate with City representatives to limit all community impact. Siemens will provide guidance, support and documentation, as needed for all community outreach efforts, design reviews and community town halls. Siemens has excluded participation in all outreach efforts, per RFI and addendums.

EXTENDED PERFORMANCE PHASE:

The Siemens warranty process provides the City of San Diego with a single communication mechanism for operational and maintenance support for the post acceptance warranty period. This process improves response times and minimizes equipment downtimes. Post acceptance will be supported by the local San Diego Office, our local dispatch center and a support team dedicated to supporting the City of San Diego. The enclosed maintenance program has been included in Alternate B pricing, of the project.

Key differentiators to consider when reviewing our lifecycle service qualifications include:

- Centralized, San Diego based, 24/7 security service call center for immediate response and issue resolution
- Dedicated Service Account Engineer (SAE); over 10 years of experience managing complex service programs with 100% uptime requirements
- Stable of tenured and certified service technicians; trained and certified with NICE, Bosch, Motorola, Pelco and Software House (20+ technicians; Average Siemens tenure 8.2 years; Average Security Industry Tenure 15.6 years)
- National / Global relationship with NICE, Bosch, Motorola and Software House; These relationships ensures the highest level of support and collaboration
- Dedicated service team; sole focus is providing ongoing service, maintenance and operating coaching

Our local Southern California offices currently provide service programs to these organizations with similar demanding environments and system uptime and reliability is of paramount importance:

- City of Santa Monica
- City of San Diego
- City of Oxnard
- City of Costa Mesa
- Calleguas Municipal Water District
- The Office of Immigrations and Customs Enforcement
- University of San Diego
- University of California, San Diego
- John Wayne Airport
- San Diego International Airport

Approach

Siemens' proposed Maintenance Plan provides a comprehensive approach to the ongoing service, upkeep and scheduled maintenance, as well as migration planning, operator coaching and training. Our approach starts with the final deployment and commissioning of the security upgrades and related infrastructure. Siemens will include our Service Account Engineer as well as Primary, Secondary and Tertiary service technicians in the final commissioning and acceptance testing of the security upgrades. These technicians will hold responsibility as first responders to City generated service calls as well as the execution of scheduled and routine maintenance. This will ensure a seamless turn over

from our
construction team
to our dedicated
service team,
minimizing
disruptions in
service, seamless

“All service will be carried out by Siemens personnel, trained and factory certified with Nice, Bosch, Motorola and Software House. Siemens will not use any sub-contractors for ongoing service maintenance.”

communication and a high level of system familiarity. Once the final punch list items are complete and acceptance testing finalized, Siemens will host a service turn over meeting with City stakeholders and system operators. The purpose of this meeting will be to present our service team members, review our service plan, and finalized communication plan for scheduled maintenance, remedial action; repair replace and outage response and quarterly reporting/planning meetings. All service will be carried out by Siemens personnel, trained and factory certified with Nice, Bosch, Motorola and Software House. Siemens will not use any sub contractors for ongoing service maintenance.

Warranty, Remedial Action- Repair Replace and Outage Response:

Siemens shall provide on-call repair services Monday through Friday 8am – 5pm. All service calls will be responded to the next business day. Emergencies, as agreed to between the City and Siemens, will be responded to on a 24/7 basis with a four (4) hour response window. Service calls can be generated as a result of findings during preventative maintenance testing, or could result in a break fix incident reported by the City through the San Diego Siemens 24/7 dispatch.

Siemens will maintain accurate work logs and documentation of all services provided. Upon completion of repair, Siemens shall provide a written summary of work performed, including a brief description of the problem, the resolution, the materials/ parts/ equipment used, serial number(s) of such items, individual performing work, and the number of labor hours spent. Reporting frequency, format, detail, and submittal shall comply with City or San Diego provisions and requirements, or detailed between the City Water contact and the Siemens Service Account Engineer.

All work orders shall be at the direction of the City Water Department. The Siemens Service Account Engineer will help to coordinate all work orders, on-call response scheduling and assist with the City dispatch and resolution process, with regards to Siemens technicians.

All communication and coordination of complex tasks, replacement projects or emergency situations will be coordinated by the Siemens Account Engineer.

In the event of an equipment malfunction or failure, such equipment shall be repaired or replaced (as applicable). Siemens shall be responsible for all costs associated with having defective equipment repaired. If such spares are not available for some reason, Siemens shall be responsible for obtaining the equipment for replacement of defective equipment.

Preventative Maintenance

Siemens routinely promotes and executes preventative maintenance plans for our clients with mission critical security requirements. Clients like John Wayne Airport, the City of Oxnard and the City of Santa Monica have leveraged these services to improve system reliability and lifecycle expectancy. Siemens has refined our approach to preventative maintenance to reduce and minimize system outages and unscheduled service calls as well as improve system lifecycle expectancy by as much as 20%. Siemens shall provide for the City of San Diego, preventative maintenance services, utilizing the designated primary, secondary and/or tertiary Siemens service technicians, ensuring that all equipment is

“Siemens’ refined approach to preventative maintenance results in reduced system downtime. Our programs have improved average system life span by 20%.”

inspected, tested and maintained by a technician familiar with each site and holding factory certification, in order to achieve the highest reliability, performance and sustainability, of the included systems.

Siemens’ Service Account Engineer will develop a detailed preventative maintenance schedule and submit for approval to the City Water Department. This schedule will be focused on short term achievable objectives and be updated upon completion. Detailed documentation and communication with the City Water Department will be the Service Account Engineer’s primary responsibility in supporting the preventative maintenance program.

Siemens’ field technicians will execute all preventative maintenance tasking, per the schedule and as dictated by the City of San Diego Water standards or manufacturer recommendations, whichever is greater. The baseline for this program will include quarterly rotational inspections to ensure **each item is inspected no less than one time per year**. These preventative maintenance visits shall incorporate, but not be limited to, the following:

Video Management / General Surveillance / NICE Situater

- **VMS/PSIM Software/Firmware Patch and Upgrades:** Siemens technicians and the dedicated service account engineer will routinely work with the manufacturers (Microsoft, NICE , Motorola) to identify software/firmware revisions that will increase or optimize the performance of the systems. It is the standard procedure that patches and upgrades are performed only after careful analysis has been made. Siemens will work with the City Water Department to identify patches and upgrades that are appropriate. These discussions will be part of periodic program review meetings (to be scheduled routinely and as part of the Siemens program). Siemens program will include all manufactures required software service agreement (SSA) licensing to ensure for immediate access to patches, revisions and upgrades as well

as technical notes and phone support. All software/firmware patches and upgrades will be documented and reported to City stakeholders.

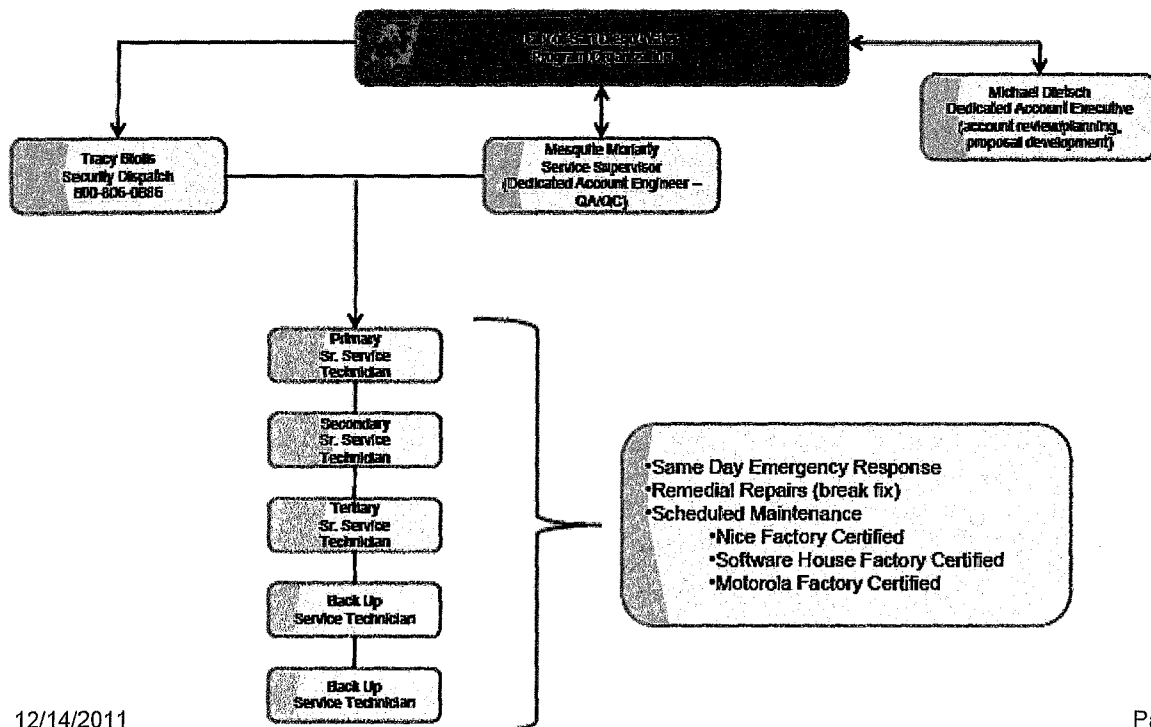
- **Surveillance Camera Cleaning:** Clean and adjust lens and housing when installed via use of a glass-cleaner. Use portable tote monitor to perform local lens adjustment, as necessary. Ensure connectors and RJ jacks (as appropriate) are securely fastened to cable. Ensure that power terminations are secure. Verify back focus adjustment on camera, if applicable. Ensure camera is focused on primary viewing object if applicable. Ensure mount is secured, environmental housing is free of debris and heater/fan is operable when equipped. Record in Report Log.
- **Power Supplies** – Record voltage and inspect units. Check battery levels (where applicable) as required and replace on 36-month cycle. Ensure wiring is secured properly, and inspect for chaffing and proper labeling.
- **Network Video Recorder / Access Control Servers / Client Work Station:** Siemens shall inspect and clean all system computers. This shall consist of cleaning filters and fans, backing up system settings, applying necessary patches/fixes and/or upgrades and checking all connections, power and battery backup. System settings and/or databases will be backed up monthly and stored indefinitely (video archives will not be backed up or stored).
- **Enclosures/HVAC:** Siemens shall ensure that all enclosures and environmental controls are clean, secure and meeting required operational temperature thresholds. Cooling units filters will be cleaned/changed quarterly, debris removed, motor lubricated and pressure level of refrigerant checked (this is critical to ensure optimal performance and efficiency).
- **Video Analytics:** Motion detection and other City specified analytics will be tested, calibrated and adjusted to ensure optimal performance.
- **Solar Power Units:** Siemens shall clean all solar units, check all connections and verify batteries are within operating specifications.
- **ACAMS Software/Firmware Patch and Upgrades:** Siemens technicians and the dedicated service account engineer will routinely work with Software House to identify software/firmware revisions that will increase or optimize the performance of the access control system. It is the standard procedure that patches and upgrades are performed only after careful analysis has been made. Siemens will work with the City Water Department to identify patches and upgrades that are appropriate. These discussions will be part of periodic program review meetings (to be scheduled routinely and as part of the Siemens program). Siemens program will include Software Houses software service agreement (SSA) licensing to ensure for immediate access to patches, revisions and upgrades as well as technical notes and phone support. All software/firmware patches and upgrades will be documented and reported to City stakeholders. Back-up database and all historical activity.

Proximity Card Access:

- Verify that all devices are securely mounted
 - Verify power source for correct voltage
 - Verify lock power is correct for locks
 - Test door contacts for proper operation
 - Verify read range of all proximity readers
 - Verify operation of all associated devices
 - Measure battery voltage and replace batteries if necessary
 - Review history reports for correct system operation
 - Lubricate moving parts as required
 - Back-up database / Archive all historical data
- **Alarm Testing:** All sensors and alarm points will be tested back to the Chollas SOC to ensure connectivity and functionality.
 - **Vehicle Gates:** All Vehicle gates to be tested, cleaned and aligned to ensure for smooth operation. Gate motor and locking mechanisms to be inspected, cleaned and lubricated per the manufactures specifications.

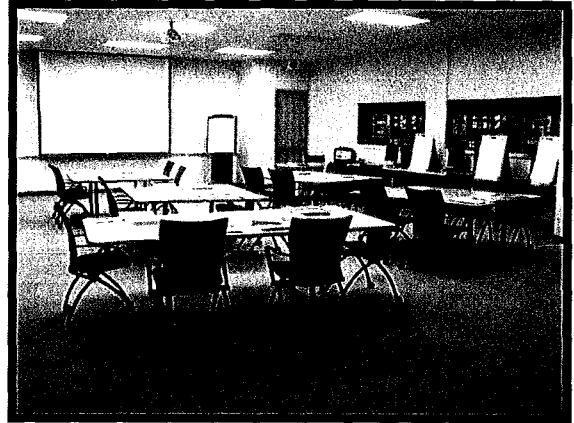
Coordination with Owners Work Force

The Siemens Service Account Engineer (SAE) will be the primary contact for coordinating all scheduled maintenance, upgrades and remedial repairs. While the City Water Department will utilize the 24/7 dispatch 800 number to report system outages, or repair requests, the SAE will serve as the primary contact for follow up, remediation and ticket closure. The SAE will coordinate directly with owner, owners representative or key stakeholders (distribution list to be provided by City Water) via email on all open work orders, upcoming scheduled maintenance and reporting. The SAE will chair a quarterly meeting with owner, owners representative or key stakeholders to review service history, upgrades/patches/fixes and preventative maintenance schedule.



Operator Training Program

Siemens training program will incorporate provide a customized program of instruction aimed at training both administrators and operators of the systems. This training will be conducted on site and in the Siemens training center. The local Siemens office maintains a state of the art facility, less than 15 miles from the Chollas Security Operations Center.



Siemens will utilize factory trained and certified instructors to provide in-depth administrator and operator training with printed manuals, computer workstations and relevant collateral, including the actual systems in the test environment.

**Operating Training – 2 Classroom
1 Day Onsite**

High Level Content Overview

- Operator commands
- Camera Call Up
- Camera Control
- Video Retrieval / Playback Controls
- Video Export
- Visualization
- Door/Gate Release
- Alarm Acknowledgment
- PTZ Control Setting and Actions
- Alarm Reporting
- Event Monitoring
- Alarm Shunting
- Incident Reporting
- Intercom Activation
- Remedial Troubleshooting
- Setting Favorites
- PTZ Controls
- Setting Up Views

**Administrator Training – 2 Days Classroom
2 Days Onsite**

High Level Content Overview

- Database Administration
- Configuring and Running Reports
- Security Levels
- User Permissions
- Schedules
- Advanced Settings
- Alarm/Event Linking
- Creating/Editing SOPS
- Mapping
- Display Settings
- Running Diagnostics
- Naming / Titles
- Display Management
- Advanced Troubleshooting
- Adjusting Video Panel
- Concept of Operations

Training will be part of the master construction schedule. Initial operator and administrator training will coincide with the “beneficial usage” milestone or commissioning of the Chollas SOC. Formal administrator training and operator refresher training will take place 30 days prior to system acceptance. As part of Siemens

comprehensive maintenance program, four (4) hours of administrator/operator coaching will be provided on a quarterly basis.

System Component	Timing	Personnel Type	# of Personnel	Session	Location
NICE VMS/PSIM	System Acceptance	Operator	Up to 8	8 hours	Siemens Training Center – San Diego
Nice VMS/PSIM	System Acceptance	Administrator	Up to 3	8 hours	Siemens Training Center – San Diego
Software House ACAMS	System Acceptance	Operator	Up to 8	8 hours	Siemens Training Center – San Diego
Software House ACAMS	System Acceptance	Administrator	Up to 3	8 hours	Siemens Training Center – San Diego
 					
NICE VMS/PSIM	75% Completion – Chollas SOC	Operator	Up to 3	4 hours	Chollas SOC
Nice VMS/PSIM	75% Completion – Chollas SOC	Administrator	Up to 3	8 hours	Chollas SOC
Software House ACAMS	75% Completion – Chollas SOC	Operator	Up to 8	4 hours	Chollas SOC
Software House ACAMS	75% Completion – Chollas SOC	Administrator	Up to 3	8 hours	Chollas SOC
 					
Training Updates / Operator Coaching	Quarterly	Operator	Up to 1	2 hours	Chollas SOC
Training Updates / Administrator Coaching	Annually	Administrator	Up to 1	2 hours	Chollas SOC



City of San Diego Water Department
Security Upgrades Design Build Contract

 **EQUAL EMPLOYMENT AND CONTRACTING OPPORTUNITY**

BIDDING DOCUMENTS

DESIGN-BUILD LIST OF SUBCONTRACTORS TO BE INCLUDED IN THE TECHNICAL (NON-PRICE) PROPOSAL ONLY

In accordance with the requirements provided in the "Subletting and Subcontracting Fair Practices Act", Division 2, Part 1, Chapter 4 of the Public Contract Code, the Design-Builder shall list below the name and address of each Subcontractor who will perform work, labor, render services or specially fabricates and installs a portion [type] of the work or improvement, in an amount in excess of 0.5% of the Design-Builder's total Bid. The Design-Builder shall also list below the portion of the work which will be done by each Subcontractor under this contract. The Design-Builder shall list only one Subcontractor for each portion of the Work. The **PERCENT VALUE** of the total Bid to be performed shall be stated for all Subcontractors listed. Failure to comply with this requirement shall result in the Bid being rejected as non-responsive and ineligible for award. The Design-Builder's attention is directed to the Special Provisions - General; Paragraph 2-3 Subcontracts, which stipulates the percent of the Work to be performed with the Design-Builder's own forces. The Design-Builder shall list all SLBE, ELBE, DBE, DVBE, MBE, WBE, OBE, SDB, WoSB, HUBZone, and SDVOSB Subcontractors that Design-Builder are seeking recognition towards achieving any mandatory, voluntary, or both subcontracting participation percentages.

NAME, ADDRESS AND TELEPHONE NUMBER OF SUBCONTRACTOR	CONSTRUCTOR OR DESIGNER	TYPE OF WORK	PERCENT VALUE OF SUBCONTRACT	MBE, WBE, DBE, DVBE, OBE, ELBE, SLBE, SDB, WoSB, HUBZone, OR SDVOSB ^①	WHERE CERTIFIED ^②	CHECK IF JOINT VENTURE PARTNERSHIP
Name: Athenx, Inc. Address: 7140 Opportunity Rd. City: San Diego State: CA Zip: 92111 Phone: (805) 505-8025	Design/Constructor	General Contractor Wireless Security	28.1%	SLBE 11AX0490	City	
Name: HMT Electric, Inc. Address: 9550 Waples St., Ste 105 City: San Diego State: CA Zip: 92121 Phone: (760) 744-4124	Design/Constructor	Electrical	9.6%			
Name: Access Professional Systems Address: 3959 Ruffin Rd., Ste. C City: San Diego State: CA Zip: 92123 Phone: (858) 571-4444	Design/Constructor	Gate Automation	4.0%	SBE	CA	

① As appropriate, Design-Builder shall identify Subcontractor as one of the following and shall include a valid proof of certification (except for OBE, SLBE and ELBE):

Certified Minority Business Enterprise	MBE	Certified Woman Business Enterprise	WBE
Certified Disadvantaged Business Enterprise	DBE	Certified Disabled Veteran Business Enterprise	DVBE
Other Business Enterprise	OBE	Certified Emerging Local Business Enterprise	ELBE
Certified Small Local Business Enterprise	SLBE	Small Disadvantaged Business	SDB
Woman-Owned Small Business	WoSB	HUBZone Business	HUBZone
Service-Disabled Veteran Owned Small Business	SDVOSB		

② As appropriate, Design-Builder shall indicate if Subcontractor is certified by:

City of San Diego	CITY	State of California Department of Transportation	CALTRANS
California Public Utilities Commission	CPUC	San Diego Regional Minority Supplier Diversity Council	SRMSDC
State of California's Department of General Services	CADoGS	City of Los Angeles	LA
State of California	CA	U.S. Small Business Administration	SBA

The Design-Builder will not receive any subcontracting participation percentages if the Design-Builder fails to submit the required proof of certification (except for OBE, SLBE and ELBE).

BIDDING DOCUMENTS

DESIGN-BUILD LIST OF SUBCONTRACTORS TO BE INCLUDED IN THE TECHNICAL (NON-PRICE) PROPOSAL ONLY

In accordance with the requirements provided in the "Subletting and Subcontracting Fair Practices Act", Division 2, Part 1, Chapter 4 of the Public Contract Code, the Design-Builder shall list below the name and address of each Subcontractor who will perform work, labor, render services or specially fabricates and installs a portion [type] of the work or improvement, in an amount in excess of 0.5% of the Design-Builder's total Bid. The Design-Builder shall also list below the portion of the work which will be done by each Subcontractor under this contract. The Design-Builder shall list only one Subcontractor for each portion of the Work. The **PERCENT VALUE** of the total Bid to be performed shall be stated for all Subcontractors listed. Failure to comply with this requirement shall result in the Bid being rejected as non-responsive and ineligible for award. The Design-Builder's attention is directed to the Special Provisions - General; Paragraph 2-3 Subcontracts, which stipulates the percent of the Work to be performed with the Design-Builder's own forces. The Design-Builder shall list all SLBE, ELBE, DBE, DVBE, MBE, WBE, OBE, SDB, WoSB, HUBZone, and SDVOSB Subcontractors that Design-Builder are seeking recognition towards achieving any mandatory, voluntary, or both subcontracting participation percentages.

NAME, ADDRESS AND TELEPHONE NUMBER OF SUBCONTRACTOR	CONSTRUCTOR OR DESIGNER	TYPE OF WORK	PERCENT VALUE OF SUBCONTRACT	MBE, WBE, DBE, DVBE, OBE, ELBE, SLBE, SDB, WoSB, HUBZone, OR SDVOSB ^①	WHERE CERTIFIED ^②	CHECK IF JOINT VENTURE PARTNERSHIP
Name: Net Logix Address: 5425 Oberlin Dr., Ste. 200 City: San Diego State: CA Zip: 92121 Phone: (858) 764-1972	Design/ Constructor	Wireless	7.9%			
Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____						
Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____						

① As appropriate, Design-Builder shall identify Subcontractor as one of the following and shall include a valid proof of certification (except for OBE, SLBE and ELBE):

Certified Minority Business Enterprise	MBE	Certified Woman Business Enterprise	WBE
Certified Disadvantaged Business Enterprise	DBE	Certified Disabled Veteran Business Enterprise	DVBE
Other Business Enterprise	OBE	Certified Emerging Local Business Enterprise	ELBE
Certified Small Local Business Enterprise	SLBE	Small Disadvantaged Business	SDB
Woman-Owned Small Business	WoSB	HUBZone Business	HUBZone
Service-Disabled Veteran Owned Small Business	SDVOSB		

② As appropriate, Design-Builder shall indicate if Subcontractor is certified by:

City of San Diego	CITY	State of California Department of Transportation	CALTRANS
California Public Utilities Commission	CPUC	San Diego Regional Minority Supplier Diversity Council	SRMSDC
State of California's Department of General Services	CADoGS	City of Los Angeles	LA
State of California	CA	U.S. Small Business Administration	SBA

The Design-Builder will not receive any subcontracting participation percentages if the Design-Builder fails to submit the required proof of certification (except for OBE, SLBE and ELBE).

BIDDING DOCUMENTS

**DESIGN-BUILD LIST OF SUBCONTRACTORS TO BE INCLUDED IN THE TECHNICAL (NON-PRICE) PROPOSAL ONLY
ADDITIVE/DEDUCTIVE ALTERNATE
(USE ONLY WHEN ADDITIVE ALTERNATES ARE REQUIRED)**

The Design-Builder shall list all Subcontractors described in the Design-Builder's Base Bid whose percentage of work will increase or decrease if alternates are selected for award. Design-Builder shall also list additional Subcontractors not described in the Design-Builder's Base Bid who, as a result of the alternates, will perform work or labor, or render services, or specially fabricate and install a portion [type] of work or improvements in an amount in excess of 0.5%. Failure to comply with this requirement shall result in the bid being rejected as non-responsive and ineligible for award. The Design-Builder shall list all SLBE, ELBE, DBE, DVBE, MBE, WBE, OBE, SDB WoSB, HUBZone, and SDVOSB Subcontractors that Design-Builder are seeking recognition towards achieving any mandatory, voluntary, or both subcontracting participation percentages.

ADDITIVE/DEDUCTIVE ALTERNATE	NAME, ADDRESS AND TELEPHONE NUMBER OF SUBCONTRACTOR	CONSTRUCTOR OR DESIGNER	TYPE OF WORK	PERCENT VALUE OF SUBCONTRACT	MBE, WBE, DBE, DVBE, OBE, ELBE, SLBE, SDB, WoSB, HUBZone, OR SDVOSB ^①	WHERE CERTIFIED ^②	CHECK IF JOINT VENTURE PARTNERSHIP
	Name: Athenz, Inc. Address: 7140 Opportunity Rd. City: San Diego State: CA Zip: 92111 Phone: (805) 505-8025	Design/ Constructor	General Contractor Wireless Security	12.3%	SLBE 11AX0490	City	
	Name: HMT Electric, Inc. Address: 9550 Waples St., Ste 105 City: San Diego State: CA Zip: 92121 Phone: (760) 744-4124	Design/ Constructor	Electrical	8.2%			
	Name: Access Professional Systems Address: 3959 Ruffin Rd., Ste. C City: San Diego State: CA Zip: 92123 Phone: (858) 571-4444	Design/ Constructor	Gate Automation	2.0%	SBE	CA	

① As appropriate, Design-Builder shall identify Subcontractor as one of the following and shall include a valid proof of certification (except for OBE, SLBE and ELBE):

Certified Minority Business Enterprise	MBE	Certified Woman Business Enterprise	WBE
Certified Disadvantaged Business Enterprise	DBE	Certified Disabled Veteran Business Enterprise	DVBE
Other Business Enterprise	OBE	Certified Emerging Local Business Enterprise	ELBE
Certified Small Local Business Enterprise	SLBE	Small Disadvantaged Business	SDB
Woman-Owned Small Business	WoSB	HUBZone Business	HUBZone
Service-Disabled Veteran Owned Small Business	SDVOSB		

② As appropriate, Design-Builder shall indicate if Subcontractor is certified by:

City of San Diego	CITY	State of California Department of Transportation	CALTRANS
California Public Utilities Commission	CPUC	San Diego Regional Minority Supplier Diversity Council	SRMSDC
State of California's Department of General Services	CADoGS	City of Los Angeles	LA
State of California	CA	U.S. Small Business Administration	SBA

The Design-Builder will not receive any subcontracting participation percentages if the Design-Builder fails to submit the required proof of certification (except for OBE, SLBE and ELBE).

Form Title: DESIGN-BUILD LIST OF SUBCONTRACTORS TO BE INCLUDED IN THE TECHNICAL (NON-PRICE) PROPOSAL ONLY
ADDITIVE/DEDUCTIVE ALTERNATE

(Rev. May 2011)

Form Number: AA20

Project Title:

BIDDING DOCUMENTS

**DESIGN-BUILD LIST OF SUBCONTRACTORS TO BE INCLUDED IN THE TECHNICAL (NON-PRICE) PROPOSAL ONLY
ADDITIVE/DEDUCTIVE ALTERNATE
(USE ONLY WHEN ADDITIVE ALTERNATES ARE REQUIRED)**

The Design-Builder shall list all Subcontractors described in the Design-Builder's Base Bid whose percentage of work will increase or decrease if alternates are selected for award. Design-Builder shall also list additional Subcontractors not described in the Design-Builder's Base Bid who, as a result of the alternates, will perform work or labor, or render services, or specially fabricate and install a portion [type] of work or improvements in an amount in excess of 0.5%. Failure to comply with this requirement shall result in the bid being rejected as non-responsive and ineligible for award. The Design-Builder shall list all SLBE, ELBE, DBE, DVBE, MBE, WBE, OBE, SDB WoSB, HUBZone, and SDVOSB Subcontractors that Design-Builder are seeking recognition towards achieving any mandatory, voluntary, or both subcontracting participation percentages.

ADDITIVE/DEDUCTIVE ALTERNATE	NAME, ADDRESS AND TELEPHONE NUMBER OF SUBCONTRACTOR	CONSTRUCTOR OR DESIGNER	TYPE OF WORK	PERCENT VALUE OF SUBCONTRACT	MBE, WBE, DBE, DVBE, OBE, ELBE, SLBE, SDB, WoSB, HUBZone, OR SDVOSB [ⓐ]	WHERE CERTIFIED [ⓑ]	CHECK IF JOINT VENTURE PARTNERSHIP
	Name: Net Logix Address: 5425 Oberlin Dr., Ste. 200 City: San Diego State: CA Zip: 92121 Phone: (858) 764-1972	Design/ Constructor	Wireless	0%			
	Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____						
	Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____						

① As appropriate, Design-Builder shall identify Subcontractor as one of the following and shall include a valid proof of certification (except for OBE, SLBE and ELBE):

- | | | | |
|---|--------|--|---------|
| Certified Minority Business Enterprise | MBE | Certified Woman Business Enterprise | WBE |
| Certified Disadvantaged Business Enterprise | DBE | Certified Disabled Veteran Business Enterprise | DVBE |
| Other Business Enterprise | OBE | Certified Emerging Local Business Enterprise | ELBE |
| Certified Small Local Business Enterprise | SLBE | Small Disadvantaged Business | SDB |
| Woman-Owned Small Business | WoSB | HUBZone Business | HUBZone |
| Service-Disabled Veteran Owned Small Business | SDVOSB | | |

② As appropriate, Design-Builder shall indicate if Subcontractor is certified by:

- | | | | |
|--|--------|--|----------|
| City of San Diego | CITY | State of California Department of Transportation | CALTRANS |
| California Public Utilities Commission | CPUC | San Diego Regional Minority Supplier Diversity Council | SRMSDC |
| State of California's Department of General Services | CADoGS | City of Los Angeles | LA |
| State of California | CA | U.S. Small Business Administration | SBA |

The Design-Builder will not receive any subcontracting participation percentages if the Design-Builder fails to submit the required proof of certification (except for OBE, SLBE and ELBE).

Form Title: DESIGN-BUILD LIST OF SUBCONTRACTORS TO BE INCLUDED IN THE TECHNICAL (NON-PRICE) PROPOSAL ONLY
ADDITIVE/DEDUCTIVE ALTERNATE

(Rev. May 2011)

Form Number: AA20

Project Title:



THE CITY OF SAN DIEGO

July 28, 2011

Athenx, Inc.
Wendy Turner
Ed Vergara
Daniel Barnett
7140 Opportunity Road
San Diego, CA 92111

Subject: Small Local Business Enterprise Certification

Dear Wendy, Ed, and Daniel:

Congratulations! We have reviewed your application and you have been approved for certification as a City of San Diego Small Local Business Enterprise (SLBE). Your certification number is 11AX0490 and your classification is General Services. Please reference this certification number when bidding on City projects.

For the City's SLBE Program, your certification is effective July 25, 2011. This certification expires on July 25, 2013 at which time you will need to reapply in accordance with the SLBE guidelines.

If you have any questions please call 619-236-6297.

Thank you,


Debra Fischle-Faulk
Department Director



Administration Department
Small Local Business Enterprise Program
202 C Street, 9th Floor, MS 9A
San Diego, CA 92101-4806
Telephone (619) 236-6297 Fax (619) 236-7344

BIDDING DOCUMENTS

DESIGN-BUILD NAMED EQUIPMENT/MATERIAL SUPPLIER LIST TO BE INCLUDED IN THE TECHNICAL (NON-PRICE) PROPOSAL ONLY

The Design-Builder seeking the recognition of equipment, materials, or supplies obtained from Suppliers towards achieving any mandatory, voluntary, or both subcontracting participation percentages shall submit with the Bid the Named Equipment/Material Supplier List. The Named Equipment/Material Supplier List, at a minimum, should have the name, locations (City) and the **PERCENT VALUE** of the Suppliers. The Design-Builder will be credited up to 60% of the amount to be paid to the Suppliers for such materials/supplies unless vendor manufactures or substantially alters materials/supplies in which case 100% will be credited. The Design-Builder shall indicate (Yes/No) whether listed firm is a supplier or manufacturer. In calculating the subcontractor participation percentages, vendors/suppliers will receive 60% credit of the listed **PERCENT VALUE**, whereas manufacturers will receive 100% credit. If no indication provided, listed firm will be credited at 60% of the listed **PERCENT VALUE** for purposes of calculating the subcontractor participation percentages, Suppliers will receive 60% credit of the listed **PERCENT VALUE**, whereas manufacturers will receive 100% credit. If no indication provided, listed firm will be credited at 60% of the listed **PERCENT VALUE** for purposes of calculating the subcontractor participation percentages.

NAME, ADDRESS AND TELEPHONE NUMBER OF VENDOR/SUPPLIER	MATERIALS OR SUPPLIES	PERCENT VALUE OF MATERIAL OR SUPPLIES	SUPPLIER (Yes/No)	MANUFACTURER (Yes/No)	MBE, WBE, DBE, DVBE, OBE, ELBE, SLBE, SDB, WoSB, HUBZone, OR SDVOSB ^①	WHERE CERTIFIED ^②
Name: Not applicable Address: _____ City: _____ State: _____ Zip: _____ Phone: _____	--	--	--	--	--	--
Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____						
Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____						

① As appropriate, Design-Builder shall identify Vendor/Supplier as one of the following and shall include a valid proof of certification (except for OBE, SLBE and ELBE):

Certified Minority Business Enterprise	MBE	Certified Woman Business Enterprise	WBE
Certified Disadvantaged Business Enterprise	DBE	Certified Disabled Veteran Business Enterprise	DVBE
Other Business Enterprise	OBE	Certified Emerging Local Business Enterprise	ELBE
Certified Small Local Business Enterprise	SLBE	Small Disadvantaged Business	SDB
Woman-Owned Small Business	WoSB	HUBZone Business	HUBZone
Service-Disabled Veteran Owned Small Business	SDVOSB		

② As appropriate, Design-Builder shall indicate if Vendor/Supplier is certified by:

City of San Diego	CITY	State of California Department of Transportation	CALTRANS
California Public Utilities Commission	CPUC	San Diego Regional Minority Supplier Diversity Council	SRMSDC
State of California's Department of General Services	CADoGS	City of Los Angeles	LA
State of California	CA	U.S. Small Business Administration	SBA

The Design-Builder will not receive any subcontracting participation percentages if the Design-Builder fails to submit the required proof of certification (except for OBE, SLBE and ELBE).

Form Title: DESIGN-BUILD NAMED EQUIPMENT/MATERIAL SUPPLIER LIST
TO BE INCLUDED IN THE TECHNICAL (NON-PRICE) PROPOSAL ONLY

(Rev. May 2011)

Form Number: AA30

Project Title:

BIDDING DOCUMENTS

**DESIGN-BUILD NAMED EQUIPMENT/MATERIAL SUPPLIER ADDITIVE/DEDUCTIVE ALTERNATE
TO BE INCLUDED IN THE TECHNICAL (NON-PRICE) PROPOSAL ONLY**

(USE ONLY WHEN ADDITIVE ALTERNATES ARE REQUIRED)

The Design-Builder shall list all Suppliers described in the Design-Builder's Total Proposed Price whose percentage of work will increase or decrease if alternates are selected for award. The Design-Builder shall also list additional Suppliers not described in the Design-Builder's Total Proposed Price who, as a result of the alternates, will perform work or labor, or render services, or specially fabricate and install a portion [type] of work or improvements in an amount in excess of 0.5%. The Design-Builder shall list all SLBE, ELBE, DBE, DVBE, MBE, WBE, OBE, SDB, WoSB, HUBZone, and SDVOSB Suppliers that Design-Builders are seeking recognition towards achieving any mandatory, voluntary, or both subcontracting participation percentages.

ADDITIVE/ DEDUCTIVE ALTERNATE	NAME, ADDRESS AND TELEPHONE NUMBER OF VENDOR/SUPPLIER	MATERIALS OR SUPPLIES	PERCENT VALUE OF MATERIAL OR SUPPLIES	SUPPLIER (Yes/No)	MANUFACTURER (Yes/No)	MBE, WBE, DBE, DVBE, OBE, ELBE, SLBE, SDB, WoSB, HUBZone, OR SDVOSB®	WHERE CERTIFIED ②
	Name: Not applicable Address: _____ City: _____ State: _____ Zip: _____ Phone: _____	--	--	--	--	--	--
	Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____						
	Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____						

① As appropriate, Design-Builder shall identify Vendor/Supplier as one of the following and shall include a valid proof of certification (except for OBE, SLBE and ELBE):

- | | | | |
|---|--------|--|---------|
| Certified Minority Business Enterprise | MBE | Certified Woman Business Enterprise | WBE |
| Certified Disadvantaged Business Enterprise | DBE | Certified Disabled Veteran Business Enterprise | DVBE |
| Other Business Enterprise | OBE | Certified Emerging Local Business Enterprise | ELBE |
| Certified Small Local Business Enterprise | SLBE | Small Disadvantaged Business | SDB |
| Woman-Owned Small Business | WoSB | HUBZone Business | HUBZone |
| Service-Disabled Veteran Owned Small Business | SDVOSB | | |

② As appropriate, Design-Builder shall indicate if Vendor/Supplier is certified by:

- | | | | |
|--|--------|--|----------|
| City of San Diego | CITY | State of California Department of Transportation | CALTRANS |
| California Public Utilities Commission | CPUC | San Diego Regional Minority Supplier Diversity Council | SRMSDC |
| State of California's Department of General Services | CADoGS | City of Los Angeles | LA |
| State of California | CA | U.S. Small Business Administration | SBA |

The Design-Builder will not receive any subcontracting participation percentages if the Design-Builder fails to submit the required proof of certification (except for OBE, SLBE and ELBE)

BIDDING DOCUMENTS

LIST OF WORK MADE AVAILABLE

List items of the Work the Bidder made available to SLBE-ELBE firms. Identify those items of the Work the Bidder might otherwise perform with its own forces and those items that have been broken down into economically feasible units to facilitate SLBE-ELBE participation. For each item listed, show the dollar amount and percentage of the the Base Bid. The Bidder must demonstrate that enough work to meet the goal was made available to SLBE-ELBE firms.

ITEM OF WORK MADE AVAILABLE	BIDDER NORMALLY PERFORMS ITEM (Y/N)	ITEM BROKEN DOWN TO FACILITATE PARTICIPATION (Y/N)	AMOUNT	PERCENTAGE OF BASE BID
N/A	—	—	—	—

BIDDING DOCUMENTS



City of San Diego
EQUAL OPPORTUNITY CONTRACTING PROGRAM
1200 Third Avenue, Suite 200, San Diego, CA 92101
(619) 236-6000 FAX: (619) 235-5209

WORK FORCE REPORT

The objective of the Equal Employment Opportunity Outreach Program, San Diego Municipal Code Sections 22.3501 through 22.3517, is to ensure that contractors doing business with the City, or receiving funds from the City, do not engage in unlawful discriminatory employment practices prohibited by State and Federal law. Such employment practices include, but are not limited to unlawful discrimination in the following: employment, promotion or upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination, rate of pay or other forms of compensation, and selection for training, including apprenticeship. Contractors are required to provide a completed Work Force Report.

CONTRACTOR IDENTIFICATION

Type of Contractor: [] Construction [] Supplier [] Financial Institution [] Lessee/Lessor
[] Consultant [] Grant Recipient [] Insurance Company [X] Other See attached response
Name of Company: Siemens Industry, Inc.
AKA/DBA: See attached list of subsidiaries
Address (Corporate Headquarters, where applicable): 1000 Deerfield Parkway
City Buffalo Grove County Lake State IL Zip 60089
Telephone Number: (847) 215-1000 FAX Number: (847) 215-1093
Name of Company CEO: Daryl Dulaney
Address(es), phone and fax number(s) of company facilities located in San Diego County (if different from above):
Address: 10100 Willow Creek Road
City San Diego County San Diego State CA Zip 92131
Telephone Number: (858) 693-8711 FAX Number: (858) 289-3006
Type of Business: See attached response Type of License: General Contracting/Spec/Eng
The Company has appointed: Kerianne Gray
as its Equal Employment Opportunity Officer (EEOO). The EEOO has been given authority to establish, disseminate, and enforce equal employment and affirmative action policies of this company. The EEOO may be contacted at:
Address: 8 Fernwood Road, Florham Park, NJ 07932
Telephone Number: (973) 593-2618 FAX Number: (973) 572-7968
For Firms: [X] San Diego Work Force and/or [X] Managing Office Work Force
I, the undersigned representative of Siemens Industry, Inc.

San Diego (County) California (State) hereby certify that information provided here is true and correct. This document was executed on this day of 11-30, 2011.
Eric Ackermann (Authorized Signature) Eric Ackermann (Print Authorized Signature Name)

BIDDING DOCUMENTS

WORK FORCE REPORT - Page 2

NAME OF FIRM: Siemens Industry, Inc.

DATE: 11/04/2011

INSTRUCTIONS: For each occupational category, indicate number of males and females in every ethnic group. Total columns in row provided. Sum of all totals should be equal to your total work force. Include all those employed by your company on either a full or part-time basis. The following groups are to be included in ethnic categories listed in columns below:

- | | |
|--|--|
| (1) African-American, Black | (5) Filipino |
| (2) Latino, Hispanic, Mexican-American, Puerto Rican | (6) Caucasian |
| (3) Asian, Pacific Islander | (7) Other ethnicity; not falling into other groups |
| (4) American Indian, Eskimo | |

OCCUPATIONAL CATEGORY	(1) African-American		(2) Latino		(3) Asian		(4) American Indian		(5) Filipino		(6) Caucasian		(7) Other Ethnicities	
	(M)	(F)	(M)	(F)	(M)	(F)	(M)	(F)	(M)	(F)	(M)	(F)	(M)	(F)
Executive, Administrative, Managerial	0	0	3	0	1	0	1	0	0	0	16	4	0	0
Professional Specialty	2	0	4	0	7	2	0	1	0	0	22	4	0	0
Engineers/Architects	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Technicians and Related Support	1	0	5	0	10	1	0	0	0	0	24	0	0	0
Sales	0	0	2	0	2	0	1	0	0	0	16	7	0	1
Administrative Support/Clerical	0	1	0	4	1	1	0	0	0	0	3	7	0	0
Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Precision Production, Craft and Repair	3	0	19	0	3	0	0	0	0	0	22	0	1	0
Machine Operators, Assemblers, Inspectors	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transportation and Material Moving	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Handlers, Equipment Cleaners, Helpers and Non-construction Laborers*	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*Construction laborers and other field employees are not to be included on this page

TOTALS EACH COLUMN	6	1	33	4	24	4	2	1	0	0	103	22	1	1
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GRAND TOTAL ALL EMPLOYEES	202
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INDICATE BY GENDER AND ETHNICITY THE NUMBER OF ABOVE EMPLOYEES WHO ARE DISABLED:

DISABLED	0													
----------	---	--	--	--	--	--	--	--	--	--	--	--	--	--

NON-PROFIT ORGANIZATIONS ONLY:

BOARD OF DIRECTORS														
VOLUNTEERS														
ARTISTS														

BIDDING DOCUMENTS

WORK FORCE REPORT - Page 3

NAME OF FIRM: Siemens Industry, Inc.

DATE: 11/04/2011

INSTRUCTIONS: For each occupational category, indicate number of males and females in every ethnic group. Total columns in row provided. Sum of all totals should be equal to your total work force. Include all those employed by your company on either a full or part-time basis. The following groups are to be included in ethnic categories listed in columns below:

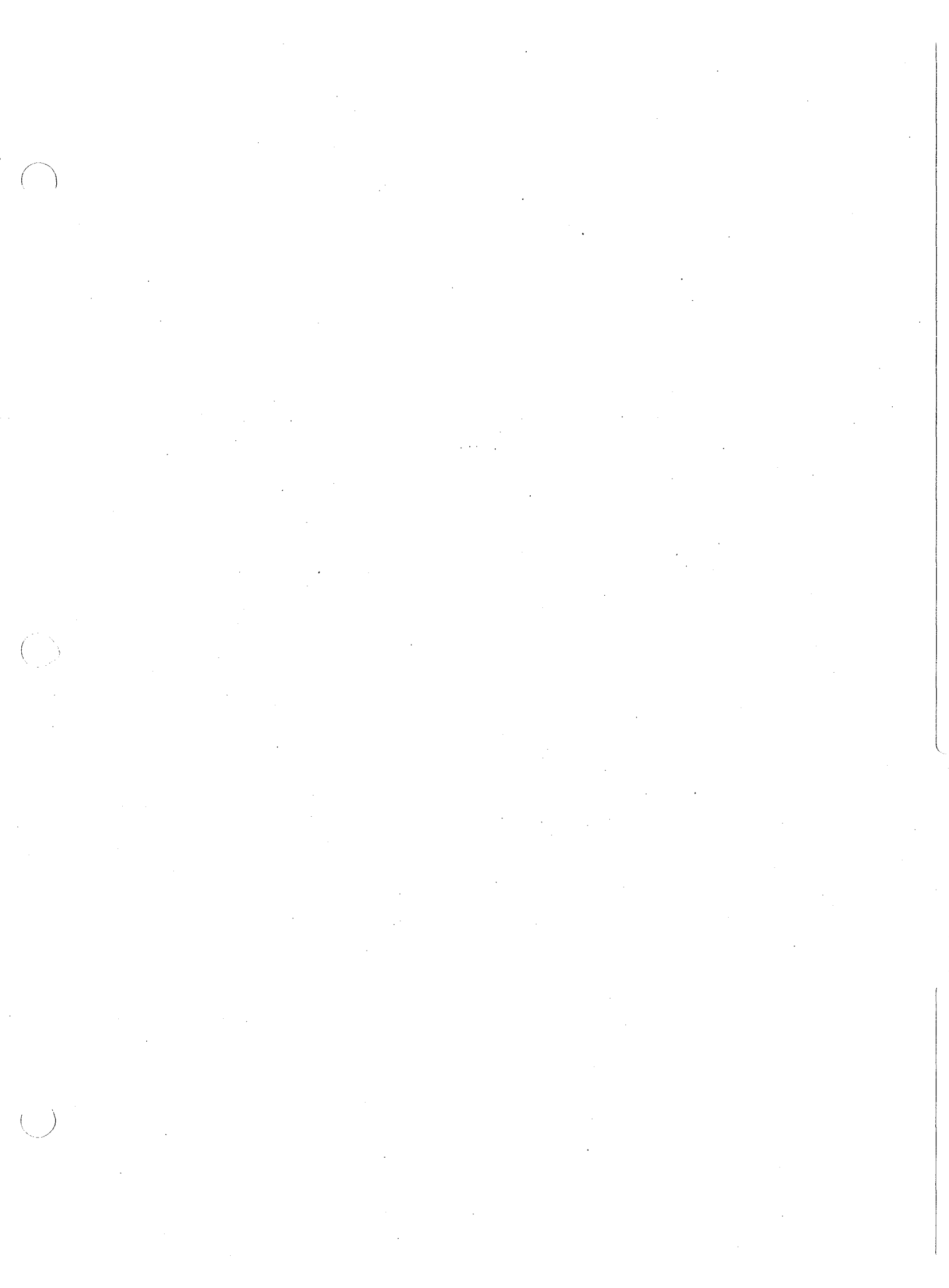
- | | |
|--|--|
| (1) African-American, Black | (5) Filipino |
| (2) Latino, Hispanic, Mexican-American, Puerto Rican | (6) Caucasian |
| (3) Asian, Pacific Islander | (7) Other ethnicity; not falling into other groups |
| (4) American Indian, Eskimo | |

OCCUPATIONAL CATEGORY	(1) African-American		(2) Latino		(3) Asian		(4) American Indian		(5) Filipino		(6) Caucasian		(7) Other Ethnicities	
	(M)	(F)	(M)	(F)	(M)	(F)	(M)	(F)	(M)	(F)	(M)	(F)	(M)	(F)
	Carpenter													
Drywall Installer														
Electrician														
Elevator Installers														
Finishers, Concrete or Terrazzo														
Glaziers														
Helpers, Construction Trade														
Ironworkers, Structural Metal Workers														
Laborers														
Millwrights														
Masons, Bricklayers														
Tilesetters														
Operators														
Painters														
Pipefitter, Plumbers	1	0	4	0	1	0	0	0	0	0	1	2	0	0
Plasterers														
Roofers														
Security, Protective Services														
Sheet Metal, Duct Installers														
Welders, Cutters														
TOTALS EACH COLUMN														
GRAND TOTAL ALL EMPLOYEES			18											

INDICATE BY GENDER AND ETHNICITY THE NUMBER OF ABOVE EMPLOYEES WHO ARE DISABLED:

DISABLED	0													
----------	---	--	--	--	--	--	--	--	--	--	--	--	--	--

Form Title: **WORK FORCE REPORT**
 Form Number: **BB05**
 Attachment **D**
 Water Department Security Upgrade Design-Build Contract



DESIGN BUILD SURVEILLANCE & WIRELESS REFERENCES

Siemens Project References:

Chicago Housing Authority (2011)

Single program, inclusive of adds and changes. Approximate Value: \$22M

Brian Bond o: 312-913-7216 bbond@thecha.org

City-wide surveillance system that included the design and development of a centralized Security Operations Center, wireless communications network, video management system and over 3000 channels of IP video across 900 buildings and 57 sites.

County of Orange: John Wayne Airport (2011)

Multiple Projects: BHS Upgrades, Parking Lots, Central Plant, Jet Bridges, Terminal Expansion and Airline Tenant Improvements. Approximate Value: \$5.2M

Marty Merck o: 949-252-0541

Siemens has been providing design, installation and supporting maintenance services for the County of Orange at JWA for over 9 years. Systems include Software House CCURE access control, Pelco and American Dynamics Video Management Systems.

San Diego County Regional Airport Authority: San Diego International Airport (2009)

Security Technology Enhancement Program (STEP), Phase I and Phase II. Approximate Value: \$4M

Iraj Ghaemi, Director of Facility Development o: 619-400-2597 ighaemi@san.org

Siemens was awarded and executed the STEP design build program for the airport. Project included the re-design of airport security screening surveillance systems, deployment of the NICE video management platform and a state of the art Situational Management System. Siemens provided all aspects of design: 30%/60%/Final and turnkey implementation.

Netlogix and Motorola Wireless Project References:

Housing Authority of City of Los Angeles (HACLA)

Program Approximate Value: \$6.1M

Sergeant Jason Liguori o:213-996-1307

Jason.Liguori@lapd.lacity.org

Kamton Joe, Project Manager o: 213-252-2635

Sgt. Daniel Gomes, LAPD o: 213-276-3490

Project included seven public housing neighborhoods in Los Angeles requiring security and safety enhancements for the residents. Solution provided PTP and PMP network links with coverage across the entire LA Basin. Solution included 120+ cameras, video management solution and networked storage solution. Evidentiary quality of video for crime prevention, detection and suppression was a requirement

Netlogix Wireless Project Reference:

City of San Diego: Communications Department

Project NOMAD. Approximate Value: \$ 400K

Huw Williams o: 619-525-8582 huww@sandiego.gov

Netlogix performed detailed design and deployment for NOMAD, developing a new architecture based on requirements using the Motorola PTP600 platform. Using a FCC experimental license to validate the architecture based on city specifications, deployed all high site technology, modified a City and County Command vehicle, and built a specialized wireless relay trailer so that San Diego Police department Nomadic Command Vehicles would have remote broadband access to the 3Cs network.

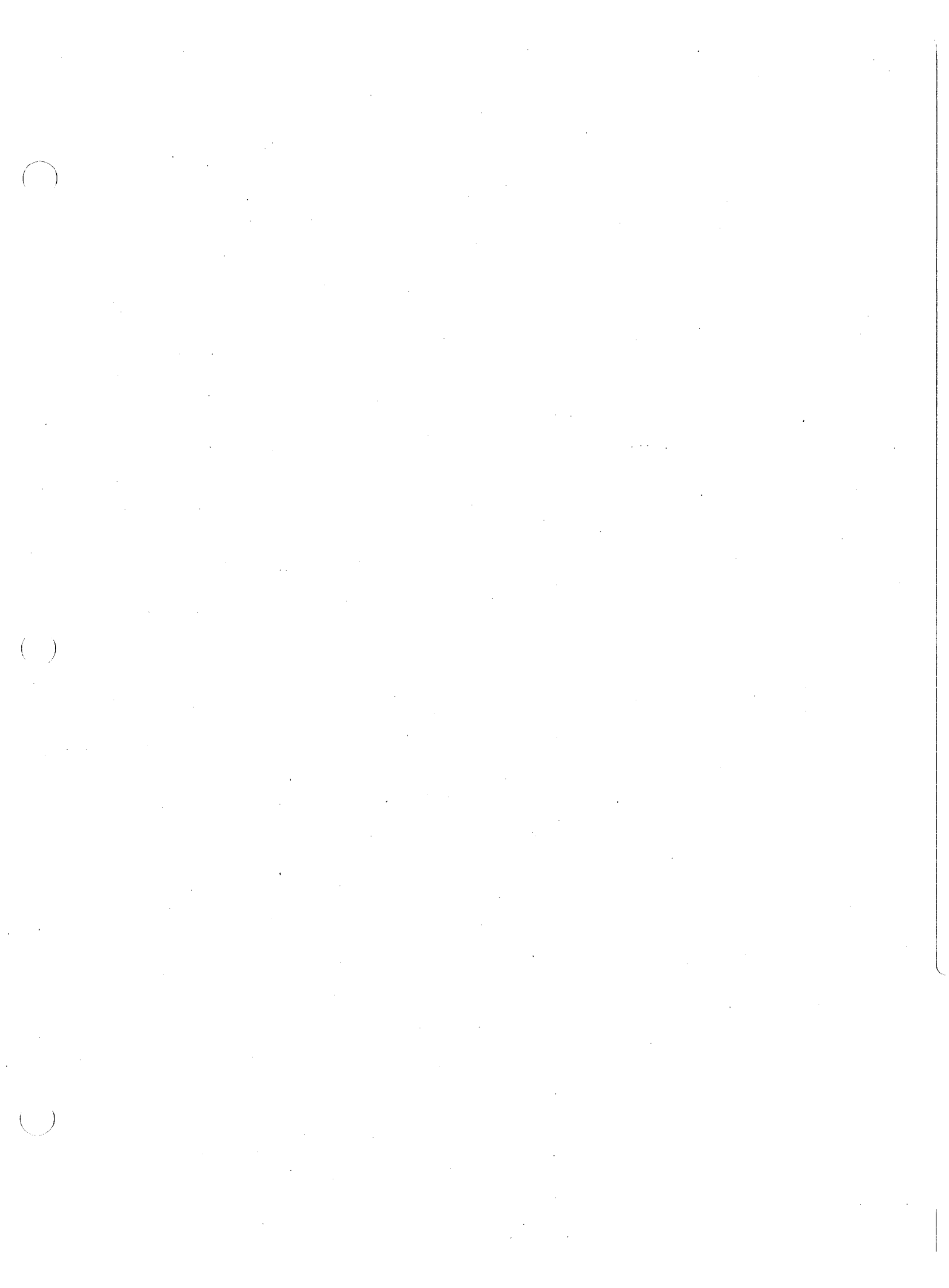
Motorola Wireless Project Reference:

City of Cleveland Homeland Security: Cleveland Shared Surveillance System

Project approximate Value unknown

Larry Jones II o: 216-664-3733 ljones4@city.cleveland.oh.us

The Scope of the project involved a build out of a wireless broadband network along with 65 cameras. City has contracted with Motorola to provide a wireless broadband PTP (Point-to-Point) ring connecting their radio towers in addition to PMP (Point to Multipoint) clusters to enable connecting remote wireless cameras at remote locations in the City. Several camera projects have been completed in the past few years including adding cameras around the Key Bank building , video surveillance around Public Square, cameras around the Arena and Stadium, plus on the streets around the Cleveland Federal Reserve. There are also a total of 12 PMP400 AP clusters (qty 4 APs per site for 360 degree coverage) on 5.4 GHz for the video backhaul. The PTP and PMP backbone was built in support of cameras which are planned throughout the Cleveland Area



APPENDIX

- Project Team Bio's
- Site Security Schedule of Protection (Bill of Material)
- Site Communications Equipment Schedule (Bill of Material)
- RFP Scope Compliance Matrix
- Major Component Datasheets
 - Cameras
 - Access Control Panel
 - Card Readers
 - Wireless Radios
 - Network Switches
 - Network Video Recorders
 - SNMP Network Monitoring and Management

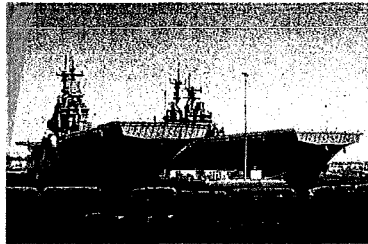
Project Team Members





Bruce G. Becker

Program Manager
San Diego, California



Bruce has twenty years experience with Siemens Industry, Inc. encompassing design engineering, software development, project management and supervisory positions. Prior to Siemens, Bruce worked for fifteen years as an engineer and engineering manager for a construction related firm, making him an invaluable asset to large-scale design-build projects.

Bruce has been involved in new construction and existing building retrofit projects for many years. Specific tasks routinely performed to ensure prompt project execution include developing and managing project schedules, financial management, supervision of all field activities, system commissioning and owner takeover. Bruce has earned the highest level project management certification in the Siemens organization.

Bruce's key program accomplishments include the completion of the \$4 million Security Technology Enhancement Program for the San Diego International Airport. The project included two major phases including the design and development of the functional requirements, design development and documentation and the implementation of the system. The program involved the installation of over 160 megapixel cameras into a state of the art video management system and cloud storage network. The program also provided the design and deployment of a Situational Management System (Command and Control). Bruce also handled all network design and development, interfacing intimately with the airport, TSA and the airports project management team. Among Bruce's other notable program accomplishments is the completion of a \$1 million Ethernet system for NavFac in San Diego, which utilized the customer's existing copper phone line infrastructure to bring communication to six Navy bases and the soon to be completed Palomar Pomerado Health Hospital in Escondido. He has recently completed three multi-million dollar integration projects with Scripps Health and has completed three separate LEED projects for the San Diego County Regional Airport Authority Facility Management Department.

- Year of Experience
Siemens: 20
Other firms: 15

-PMP (Project Management Institute)

-PM@Siemens Certified

-Mensa Member

-IEEE Member

-IEEE Fellow

Technical Expertise:

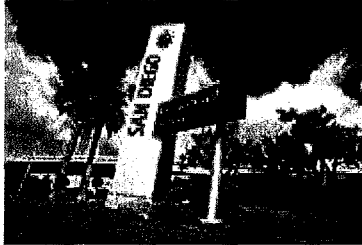
- Access Control
- Wireless Infrastructure
- CCTV
- LAN/WAN

Additional Project/Customer References:

- Scripps Memorial Hospital La Jolla, California
- TSRI La Jolla, California
- UCSD Price Center San Diego, California
- Abbott Central Plant Temecula, California
- Sandia National Labs Albuquerque, New Mexico
- Venetian, MGM Grand Las Vegas, Nevada

Jason M. Knox

Solutions Architect- Senior Applications Engineer
Southern California, California



Jason Knox is the Southern California team technical lead for project development at Siemens Industry, Incorporated. With over 30 years of hands on security integration experience, Jason serves as the lead systems designer and is responsible for concepts, engineering and design supervision. He is knowledgeable about digital electronics and has significant experience with enterprise security systems, communications, network development and system interoperability. As the project application engineer, he is well versed in the technology evaluation and cost benefit analysis on existing and emerging technologies to determine "best of breed" in the open architecture security solutions environment. He is experienced in providing highly sophisticated and integrated solutions, across a broad spectrum of technology and security system requirements. Jason has an extensive understanding of current and emerging technology choices and how they are best applied to achieve a client's security plans and long-term technology strategy. Jason is also certified across a spectrum of products, applications and standards, including various Microsoft certifications and Cisco Certifications.

Most recently, Jason served in a consultant role to the San Diego County Regional Airport Authority, and was a key member of the Siemens team in the development of the Security Technology Enhancement Program, a program that will leverage advanced detection technologies to gain situational awareness in a civil aviation environment. The program includes a state of the art Security Operations Center, perimeter intrusion detection sensors, radars, thermal and infrared camera sensors and an integrated operational software application (the first of its kind in a civil aviation operational environment). In addition to Jason's technical role and capabilities, he also has served as regional operations manager for Siemens, responsible for all new security programs and service for Southern California.

- Year of Experience
Siemens: 12
Other firms: 19

- Cisco Certified Network Trained (CCN)

- Licensed Electrical Contractor

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Technical Expertise:

- Situational Management Software
- Perimeter Intrusion Detection
- Intelligent Video Analytics
- Access Control
- Wireless Infrastructure
- Video Management Platforms

Additional Project/Customer References:

- John Wayne Airport Santa Ana, California
- Costa Mesa Police Costa Mesa, California
- Edwards Life Science Irvine, California
- KPMG Los Angeles, California
- Cal Poly, Pomona Pomona, California

Eric Pearson

Senior Project Manager
San Diego, California



Eric Pearson is a lead Senior Project Manager for Siemens Industry, Inc. who brings 32 years of local security experience in the San Diego market to our team. As a Senior Project Manager with Siemens, Eric directly manages a portfolio of large, complex, fully integrated projects that account for \$4 million of annual revenue. Eric is responsible for the ordering of materials and the scheduling of project timelines and team members to ensure each project is delivered on-time and on-budget. Eric manages the individual project performance goals, quality and safety practices for each project. In complex multi-project programs, Eric works closely with the Program Manager to ensure the overall project mission and goals are achieved.

Eric's extensive tenure in the San Diego security market has made him extremely knowledgeable of all state and local laws governing the industry, and allows him to operate his projects in strict accordance with all regulations. His intimate knowledge of network architecture, wireless technologies and complex command and control systems makes him highly valuable for all municipal wide area security projects.

Among Eric's most notable program experience is his work on the AOC Superior Court Projects, California. This multi-million dollar program consisted of the deployment of large-scale CCTV systems installed in multiple locations throughout the state including, Santa Barbara, Orange County, Riverside, Santa Maria, and the Imperial Valley. Eric provided installation coordination and system deployment programming for the San Diego Airport program, working closely with Bruce Becker, PgM, and Jason Knox, engineer.

Eric is currently the lead Project Manager for a \$700,000 access control and CCTV installation for the County of San Diego's County Operations Center. The project includes over 600 new card readers, 400 cameras and a central monitoring center with control of all perimeter facility sensors, camera systems and intrusion systems for the County of San Diego. The program is schedule for completion in 2012

- Year of Experience
Siemens: 6
Other firms: 26

- California State Alarm Company
Manager Licensed (AGC 4913)

- CSPM (Certified) (M) (I) (A) (E) (F) (G) (H) (J) (K) (L) (M) (N) (O) (P) (Q) (R) (S) (T) (U) (V) (W) (X) (Y) (Z)

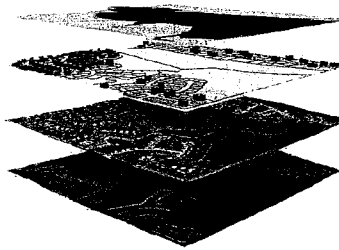
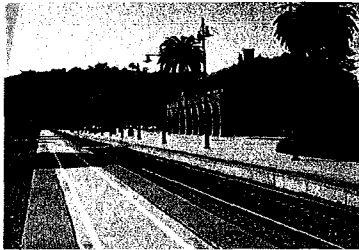
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Technical Experience:

- NICE Certified
 - Software House
 - Pelco Endura Architecture &
 - Network Design Certified
 - Proximex Certified
 - Wireless Certifications (FluidMesh)
 - GE, AMAG, Pelco, Milestone, Genetec, Pivot3 certified
- Additional Project/Customer References:
- Amylin Pharmaceuticals, UCSD, Scripps Mercy Hospital

Wendy Turner

Athenx President/CEO
SLBE-WBE - SDB - SBE - EBE



Ms. Turner is a subject matter expert in overseeing the design and deployment of complex customized CCTV security installations, Wireless Solutions, Public Safety software, including Computer Assisted Dispatch (CAD), Records Management Systems (RMS) and Mobile Data Computer Solutions (MDC) utilizing a Geographic Information System (GIS) infrastructure. During her career, Ms. Turner has led her companies to many innovative firsts in the nation in their niche; one of the first CAD/Mobile Data Terminal (now Computer) (MDT/MDC) interfaces; one of the first combined customized Police/Fire/EMS multi-jurisdictional/multi-agency CAD/RMS systems, the first fully customized CAD/RMS in a Railroad Police Department; one of the first custom, Graphical User Interface (GUI) State Police CAD systems; one of the first fully compliant National Incident Based Reporting Systems (NIBRS) Field Reporting Systems. She has also served as Director of a Security Technology Business Unit where she oversaw and managed the design and implementation of surveillance and security integrations for DoD, DHS, Public Safety, Transportation, and other Critical Infrastructure and High-Value Asset protection agencies.

Among Ms. Turner's most notable program management experience is her work with the large-scale CCTV Surveillance System Installation for AMTRAK West at several locations throughout California. Ms. Turner managed the installation of CCTV, PA Systems, and other security system installations in Bakersfield, Fresno, Hanford, Merced, Modesto, Santa Barbara, Stockton and the Los Angeles Union Station. Wireless solutions were designed and deployed in the LA Maintenance Yard, Bakersfield, Fresno and Merced Stations. Ms. Turner managed the Video Surveillance program for the Department of VAMC Loma Linda Police Services Operation Center. During her work on this program Ms. Turner managed the design and implementation of a Video Surveillance solution and redesign configuration. The project required a retrofit of the existing analog camera system and the engineering of a solution which created an IP based infrastructure on which a network based Video Management System (VMS) was installed that could be scaled to accommodate native IP based cameras while still maintaining the existing analog system.

- Year of Experience
25 years

- California Contractor's State License B-1
License #917152 - 2008-present

Department of Defense
Top Secret Clearance - 5/2/09

Subject Matter Expertise:

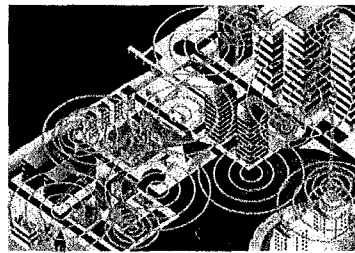
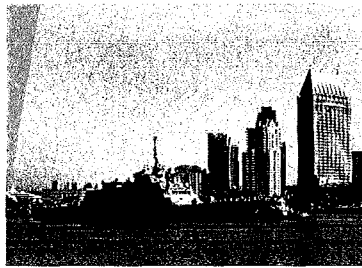
- Wireless Infrastructure
- Video Management System
- CCTV & Video Analytics
- Public Safety Software

Additional Project/Customer References:

- Port of San Diego San Diego, California
- USMC Camp Pendleton, California
- Consolidated Railway Police Philadelphia, Pennsylvania
- Rapides Parish Police Dept. Rapides Parish, Louisiana

Ed Vergara

Athenx Vice President/CTO
SLBE-WBE - SDB - SBE - EBE



Mr. Vergara has over thirty (30) years of direct experience providing systems architecture, systems design, engineering, systems integration and software programming interface development for complex security and surveillance systems, wide area networks and digital signal processing installations from the field to the Command and Control Operations Center. He has managed multi-million dollar hardware and software projects, including oversight of large teams of software and hardware engineers. He is a professionally trained and experienced Security Engineer who strives to maintain knowledge of the latest technological advances to keep his designs on the leading edge.

Mr. Vergara's extensive experience includes serving as Project Manager and Technical Lead on designing Integrated Security, Surveillance and Incident Management systems employing state-of-the-art IP based secure networks, including sophisticated cameras, intelligent video, wireless infrastructures, RFID and maritime identification systems, such as AIS with Blue Force Tracking, Radar and Sonar applications. These custom solutions provide clients with a comprehensive end to end security solution.

Mr. Vergara was awarded SPAWAR's Sustained Superior Performance Award for his role as the AIS/BFT Technical Lead in the design of the system architecture for the first operational Automatic Identification System (AIS) Blue Force Tracking system in the country implemented at the Joint Harbor Operations Center (JHOC) in San Diego, CA. Ed played an integral role in the Operation Golden Phoenix Training Exercise 2008 in San Diego, CA. Ed designed and engineered a rapidly deployable wireless tactical solution that supported border crossing/checkpoint type training activities which included perimeter intrusion detection. This four-day training exercise allowed US Customs and Border Protection, USMC Marine Aircraft Group - 46, the County of San Diego, City of San Diego and other participating agencies to join other partners in a simulated response to mock terrorism attacks and post incident responses. The solution included long range intelligent video analytic sensors and CBRNE sensors that were integrated with a ruggedized PTZ and engineered to transmit alarm data via wireless mesh into Situational Management Software (C2/SMS) in a remote mobile command center.

- Year of Experience
32 years

- Wireless Subject Matter Expert

Department of Defense
Special Operations

Subject Matter Expertise:

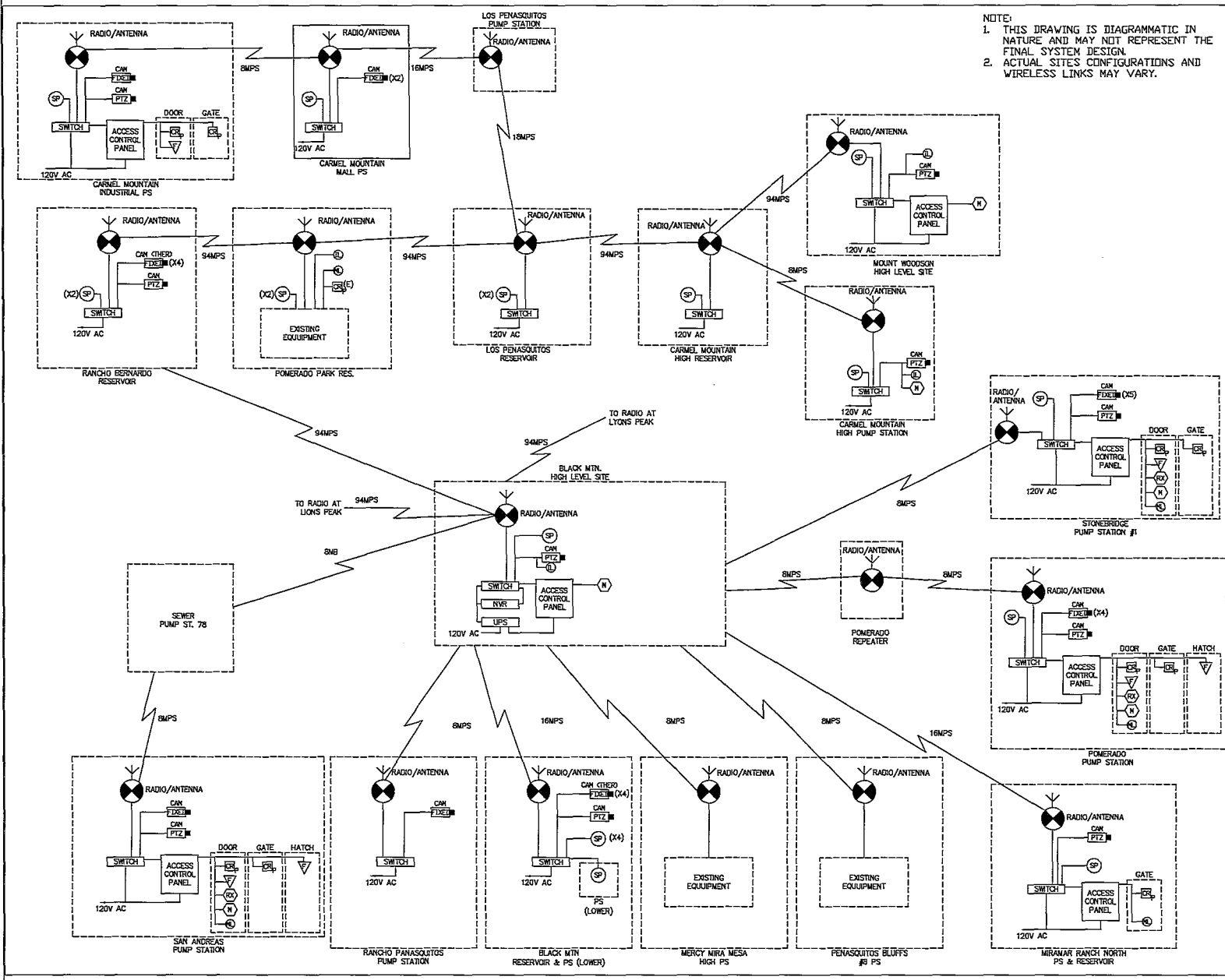
- Wireless Infrastructure
- Security Surveillance Design
- LAN/WAN Design
- Command and Control

Additional Project/Customer References:

- San Diego Joint Harbor Operations Center
- Marine Terminal Security Project (San Diego)
- Alabama State Port Authority (Mobile)

Site Security Schedule of Protection (Bill of Materials):

The following equipment schedule of protection is provided for each individual site. This equipment breakout is inclusive of all facilities, including Base Bid and Alternate B sites:



NOTE:
 1. THIS DRAWING IS DIAGRAMMATIC IN NATURE AND MAY NOT REPRESENT THE FINAL SYSTEM DESIGN.
 2. ACTUAL SITES CONFIGURATIONS AND WIRELESS LINKS MAY VARY.

CITY OF SAN DIEGO

SIEMENS
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 Cypress, CA 90630 USA
 Phone: (714) 765-2200
 Fax: (714) 765-2224
 C10: 738796

REVISION	DATE	REMARKS
-	-	-

JOB NAME:
 SECURITY UPGRADES FOR THE CITY OF SAN DIEGO DESIGN - BUILD CONTRACT - 6471

PROJECT NUMBER:
 440P-XXXXXX

OSHPD PROJECT NUMBER:
 N/A

ENGINEER:

DRAWN:
 A.M.

PROJECT MANAGER:
 --

DATE: 11/01/11 APPROVED:

SHEET DESCRIPTION:

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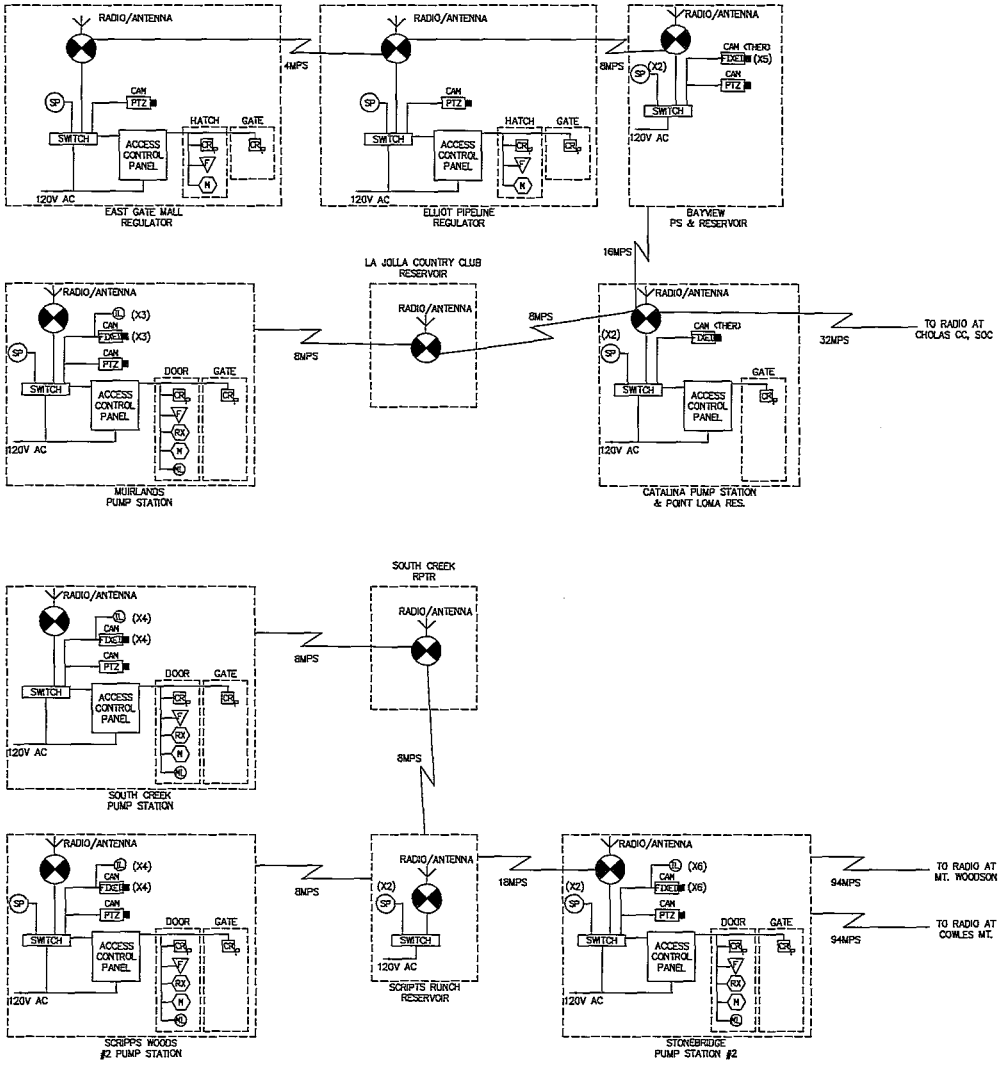
JOB DESCRIPTION:

SECURITY SYSTEM UPGRADE

JOB ADDRESS:
 CITY OF SAN DIEGO
 PUBLIC WORKS DEPARTMENT
 1200 THIRD AVE., SUITE 200, MS56P
 SAN DIEGO, CA 92101

SCALE:	NTS	SE-R1
SIZE:	D 363	
DWG. NO.:	W. R. NO. --	

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 Fax: (714) 761-3324
 CID: 758796

REVISION:	DATE:	REMARKS:
-	-	-
-	-	-
-	-	-
-	-	-

JOB NAME:
 SECURITY UPGRADES FOR THE CITY OF SAN DIEGO DESIGN - BUILD CONTRACT - 5171

PROJECT NUMBER:
 440P-XXXXXX

OSHPD PROJECT NUMBER:
 N/A

ENGINEER:
 -

DRAWN:
 A.M.

PROJECT MANAGER:
 -

DATE: 11/01/11 APPROVED:

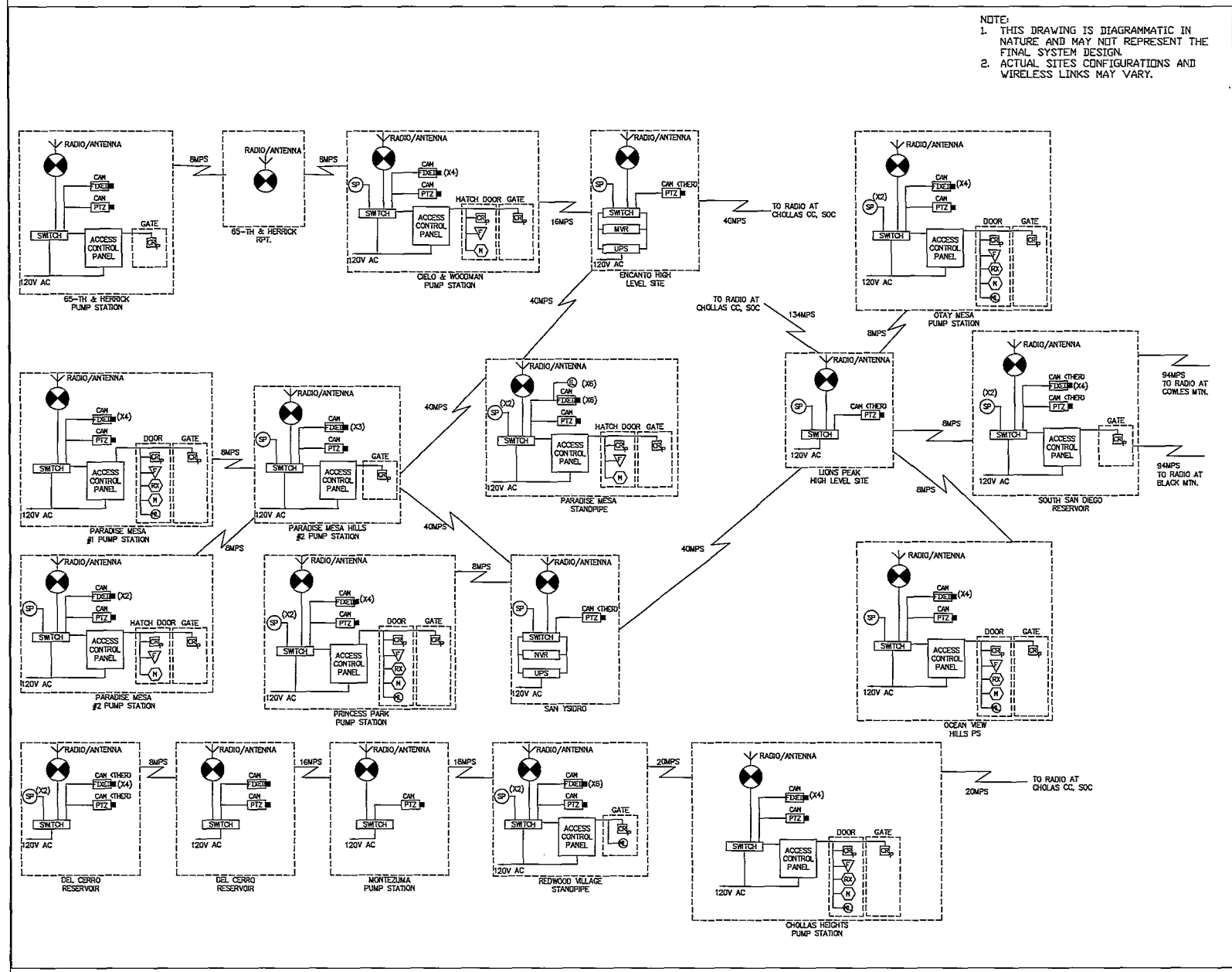
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JOB DESCRIPTION:
 SECURITY SYSTEM UPGRADE

JOB ADDRESS:
 CITY OF SAN DIEGO
 PUBLIC WORKS DEPARTMENT
 1200 THIRD AVE., SUITE 200, MS56P
 SAN DIEGO, CA 92101

SCALE: NTS	SE-R2
SIZE: CODE IDENT NO. D SES	
DWG NO.	W. R. NO. -

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 CIO: 758796

REVISION	DATE	REMARKS
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JOB NAME:
 SECURITY UPGRADES FOR THE CITY OF SAN DIEGO DESIGN - BUILD CONTRACT - 5171

PROJECT NUMBER:
440P-XXXXXX

OSHPD PROJECT NUMBER:
 N/A

ENGINEER:
 -

DRAWN:
A.M.

PROJECT MANAGER:
 -

DATE: 11/01/11 APPROVED:

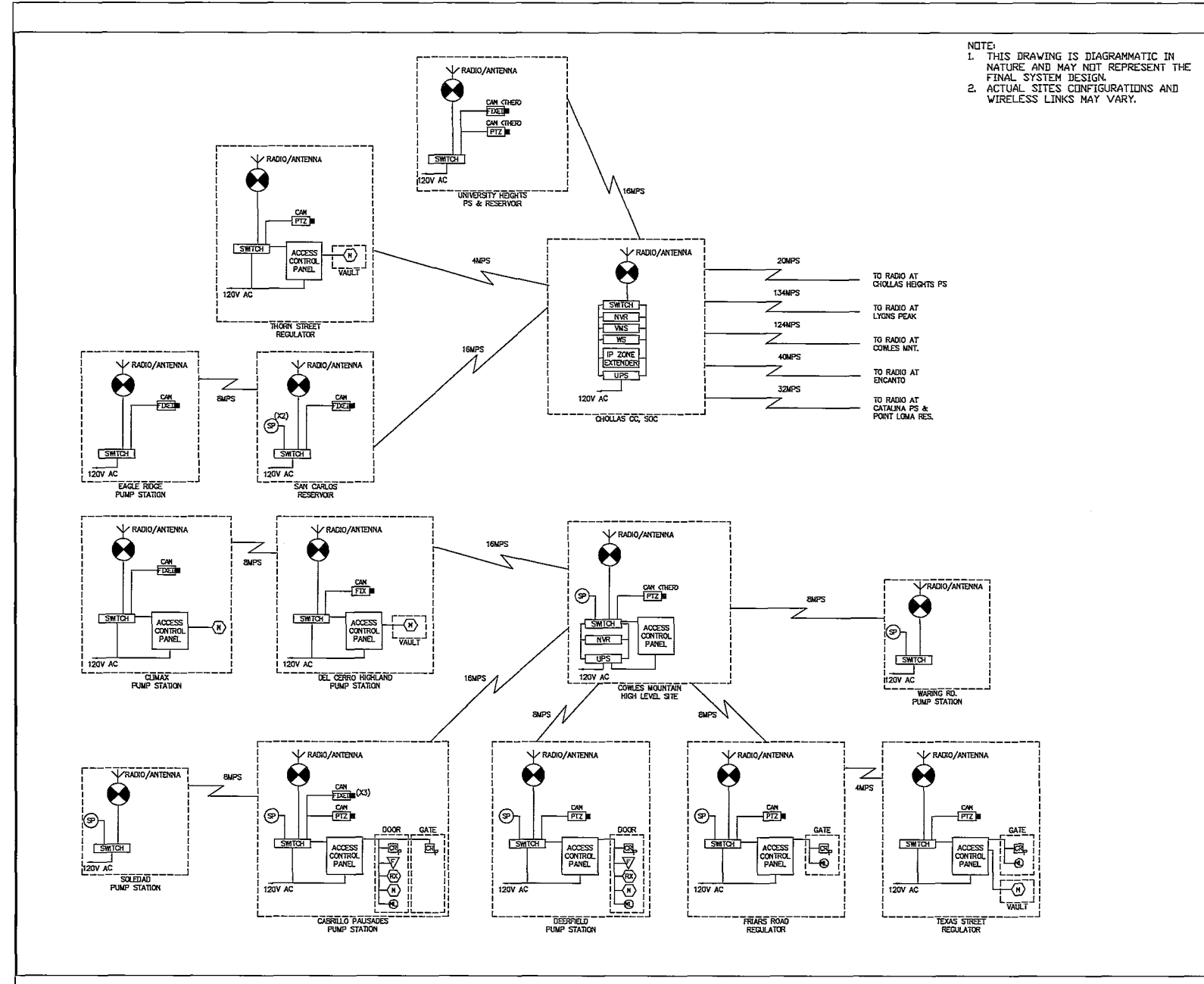
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SECURITY SYSTEM UPGRADE

JOB ADDRESS:
 CITY OF SAN DIEGO
 PUBLIC WORKS DEPARTMENT
 1200 THIRD AVE., SUITE 200, MS56P
 SAN DIEGO, CA 92101

SCALE:
 NTS
SE-R3

SIZE	CODE IDENT. NO.
D	SES
DWG. NO.	
W. R. NO. -	



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 FAX: (714) 761-3324
 C10-758796

REVISION	DATE	REMARKS
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JOB NAME:
 SECURITY UPGRADES FOR THE CITY OF SAN DIEGO DESIGN - BUILD
 CONTRACT - 5171

PROJECT NUMBER:
440P-XXXXXX

OSHPD PROJECT NUMBER:
 N/A

ENGINEER:
 -

DRAWN:
A.M.

PROJECT MANAGER:
 -

DATE: 11/01/11 APPROVER:

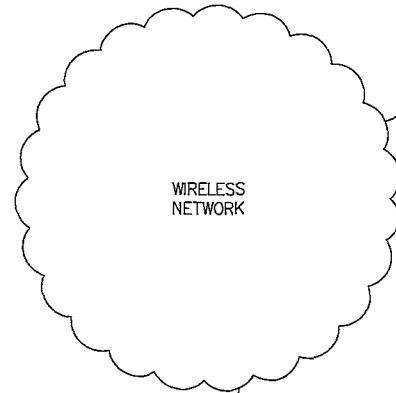
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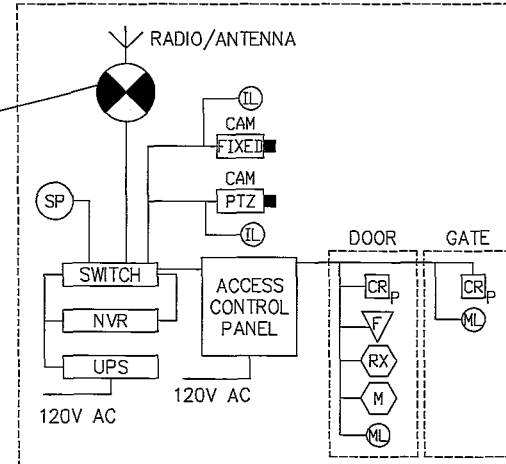
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**SECURITY SYSTEM
 UPGRADE**

JOB ADDRESS:
 CITY OF SAN DIEGO
 PUBLIC WORKS DEPARTMENT
 1200 THIRD AVE., SUITE 200, MS56P
 SAN DIEGO, CA 92101

SCALE: NTS	SE-R4
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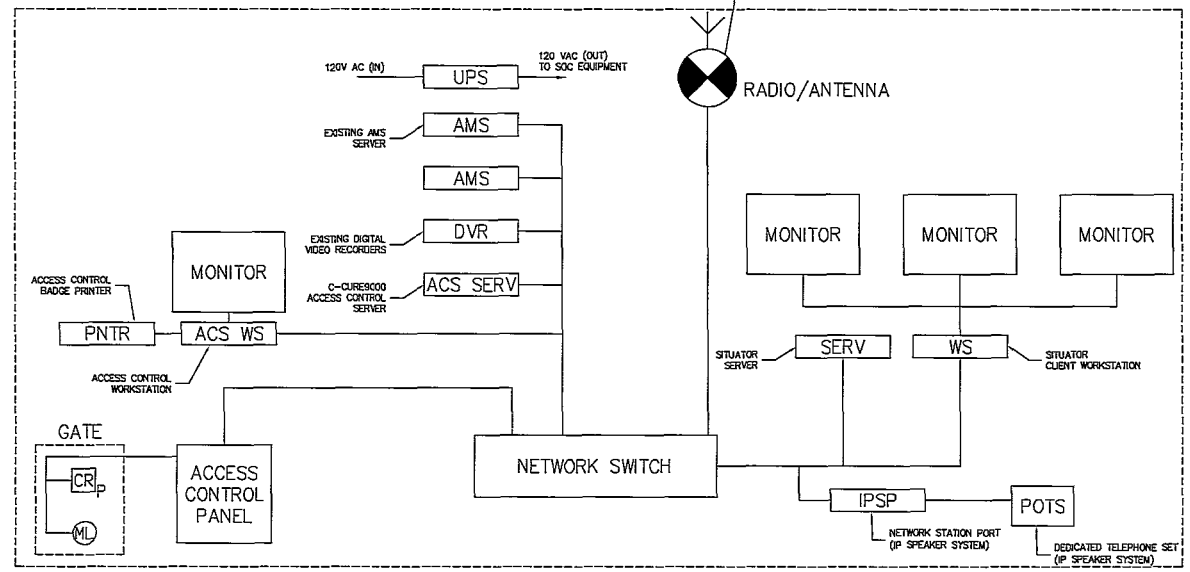


WIRELESS LINK



TYPICAL SITE

CHOLLAS CC, SOC



NOTE:
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 2. ACTUAL SITES CONFIGURATIONS MAY VARY.

CITY OF SAN DIEGO

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 Cypress, CA 95628 USA
 Phone: (714) 961-2200
 Fax: (714) 751-8324
 C10: 758796

REVISION	DATE	REMARKS
-	-	-

JOB NAME:
 SECURITY UPGRADES FOR THE CITY OF SAN DIEGO DESIGN-BUILD CONTRACT-3171

PROJECT NUMBER:
440P-XXXXXX

OSHPD PROJECT NUMBER:
 N/A

ENGINEER:

DRAWN:
A.M.

PROJECT MANAGER:

DATE: 11/01/11 APPROVED:

SHEET DESCRIPTION:

SECURITY SYSTEM BLOCK DIAGRAM

JOB DESCRIPTION:
SECURITY SYSTEM UPGRADE

JOB ADDRESS:
 CITY OF SAN DIEGO
 PUBLIC WORKS DEPARTMENT
 1200 THIRD AVE., SUITE 200, MS56P
 SAN DIEGO, CA 92101

SCALE: NTS		SE-R5
SIZE: D	CODE IDENT NO. SES	
DWG NO.		W. R. NO. --

65th and Herrick Pump Station

QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
1	Software House	SWH-4000	Card Reader
1	UTC/Interlogix (Sentrol)	2507AD-L	Door Position Switch
2	Protech	SDI-77XL2	Exterior Motion Sensor (wide angle 90x50)
1	Bosch	NDN-498V09-22PS	IP minidome Camera (FLEXI 2X D/N H264 9-22 NTSC IVA POE SMB)
1	Bosch	VG5-723-ECE2	PTZ Day/Night Camera PTZ Day Night 28x (G5 700 28X DN IP IN/OUT PEND CLEAR NTSC)
1	Bosch	VG4-SBUB-PCL	G4 Autodome modular pendant housing (clear)
1	Bosch	VG4-A-PA1	G4 Pendant Arm with 120VAC White
2	Bosch	UFLED10-8DB	IR illuminator-AEGIS UFLED (850-10) EX PSU
2	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W
2	Bosch	UFLED-CI-5M	Cable for UFLED
1	NICE	NV-ENT-SVR9100H-OLS-2TB	NiceVision Enterprise Smart Video Recorder 9100, 1U, hybrid ready, with internal 2TB net storage.
1	Middle Atlantic	DWR-18-26	26" deep (for 24"equipment) 19" rack 18 spaces
1	Middle Atlantic	PD-815SC	6 Outlet, single 15 Amp, surge/spike protection, Power Distributor
1	Middle Atlantic	FD-21	Solid Front door (Black)
1	Middle Atlantic	DWR-FK26	Enclosure Fan Kit (4-1/2" exhaust fans, w/mounting accessories)
1	Middle Atlantic	PB-DWR	Bracket to mount Middle Atlantic power strip
1	Middle Atlantic	DWR-RR18	18 SPACE (31 1/2") DWR REAR RAIL KIT
2	Valcom	VIP-480L	IP Paging Horn
1	TrippLite	SU1000RTLXL2UA	UPS, 1KVA, On-Line Double conversion, 2U rack/tower

Bayview Pump Station

QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Middle Atlantic	DWR-18-26	26" deep (for 24"equipment) 19" rack 18 spaces
1	Middle Atlantic	PD-815SC	6 Outlet, single 15 Amp, surge/spike protection, Power Distributor
1	Middle Atlantic	FD-21	Solid Front door (Black)
1	Middle Atlantic	DWR-FK26	Enclosure Fan Kit (4-1/2" exhaust fans, w/mounting accessories)
1	Middle Atlantic	PB-DWR	Bracket to mount Middle Atlantic power strip
1	Middle Atlantic	DWR-RR18	18 SPACE (31 1/2") DWR REAR RAIL KIT

Bayview Reservoir

QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Bosch	DS150i	Request to Exit Sensor
1	Securitron	M62FB	Door Maglock
1	Securitron	PB2	Pushbutton Release 2" Momentary
4	Protech	SDI-77XL2	Exterior Motion Sensor (wide angle 90x50)
5	Pelco	TI335 (w/35mm)	Thermal camera
5	Pelco	EM1109	Pole mount
2	Pelco	WCS4-20	Power Supply (24VAC, 4 out)
1	NICE	NV-ENT-SVR9200H-OLS-4TB	NiceVision Enterprise Smart Video Recorder 9200, 1U, hybrid ready, with internal 4TB net storage.
1	Middle Atlantic	DWR-18-26	26" deep (for 24"equipment) 19" rack 18 spaces
1	Middle Atlantic	PD-815SC	6 Outlet, single 15 Amp, surge/spike protection, Power Distributor
1	Middle Atlantic	FD-21	Solid Front door (Black)

1	Middle Atlantic	DWR-FK26	Enclosure Fan Kit (4-1/2" exhaust fans, w/mounting accessories)
1	Middle Atlantic	PB-DWR	Bracket to mount Middle Atlantic power strip
1	Middle Atlantic	DWR-RR18	18 SPACE (31 1/2") DWR REAR RAIL KIT
2	Valcom	VIP-480L	IP Paging Horn
1	Tripplite	SU1000RTL2UA	UPS, 1KVA, On-Line Double conversion, 2U rack/tower

Bernardo Heights Pump Station

QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Bosch	DS150i	Request to Exit Sensor
1	Securitron	M62FB	Door Maglock
1	Securitron	PB2	Pushbutton Release 2" Momentary
1	Valcom	VIP-480L	IP Paging Horn

Black Mountain Pump Station (Lower)

QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Valcom	VIP-480L	IP Paging Horn

Black Mountain Reservoir

QTY	MANUFACTURER	MODEL	DESCRIPTION
2	Bosch	NEI-308V05-21W	Fixed Camera, IP CAM/WHT DIA (850) D/N HI-RES 5-50MM N, W/IR
2	Bosch	VG4-A-9541	Mast Pole Mount, GEN4
4	Pelco	TI335 (w/35mm)	Thermal camera
4	Pelco	EM1109	Pole mount
1	Pelco	WCS4-20	Power Supply (24VAC, 4 out)
2	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W
2	Bosch	UFLED-CI-5M	Cable for UFLED
1	NICE	NV-ENT-SVR9200H-OLS-4TB	NiceVision Enterprise Smart Video Recorder 9200, 1U, hybrid ready, with internal 4TB net storage.
1	Middle Atlantic	DWR-18-26	26" deep (for 24"equipment) 19" rack 18 spaces
1	Middle Atlantic	PD-815SC	6 Outlet, single 15 Amp, surge/spike protection, Power Distributor
1	Middle Atlantic	FD-21	Solid Front door (Black)
1	Middle Atlantic	DWR-FK26	Enclosure Fan Kit (4-1/2" exhaust fans, w/mounting accessories)
1	Middle Atlantic	PB-DWR	Bracket to mount Middle Atlantic power strip
1	Middle Atlantic	DWR-RR18	18 SPACE (31 1/2") DWR REAR RAIL KIT
4	Valcom	VIP-480L	IP Paging Horn
1	Tripplite	SU1000RTL2UA	UPS, 1KVA, On-Line Double conversion, 2U rack/tower

Cabrillo Palisades Pump Station

QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
1	Bosch	DS150i	Request to Exit Sensor
2	Software House	SWH-4000	Card Reader
2	UTC/Interlogix (Sentrol)	2507AD-L	Door Position Switch
1	Securitron	M62FB	Door Maglock
1	Securitron	PB2	Pushbutton Release 2" Momentary

3	Bosch	NDN-498V09-22PS	IP minidome Camera (FLEXI 2X D/N H264 9-22 NTSC IVA POE SMB)
1	Bosch	VG5-723-ECE2	PTZ Day/Night Camera PTZ Day Night 28x (G5 700 28X DN IP IN/OUT PEND CLEAR NTSC)
1	Bosch	VG4-SBUB-PCL	G4 Autodome modular pendant housing (clear)
1	Bosch	VG4-A-PA1	G4 Pendant Arm with 120VAC White
3	Bosch	UFLED10-8DB	IR illuminator-AEGIS UFLED (850-10) EX PSU
3	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W
3	Bosch	UFLED-CI-5M	Cable for UFLED
1	NICE	NV-ENT-SVR9200H-OLS-4TB	NiceVision Enterprise Smart Video Recorder 9200, 1U, hybrid ready, with internal 4TB net storage.
1	Hoffman	A363010SSLP	Hoffman outdoor NEMA-4x enclosure 30X36X10
1	Hoffman	CP3630	Enclosure back Panel
1	Hoffman	T150116G100	Outdoor Enclosure Air Conditioner (800 BTU, 115VAC, 3.8Amp)
1	Valcom	VIP-480L	IP Paging Horn
1	TrippLite	SU1000RTXL2UA	UPS, 1KVA, On-Line Double conversion, 2U rack/tower

Carmel Mountain High Pump Station			
QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Bosch	NDN-498V09-22PS	IP minidome Camera with OnBoard Storage Card (FLEXI 2X D/N H264 9-22 NTSC IVA POE SMB)
1	Bosch	UFLED10-8DB	IR illuminator-AEGIS UFLED (850-10) EX PSU
1	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W
1	Bosch	UFLED-CI-5M	Cable for UFLED

Carmel Mountain High Reservoir			
QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Valcom	VIP-480L	IP Paging Horn

Carmel Mountain Industrial Pump Station			
QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
1	Bosch	DS150i	Request to Exit Sensor
2	Software House	SWH-4000	Card Reader
1	UTC/Interlogix (Sentrol)	2507AD-L	Door Position Switch
	Bosch	DS825	Indoor Motion
1	Securitron	M62FB	Door Maglock
1	Securitron	PB2	Pushbutton Release 2" Momentary
2	Protech	SDI-77XL2	Exterior Motion Sensor (wide angle 90x50)
1	Bosch	NDN-498V09-22PS	IP minidome Camera (FLEXI 2X D/N H264 9-22 NTSC IVA POE SMB)
1	NICE	NV-ENT-SVR9100H-OLS-2TB	NiceVision Enterprise Smart Video Recorder 9100, 1U, hybrid ready, with internal 2TB net storage.
2	NICE	NVE-I008	8 Channel Video Encoder

Carmel Mountain Mall Pump Station			
QTY	MANUFACTURER	MODEL	DESCRIPTION

2	Bosch	UFLED10-8DB	IR illuminator-AEGIS UFLED (850-10) EX PSU
2	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W
2	Bosch	UFLED-CI-5M	Cable for UFLED
1	Middle Atlantic	DWR-18-26	26" deep (for 24"equipment) 19" rack 18 spaces
1	Middle Atlantic	PD-815SC	6 Outlet, single 15 Amp, surge/spike protection, Power Distributor
1	Middle Atlantic	FD-21	Solid Front door (Black)
1	Middle Atlantic	DWR-FK26	Enclosure Fan Kit (4-1/2" exhaust fans, w/mounting accessories)
1	Middle Atlantic	PB-DWR	Bracket to mount Middle Atlantic power strip
1	Middle Atlantic	DWR-RR18	18 SPACE (31 1/2") DWR REAR RAIL KIT
1	Valcom	VIP-480L	IP Paging Horn

Catalina Pump Station

QTY	MANUFACTURER	MODEL	DESCRIPTION
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Security Operations Center (Chollas)

QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
	Bosch	DS150i	Request to Exit Sensor
1	Software House	SWH-4000	Card Reader
	Protech	SDI-77XL2	Exterior Motion Sensor (wide angle 90x50)
1	Valcom	VIP-811	Network Station Port

Collas Heights Pump Station

QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
1	Bosch	DS150i	Request to Exit Sensor
2	Software House	SWH-4000	Card Reader
1	UTC/Interlogix (Sentrol)	2507AD-L	Door Position Switch
	Bosch	DS825	Indoor Motion
1	Securitron	M62FB	Door Maglock
1	Securitron	PB2	Pushbutton Release 2" Momentary
	Protech	SDI-77XL2	Exterior Motion Sensor (wide angle 90x50)
4	Bosch	NDN-498V09-22PS	IP minidome Camera (FLEXI 2X D/N H264 9-22 NTSC IVA POE SMB)
1	Bosch	VG5-723-ECE2	PTZ Day/Night Camera PTZ Day Night 28x (G5 700 28X DN IP IN/OUT PEND CLEAR NTSC)
1	Bosch	VG4-SBUB-PCL	G4 Autodome modular pendant housing (clear)
1	Bosch	VG4-A-PA1	G4 Pendant Arm with 120VAC White
4	Bosch	UFLED10-8DB	IR illuminator-AEGIS UFLED (850-10) EX PSU
4	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W
4	Bosch	UFLED-CI-5M	Cable for UFLED
1	NICE	NV-ENT-SVR9200H-OLS-4TB	NiceVision Enterprise Smart Video Recorder 9200, 1U, hybrid ready, with internal 4TB net storage.
1	Middle Atlantic	DWR-18-26	26" deep (for 24"equipment) 19" rack 18 spaces
1	Middle Atlantic	PD-815SC	6 Outlet, single 15 Amp, surge/spike protection, Power Distributor
1	Middle Atlantic	FD-21	Solid Front door (Black)

1	Middle Atlantic	DWR-FK26	Enclosure Fan Kit (4-1/2" exhaust fans, w/mounting accessories)
1	Middle Atlantic	PB-DWR	Bracket to mount Middle Atlantic power strip
1	Middle Atlantic	DWR-RR18	18 SPACE (31 1/2") DWR REAR RAIL KIT
1	Valcom	VIP-480L	IP Paging Horn
1	Tripplite	SU1000RTLXL2UA	UPS, 1KVA, On-Line Double conversion, 2U rack/tower

Cielo and Woodman Pump Station

QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
	Bosch	DS150i	Request to Exit Sensor
2	Software House	SWH-4000	Card Reader
2	Protech	SDI-77XL2	Exterior Motion Sensor (wide angle 90x50)
3	Bosch	NEI-308V05-21W	Fixed Camera, IP CAM/WHT DIA (850) D/N HI-RES 5-50MM N, W/IR
3	Bosch	VG4-A-9541	Mast Pole Mount,GEN4
1	Bosch	VG5-723-ECE2	PTZ Day/Night Camera PTZ Day Night 28x (G5 700 28X DN IP IN/OUT PEND CLEAR NTSC)
1	Bosch	VG4-SBUB-PCL	G4 Autodome modular pendant housing (clear)
1	Bosch	VG4-A-PA1	G4 Pendant Arm with 120VAC White
3	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W
3	Bosch	UFLED-CI-5M	Cable for UFLED
1	NICE	NV-ENT-SVR9200H-OLS-4TB	NiceVision Enterprise Smart Video Recorder 9200, 1U, hybrid ready, with internal 4TB net storage.
1	Hoffman	A363010SSLP	Hoffman outdoor NEMA-4x enclosure 30X36X10
1	Hoffman	CP3630	Enclosure back Panel
1	Hoffman	T150116G100	Outdoor Enclosure Air Conditioner (800 BTU, 115VAC, 3.8Amp)
1	Valcom	VIP-480L	IP Paging Horn
1	Tripplite	SU1000RTLXL2UA	UPS, 1KVA, On-Line Double conversion, 2U rack/tower

Climax Pump Station

QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Bosch	DS825	Indoor Motion
1	Bosch	NDN-498V09-22PS	IP minidome Camera with OnBoard Storage Card (FLEXI 2X D/N H264 9-22 NTSC IVA POE SMB)

Deerfield Pump Station

QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
1	Bosch	DS150i	Request to Exit Sensor
1	Software House	SWH-4000	Card Reader
1	UTC/Interlogix (Sentrol)	2507AD-L	Door Position Switch
1	Securitron	M62FB	Door Maglock
1	Securitron	PB2	Pushbutton Release 2" Momentary
4	Protech	SDI-77XL2	Exterior Motion Sensor (wide angle 90x50)
2	Bosch	NEI-308V05-21W	Fixed Camera, IP CAM/WHT DIA (850) D/N HI-RES 5-50MM N, W/IR
2	Bosch	VG4-A-9541	Mast Pole Mount,GEN4

1	Bosch	VG5-723-ECE2	PTZ Day/Night Camera PTZ Day Night 28x (G5 700 28X DN IP IN/OUT PEND CLEAR NTSC)
1	Bosch	VG4-SBUB-PCL	G4 Autodome modular pendant housing (clear)
1	Bosch	VG4-A-PA1	G4 Pendant Arm with 120VAC White
4	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W
4	Bosch	UFLED-CI-5M	Cable for UFLED
1	NICE	NV-ENT-SVR9200H-OLS-4TB	NiceVision Enterprise Smart Video Recorder 9200, 1U, hybrid ready, with internal 4TB net storage.
1	Middle Atlantic	DWR-18-26	26" deep (for 24"equipment) 19" rack 18 spaces
1	Middle Atlantic	PD-815SC	6 Outlet, single 15 Amp, surge/spike protection, Power Distributor
1	Middle Atlantic	FD-21	Solid Front door (Black)
1	Middle Atlantic	DWR-FK26	Enclosure Fan Kit (4-1/2" exhaust fans, w/mounting accessories)
1	Middle Atlantic	PB-DWR	Bracket to mount Middle Atlantic power strip
1	Middle Atlantic	DWR-RR18	18 SPACE (31 1/2") DWR REAR RAIL KIT
1	Valcom	VIP-480L	IP Paging Horn

Del Cerro Highland Pump Station			
QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Bosch	DS825	Indoor Motion
1	Bosch	NDN-498V09-22PS	IP minidome Camera with OnBoard Storage Card (FLEXI 2X D/N H264 9-22 NTSC IVA POE SMB)

Del Cerro Pump Station			
QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
1	Bosch	DS150i	Request to Exit Sensor
1	Software House	SWH-4000	Card Reader
1	UTC/Interlogix (Sentrol)	2507AD-L	Door Position Switch
1	Securitron	M62FB	Door Maglock
1	Securitron	PB2	Pushbutton Release 2" Momentary
2	Protech	SDI-77XL2	Exterior Motion Sensor (wide angle 90x50)
1	Bosch	NDN-498V09-22PS	IP minidome Camera (FLEXI 2X D/N H264 9-22 NTSC IVA POE SMB)
1	Bosch	VG5-723-ECE2	PTZ Day/Night Camera PTZ Day Night 28x (G5 700 28X DN IP IN/OUT PEND CLEAR NTSC)
1	Bosch	VG4-SBUB-PCL	G4 Autodome modular pendant housing (clear)
1	Bosch	VG4-A-PA1	G4 Pendant Arm with 120VAC White
3	Bosch	UFLED10-8DB	IR Illuminator-AEGIS UFLED (850-10) EX PSU
3	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W
3	Bosch	UFLED-CI-5M	Cable for UFLED
1	NICE	NV-ENT-SVR9100H-OLS-2TB	NiceVision Enterprise Smart Video Recorder 9100, 1U, hybrid ready, with internal 2TB net storage.
1	Middle Atlantic	DWR-18-26	26" deep (for 24"equipment) 19" rack 18 spaces
1	Middle Atlantic	PD-815SC	6 Outlet, single 15 Amp, surge/spike protection, Power Distributor
1	Middle Atlantic	FD-21	Solid Front door (Black)
1	Middle Atlantic	DWR-FK26	Enclosure Fan Kit (4-1/2" exhaust fans, w/mounting accessories)
1	Middle Atlantic	PB-DWR	Bracket to mount Middle Atlantic power strip
1	Middle Atlantic	DWR-RR18	18 SPACE (31 1/2") DWR REAR RAIL KIT

Del Cerro Reservoir

QTY	MANUFACTURER	MODEL	DESCRIPTION
4	Pelco	TI335 (w/35mm)	Thermal camera
4	Pelco	EM1109	Pole mount
1	Pelco	WCS4-20	Power Supply (24VAC, 4 out)
1	Bosch	VG5-723-ECE2	PTZ Day/Night Camera PTZ Day Night 28x (G5 700 28X DN IP IN/OUT PEND CLEAR NTSC)
1	Bosch	VG4-SBUB-PCL	G4 Autodome modular pendant housing (clear)
1	Bosch	VG4-A-PA1	G4 Pendant Arm with 120VAC White
1	NICE	NV-ENT-SVR9200H-OLS-4TB	NiceVision Enterprise Smart Video Recorder 9200, 1U, hybrid ready, with internal 4TB net storage.
1	Hoffman	A363010SSLP	Hoffman outdoor NEMA-4x enclosure 30X36X10
1	Hoffman	CP3630	Enclosure back Panel
1	Hoffman	T150116G100	Outdoor Enclosure Air Conditioner (800 BTU, 115VAC, 3.8Amp)
2	Valcom	VIP-480L	IP Paging Horn
1	TrippLite	SU1000RTXL2UA	UPS, 1KVA, On-Line Double conversion, 2U rack/tower

Eagle Ridge Pump Station

QTY	MANUFACTURER	MODEL	DESCRIPTION
2	Bosch	NDN-498V09-22PS	IP minidome Camera (FLEXI 2X D/N H264 9-22 NTSC IVA POE SMB)
1	NICE	NV-ENT-SVR9100H-OLS-2TB	NiceVision Enterprise Smart Video Recorder 9100, 1U, hybrid ready, with internal 2TB net storage.
1	Middle Atlantic	DWR-18-26	26" deep (for 24"equipment) 19" rack 18 spaces
1	Middle Atlantic	PD-815SC	6 Outlet, single 15 Amp, surge/spike protection, Power Distributor
1	Middle Atlantic	FD-21	Solid Front door (Black)
1	Middle Atlantic	DWR-FK26	Enclosure Fan Kit (4-1/2" exhaust fans, w/mounting accessories)
1	Middle Atlantic	PB-DWR	Bracket to mount Middle Atlantic power strip
1	Middle Atlantic	DWR-RR18	18 SPACE (31 1/2") DWR REAR RAIL KIT

East Gate Mall Regulator

QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
2	Software House	SWH-4000	Card Reader
2	UTC/Interlogix (Sentrol)	2507AD-L	Door Position Switch
1	Bosch	DS825	Indoor Motion
2	Protech	SDI-77XL2	Exterior Motion Sensor (wide angle 90x50)
2	Bosch	NDN-498V09-22PS	IP minidome Camera with OnBoard Storage Card (FLEXI 2X D/N H264 9-22 NTSC IVA POE SMB)
2	Bosch	UFLED10-8DB	IR illuminator-AEGIS UFLED (850-10) EX PSU
2	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W
2	Bosch	UFLED-CI-5M	Cable for UFLED
1	Hoffman	A363010SSLP	Hoffman outdoor NEMA-4x enclosure 30X36X10
1	Hoffman	CP3630	Enclosure back Panel
1	Hoffman	T150116G100	Outdoor Enclosure Air Conditioner (800 BTU, 115VAC, 3.8Amp)

Elliot Pipeline Regulator			
QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
	Bosch	DS150i	Request to Exit Sensor
2	Software House	SWH-4000	Card Reader
2	UTC/Interlogix (Sentrol)	2507AD-L	Door Position Switch
1	Bosch	DS825	Indoor Motion
	Securitron	M62FB	Door Maglock
	Securitron	PB2	Pushbutton Release 2" Momentary
1	Protech	SDI-77XL2	Exterior Motion Sensor (wide angle 90x50)
2	Bosch	NDN-498V09-22PS	IP minidome Camera with OnBoard Storage Card (FLEXI 2X D/N H264 9-22 NTSC IVA POE SMB)
1	Bosch	UFLED10-8DB	IR illuminator-AEGIS UFLED (850-10) EX PSU
1	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W
1	Bosch	UFLED-CI-5M	Cable for UFLED
1	Hoffman	A363010SSLP	Hoffman outdoor NEMA-4x enclosure 30X36X10
1	Hoffman	CP3630	Enclosure back Panel
1	Hoffman	T150116G100	Outdoor Enclosure Air Conditioner (800 BTU, 115VAC, 3.8Amp)
1	Tripplite	SU1000RTXL2UA	UPS, 1KVA, On-Line Double conversion, 2U rack/tower

Friars Road Regulator			
QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
	Bosch	DS150i	Request to Exit Sensor
1	Software House	SWH-4000	Card Reader
2	Bosch	NDN-498V09-22PS	IP minidome Camera with OnBoard Storage Card (FLEXI 2X D/N H264 9-22 NTSC IVA POE SMB)
1	Bosch	UFLED10-8DB	IR illuminator-AEGIS UFLED (850-10) EX PSU
1	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W
1	Bosch	UFLED-CI-5M	Cable for UFLED
1	Hoffman	A363010SSLP	Hoffman outdoor NEMA-4x enclosure 30X36X10
1	Hoffman	CP3630	Enclosure back Panel
1	Hoffman	T150116G100	Outdoor Enclosure Air Conditioner (800 BTU, 115VAC, 3.8Amp)
1	Valcom	VIP-480L	IP Paging Horn

La Jolla View Standpipe			
QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
1	Software House	SWH-4000	Card Reader
2	Protech	SDI-77XL2	Exterior Motion Sensor (wide angle 90x50)
4	Pelco	TI335 (w/35mm)	Thermal camera
4	Pelco	EM1109	Pole mount
1	Pelco	WCS4-20	Power Supply (24VAC, 4 out)
1	Bosch	MIC-500-ALB18N	PTZ Camera w/ IR heads,ALUMINIUM, 18X NTSC, BLACK
1	Bosch	MIC-DCA	Deep Conduit Adapter (black)

1	Bosch	MIC-WMB-B	Wall mount bracket (black)
1	Bosch	MIC-25M	25M Shielded composite cable for Power, Data & Video
1	Bosch	MIC-115PSU-UL	115V AC Power Supply
1	NICE	NV-NVE-1002	NiceVision Encoder 1002 supp. 2 cam. 15/12.5fps /4CIF (30/25fps/2CIF) Or, 1 cam. 30/25fps /4CIF
1	NICE	NV-ENT-SVR9200H-OLS-4TB	NiceVision Enterprise Smart Video Recorder 9200, 1U, hybrid ready, with internal 4TB net storage.
1	Hoffman	A363010SSLP	Hoffman outdoor NEMA-4x enclosure 30X36X10
1	Hoffman	CP3630	Enclosure back Panel
1	Hoffman	T150116G100	Outdoor Enclosure Air Conditioner (800 BTU, 115VAC, 3.8Amp)
2	Valcom	VIP-480L	IP Paging Horn
1	TrippLite	SU1000RTXL2UA	UPS, 1KVA, On-Line Double conversion, 2U rack/tower

Los Penasquitos Pump Station

QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Bosch	NDN-498V09-22PS	IP minidome Camera with OnBoard Storage Card (FLEXI 2X D/N H264 9-22 NTSC IVA POE SMB)

Los Penasquitos Reservoir

QTY	MANUFACTURER	MODEL	DESCRIPTION
2	Valcom	VIP-480L	IP Paging Horn

Mercy Mira Mesa High Pump Station

QTY	MANUFACTURER	MODEL	DESCRIPTION
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Miramar Ranch North Reservoir

QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
1	Software House	SWH-4000	Card Reader
2	Valcom	VIP-480L	IP Paging Horn

Montezuma Pump Station

QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Bosch	VG5-723-ECE2	PTZ Day/Night Camera PTZ Day Night 28x (G5 700 28X DN IP IN/OUT PEND CLEAR NTSC)
1	Bosch	VG4-SBUB-PCL	G4 Autodome modular pendant housing (clear)
1	Bosch	VG4-A-PA1	G4 Pendant Arm with 120VAC White
1	NICE	NV-ENT-SVR9100H-OLS-2TB	NiceVision Enterprise Smart Video Recorder 9100, 1U, hybrid ready, with internal 2TB net storage.

Muirlands Pump Station

QTY	MANUFACTURER	MODEL	DESCRIPTION
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1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
1	Bosch	DS150i	Request to Exit Sensor
2	Software House	SWH-4000	Card Reader
4	UTC/Interlogix (Sentrol)	2507AD-L	Door Position Switch
1	Securitron	M62FB	Door Maglock
1	Securitron	PB2	Pushbutton Release 2" Momentary
1	Protech	SDI-77XL2	Exterior Motion Sensor (wide angle 90x50)
4	Bosch	NEI-308V05-21W	Fixed Camera, IP CAM/WHT DIA (850) D/N HI-RES 5-50MM N, W/IR
4	Bosch	VG4-A-9541	Mast Pole Mount,GEN4
1	Bosch	VG5-723-ECE2	PTZ Day/Night Camera PTZ Day Night 28x (G5 700 28X DN IP IN/OUT PEND CLEAR NTSC)
1	Bosch	VG4-SBUB-PCL	G4 Autodome modular pendant housing (clear)
1	Bosch	VG4-A-PA1	G4 Pendant Arm with 120VAC White
4	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W
4	Bosch	UFLED-CI-5M	Cable for UFLED
1	NICE	NV-ENT-SVR9200H-OLS-4TB	NiceVision Enterprise Smart Video Recorder 9200, 1U, hybrid ready, with internal 4TB net storage.
1	Hoffman	A363010SSLP	Hoffman outdoor NEMA-4x enclosure 30X36X10
1	Hoffman	CP3630	Enclosure back Panel
1	Hoffman	T150116G100	Outdoor Enclosure Air Conditioner (800 BTU, 115VAC, 3.8Amp)
1	Middle Atlantic	DWR-18-26	26" deep (for 24"equipment) 19" rack 18 spaces
1	Middle Atlantic	PD-815SC	6 Outlet, single 15 Amp, surge/spike protection, Power Distributor
1	Middle Atlantic	FD-21	Solid Front door (Black)
1	Middle Atlantic	DWR-FK26	Enclosure Fan Kit (4-1/2" exhaust fans, w/mounting accessories)
1	Middle Atlantic	PB-DWR	Bracket to mount Middle Atlantic power strip
1	Middle Atlantic	DWR-RR18	18 SPACE (31 1/2") DWR REAR RAIL KIT
2	Valcom	VIP-480L	IP Paging Horn
1	TrippLite	SU1000RTXL2UA	UPS, 1KVA, On-Line Double conversion, 2U rack/tower

Ocean Hills Pump Station			
QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
1	Bosch	DS150i	Request to Exit Sensor
2	Software House	SWH-4000	Card Reader
4	UTC/Interlogix (Sentrol)	2507AD-L	Door Position Switch
2	Bosch	DS825	Indoor Motion
1	Securitron	M62FB	Door Maglock
1	Securitron	PB2	Pushbutton Release 2" Momentary
4	Bosch	NEI-308V05-21W	Fixed Camera, IP CAM/WHT DIA (850) D/N HI-RES 5-50MM N, W/IR
4	Bosch	VG4-A-9541	Mast Pole Mount,GEN4
1	Bosch	VG5-723-ECE2	PTZ Day/Night Camera PTZ Day Night 28x (G5 700 28X DN IP IN/OUT PEND CLEAR NTSC)
1	Bosch	VG4-SBUB-PCL	G4 Autodome modular pendant housing (clear)
1	Bosch	VG4-A-PA1	G4 Pendant Arm with 120VAC White
4	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W
4	Bosch	UFLED-CI-5M	Cable for UFLED
1	NICE	NV-ENT-SVR9200H-OLS-4TB	NiceVision Enterprise Smart Video Recorder 9200, 1U, hybrid ready, with internal 4TB net storage.

1	Middle Atlantic	DWR-18-26	26" deep (for 24"equipment) 19" rack 18 spaces
1	Middle Atlantic	PD-815SC	6 Outlet, single 15 Amp, surge/spike protection, Power Distributor
1	Middle Atlantic	FD-21	Solid Front door (Black)
1	Middle Atlantic	DWR-FK26	Enclosure Fan Kit (4-1/2" exhaust fans, w/mounting accessories)
1	Middle Atlantic	PB-DWR	Bracket to mount Middle Atlantic power strip
1	Middle Atlantic	DWR-RR18	18 SPACE (31 1/2") DWR REAR RAIL KIT
1	Valcom	VIP-480L	IP Paging Horn
1	TrippLite	SU1000RTXL2UA	UPS, 1KVA, On-Line Double conversion, 2U rack/tower

Otay Mesa Pump Station			
QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
1	Bosch	DS150i	Request to Exit Sensor
2	Software House	SWH-4000	Card Reader
1	UTC/Interlogix (Sentrol)	2507AD-L	Door Position Switch
1	Bosch	DS825	Indoor Motion
1	Securitron	M62FB	Door Maglock
1	Securitron	PB2	Pushbutton Release 2" Momentary
2	Protech	SDI-77XL2	Exterior Motion Sensor (wide angle 90x50)
4	Bosch	NEI-308V05-21W	Fixed Camera, IP CAM/WHT DIA (850) D/N HI-RES 5-50MM N, W/IR
4	Bosch	VG4-A-9541	Mast Pole Mount,GEN4
1	Bosch	VG5-723-ECE2	PTZ Day/Night Camera PTZ Day Night 28x (G5 700 28X DN IP IN/OUT PEND CLEAR NTSC)
1	Bosch	VG4-SBUB-PCL	G4 Autodome modular pendant housing (clear)
1	Bosch	VG4-A-PA1	G4 Pendant Arm with 120VAC White
3	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W
3	Bosch	UFLED-CI-5M	Cable for UFLED
1	NICE	NV-ENT-SVR9200H-OLS-4TB	NiceVision Enterprise Smart Video Recorder 9200, 1U, hybrid ready, with internal 4TB net storage.
1	Middle Atlantic	DWR-18-26	26" deep (for 24"equipment) 19" rack 18 spaces
1	Middle Atlantic	PD-815SC	6 Outlet, single 15 Amp, surge/spike protection, Power Distributor
1	Middle Atlantic	FD-21	Solid Front door (Black)
1	Middle Atlantic	DWR-FK26	Enclosure Fan Kit (4-1/2" exhaust fans, w/mounting accessories)
1	Middle Atlantic	PB-DWR	Bracket to mount Middle Atlantic power strip
1	Middle Atlantic	DWR-RR18	18 SPACE (31 1/2") DWR REAR RAIL KIT
2	Valcom	VIP-480L	IP Paging Horn
1	TrippLite	SU1000RTXL2UA	UPS, 1KVA, On-Line Double conversion, 2U rack/tower

Paradise Mesa #1 Pump Station			
QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
1	Bosch	DS150i	Request to Exit Sensor
2	Software House	SWH-4000	Card Reader
1	UTC/Interlogix (Sentrol)	2507AD-L	Door Position Switch
1	Bosch	DS825	Indoor Motion
1	Securitron	M62FB	Door Maglock
1	Securitron	PB2	Pushbutton Release 2" Momentary

2	Protech	SDI-77XL2	Exterior Motion Sensor (wide angle 90x50)
4	Bosch	NEI-308V05-21W	Fixed Camera, IP CAM/WHT DIA (850) D/N HI-RES 5-50MM N, W/IR
4	Bosch	VG4-A-9541	Mast Pole Mount, GEN4
1	Bosch	VG5-723-ECE2	PTZ Day/Night Camera PTZ Day Night 28x (G5 700 28X DN IP IN/OUT PEND CLEAR NTSC)
1	Bosch	VG4-SBUB-PCL	G4 Autodome modular pendant housing (clear)
1	Bosch	VG4-A-PA1	G4 Pendant Arm with 120VAC White
4	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W
4	Bosch	UFLED-CI-5M	Cable for UFLED
1	NICE	NV-ENT-SVR9200H-OLS-4TB	NiceVision Enterprise Smart Video Recorder 9200, 1U, hybrid ready, with internal 4TB net storage.
1	Middle Atlantic	DWR-18-26	26" deep (for 24" equipment) 19" rack 18 spaces
1	Middle Atlantic	PD-815SC	6 Outlet, single 15 Amp, surge/spike protection, Power Distributor
1	Middle Atlantic	FD-21	Solid Front door (Black)
1	Middle Atlantic	DWR-FK26	Enclosure Fan Kit (4-1/2" exhaust fans, w/mounting accessories)
1	Middle Atlantic	PB-DWR	Bracket to mount Middle Atlantic power strip
1	Middle Atlantic	DWR-RR18	18 SPACE (31 1/2") DWR REAR RAIL KIT
1	Valcom	VIP-480L	IP Paging Horn

Paradise Mesa #2 Pump Station			
QTY	MANUFACTURER	MODEL	DESCRIPTION
2	Bosch	NDN-498V09-22PS	IP minidome Camera (FLEXI 2X D/N H264 9-22 NTSC IVA POE SMB)
1	Bosch	VG5-723-ECE2	PTZ Day/Night Camera PTZ Day Night 28x (G5 700 28X DN IP IN/OUT PEND CLEAR NTSC)
1	Bosch	VG4-SBUB-PCL	G4 Autodome modular pendant housing (clear)
1	Bosch	VG4-A-PA1	G4 Pendant Arm with 120VAC White
2	Bosch	UFLED10-8DB	IR illuminator-AEGIS UFLED (850-10) EX PSU
2	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W
2	Bosch	UFLED-CI-5M	Cable for UFLED
1	NICE	NV-ENT-SVR9200H-OLS-4TB	NiceVision Enterprise Smart Video Recorder 9200, 1U, hybrid ready, with internal 4TB net storage.
1	Hoffman	A363010SSLP	Hoffman outdoor NEMA-4x enclosure 30X36X10
1	Hoffman	CP3630	Enclosure back Panel
1	Hoffman	T150116G100	Outdoor Enclosure Air Conditioner (800 BTU, 115VAC, 3.8Amp)
1	Valcom	VIP-480L	IP Paging Horn

Paradis Mesa Hills #2 Pump Station			
QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
1	Software House	SWH-4000	Card Reader
2	Protech	SDI-77XL2	Exterior Motion Sensor (wide angle 90x50)
3	Bosch	NDN-498V09-22PS	IP minidome Camera (FLEXI 2X D/N H264 9-22 NTSC IVA POE SMB)
1	Bosch	VG5-723-ECE2	PTZ Day/Night Camera PTZ Day Night 28x (G5 700 28X DN IP IN/OUT PEND CLEAR NTSC)
1	Bosch	VG4-SBUB-PCL	G4 Autodome modular pendant housing (clear)
1	Bosch	VG4-A-PA1	G4 Pendant Arm with 120VAC White
3	Bosch	UFLED10-8DB	IR illuminator-AEGIS UFLED (850-10) EX PSU
3	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W

3	Bosch	UFLED-CI-5M	Cable for UFLED
1	NICE	NV-ENT-SVR9200H-OLS-4TB	NiceVision Enterprise Smart Video Recorder 9200, 1U, hybrid ready, with internal 4TB net storage.
1	Hoffman	A363010SSLP	Hoffman outdoor NEMA-4x enclosure 30X36X10
1	Hoffman	CP3630	Enclosure back Panel
1	Hoffman	T150116G100	Outdoor Enclosure Air Conditioner (800 BTU, 115VAC, 3.8Amp)
1	Valcom	VIP-480L	IP Paging Horn

Paradise Mesa Standpipe			
QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
1	Software House	SWH-4000	Card Reader
4	Protech	SDI-77XL2	Exterior Motion Sensor (wide angle 90x50)
5	Bosch	NEI-308V05-21W	Fixed Camera, IP CAM/WHIT DIA (850) D/N HI-RES 5-50MM N, W/IR
5	Bosch	VG4-A-9541	Mast Pole Mount, GEN4
2	Bosch	VG5-723-ECE2	PTZ Day/Night Camera PTZ Day Night 28x (G5 700 28X DN IP IN/OUT PEND CLEAR NTSC)
2	Bosch	VG4-SBUB-PCL	G4 Autodome modular pendant housing (clear)
2	Bosch	VG4-A-PA1	G4 Pendant Arm with 120VAC White
5	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W
5	Bosch	UFLED-CI-5M	Cable for UFLED
1	NICE	NV-ENT-SVR9200H-OLS-4TB	NiceVision Enterprise Smart Video Recorder 9200, 1U, hybrid ready, with internal 4TB net storage.
1	Hoffman	A363010SSLP	Hoffman outdoor NEMA-4x enclosure 30X36X10
1	Hoffman	CP3630	Enclosure back Panel
1	Hoffman	T150116G100	Outdoor Enclosure Air Conditioner (800 BTU, 115VAC, 3.8Amp)
2	Valcom	VIP-480L	IP Paging Horn
1	TrippLite	SU1000RTXL2UA	UPS, 1KVA, On-Line Double conversion, 2U rack/tower

Penasuitos Bluffs #8 Pump Station			
QTY	MANUFACTURER	MODEL	DESCRIPTION

Point Loma Reservoir			
QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
1	Software House	SWH-4000	Card Reader
4	Protech	SDI-77XL2	Exterior Motion Sensor (wide angle 90x50)
4	Bosch	NDN-498V09-22PS	IP minidome Camera (FLEXI 2X D/N H264 9-22 NTSC IVA POE SMB)
4	Bosch	UFLED10-8DB	IR illuminator-AEGIS UFLED (850-10) EX PSU
4	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W
4	Bosch	UFLED-CI-5M	Cable for UFLED
1	NICE	NV-ENT-SVR9200H-OLS-4TB	NiceVision Enterprise Smart Video Recorder 9200, 1U, hybrid ready, with internal 4TB net storage.
2	Valcom	VIP-480L	IP Paging Horn
1	TrippLite	SU1000RTXL2UA	UPS, 1KVA, On-Line Double conversion, 2U rack/tower

Pomerado Park Reservoir			
QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Bosch	UFLED10-8DB	IR illuminator-AEGIS UFLED (850-10) EX PSU
1	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W
1	Bosch	UFLED-CI-5M	Cable for UFLED
1	Valcom	VIP-480L	IP Paging Horn

Pomerado Pump Station			
QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
1	Bosch	DS150i	Request to Exit Sensor
2	Software House	SWH-4000	Card Reader
4	UTC/Interlogix (Sentrol)	2507AD-L	Door Position Switch
1	Securitron	M62FB	Door Maglock
1	Securitron	PB2	Pushbutton Release 2" Momentary
4	Bosch	NDN-498V09-22PS	IP minidome Camera (FLEXI 2X D/N H264 9-22 NTSC IVA POE SMB)
1	Bosch	VG5-723-ECE2	PTZ Day/Night Camera PTZ Day Night 28x (G5 700 28X DN IP IN/OUT PEND CLEAR NTSC)
1	Bosch	VG4-SBUB-PCL	G4 Autodome modular pendant housing (clear)
1	Bosch	VG4-A-PA1	G4 Pendant Arm with 120VAC White
4	Bosch	UFLED10-8DB	IR illuminator-AEGIS UFLED (850-10) EX PSU
4	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W
4	Bosch	UFLED-CI-5M	Cable for UFLED
1	NICE	NV-ENT-SVR9200H-OLS-4TB	NiceVision Enterprise Smart Video Recorder 9200, 1U, hybrid ready, with internal 4TB net storage.
1	Middle Atlantic	DWR-18-26	26" deep (for 24" equipment) 19" rack 18 spaces
1	Middle Atlantic	PD-815SC	6 Outlet, single 15 Amp, surge/spike protection, Power Distributor
1	Middle Atlantic	FD-21	Solid Front door (Black)
1	Middle Atlantic	DWR-FK26	Enclosure Fan Kit (4-1/2" exhaust fans, w/mounting accessories)
1	Middle Atlantic	PB-DWR	Bracket to mount Middle Atlantic power strip
1	Middle Atlantic	DWR-RR18	18 SPACE (31 1/2") DWR REAR RAIL KIT
2	Valcom	VIP-480L	IP Paging Horn

Princess Park Pump Station			
QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
1	Bosch	DS150i	Request to Exit Sensor
2	Software House	SWH-4000	Card Reader
4	UTC/Interlogix (Sentrol)	2507AD-L	Door Position Switch
1	Bosch	DS825	Indoor Motion
1	Securitron	M62FB	Door Maglock
1	Securitron	PB2	Pushbutton Release 2" Momentary
2	Protech	SDI-77XL2	Exterior Motion Sensor (wide angle 90x50)
4	Bosch	NDN-498V09-22PS	IP minidome Camera (FLEXI 2X D/N H264 9-22 NTSC IVA POE SMB)

1	Bosch	VG5-723-ECE2	PTZ Day/Night Camera PTZ Day Night 28x (G5 700 28X DN IP IN/OUT PEND CLEAR NTSC)
1	Bosch	VG4-SBUB-PCL	G4 Autodome modular pendant housing (clear)
1	Bosch	VG4-A-PA1	G4 Pendant Arm with 120VAC White
4	Bosch	UFLED10-8DB	IR illuminator-AEGIS UFLED (850-10) EX PSU
4	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W
4	Bosch	UFLED-CI-5M	Cable for UFLED
1	NICE	NV-ENT-SVR9200H-OLS-4TB	NiceVision Enterprise Smart Video Recorder 9200, 1U, hybrid ready, with internal 4TB net storage.
1	Middle Atlantic	DWR-18-26	26" deep (for 24"equipment) 19" rack 18 spaces
1	Middle Atlantic	PD-815SC	6 Outlet, single 15 Amp, surge/spike protection, Power Distributor
1	Middle Atlantic	FD-21	Solid Front door (Black)
1	Middle Atlantic	DWR-FK26	Enclosure Fan Kit (4-1/2" exhaust fans, w/mounting accessories)
1	Middle Atlantic	PB-DWR	Bracket to mount Middle Atlantic power strip
1	Middle Atlantic	DWR-RR18	18 SPACE (31 1/2") DWR REAR RAIL KIT
2	Valcom	VIP-480L	IP Paging Horn
1	TrippLite	SU1000RTXL2UA	UPS, 1KVA, On-Line Double conversion, 2U rack/tower

Rancho Bernardo Industrial Pump Station			
QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
1	Software House	SWH-4000	Card Reader
4	Bosch	NDN-498V09-22PS	IP minidome Camera (FLEXI 2X D/N H264 9-22 NTSC IVA POE SMB)
4	Bosch	UFLED10-8DB	IR illuminator-AEGIS UFLED (850-10) EX PSU
4	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W
4	Bosch	UFLED-CI-5M	Cable for UFLED
1	NICE	NV-ENT-SVR9200H-OLS-4TB	NiceVision Enterprise Smart Video Recorder 9200, 1U, hybrid ready, with internal 4TB net storage.
1	Middle Atlantic	DWR-18-26	26" deep (for 24"equipment) 19" rack 18 spaces
1	Middle Atlantic	PD-815SC	6 Outlet, single 15 Amp, surge/spike protection, Power Distributor
1	Middle Atlantic	FD-21	Solid Front door (Black)
1	Middle Atlantic	DWR-FK26	Enclosure Fan Kit (4-1/2" exhaust fans, w/mounting accessories)
1	Middle Atlantic	PB-DWR	Bracket to mount Middle Atlantic power strip
1	Middle Atlantic	DWR-RR18	18 SPACE (31 1/2") DWR REAR RAIL KIT
1	Valcom	VIP-480L	IP Paging Horn

Rancho Bernardo Reservoir			
QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
1	Software House	SWH-4000	Card Reader
1	Securitron	M62FB	Door Maglock
1	Securitron	PB2	Pushbutton Release 2" Momentary
4	Pelco	TI335 (w/35mm)	Thermal camera
4	Pelco	EM1109	Pole mount
1	Pelco	WCS4-20	Power Supply (24VAC, 4 out)

Rancho Penasquitos Pump Station

QTY	MANUFACTURER	MODEL	DESCRIPTION
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Redwood Village Standpipe

QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
1	Software House	SWH-4000	Card Reader
3	Protech	SDI-77XL2	Exterior Motion Sensor (wide angle 90x50)
4	Bosch	NDN-498V09-22PS	IP minidome Camera (FLEXI 2X D/N H264 9-22 NTSC IVA POE SMB)
1	Bosch	VG5-723-ECE2	PTZ Day/Night Camera PTZ Day Night 28x (G5 700 28X DN IP IN/OUT PEND CLEAR NTSC)
1	Bosch	VG4-SBUB-PCL	G4 Autodome modular pendant housing (clear)
1	Bosch	VG4-A-PA1	G4 Pendant Arm with 120VAC White
4	Bosch	UFLED10-8DB	IR illuminator-AEGIS UFLED (850-10) EX PSU
4	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W
4	Bosch	UFLED-CI-5M	Cable for UFLED
1	NICE	NV-ENT-SVR9200H-OLS-4TB	NiceVision Enterprise Smart Video Recorder 9200, 1U, hybrid ready, with internal 4TB net storage.
1	Hoffman	A363010SSLP	Hoffman outdoor NEMA-4x enclosure 30X36X10
1	Hoffman	CP3630	Enclosure back Panel
1	Hoffman	T150116G100	Outdoor Enclosure Air Conditioner (800 BTU, 115VAC, 3.8Amp)
2	Valcom	VIP-480L	IP Paging Horn
1	Tripplite	SU1000RTXL2UA	UPS, 1KVA, On-Line Double conversion, 2U rack/tower

San Andreas Pump Station

QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
1	Bosch	DS150i	Request to Exit Sensor
2	Software House	SWH-4000	Card Reader
1	UTC/Interlogix (Sentrol)	2507AD-L	Door Position Switch
1	Securitron	M62FB	Door Maglock
1	Securitron	PB2	Pushbutton Release 2" Momentary
1	Bosch	NDN-498V09-22PS	IP minidome Camera (FLEXI 2X D/N H264 9-22 NTSC IVA POE SMB)
1	Bosch	VG5-723-ECE2	PTZ Day/Night Camera PTZ Day Night 28x (G5 700 28X DN IP IN/OUT PEND CLEAR NTSC)
1	Bosch	VG4-SBUB-PCL	G4 Autodome modular pendant housing (clear)
1	Bosch	VG4-A-PA1	G4 Pendant Arm with 120VAC White
1	Bosch	UFLED10-8DB	IR illuminator-AEGIS UFLED (850-10) EX PSU
1	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W
1	Bosch	UFLED-CI-5M	Cable for UFLED
1	NICE	NV-ENT-SVR9100H-OLS-2TB	NiceVision Enterprise Smart Video Recorder 9100, 1U, hybrid ready, with internal 2TB net storage.
1	Middle Atlantic	DWR-18-26	26" deep (for 24"equipment) 19" rack 18 spaces
1	Middle Atlantic	PD-815SC	6 Outlet, single 15 Amp, surge/spike protection, Power Distributor
1	Middle Atlantic	FD-21	Solid Front door (Black)
1	Middle Atlantic	DWR-FK26	Enclosure Fan Kit (4-1/2" exhaust fans, w/mounting accessories)

1	Middle Atlantic	PB-DWR	Bracket to mount Middle Atlantic power strip
1	Middle Atlantic	DWR-RR18	18 SPACE (31 1/2") DWR REAR RAIL KIT
1	Valcom	VIP-480L	IP Paging Horn
1	Tripplite	SU1000RTXL2UA	UPS, 1KVA, On-Line Double conversion, 2U rack/tower

San Carlos Reservoir			
QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Bosch	VG5-723-ECE2	PTZ Day/Night Camera PTZ Day Night 28x (G5 700 28X DN IP IN/OUT PEND CLEAR NTSC)
1	Bosch	VG4-SBUB-PCL	G4 Autodome modular pendant housing (clear)
1	Bosch	VG4-A-PA1	G4 Pendant Arm with 120VAC White
1	NICE	NV-ENT-SVR9100H-OLS-2TB	NiceVision Enterprise Smart Video Recorder 9100, 1U, hybrid ready, with internal 2TB net storage.
1	Valcom	VIP-480L	IP Paging Horn

Scripps Ranch Reservoir/ Scripps McMillian Pump Station			
QTY	MANUFACTURER	MODEL	DESCRIPTION
2	Valcom	VIP-480L	IP Paging Horn

Scripps Woods #2 Pump Station			
QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
1	Bosch	DS150i	Request to Exit Sensor
2	Software House	SWH-4000	Card Reader
4	UTC/Interlogix (Sentrol)	2507AD-L	Door Position Switch
1	Securitron	M62FB	Door Maglock
1	Securitron	PB2	Pushbutton Release 2" Momentary
4	Bosch	NDN-498V09-22PS	IP minidome Camera (FLEXI 2X D/N H264 9-22 NTSC IVA POE SMB)
1	Bosch	VG5-723-ECE2	PTZ Day/Night Camera PTZ Day Night 28x (G5 700 28X DN IP IN/OUT PEND CLEAR NTSC)
1	Bosch	VG4-SBUB-PCL	G4 Autodome modular pendant housing (clear)
1	Bosch	VG4-A-PA1	G4 Pendant Arm with 120VAC White
4	Bosch	UFLED10-8DB	IR illuminator-AEGIS UFLED (850-10) EX PSU
4	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W
4	Bosch	UFLED-CI-5M	Cable for UFLED
1	NICE	NV-ENT-SVR9200H-OLS-4TB	NiceVision Enterprise Smart Video Recorder 9200, 1U, hybrid ready, with internal 4TB net storage.
1	Middle Atlantic	DWR-18-26	26" deep (for 24"equipment) 19" rack 18 spaces
1	Middle Atlantic	PD-815SC	6 Outlet, single 15 Amp, surge/spike protection, Power Distributor
1	Middle Atlantic	FD-21	Solid Front door (Black)
1	Middle Atlantic	DWR-FK26	Enclosure Fan Kit (4-1/2" exhaust fans, w/mounting accessories)
1	Middle Atlantic	PB-DWR	Bracket to mount Middle Atlantic power strip
1	Middle Atlantic	DWR-RR18	18 SPACE (31 1/2") DWR REAR RAIL KIT
1	Valcom	VIP-480L	IP Paging Horn

Soldadad Reservoir

QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Valcom	VIP-480L	IP Paging Horn

South Creek Pump Station

QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
1	Bosch	DS150i	Request to Exit Sensor
2	Software House	SWH-4000	Card Reader
2	UTC/Interlogix (Sentrol)	2507AD-L	Door Position Switch
1	Bosch	DS825	Indoor Motion
1	Securitron	M62FB	Door Maglock
1	Securitron	PB2	Pushbutton Release 2" Momentary
1	Protech	SDI-77XL2	Exterior Motion Sensor (wide angle 90x50)
4	Bosch	NDN-498V09-22PS	IP minidome Camera (FLEXI 2X D/N H264 9-22 NTSC IVA POE SMB)
1	Bosch	VG5-723-ECE2	PTZ Day/Night Camera PTZ Day Night 28x (G5 700 28X DN IP IN/OUT PEND CLEAR NTSC)
1	Bosch	VG4-SBUB-PCL	G4 Autodome modular pendant housing (clear)
1	Bosch	VG4-A-PA1	G4 Pendant Arm with 120VAC White
4	Bosch	UFLED10-8DB	IR illuminator-AEGIS UFLED (850-10) EX PSU
4	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W
4	Bosch	UFLED-CI-5M	Cable for UFLED
1	NICE	NV-ENT-SVR9200H-OLS-4TB	NiceVision Enterprise Smart Video Recorder 9200, 1U, hybrid ready, with internal 4TB net storage.
1	Middle Atlantic	DWR-18-26	26" deep (for 24"equipment) 19" rack 18 spaces
1	Middle Atlantic	PD-815SC	6 Outlet, single 15 Amp, surge/spike protection, Power Distributor
1	Middle Atlantic	FD-21	Solid Front door (Black)
1	Middle Atlantic	DWR-FK26	Enclosure Fan Kit (4-1/2" exhaust fans, w/mounting accessories)
1	Middle Atlantic	PB-DWR	Bracket to mount Middle Atlantic power strip
1	Middle Atlantic	DWR-RR18	18 SPACE (31 1/2") DWR REAR RAIL KIT
1	Valcom	VIP-480L	IP Paging Horn
1	Tripplite	SU1000RTXL2UA	UPS, 1KVA, On-Line Double conversion, 2U rack/tower

South San Diego Reservoir

QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
1	Software House	SWH-4000	Card Reader
1	Securitron	M62FB	Door Maglock
1	Securitron	PB2	Pushbutton Release 2" Momentary
2	Protech	SDI-77XL2	Exterior Motion Sensor (wide angle 90x50)
4	Pelco	TI335 (w/35mm)	Thermal camera
4	Pelco	EM1109	Pole mount
1	Pelco	WCS4-20	Power Supply (24VAC, 4 out)
1	Bosch	MIC-500-ALB18N	PTZ Camera w/ IR heads,ALUMINIUM, 18X NTSC, BLACK
1	Bosch	MIC-DCA	Deep Conduit Adapter (black)
1	Bosch	MIC-WMB-B	Wall mount bracket (black)

1	Bosch	MIC-25M	25M Shielded composite cable for Power, Data & Video
1	Bosch	MIC-115PSU-UL	115V AC Power Supply
1	NICE	NV-NVE-1002	NiceVision Encoder 1002 supp. 2 cam. 15/12.5fps /4CIF (30/25fps/2CIF) Or, 1 cam. 30/25fps /4CIF
1	NICE	NV-ENT-SVR9200H-OLS-4TB	NiceVision Enterprise Smart Video Recorder 9200, 1U, hybrid ready, with internal 4TB net storage.
1	Hoffman	A363010SSLP	Hoffman outdoor NEMA-4x enclosure 30X36X10
1	Hoffman	CP3630	Enclosure back Panel
1	Hoffman	T150116G100	Outdoor Enclosure Air Conditioner (800 BTU, 115VAC, 3.8Amp)
2	Valcom	VIP-480L	IP Paging Horn
1	Tripplite	SU1000RTXL2UA	UPS, 1KVA, On-Line Double conversion, 2U rack/tower

Stonebridge Pump Station #1			
QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
1	Bosch	DS150i	Request to Exit Sensor
2	Software House	SWH-4000	Card Reader
4	UTC/Interlogix (Sentrol)	2507AD-L	Door Position Switch
2	Bosch	DS825	Indoor Motion
1	Securitron	M62FB	Door Maglock
1	Securitron	PB2	Pushbutton Release 2" Momentary
4	Bosch	NDN-498V09-22PS	IP minidome Camera (FLEXI 2X D/N H264 9-22 NTSC IVA POE SMB)
1	Bosch	VG5-723-ECE2	PTZ Day/Night Camera PTZ Day Night 28x (G5 700 28X DN IP IN/OUT PEND CLEAR NTSC)
1	Bosch	VG4-SBUB-PCL	G4 Autodome modular pendant housing (clear)
1	Bosch	VG4-A-PA1	G4 Pendant Arm with 120VAC White
4	Bosch	UFLED10-8DB	IR illuminator-AEGIS UFLED (850-10) EX PSU
4	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W
4	Bosch	UFLED-CI-5M	Cable for UFLED
1	NICE	NV-ENT-SVR9200H-OLS-4TB	NiceVision Enterprise Smart Video Recorder 9200, 1U, hybrid ready, with internal 4TB net storage.
1	Middle Atlantic	DWR-18-26	26" deep (for 24"equipment) 19" rack 18 spaces
1	Middle Atlantic	PD-815SC	6 Outlet, single 15 Amp, surge/spike protection, Power Distributor
1	Middle Atlantic	FD-21	Solid Front door (Black)
1	Middle Atlantic	DWR-FK26	Enclosure Fan Kit (4-1/2" exhaust fans, w/mounting accessories)
1	Middle Atlantic	PB-DWR	Bracket to mount Middle Atlantic power strip
1	Middle Atlantic	DWR-RR18	18 SPACE (31 1/2") DWR REAR RAIL KIT
2	Valcom	VIP-480L	IP Paging Horn
1	Tripplite	SU1000RTXL2UA	UPS, 1KVA, On-Line Double conversion, 2U rack/tower

Stonebridge Pump Station #2			
QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
1	Bosch	DS150i	Request to Exit Sensor
2	Software House	SWH-4000	Card Reader
4	UTC/Interlogix (Sentrol)	2507AD-L	Door Position Switch
2	Bosch	DS825	Indoor Motion

1	Securitron	M62FB	Door Maglock
1	Securitron	PB2	Pushbutton Release 2" Momentary
6	Bosch	NDN-498V09-22PS	IP minidome Camera (FLEXI 2X D/N H264 9-22 NTSC IVA POE SMB)
1	Bosch	VG5-723-ECE2	PTZ Day/Night Camera PTZ Day Night 28x (G5 700 28X DN IP IN/OUT PEND CLEAR NTSC)
1	Bosch	VG4-SBUB-PCL	G4 Autodome modular pendant housing (clear)
1	Bosch	VG4-A-PA1	G4 Pendant Arm with 120VAC White
6	Bosch	UFLED10-8DB	IR illuminator-AEGIS UFLED (850-10) EX PSU
6	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W
6	Bosch	UFLED-CI-5M	Cable for UFLED
1	NICE	NV-ENT-SVR9200H-OLS-4TB	NiceVision Enterprise Smart Video Recorder 9200, 1U, hybrid ready, with internal 4TB net storage.
1	Middle Atlantic	DWR-18-26	26" deep (for 24"equipment) 19" rack 18 spaces
1	Middle Atlantic	PD-815SC	6 Outlet, single 15 Amp, surge/spike protection, Power Distributor
1	Middle Atlantic	FD-21	Solid Front door (Black)
1	Middle Atlantic	DWR-FK26	Enclosure Fan Kit (4-1/2" exhaust fans, w/mounting accessories)
1	Middle Atlantic	PB-DWR	Bracket to mount Middle Atlantic power strip
1	Middle Atlantic	DWR-RR18	18 SPACE (31 1/2") DWR REAR RAIL KIT
2	Valcom	VIP-480L	IP Paging Horn

Texas Street Regulator			
QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Software House	iStar Edge 2Rdr	Panel (ACS)
1	Altronix	AL400ULPD8	Power Supply (12/24) . Eight Zone Power Supply 12vdc
2	Software House	SWH-4000	Card Reader
1	UTC/Interlogix (Sentrol)	2507AD-L	Door Position Switch
1	Bosch	DS825	Indoor Motion
1	Securitron	M62FB	Door Maglock
1	Securitron	PB2	Pushbutton Release 2" Momentary
1	Bosch	VG5-723-ECE2	PTZ Day/Night Camera PTZ Day Night 28x (G5 700 28X DN IP IN/OUT PEND CLEAR NTSC)
1	Bosch	VG4-SBUB-PCL	G4 Autodome modular pendant housing (clear)
1	Bosch	VG4-A-PA1	G4 Pendant Arm with 120VAC White
1	Bosch	UFLED10-8DB	IR illuminator-AEGIS UFLED (850-10) EX PSU
1	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W
1	Bosch	UFLED-CI-5M	Cable for UFLED
1	NICE	NV-ENT-SVR9100H-OLS-2TB	NiceVision Enterprise Smart Video Recorder 9100, 1U, hybrid ready, with internal 2TB net storage.
1	Hoffman	A363010SSLP	Hoffman outdoor NEMA-4x enclosure 30X36X10
1	Hoffman	CP3630	Enclosure back Panel
1	Hoffman	T150116G100	Outdoor Enclosure Air Conditioner (800 BTU, 115VAC, 3.8Amp)

Thorn Street Regulator			
QTY	MANUFACTURER	MODEL	DESCRIPTION
1	UTC/Interlogix (Sentrol)	2507AD-L	Door Position Switch
1	Bosch	DS825	Indoor Motion
1	Bosch	NDN-498V09-22PS	IP minidome Camera (FLEXI 2X D/N H264 9-22 NTSC IVA POE SMB)
1	NICE	NV-ENT-SVR9100H-OLS-2TB	NiceVision Enterprise Smart Video Recorder 9100, 1U, hybrid ready, with internal 2TB net storage.

1	Hoffman	A363010SSLP	Hoffman outdoor NEMA-4x enclosure 30X36X10
1	Hoffman	CP3630	Enclosure back Panel
1	Hoffman	T150116G100	Outdoor Enclosure Air Conditioner (800 BTU, 115VAC, 3.8Amp)

University Hieghts Pump Station			
QTY	MANUFACTURER	MODEL	DESCRIPTION
6	UTC/Interlogix (Sentrol)	2507AD-L	Door Position Switch
6	Protech	SDI-77XL2	Exterior Motion Sensor (wide angle 90x50)
6	Bosch	NDN-498V09-22PS	IP minidome Camera (FLEXI 2X D/N H264 9-22 NTSC IVA POE SMB)
1	Bosch	VG5-723-ECE2	PTZ Day/Night Camera PTZ Day Night 28x (G5 700 28X DN IP IN/OUT PEND CLEAR NTSC)
1	Bosch	VG4-SBUB-PCL	G4 Autodome modular pendant housing (clear)
1	Bosch	VG4-A-PA1	G4 Pendant Arm with 120VAC White
6	Bosch	UFLED10-8DB	IR illuminator-AEGIS UFLED (850-10) EX PSU
6	Bosch	PSU-224-DC100	Universal Power Supply 2x24VDC 100W
6	Bosch	UFLED-CI-5M	Cable for UFLED
1	NICE	NV-ENT-SVR9200H-OLS-4TB	NiceVision Enterprise Smart Video Recorder 9200, 1U, hybrid ready, with internal 4TB net storage.
1	Middle Atlantic	DWR-18-26	26" deep (for 24"equipment) 19" rack 18 spaces
1	Middle Atlantic	PD-815SC	6 Outlet, single 15 Amp, surge/spike protection, Power Distributor
1	Middle Atlantic	FD-21	Solid Front door (Black)
1	Middle Atlantic	DWR-FK26	Enclosure Fan Kit (4-1/2" exhaust fans, w/mounting accessories)
1	Middle Atlantic	PB-DWR	Bracket to mount Middle Atlantic power strip
1	Middle Atlantic	DWR-RR18	18 SPACE (31 1/2") DWR REAR RAIL KIT
2	Valcom	VIP-480L	IP Paging Horn
1	Tripplite	SU1000RTXL2UA	UPS, 1KVA, On-Line Double conversion, 2U rack/tower

Waring Road Pump Station			
QTY	MANUFACTURER	MODEL	DESCRIPTION
2	Valcom	VIP-480L	IP Paging Horn

Black Mountain High Level Site			
QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Protech	SDI-77XL2	Exterior Motion Sensor (wide angle 90x50)
1	Bosch	MIC-500-ALB18N	PTZ Camera w/ IR heads,ALUMINIUM, 18X NTSC, BLACK
1	Bosch	MIC-DCA	Deep Conduit Adapter (black)
1	Bosch	MIC-WMB-B	Wall mount bracket (black)
1	Bosch	MIC-25M	25M Shielded composite cable for Power, Data & Video
1	Bosch	MIC-115PSU-UL	115V AC Power Supply
1	NICE	NV-NVE-1002	NiceVision Encoder 1002 supp. 2 cam. 15/12.5fps /4CIF (30/25fps/2CIF) Or, 1 cam. 30/25fps /4CIF
1	NICE	NV-ENT-SVR9100H-OLS-2TB	NiceVision Enterprise Smart Video Recorder 9100, 1U, hybrid ready, with internal 2TB net storage.
1	Valcom	VIP-480L	IP Paging Horn
1	Tripplite	SU1000RTXL2UA	UPS, 1KVA, On-Line Double conversion, 2U rack/tower

Cowles Mountain High Level Site

QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Protech	SDI-77XL2	Exterior Motion Sensor (wide angle 90x50)
1	Bosch	MIC-500-ALB18N	PTZ Camera w/ IR heads,ALUMINIUM, 18X NTSC, BLACK
1	Bosch	MIC-DCA	Deep Conduit Adapter (black)
1	Bosch	MIC-WMB-B	Wall mount bracket (black)
1	Bosch	MIC-25M	25M Shielded composite cable for Power, Data & Video
1	Bosch	MIC-115PSU-UL	115V AC Power Supply
1	NICE	NV-NVE-1002	NiceVision Encoder 1002 supp. 2 cam. 15/12.5fps /4CIF (30/25fps/2CIF) Or, 1 cam. 30/25fps /4CIF
1	NICE	NV-ENT-SVR9100H-OLS-2TB	NiceVision Enterprise Smart Video Recorder 9100, 1U, hybrid ready, with internal 2TB net storage.
1	Valcom	VIP-480L	IP Paging Horn
1	TrippLite	SU1000RTXL2UA	UPS, 1KVA, On-Line Double conversion, 2U rack/tower

Encanto High Level Site

QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Protech	SDI-77XL2	Exterior Motion Sensor (wide angle 90x50)
1	Bosch	MIC-500-ALB18N	PTZ Camera w/ IR heads,ALUMINIUM, 18X NTSC, BLACK
1	Bosch	MIC-DCA	Deep Conduit Adapter (black)
1	Bosch	MIC-WMB-B	Wall mount bracket (black)
1	Bosch	MIC-25M	25M Shielded composite cable for Power, Data & Video
1	Bosch	MIC-115PSU-UL	115V AC Power Supply
1	NICE	NV-NVE-1002	NiceVision Encoder 1002 supp. 2 cam. 15/12.5fps /4CIF (30/25fps/2CIF) Or, 1 cam. 30/25fps /4CIF
1	NICE	NV-ENT-SVR9100H-OLS-2TB	NiceVision Enterprise Smart Video Recorder 9100, 1U, hybrid ready, with internal 2TB net storage.
1	Valcom	VIP-480L	IP Paging Horn
1	TrippLite	SU1000RTXL2UA	UPS, 1KVA, On-Line Double conversion, 2U rack/tower

Lyons Peak High Level Site

QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Protech	SDI-77XL2	Exterior Motion Sensor (wide angle 90x50)
1	Bosch	MIC-500-ALB18N	PTZ Camera w/ IR heads,ALUMINIUM, 18X NTSC, BLACK
1	Bosch	MIC-DCA	Deep Conduit Adapter (black)
1	Bosch	MIC-WMB-B	Wall mount bracket (black)
1	Bosch	MIC-25M	25M Shielded composite cable for Power, Data & Video
1	Bosch	MIC-115PSU-UL	115V AC Power Supply
1	NICE	NV-NVE-1002	NiceVision Encoder 1002 supp. 2 cam. 15/12.5fps /4CIF (30/25fps/2CIF) Or, 1 cam. 30/25fps /4CIF
1	NICE	NV-ENT-SVR9100H-OLS-2TB	NiceVision Enterprise Smart Video Recorder 9100, 1U, hybrid ready, with internal 2TB net storage.
1	Valcom	VIP-480L	IP Paging Horn
1	TrippLite	SU1000RTXL2UA	UPS, 1KVA, On-Line Double conversion, 2U rack/tower

Mount Woodson High Level Site

QTY	MANUFACTURER	MODEL	DESCRIPTION
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1	Protech	SDI-77XL2	Exterior Motion Sensor (wide angle 90x50)
1	Bosch	MIC-500-ALB18N	PTZ Camera w/ IR heads,ALUMINIUM, 18X NTSC, BLACK
1	Bosch	MIC-DCA	Deep Conduit Adapter (black)
1	Bosch	MIC-WMB-B	Wall mount bracket (black)
1	Bosch	MIC-25M	25M Shielded composite cable for Power, Data & Video
1	Bosch	MIC-115PSU-UL	115V AC Power Supply
1	NICE	NV-NVE-1002	NiceVision Encoder 1002 supp. 2 cam. 15/12.5fps /4CIF (30/25fps/2CIF) Or, 1 cam. 30/25fps /4CIF
1	NICE	NV-ENT-SVR9100H-OLS-2TB	NiceVision Enterprise Smart Video Recorder 9100, 1U, hybrid ready, with internal 2TB net storage.
1	Valcom	VIP-480L	IP Paging Horn
1	Tripplite	SU1000RTXL2UA	UPS, 1KVA, On-Line Double conversion, 2U rack/tower

San Ysidro High Level Site			
QTY	MANUFACTURER	MODEL	DESCRIPTION
1	Protech	SDI-77XL2	Exterior Motion Sensor (wide angle 90x50)
1	Bosch	MIC-500-ALB18N	PTZ Camera w/ IR heads,ALUMINIUM, 18X NTSC, BLACK
1	Bosch	MIC-DCA	Deep Conduit Adapter (black)
1	Bosch	MIC-WMB-B	Wall mount bracket (black)
1	Bosch	MIC-25M	25M Shielded composite cable for Power, Data & Video
1	Bosch	MIC-115PSU-UL	115V AC Power Supply
1	NICE	NV-NVE-1002	NiceVision Encoder 1002 supp. 2 cam. 15/12.5fps /4CIF (30/25fps/2CIF) Or, 1 cam. 30/25fps /4CIF
1	NICE	NV-ENT-SVR9100H-OLS-2TB	NiceVision Enterprise Smart Video Recorder 9100, 1U, hybrid ready, with internal 2TB net storage.
1	Valcom	VIP-480L	IP Paging Horn
1	Tripplite	SU1000RTXL2UA	UPS, 1KVA, On-Line Double conversion, 2U rack/tower

Communications Equipment Schedule (Bill of Materials)

Location	Latitude	Longitude	Height (ft)	Power (W)	Equipment	Quantity
65th and Herrick	32.71111N	117.05785W	10	1	PtP230 5GHz with Reflector Antenna	1
					Enterasys C5G124-24P2	1
65th and Herrick Repeater	32.71078N	117.05479W	25	2	PtP230 5GHz with Reflector Antenna	2
RayviewPSandRes	32.81812N	117.23959W	20	2	PtP250 5GHz Connectorized	4
					MARS 2ft Dual Panel Antenna (MA-WA56-DP28) 29 dBi	4
					Enterasys C5G124-24P2	1
BernardoHeightsPS and PomeradoParkRes	33.00475N	117.07508W	30	2	PtP18800	1
					ODU-B 18GHz	1
					2ft HP Antenna 18GHz	1
					PtP800 Modem	1
					AC-DC PS Converter	1
					PtP250 5GHz, Integrated Dual Polar Antenna	1
					Enterasys C5G124-24P2	1
BlackMtn	32.98139N	117.11650W	50	10	PtP11800	1
					ODU-B 11GHz	1
					6ft HP Antenna 11GHz	1
					PtP18800	9
					ODU-B 18GHz	9
					2ft HP Antenna 18GHz	9
					PtP800 Modem	10
					AC-DC PS Converter	10
Enterasys C5G124-24P2	1					
BlackMtnPSandRes	32.98568N	117.12824W	10	1	PtP18800	1
					ODU-B 18GHz	1
					2ft HP Antenna 18GHz	1
					PtP800 Modem	1
					AC-DC PS Converter	1
CabrilloPalisadesPS	32.80169N	117.15269W	10	2	PtP18800	1
					ODU B 18GHz	1
					2ft HP Antenna 18GHz	1
					PtP800 Modem	1
					AC-DC PS Converter	1
					PtP250 5GHz Connectorized	1
					MARS 2ft Dual Panel Antenna (MA-WA56-DP28) 29 dBi	1
Enterasys C5G124-24P2	1					
CarmelMtnHighPS	32.96621N	117.08034W	10	1	PtP230 5GHz with Reflector Antenna	1

Location	Latitude	Longitude	Altitude (ft)	Number of Antennas	Equipment	Quantity
					Enterasys C5G124-24P2	1
CarmelMtnHighRes	32.96561	117.07722W	15	3	PtP230 5GHz with Refelector Antenna	1
					PtP18800	2
					ODU-B 18GHz	2
					2ft HP Antenna 18GHz	2
					PtP800 Modem	2
					AC-DC PS Converter	2
CarmelMtnIndustrialPS	32.98574N	117.08207W	10	1	PtP230 5GHz with Refelector Antenna	2
CarmelMtnMallPS	32.98213N	117.08332W	20	2	PtP230 5GHz with Refelector Antenna	4
					Enterasys C5G124-24P2	1
CatalinaPSandPtLomaRes	32.72549N	117.24388W	10	2*	PtP250 5GHz Connectorized	2
					PtP58500	2
					MARS 2ft Dual Panel Antenna (MA-WA56-DP28) 29 dBi	4
					Enterasys C5G124-24P2	1
Chollas-SOC	32.73473N	117.07164W	50	7*	PtP11800	1
					ODU-B 11GHz	1
					4ft HP Antenna 11GHz	1
					PtP18800	6
					ODU Coupler Mounting Kit 18GHz	1
					ODU-B 18GHz	6
					2ft HP Antenna 18GHz	6
					PtP800 Modem	7
					AC-DC PS Converter	7
					Enterasys C5G124-24P2	1
					ChollasHeightsPS	32.74105N
ODU Coupler Mounting Kit 18GHz	1					
ODU-B 18GHz	1					
2ft HP Antenna 18GHz	1					
PtP800 Modem	1					
AC-DC PS Converter	1					
PtP250 5GHz, Integrated Dual Polar Antenna	2					
CieloWoodmanPS	32.70370N	117.05495W	35	2	PtP18800	1
					ODU Coupler Mounting Kit 18GHz	1
					ODU-B 18GHz	1
					2ft HP Antenna 18GHz	1

Location	Latitude	Longitude	Altitude (ft)	Antenna Type	Antenna Height (ft)	Quantity	Notes
						1	PtP800 Modem
						1	AC-DC PS Converter
						1	PtP230 5GHz Integrated
						1	Enterasys C5G124-24P2
ClimaxPS	32.81095N	117.01841W	30	1		1	PtP230 5GHz with Reflector Antenna
CowlesMountain	32.81350N	117.03220W	50	8		1	PtP11800
						1	ODU-B 11GHz
						1	6ft HP Antenna 11GHz
						7	PtP18800
						7	ODU-B 18GHz
						5	2ft HP Antenna 18GHz
						1	3ft HP Antenna 18GHz
						1	6ft HP Antenna 18GHz
						8	PtP800 Modem
						8	AC-DC PS Converter
						1	Enterasys C5G124-24P2
DeerfieldPS	32.81629N	117.06245W	10	1		1	PtP18800
						1	ODU-B 18GHz
						1	2ft HP Antenna 18GHz
						1	PtP800 Modem
						1	AC-DC PS Converter
						1	Enterasys C5G124-24P2
DelCerroHighlandsPS	32.78906N	117.05562W	30	2		1	PtP18800
						1	ODU-B 18GHz
						1	2ft HP Antenna 18GHz
						1	PtP800 Modem
						1	AC-DC PS Converter
						1	Enterasys C5G124-24P2
						1	PtP250 5GHz, Integrated Dual Polar Antenna
						1	Enterasys C5G124-24P2
DelCerroPS	32.78238N	117.06158W	10	2		2	PtP250 5GHz, Integrated Dual Polar Antenna
						2	PtP230 5GHz with Reflector Antenna
						1	Enterasys C5G124-24P2
DelCerroRes	32.78679N	117.05978W	10	1		2	PtP230 5GHz with Reflector Antenna
						1	Enterasys C5G124-24P2
EagleRidgePS	32.80535N	117.02765W	10	1		1	PtP230 5GHz with Reflector Antenna
						1	Enterasys C5G124-24P2
EastgateMallReg	32.88054N	117.18913W	35	1		2	PtP250 5GHz Connectorized
						2	MARS 7ft Dual Panel Antenna (MA-WA56-DP28) 29 dBi

Location	Latitude	Longitude	Antenna Panel 1 Gain (dBi)	Antenna Panel 2 Gain (dBi)	Equipment Description	Qty
					Enterasys C5G124-24P2	1
ElliotPipelineReg	32.83425N	117.17223W	30	2	PtP250 5GHz Connectorized	4
					MARS 2ft Dual Panel Antenna (MA-WA56-DP28) 29 dBi	4
					Enterasys C5G124-24P2	1
Encanto	32.70461N	117.05250W	40	3	PtP18800	3
					ODU Coupler Mounting Kit 18GHz	1
					ODU-B 18GHz	3
					2ft HP Antenna 18GHz	3
					PtP800 Modem	3
					AC-DC PS Converter	3
					Enterasys C5G124 24P2	1
FriarsRdReg	32.77794N	117.13535W	10	2	PtP18800	1
					ODU-B 18GHz	1
					2ft HP Antenna 18GHz	1
					PtP800 Modem	1
					AC-DC PS Converter	1
					PtP230 5GHz with Reflector Antenna	1
					Enterasys C5G124-24P2	1
LaJollaCCRes	32.84147N	117.25769W	40	2	PtP58500	2
					MARS 2ft Dual Panel Antenna (MA-WA56-DP28) 29 dBi	2
					PtP230 5GHz with Reflector Antenna	2
					Enterasys C5G124-24P2	1
LaJollaViewSP	32.84209N	117.26151W	10	2	PtP230 5GHz with Reflector Antenna	4
					Enterasys C5G124-24P2	1
LosPenasquitosPS	32.99137N	117.08451W	15	2	PtP230 5GHz with Reflector Antenna	4
LosPenasquitosRes	32.98583N	117.09238W	30	3	PtP18800	2
					ODU-B 18GHz	2
					2ft HP Antenna 18GHz	2
					PtP800 Modem	2
					AC-DC PS Converter	2
					PtP230 5GHz with Reflector Antenna	2
					Enterasys C5G124-24P2	1
LyonsPeak	32.70104N	116.76563W	50	7	PtP11800	7
					ODU-B 11GHz	7
					2.6ft HP Antenna 11GHz	2
					4ft HP Antenna 11GHz	1

Location	Latitude	Longitude	Altitude (ft)	Number of Sites	Equipment	Quantity
					4ft HP Antenna 11GHz	4
					PtP800 Modem	7
					AC-DC PS Converter	7
					Enterasys C5G124-24P2	1
MercyMiraMesaHighPS	32.93642N	117.12301W	50	1	PtP18800	1
					ODU-B 18GHz	1
					2ft HP Antenna 18GHz	1
					PtP800 Modem	1
					AC-DC PS Converter	1
					Enterasys C5G124-24P2	1
MiramarRanchNorthPS and Reservoir	32.92791N	117.10117W	10	1	PtP18800	1
					ODU-B 18GHz	1
					2ft HP Antenna	1
					PtP800 Modem	1
					AC-DC PS Converter	1
					Enterasys C5G124-24P2	1
MontezumaPS	32.76881N	117.05854W	30	2	PtP250 5GHz, Integrated Dual Polar Antenna	4
					Enterasys C5G124-24P2	1
MountWoodson	33.00903N	116.97354W	50	2	PtP18800	2
					ODU-B 18GHz	2
					2ft HP Antenna	2
					PtP800 Modem	2
					AC-DC PS Converter	2
					Enterasys C5G124-24P2	1
MuirlandsPS	32.84188N	117.26339W	10	1	PtP230 5GHz with Reflector Antenna	2
					Enterasys C5G124-24P2	1
OceanViewHillsPS	32.58180N	117.02540W	50	1	PtP11800	1
					ODU-B 11GHz	1
					2.6ft HP Antenna	1
					PtP800 Modem	1
					AC-DC PS Converter	1
					Enterasys C5G124-24P2	1
OtayMesaPS	32.58505N	117.01183W	50	1	PtP11800	1
					ODU-B 11GHz	1
					2.5ft HP Antenna	1
					PtP800 Modem	1
					AC-DC PS Converter	1
					Enterasys C5G124-24P2	1
ParadiseMesa1PS	32.69135N	117.05228W	50	1	PtP230 5GHz with Reflector Antenna	1
					Enterasys C5G124-24P2	1

Location	Latitude	Longitude	Height (ft)	Antenna Type	Equipment	Qty
ParadiseMesa2PS	32.67845N	117.04575W	40	1	PtP230 5GHz with Reflector Antenna	1
					Enterasys C5G124-24P2	1
ParadiseMesaHillsPS2	32.68428N	117.05555W	30	4	PtP18800	2
					ODU-B 18GHz	2
					2ft HP Antenna	2
					PtP800 Modem	2
					AC-DC PS Converter	2
					PtP230 5GHz with Reflector Antenna	2
ParadiseMesaSP	32.69322N	117.04622W	15	2	Enterasys C5G124-24P2	1
					PtP18800	2
					ODU-B 18GHz	2
					2ft HP Antenna 18GHz	2
					PtP800 Modem	2
					AC-DC PS Converter	2
PenasquitosBluffs8PS	32.96843N	117.12959W	15	1	Enterasys C5G124-24P2	1
					PtP18800	1
					ODU-B 18GHz	1
					2ft HP Antenna 18GHz	1
					PtP800 Modem	1
PomeradoPS	32.89844N	117.10044W	10	1	AC-DC PS Converter	1
					PtP230 5GHz with Reflector Antenna	1
PomeradoPSRepeater	32.89415N	117.11064W	25	2	Enterasys C5G124-24P2	1
					PtP18800	1
					ODU-B 18GHz	1
					2ft HP Antenna	1
					PtP800 Modem	1
					AC-DC PS Converter	1
PrincessParkPS	32.56560N	117.03983W	10	1	PtP230 5GHz with Reflector Antenna	1
					PtP18800	1
					ODU-B 18GHz	1
					2ft HP Antenna 18GHz	1
					PtP800 Modem	1
					AC-DC PS Converter	1
RanchoBernardoIndust PS and Reservoir	33.00751N	117.08435W	10	2	Enterasys C5G124-24P2	1
					PtP18800	2
					ODU-B 18GHz	2
					2ft HP Antenna 18GHz	2
					PtP800 Modem	2

Location	Latitude	Longitude	Power (W)	Power (dBm)	Equipment	Quantity
					AC-DC PS Converter	2
					Enterasys C5G124-24P2	1
RanchoPenasquitosPS	32.97303N	117.13501W	10	1	PtP18800	1
					ODU-B 18GHz	1
					2ft HP Antenna 18GHz	1
					PtP800 Modem	1
					AC-DC PS Converter	1
					Enterasys C5G124-24P2	1
RedwoodVillageSP	32.74848N	117.06703W	50	2	PtP250 5GHz, Integrated Dual Polar Antenna	4
					Enterasys C5G124-24P2	1
SanAndreasPS	32.98587N	117.24544W	10	1	PtP250 5GHz, Integrated Dual Polar Antenna	1
					Enterasys C5G124-24P2	1
SanCarlosRes	32.80800N	117.02780W	10	2	PtP230 5GHz with Reflector Antenna	1
					PtP18800	1
					ODU-B 18GHz	1
					2ft HP Antenna 18GHz	1
					PtP800 Modem	1
					AC-DC PS Converter	1
					Enterasys C5G124-24P2	1
SanYsidro	32.56166N	117.03520W	50	3	PtP11800	1
					ODU-B 11GHz	1
					2.5ft HP Antenna	1
					PtP18800	2
					ODU-B 18GHz	2
					2ft HP Antenna	2
					PtP800 Modem	3
					AC-DC PS Converter	3
					Enterasys C5G124-24P2	1
ScrippsMcMillanPS and ScrippsRanchRes	32.92199N	117.06693W	50	3	PtP250 5GHz, Integrated Dual Polar Antenna	2
					PtP230 5GHz with Reflector Antenna	2
					Enterasys C5G124-24P2	1
ScrippsWoods2PS	32.75803N	117.06514W	50	1	PtP230 5GHz with Reflector Antenna	1
					Enterasys C5G124-24P2	1
SewerPS_78	32.96293N	117.25560W	30	2	PtP18800	1
					ODU-B 18GHz	1
					2ft IIP Antenna	1
					PtP800 Modem	1
					AC-DC PS Converter	1

Location	Latitude	Longitude	Height (ft)	Antenna Type	Quantity	Notes
				PtP250 5GHz, Integrated Dual Polar Antenna	1	
SoledadPSandRes	32.83774N	117.24859W	10	PtP250 5GHz Connectorized	1	
				MARS 2ft Dual Panel Antenna (MA-WA56-DP28) 29 dBi	1	
				Enterasys C5G124-24P2	1	
SouthCreekPS	32.94327N	117.07578W	10	PtP230 5GHz with Refelector Antenna	2	
				Enterasys C5G124-24P2	1	
SouthCreekRptr	32.93551N	117.06874W	35	PtP230 5GHz with Refelector Antenna	4	
SouthSDRes	32.60110N	116.97530W	10	PtP11800	1	
				ODU B	1	
				2.6ft HP Antenna 11GHz	1	
				PtP800 Modem	1	
				AC-DC PS Converter	1	
				Enterasys C5G124-24P2	1	
StonebridgePS1	32.92278N	117.03413W	30	PtP18800	1	
				ODU-B	1	
				2ft HP Antenna	1	
				PtP800 Modem	1	
				AC-DC PS Converter	1	
				Enterasys C5G124-24P2	1	
StonebridgePS2	32.92673N	117.00764W	10	PtP18800	2	
				ODU B 18GHz	2	
				2ft HP Antenna 18GHz	2	
				PtP800 Modem	2	
				AC-DC PS Converter	2	
				PtP250 Connectorized	2	
				MARS 2ft Dual Panel Antenna (MA-WA56-DP28) 29 dBi	2	
				Enterasys C5G124-24P2	1	
TexasStReg	32.77219N	117.12839W	10	PtP230 5GHz with Refelector Antenna	1	
				Enterasys C5G124-24P2	1	
ThornStReg	32.73931N	117.12917W	10	PtP18800	1	
				ODU-B 18GHz	1	
				2ft HP Antenna 18GHz	1	
				PtP800 Modem	1	
				AC-DC PS Converter	1	
				Enterasys C5G124-24P2	1	
UnivHeightsPSandRes	32.75428N	117.13406W	10	PtP18800	1	
				ODU-B 18GHz	1	

Location	Latitude	Longitude	Altitude (ft)	Quantity	Description	Quantity
					2ft HP Antenna 18GHz	1
					PtP800 Modem	1
					AC-DC PS Converter	1
					Enterasys C5G124-24P2	1
WaringRdPS	32.78313N	117.08751W	10	1	PtP18800	1
					ODU-B 18GHz	1
					2ft HP Antenna 18GHz	1
					PtP800 Modem	1
					AC-DC PS Converter	1
PTP (Unlic) Spares						
					PTP 230 5.4 GHZ COMPLETE LINK AES, US	1
					PTP 250 5GHz Integrated (FCC/IC) - End Complete	1
					PTP 250 5GHz Connectorised (FCC/IC) - End Complete	1
					PTP 58500 Full Connectorised (FCC/IC) - end Complete	1
PTP 800 (Lic) Spares						
					ODU 11 GHz Lo B5, ODU-A 11GHz, TR 490 & 500, Lo, B5 (10700.0 - 10890.0 MHz)	1
					ODU 11 GHz Hi B5, ODU-A 11GHz, TR 490 & 500, Hi, B5 (11200.0 - 11390.0 MHz)	1
					ODU 18 GHz Lo B3, ODU-A 18GHz, TR1560, Lo, B3 (17700.0 - 18140.0 MHz), Rectangular WG, Neg Pol	2
					ODU 18 GHz Hi B3, ODU-A 18GHz, TR1560, Hi, B3 (19260.0 - 19700.0 MHz), Rectangular WG, Neg Pol	2
					ODU 23 GHz Lo B5, ODU-A 23GHz, TR1200, Lo, B5 (21200.0 - 21600.0 MHz), Rectangular WG, Neg Pol	1
					ODU 23 GHz Hi B5, ODU-A 23GHz, TR1200, Hi, B5 (22400.0 - 22800.0 MHz), Rectangular WG, Neg Pol	1
					PTP800 Modem Capacity CAP - Full Capacity (per Unit)	4
					PTP800 CMU (Modem 1000/100BaseT with Capacity CAP 10 Mbps.	4

Item No.	Description	Quantity	Unit	Notes
	AC-DC Power Supply Converter (no lead cable included)	4		
	Mains Lead- US 3pin to C5 (PTP800 AC-DC PSU)	4		
	Lightning Protection Kit (2xSPU, Mounting kit)	4		

RFP/ Scope Compliance Matrix (Sections 2.0-3.18)

1.0	Project Description		
2.0	Scope of Work		
2.1	Security	COMPLY	Siemens has designed a compliant solution for the Security Upgrades at each type of facility
a.	Reservoirs	COMPLY	
i.	Above ground/ stand pipes	COMPLY	
ii.	Underground	COMPLY	
b.	Pump Stations	COMPLY	
c.	Regulators	COMPLY	
2.1.1	Security Standards for Reservoirs	COMPLY	Siemens has provided the appropriate solutions for all reservoir sites. All CCTV is NICE Vision 2.5. Access Control shall be CCURE 9000. Intrusion detection shall provide Human Sized intrusion to facilities.
a.	CCTV	COMPLY	
b.	Access Control	COMPLY	
c.	Intrusion Detection	COMPLY	
2.1.2	Security Standards for Pump Stations	COMPLY	
a.	CCTV	COMPLY	
b.	Access Control	COMPLY	
c.	Intrusion Detection	COMPLY	
2.1.3	Security Standards for Regulators	COMPLY	
a.	CCTV	COMPLY	
b.	Access Control	COMPLY	
c.	Intrusion Detection	COMPLY	
2.1.4	Security Standards for Fence Lines	COMPLY	Siemens design includes repairs of fence where applicable, new fencing where required and enhancements to existing. Vehicle gates are enhanced, replaced or repaired, as appropriate. Siemens has excluded Fence enhancements at Ocean Hills, Stonebridge #1 & #2.
a.	Existing Fence	COMPLY	
b.	New Fence	COMPLY	
c.	Existing Vehicle Gates	COMPLY	
d.	New Vehicle Gates	COMPLY	
e.	Ornamental Fencing	COMPLY	
2.1.5	Security Standard for Cabinets	COMPLY	
a.	Outdoor	COMPLY	
b.	Indoor	COMPLY	
2.1.6	Security Standards for Cameras	COMPLY	Siemens has provided the appropriate technology for each application. All sites were analyzed and our design provides technology as appropriate. Poles are at 25ft. IR provided as required. Eight Cameras are provided as analog with encoder (H.264). Required for application at high sites and three reservoirs. All IP Speaker phones are Valcom per specifications.
a.	New Cameras PTZ, Thermal...	COMPLY	
b.	IP- H.264	COMPLY	
c.	Connectivity is at Mercy of Wireless	COMPLY	
d.	Heaters, Sunshields	COMPLY	
e.	video detection/ IR integrated cameras	COMPLY	
f.	Poles at 25ft	COMPLY	
g.	One Way Audio Speaker Horns	COMPLY	
2.1.7	Security Standards for Video Recorders	COMPLY	Siemens has provided the NICE 2.5 solution. Site recorders are to provide 30days of storage per resolution and frame rate requirements. Hardware will be determined based on environmental requirements at each site. NICE9100 H/W or equal.
a.	IP- Network Based	COMPLY	
b.	30days	COMPLY	
c.	7.5/15 fps @ 4CIF	COMPLY	
d.	UPS for 10 minutes	COMPLY	
2.1.8	Security Standards for Access Control	COMPLY	CCURE 9000 with MultiTech SWh 4000 readers at

	a. Dual Technology Readers	COMPLY	gates and primary entrance door to pump house.
	b. Vehicle Gates to receive new automation	COMPLY	Siemens has specified maglocks at 1200lbs. 650lbs is easily defeated by an intruder. Reader Doors to receive REX.
	c. Maglocks at 650lbs	COMPLY	
	d. REX Sensors	COMPLY	
	e. Readers at Primary Door	COMPLY	
	f. LED within Hatch/Vault for Access Status	COMPLY	
	g. Dual Technology Motion Detectors	COMPLY	
2.1.9	Security Standards for Door/ Hatch	COMPLY w Clarification	Siemens has eliminated switches on vaults that are protected by fence and video protection
	a. Surface Mount Switches	COMPLY w Clarification	
2.1.10	Wiring	COMPLY	
	a. PVC conduit required for trenched	COMPLY	
	b. EMT for exposed	COMPLY	
	c. No Wiremold	COMPLY	
	d. Pullboxes per TIA	COMPLY	
	e. All power on dedicated security circuits	COMPLY	
	f. CAT 6	COMPLY	
	g. Wire per installation environment	COMPLY	
2.1.11	Signage	COMPLY	
	a. 50ft	COMPLY	
	b. Sign Verbage	COMPLY	
	c. Approval Process	COMPLY	
2.1.12	Audio	COMPLY	Audio will be Valcom and provide one way communications.
	a. Two-way at select locations	COMPLY	
	b. Placement and Quantities per Drawings	COMPLY	
2.1.13	Erosion Control	COMPLY	
	a. Erosion control allowance	COMPLY	
2.1.14	Foliage Control	COMPLY	
	a. As needed for 6 months of clearance	COMPLY	
2.1.15	Maintenance Standars	COMPLY	Siemens has provided a comprehensive maintenance program.
2.1.16	Spare Parts	Exception	Siemens 24/7 service center and branch office provides backstock of commonly used products to ensure the appropriate response and repair of our clients systems. However, without the proper identification of quantities, Siemens has not provided costing for Spare and Backstock parts.
2.1.17	Training	COMPLY	Siemens has provided a training program that will include both administrative and operator training. Classroom instruction with hands on product operation is to be provided.
2.2	Wireless Scope of Work		
2.2.1	General Connectivity	COMPLY w Clarification	Siemens will provide a compliant wireless network solution that meets the requirements of this RFP. Siemens solution will require approx 4-6 hours per radio for physical installation, excluding programming and configuration, testing and integration. Siemens' service response center will provide all support response services. No credit terms for lost connectivity have been provided, at this time (excluded).

2.2.2	Interfaces to Chollas	COMPLY	Interfaces will be RJ45, Demarcation will be the Ethernet Port of the IDUs for the PTP800 radios. CAT6 jumper will be supplied for cross connect.
2.2.3	DHCP and IPv6	COMPLY	A) The migration of public network to IPv6 should have no impact on the architecture being proposed. While this is primarily due to the private nature of the network, because the proposed radio platforms are bridges, all IPV6 traffic can be transported without issue.
2.2.4	Microwave Telecommunications		
	2.2.4.1 Configuration	COMPLY	A) Will Comply B) The proposal Proposes a new link as represented in Exhibit B of the RFP C) The proposal Proposes new links from Chollas to Lyons Peak and from Lyons Peak to San Ysidro D) Will Review During the Design Phase E) Proposing Motorola PTP800 (Licensed) and Motorola PTP250 (Unlicensed) equipment as approved for use per Addendum F) All heights are currently Bucket Truck accessible – will confirm during Design Phase
	2.2.4.2 Frequency Bands	COMPLY	The unlicensed portion of the network is designed using the Motorola PTP250. The benefit of the design is the use of highly directional antennas to reduce interference. While the PTP250 uses 5.8Ghz, there is current FCC approval pending for use of 5.4 Ghz in the product as well. This no cost software upgrade (soon available) will give San Diego Water the ability to use the 5.8 Ghz band or the 5.4 Ghz band in the same radio . We would need to be judicious relative to the use of 5.4 Ghz as there is quite a bit of radar as a result of the military presence in San Diego, however the directional nature of these links may make it very viable of several of them. While the city has stated that it wishes to use Licensed Frequencies in the 6.2, 6.7, 11.2 or 18Ghz range, many of these link can use Licensed 23Ghz spectrum. This would in turn allow many of these short licensed link to use 1 foot antennas. This was an RFI. The Addendum response stated that there was a concern regarding antenna size. Using 23 Ghz actually allow us to reduce the antenna size on many links which would in turn reduce antenna cost, tower loading, and enhance aesthetics in areas.

2.2.4.3	Performance	COMPLY	<p>The Performance Guarantees assumes that there is no interference on the unlicensed links, there are no licensed interferers (in FCC violation) and do not take vandalism or acts of god into account</p> <p>A) Stated Performance Guarantees</p> <ul style="list-style-type: none"> o Network Latency <ul style="list-style-type: none"> • Backhaul - The Latency between any site and Chollas shall be less than 50 ms • Last Mile - The Latency between any site and Chollas shall be less than 50 ms o Packet Loss – there shall be 0% Packet Loss o Jitter – Jitter shall be less than 5 Microseconds o Network Availability - Minimum Availability 99.999% <p>B) Comply</p>
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2.2.4.4	Equipment Requirements	COMPLY	
2.2.4.5	Digital Radios	COMPLY	
2.2.4.6	Microwave Redundancy	COMPLY	
2.2.4.7	Mesh Configured Equipment	COMPLY	
2.2.4.8	Non Ring Equipment	COMPLY	
2.2.4.9	Node Interface	COMPLY	
2.2.4.10	Test Points and metering	COMPLY	
2.2.4.11	Routing/ Switching	COMPLY	
2.2.4.12	Power Supplies	COMPLY	
2.2.4.13	Antennas	COMPLY	
2.2.4.14	Antenna Mounting	COMPLY	
2.2.4.15	Transmission Lines	COMPLY	IDU to ODU will be CNT400 (.4" diameter)
2.2.4.16	Dehydration/ Pressurization	COMPLY	
2.2.4.17	System Testing	COMPLY	Siemens and City will agree to appropriate plan and
2.2.4.18	FAT/ Staging Testing	COMPLY	Siemens and City will agree to appropriate plan and
2.2.4.21	Site Testing	COMPLY	Siemens and City will agree to appropriate plan and
2.2.4.22	Path Testing	COMPLY	Siemens and City will agree to appropriate plan and
2.2.4.23	End to End System Test	COMPLY	Siemens and City will agree to appropriate plan and
2.2.4.24	Maintenance Standards	COMPLY	
2.2.4.25	Spare Parts	COMPLY	
2.2.6	Leased Connectivity	COMPLY	
2.2.7	Training	COMPLY	Siemens to provide training on systems as needed.

3.0 Technical Specifications

3.1	Situational Management System	COMPLY	Siemens has provided Gateways for Pelco, NICE, CCURE 9000. Total Sensor Count ~550 (cameras, sensors, card readers.
3.2	SOC Upgrade	COMPLY	Siemens has provided as add alternate
3.3	DVMS	COMPLY	Siemens has provided NICE 2.5. All specifications are compliant
3.4	Cameras		
3.4.1	IP Cameras	COMPLY	Siemens will meet all performance criteria and has provided "equal" or will match
3.5	VMS Capabilities	COMPLY	Siemens has provided NICE 2.5. All specifications are
3.5.1	General	COMPLY	
3.5.2	Playback	COMPLY	

3.5.3	Web	COMPLY	
3.5.4	LoS	COMPLY	
3.5.5	PTZ	COMPLY	
3.5.6	Presets	COMPLY	
3.5.7	Maps	COMPLY	
3.5.8	Tours	COMPLY	
3.5.9	Salvos	COMPLY	
3.5.10	Pages	COMPLY	
3.5.11	Monitor Wall	COMPLY	
3.5.12	Alarm Management	COMPLY	
3.5.13	Investigation and Query	COMPLY	
3.5.14	Audit	COMPLY	
3.6	Analytics		
3.6.1	Overview capability	COMPLY	NICE 2.5 is Analytic Ready.
3.6.2	Detection Behaviors	COMPLY	
3.6.3	Performance	COMPLY	
3.6.4	Scenario Reconstruction	COMPLY	
3.6.5	Edge Analytics	COMPLY	Not applied in this project
3.7	AMS Server	COMPLY	Existing
3.8	Maintenance Alarms	COMPLY	
3.9	Resiliency	COMPLY	
3.9.1	Playback	COMPLY	
3.9.2	Redundancy	COMPLY	Siemens has supplied the NICE certified Marathon imaging solution
3.10	Security		
3.10.1	Data Accessibility	COMPLY	
3.11	Video and Audio Streaming and Recoding	COMPLY w/Clarification	Siemens has specified NVR 9100 or equal. Server class hardware in the harsh environment will result in higher install costs as well as higher maintenance and repair costs. NVR 9100 standards will meet all performance criteria for system.
3.12	Access Control	COMPLY	CC9000
3.12.1	ACS Add Alt	COMPLY	Siemens solution includes CCURE 9000 with UPS.
3.12.2	Control Panel	COMPLY	iStar Edge
3.12.3	Card Reader	COMPLY	SWH 4000- Smart Card and Prox (Multitech)
3.12.4	Maglocks	COMPLY	1200lbs holding force
3.12.5	Indicator Lights	COMPLY	
3.13	UPS	COMPLY	
3.14	Motion Detection	COMPLY	
3.15	Hatch Contacts	COMPLY	
3.16	Camera Pole	COMPLY	Minimum of 25ft
3.17	Fencing	COMPLY	
3.18	Audio	COMPLY	



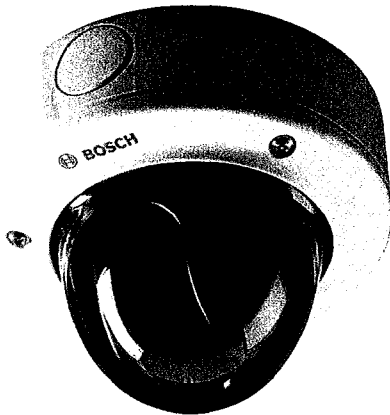
Major Component Datasheets





BOSCH
Invented for life

NDN-498 FlexiDome2X Day/Night IP Cameras



- ▶ 1/3-inch Day/Night CCD with progressive scan
- ▶ 20-bit image processing technology
- ▶ Wide Dynamic Range, 2X-dynamic engine and SmartBLC
- ▶ Tri-streaming: Dual H.264 and M-JPEG simultaneously
- ▶ Intelligence at the edge
- ▶ ONVIF conformant
- ▶ High-impact, vandal-resistant enclosure

FlexiDome2X Day/Night IP cameras are progressive scan CCD cameras in a compact, high-impact rated, vandal-resistant housing.

Equipped with 20-bit DSP with 2X-dynamic, they have a wide dynamic range for sharper, more detailed images with outstanding color reproduction.

They can tri-stream video simultaneously – on two H.264 streams and one M-JPEG stream. Features such as multicasting, internet streaming and ISCSI recording are fully supported. FlexiDome2X IP cameras have built-in video motion detection and additional processing power for video content analysis systems.

Supported by the award-winning Dinion2X digital imaging technology, they provide a proven, dependable solution for many security and surveillance requirements, day or night.

Functions

Progressive scan

To capture sharp images, even in busy scenes with high motion content, the Dinion camera uses progressive scan technology.

Superior image quality

With a 1/3-inch CCD and Bosch's advanced digital signal processing, the FlexiDome2X Day/Night IP camera provides outstanding image quality in virtually all situations. The highly accurate 20-bit digital signal is automatically processed to reveal every detail of the image in both the high and low-light areas of the scene simultaneously.

20-bit Image Processing

The highly accurate digital signal processing optimally captures the detail in both bright highlights and deep shadows simultaneously. By combining 20-bit image processing and wide dynamic range, the FlexiDome2X maximizes the information visible in the picture even with strong backlight.

Wide Dynamic Range

The superior wide dynamic range performance for all lighting conditions reveals details previously unseen.

2X-Dynamic and SmartBLC

Using 2X-Dynamic technology, pixel-by-pixel analysis provides the user with the most detailed information. Turn on SmartBLC to automatically compensate the image without the need for complicated set-up or without compromising dynamic range. Features such as Autoblack and Sharpness further improve the details in a scene, pixel by pixel.

Efficient bandwidth and storage management

The cameras use H.264 compression, bandwidth throttling, and multicasting capabilities to manage bandwidth and storage requirements efficiently, while delivering high image quality and resolution. The bandwidth of an H.264 stream using Main profile at 4CIF resolution is about the same as one MPEG-4 stream at 2CIF resolution. Bosch's innovative tri-streaming feature enables FlexiDome2X IP cameras to generate two independent H.264 streams and one M-JPEG stream simultaneously. This allows streaming of high-quality H.264 images for live viewing and recording while streaming M-JPEG images to another device at the same time. The M-JPEG video stream also provides easy integration with third-party JPEG or M-JPEG-compatible video management systems.

FlexiDome2X IP cameras offer unparalleled recording options. Attached to the network, they can use iSCSI targets directly, as well as Network Video Recorders (NVRs). The iSCSI storage target support enables the cameras to function as a conventional DVR, while streaming high-performance live video across the network.

Standard intelligence

With built-in video content analysis, the camera reinforces the Intelligence-at-the-Edge concept where edge devices become increasingly intelligent. The MOTION+ video motion analysis system, that is built into all camera versions, is the perfect solution for applications where basic video content analysis features are required. This motion analysis algorithm is based on pixel change and includes object size filtering capabilities and sophisticated tamper-detection capabilities.

Hardware enhanced

The hardware-enhanced version of the camera gives you the opportunity to upgrade the video content analysis features of the camera with the more advanced Intelligent Video Analysis (IVA) option. This option bases the IVA algorithm on digital imaging technology that uses multi-level image analysis of pixels, texture, and object direction, and is activated by installing a license.

ONVIF conformance

The camera conforms to the ONVIF (Open Network Video Interface Forum) specification which guarantees interoperability between network video products regardless of manufacturer. ONVIF conformant devices are able to exchange live video, audio, metadata and control information. They are automatically discovered and connected to network applications such as video management systems.

Tough design

The cast-aluminum housing, polycarbonate dome, and hardened inner liner can withstand the equivalent of 55 kg (120 lbs) of force. The enclosure contains the full-featured camera and integral varifocal lens. Ideal for outdoor use, the cameras are protected against water and dust to IP 66 (NEMA-4X) standards. The camera enclosure provides the extra protection necessary for applications such as schools, banks, prisons, parking garages, retail and industrial buildings.

Installation is quick and easy, as the camera comes completely assembled and ready to use. Using the proprietary pan/tilt/rotation mechanism, installers can select the exact field of view. Mounting options are numerous, including surface, wall, corner and suspended ceiling. The compact, sleek design and virtually flush-mount appearance complements any decor.

Unsurpassed flexibility

There are many ways to access the camera's video: on a PC using a web browser, with the Bosch Video Management System, or with VIDOS. The camera is also ideal for use with a Divar 700 Series digital video recorder. By routing a video stream to a Bosch video decoder, you can also present the video with ultimate clarity on an analog monitor.

Cost effective, simple installation

Three power options, PoE (Power-over-Ethernet), 24 VAC and 12 VDC are available. Using PoE makes installation easier and more cost-effective, as cameras do not require a local power source. To increase system reliability, the camera can be simultaneously connected to both PoE and 12 VDC/24 VAC supplies. Additionally, uninterruptible power supplies (UPS) can be used, which will allow continuous operation, even during a power failure.

For trouble free network cabling, the cameras support Auto-MDIX.

FlexiDome2X IP cameras can be configured using the control buttons on the camera as an alternative to configuration over IP. The On-Screen Display (OSD) simplifies back focus adjustment and network configuration, minimizing installation and support costs. The Lens Wizard automatically detects the lens type and helps focus the lens at the maximum opening to maintain proper focus.

Easy Upgrade

Remotely upgrade the camera whenever new firmware becomes available. This ensures up-to-date products, thus protecting investment with little effort.

Access Security

Various security levels are available for accessing the network, the camera, and the data channels. As well as password protection with three levels, 802.1x authentication using a RADIUS is supported. To secure Web browser access use HTTPS with a SSL certificate stored in the camera. For total data protection, the video and audio communication channels can be independently AES encrypted with 128-bit keys by installing the optional Encryption Site License.

Programmable Modes

Six independent, pre-programmed operating modes support typical applications, but are fully programmable for individual situations.

Day/Night switching

In night mode, the camera enhances low light viewing by switching the IR (Infrared) filter out of the optical path and providing a monochrome image. The camera can switch from color to monochrome mode automatically by sensing the illumination level, manually via the alarm input, or remotely via a web browser. An internal, through-the-lens IR detector enhances monochrome mode stability by preventing the camera from returning to color mode when IR-illumination is dominant.

Privacy masking

Four different privacy zones allow specific parts of a scene to be blocked. A mask for any part of the scene can be pre-programmed.

Default Shutter

The default shutter speed captures fast moving objects when sufficient light is available. When light levels fall and other adjustments have been exhausted, the shutter speed reverts to a standard setting to maintain sensitivity.

SensUp Dynamic

By increasing the integration time up to 10 times on the CCD, the effective sensitivity is dramatically enhanced. This is especially useful when relying only on moonlight for illumination.

Typical applications

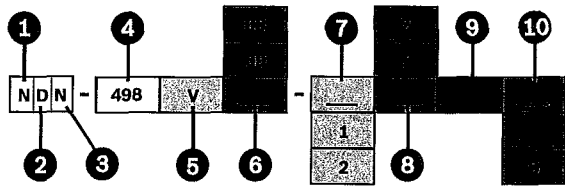
- Prisons and correctional facilities
- Traffic monitoring (air, land and sea)
- Hotels, bars and nightclubs
- Commercial and government buildings
- City surveillance and safety
- Border control

Certifications and Approvals

Region	Certification
Europe	CE Declaration of Conformity Model Identity Declaration
USA	FCC Declaration of Conformity
Electro Magnetic Compatibility	
Emission	EN55022 Class B EN61000-3-2 EN61000-3-3 CFR. 47 FCC Part 15: class B
Immunity	EN50130-4 (PoE, +12 VDC) EN55024 (24 VAC) EN50121-4
Safety	EN60950-1 UL60950-1 (2nd edition) CAN/CSA-C 22.2 No. 60950-1
Vibration	As per IEC60068-2-6 (5 m/s ² , operational)

Installation/Configuration Notes

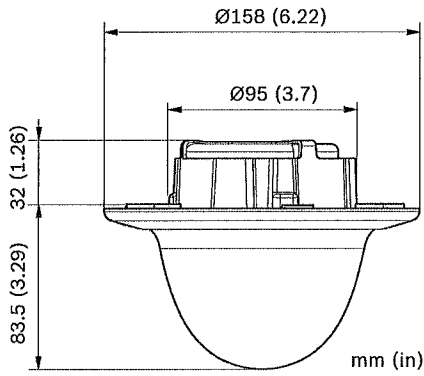
Ordering chart



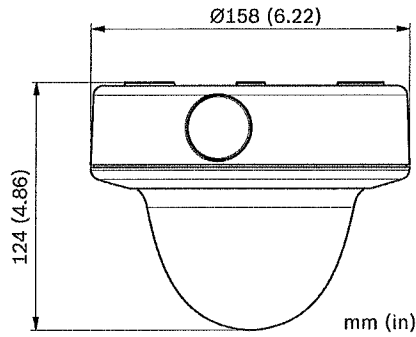
1	N	Network camera
2	D	Dome (FlexiDome fixed dome)
3	N	Day/Night
4	498	Dinion2X performance
5	V	Varifocal lens, auto iris
6	03	2.8 to 10 mm F1.2
	09	9 to 22 mm F1.4
7	1	PAL 50 Hz
	2	NTSC 60 Hz
8	1	Motion+
	2	Designed for IVA *
9	P	PoE
10		Flush mount (blank)
	S	Surface mount

* No license included

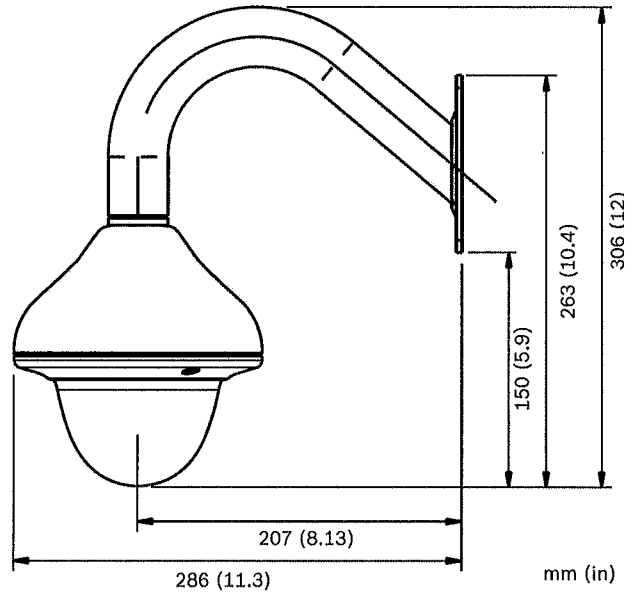
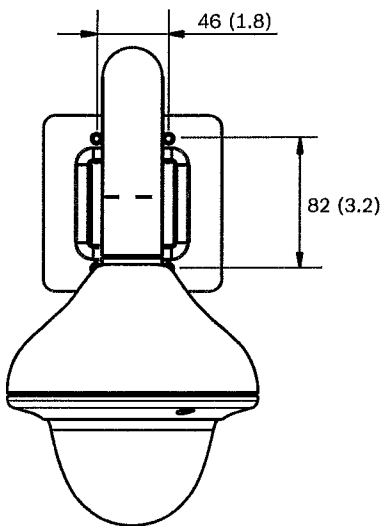
Flush Mounting



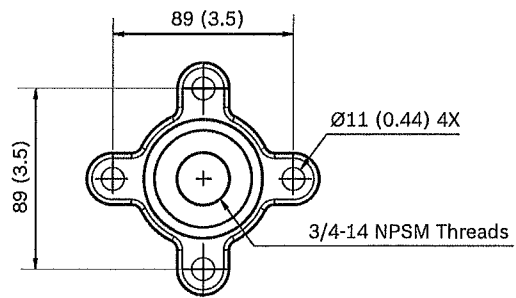
Surface Mounting

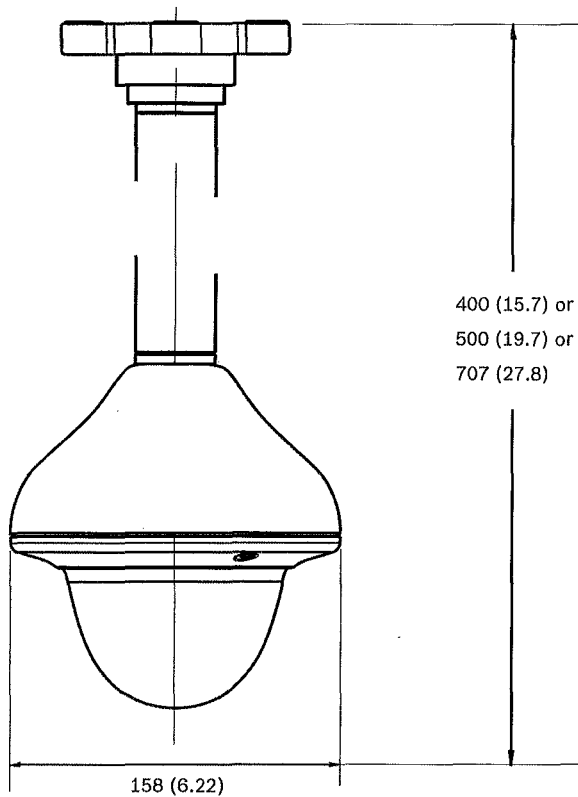


VDA-WMT-DOME -Pendant Wall Mount

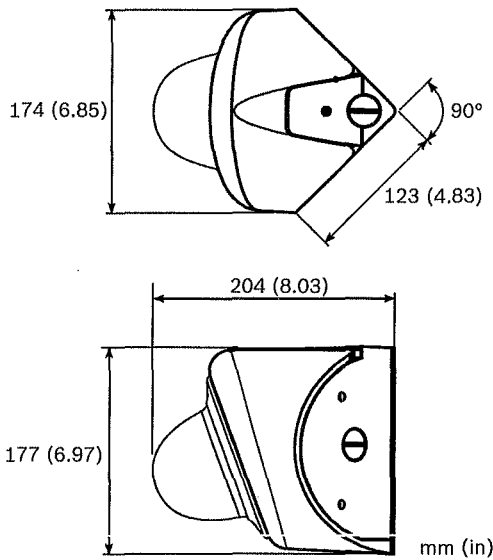


VDA-PMT-DOME -Pendant Pipe Mount





VDA-CMT-DOME –Corner Mount



Parts Included

Quantity Component

- 1 NDN-498 Series FlexiDome2X Day/Night IP Camera
- 1 Lens adjustment cap (focus aid)
- 1 Safety instructions
- 1 Quick Install Guide
- 1 Mini DVD-ROM with manuals, software, and tools
- 1 Mounting hardware kit + screwdriver bit
- 1 RJ45 network connector
- 1 Template for flush mount

Technical Specifications

Electrical

Model No.	Rated Voltage	Rated Frequency
NDN-498Vxx-1xP	24 VAC ±10%	50 Hz
	12 VDC ±10%	
	Power-over-Ethernet	
NDN-498Vxx-2xP	24 VAC ±10%	60 Hz
	12 VDC ±10%	
	Power-over-Ethernet	
Current Consumption	550 mA 700 mA IVA (12 VDC) 550 mA 700 mA IVA (24 VAC) 200 mA (PoE 48 VDC)	

Sensor

Type	1/3-inch CCD, WDR, dual shutter
Active Pixels (PAL)	752 x 582
Active Pixels (NTSC)	768 x 494

Video

Video compression	H.264 (ISO/IEC 14496-10); M-JPEG, JPEG
Data rate	9.6 Kbps to 6 Mbps
Resolution	Horizontal x vertical (PAL/NTSC ips)
• 4CIF	704 x 576/480 (25/30 ips)
• CIF	352 x 288/240 (25/30 ips)
Overall IP Delay	Min. 120 ms, Max. 240 ms
GOP structure	I, IP
Frame rate	1 to 50/60 (PAL/NTSC) H.264 1 to 25/30 (PAL/NTSC) M-JPEG

Video Out

Signal	Analog composite (NTSC or PAL) for service
Connector	2.5 mm jack, 75 Ohm
Horizontal resolution	540 TVL
Video S/N	50 dB

Sensitivity (3200 K, scene reflectivity 89%)

	Full video (100 IRE)	Usable picture (50 IRE)	Minimum illumina- tion (30 IRE)
NDN-498V03 (F1.2)			
Color	2.48 lx (0.23 fc)	0.621 lx (0.058 fc)	0.28 lx (0.027 fc)
Color + SensUp 10x	0.248 lx (0.023 fc)	0.062 lx (0.0058 fc)	0.028 lx (0.0027 fc)
Monochrome	1.01 lx (0.093 fc)	0.23 lx (0.021 fc)	0.099 lx (0.0092 fc)
Monochrome + SensUp 10x	0.1 lx (0.0093 fc)	0.023 lx (0.0021 fc)	0.0099 lx (0.00092 fc)
NDN-498V09 (F1.4)			
Color	2.7 lx (0.26 fc)	0.69 lx (0.064 fc)	0.321 lx (0.03 fc)
Color + SensUp 10x	0.27 lx (0.026 fc)	0.069 lx (0.0064 fc)	0.032 lx (0.003 fc)
Monochrome	1.1 lx (0.090 fc)	0.27 lx (0.026 fc)	0.11 lx (0.01 fc)
Monochrome + SensUp 10x	0.11 lx (0.01 fc)	0.027 lx (0.0026 fc)	0.011 lx (0.001fc)
Day/Night	Color, Mono, Auto		
Modes	6 preset programmable modes		
Dynamic range	120 dB (20-bit image processing)		
Signal-to-Noise Ratio	>50 dB		
Dynamic engine	2X-Dynamic, XF-Dynamic, SmartBLC+2X-Dy- namic		
SmartBLC	On (includes 2X-Dynamic) / Off		
AGC	AGC On or Off (0 - 30 dB) selectable		
White Balance	ATW, ATW hold and manual (2500 to 10000K)		
Shutter	Auto (1/50 [1/60] to 1/10000) selectable Auto (1/50 [1/60] to 1/50000) automatic flickerless, fixed selectable		
Sensitivity up	Adjustable from Off up to 10x		
Auto Black	Automatic continuous, Off		
Dynamic Noise Reduction	Auto, On/off selectable		
Sharpness	Sharpness enhancement level selectable		
Peak White Invert	On/Off		
Privacy Masking	Four independent areas, fully programmable		
Video Motion Analysis	Motion+ or IVA		
Test Pattern Generator	Color bars 100%, Grayscale 11-step, Saw- tooth 2H, Checker board, Cross hatch, UV plane		
Synchronization	Internal, Line Lock, HV-lock and Genlock (Burst lock) selectable		
Controls	OSD with soft-key operation (multi-lingual)		

Audio

Standard G.711	300 Hz to 3.4 kHz at 8 kHz sampling rate
Signal-to-noise ratio	> 50 dB

Input/output

Audio	1 x mono line in, 1 x mono line out
• signal line in	9 kohm typical, 5.5 Vpp max
• signal line out	3.0 Vpp at 10 kOhm typical, 2.3 Vpp at 32 Ohm typical, 1.7 Vpp at 16 Ohm typical
Alarm	1 non-isolated closing contact
• activation voltage	+5 VDC to +40 VDC (+3.3 VDC with DC-coupled 22 kOhm pull-up resistor)
Relay	1 output
• voltage	30 VAC or +40 VDC Maximum 0.5 A continuous, 10VA

Software Control

Unit Configuration	Via web browser or Configuration Manager
Flicker Control	50/60 Hz, selectable
Software update	Flash ROM, remote programmable

Network

Protocols	RTP, Telnet, UDP, TCP, IP, HTTP, HTTPS, FTP, DHCP, IGMP V2/V3, ICMP, ARP, SMTP, SNTP, SNMP, 802.1x, UPnP
Encryption	TLS 1.0, SSL, AES (optional)
Ethernet	STP, 10/100 Base-T, auto-sensing, half/full duplex, RJ45
PoE SUPPLY	IEEE 802.3af compliant

Optical

Varifocal lens	IR corrected, manual zoom and focus adjust- ment
Iris control	Automatic iris control
Viewing angle	
2.8 to 10 mm	Wide 100.8° x 73.7° (H x V) Tele 28.5° x 21.4° (H x V)
9 to 22 mm	Wide: 31.2° x 22.8° (H x V) Tele: 12.8° x 9.6° (H x V)

Mechanical

Weight	0.67 kg (1.48 lb) +SMB: 1.29 kg (2.84 lb)
Mounting	Flush mount or surface mount
Color	White (RAL9010) trim ring with black inner liner
Adjustment range	360° pan, 90° tilt, ±90° azimuth
Dome bubble	Polycarbonate, clear with UV blocking anti- scratch coating
Trim ring	Aluminum

Environmental

Operating temperature default (with heater off)	-20 °C to +50 °C (-4 °F to +122 °F) cold start
Operating temperature (with heater on)	-50 °C to +50 °C (-58 °F to +122 °F)
Storage temperature	-50 °C to +70 °C (-58 °F to +158 °F)
Operating humidity	5% to 93% relative humidity
Storage humidity	Up to 98% relative humidity
Impact protection	IEC 60068-2-75 test Eh, 50 J EN 50102, exceeding IK 10
Water/dust protection	IP 66 and NEMA-4X

Ordering Information

NDN-498V03-11P FlexiDome2X Day/Night IP Camera	NDN-498V03-11P
Vandal resistant, 1/3-inch Progressive Scan, H.264 dual stream, 2X DSP, WDR, 2.8 to 10 mm Varifocal lens, PAL, 50 Hz, Motion+, PoE, Flush mount	
NDN-498V03-21P FlexiDome2X Day/Night IP Camera	NDN-498V03-21P
Vandal resistant, 1/3-inch Progressive Scan, H.264 dual stream, 2X DSP, WDR, 2.8 to 10 mm Varifocal lens, NTSC, 60 Hz, Motion+, PoE, Flush mount	
NDN-498V03-12P FlexiDome2X Day/Night IP Camera	NDN-498V03-12P
Vandal resistant, 1/3-inch Progressive Scan, H.264 dual stream, 2X DSP, WDR, 2.8 to 10 mm Varifocal lens, PAL, 50 Hz, Designed for IVA, PoE, Flush mount	
NDN-498V03-22P FlexiDome2X Day/Night IP Camera	NDN-498V03-22P
Vandal resistant, 1/3-inch Progressive Scan, H.264 dual stream, 2X DSP, WDR, 2.8 to 10 mm Varifocal lens, NTSC, 60 Hz, Designed for IVA, PoE, Flush mount	
NDN-498V09-11P FlexiDome2X Day/Night IP Camera	NDN-498V09-11P
Vandal resistant, 1/3-inch Progressive Scan, H.264 dual stream, 2X DSP, WDR, 9 to 22 mm Varifocal lens, PAL, 50 Hz, Motion+, PoE, Flush mount	
NDN-498V09-21P FlexiDome2X Day/Night IP Camera	NDN-498V09-21P
Vandal resistant, 1/3-inch Progressive Scan, H.264 dual stream, 2X DSP, WDR, 9 to 22 mm Varifocal lens, NTSC, 60 Hz, Motion+, PoE, Flush mount	
NDN-498V09-12P FlexiDome2X Day/Night IP Camera	NDN-498V09-12P
Vandal resistant, 1/3-inch Progressive Scan, H.264 dual stream, 2X DSP, WDR, 9 to 22 mm Varifocal lens, PAL, 50 Hz, Designed for IVA, PoE, Flush mount	

Ordering Information

NDN-498V09-22P FlexiDome2X Day/Night IP Camera	NDN-498V09-22P
Vandal resistant, 1/3-inch Progressive Scan, H.264 dual stream, 2X DSP, WDR, 9 to 22 mm Varifocal lens, NTSC, 60 Hz, Designed for IVA, PoE, Flush mount	
NDN-498V03-11PS FlexiDome2X Day/Night IP Camera	NDN-498V03-11PS
Vandal resistant, 1/3-inch Progressive Scan, H.264 dual stream, 2X DSP, WDR, 2.8 to 10 mm Varifocal lens, PAL, 50 Hz, Motion+, PoE, Surface mount	
NDN-498V03-21PS FlexiDome2X Day/Night IP Camera	NDN-498V03-21PS
Vandal resistant, 1/3-inch Progressive Scan, H.264 dual stream, 2X DSP, WDR, 2.8 to 10 mm Varifocal lens, NTSC, 60 Hz, Motion+, PoE, Surface mount	
NDN-498V03-12PS FlexiDome2X Day/Night IP Camera	NDN-498V03-12PS
Vandal resistant, 1/3-inch Progressive Scan, H.264 dual stream, 2X DSP, WDR, 2.8 to 10 mm Varifocal lens, PAL, 50 Hz, Designed for IVA, PoE, Surface mount	
NDN-498V03-22PS FlexiDome2X Day/Night IP Camera	NDN-498V03-22PS
Vandal resistant, 1/3-inch Progressive Scan, H.264 dual stream, 2X DSP, WDR, 2.8 to 10 mm Varifocal lens, NTSC, 60 Hz, Designed for IVA, PoE, Surface mount	
NDN-498V09-11PS FlexiDome2X Day/Night IP Camera	NDN-498V09-11PS
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NDN-498V09-21PS FlexiDome2X Day/Night IP Camera	NDN-498V09-21PS
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Vandal resistant, 1/3-inch Progressive Scan, H.264 dual stream, 2X DSP, WDR, 9 to 22 mm Varifocal lens, NTSC, 60 Hz, Designed for IVA, PoE, Surface mount	

Ordering Information

Accessories

VDA-455SMB Surface mount box, high impact for VDC-455, VDM-455, VDC-485, VDN-498, NDC-455 and NDN-498	VDA-455SMB
VDA-WMT-DOME Wall Pendant Mount Bracket Wall pendant mount bracket for FlexiDome cameras	VDA-WMT-DOME
VDA-CMT-DOME Corner Mount Bracket Corner mount bracket for FlexiDome cameras	VDA-CMT-DOME
VDA-PMT-DOME Pendant Pipe Mount Bracket Pendant pipe mount bracket for FlexiDome cameras	VDA-PMT-DOME
S1460 Service/Monitor Cable for FlexiDome analog and IP (2.5 mm connec- tor to BNC), 1 m	S1460
UPA-2410-60 Power Supply 120 VAC, 60 Hz, 24 VAC, 10 VA Out	UPA-2410-60
UPA-2430-60 Power Supply 120 VAC, 60 Hz, 24 VAC, 30 VA Out	UPA-2430-60
UPA-2450-60 Power Supply 120 VAC, 60 Hz, 24 VAC, 50 VA Out	UPA-2450-60
UPA-2420-50 Power Supply 220 VAC, 50 Hz, 24 VAC, 20 VA Out	UPA-2420-50
UPA-2450-50 Power Supply 220 VAC, 50 Hz, 24 VAC, 50 VA Out	UPA-2450-50
VDA-455TBL Tinted bubble Tinted bubble for FlexiDome series	VDA-455TBL
VDA-455CBL Clear bubble Clear Bubble for FlexiDome series	VDA-455CBL
Software Options	
MVC-FIVA4-CAM IVA 4.0 VCA software license for IP camera/ dome (e-license)	MVC-FIVA4-CAM
MVC-FENC-AES BVIP AES 128 Bit Encryption BVIP AES 128-bit encryption site license. This license is required only once per installa- tion. It enables encrypted communication be- tween BVIP encoders, decoders and manage- ment stations.	MVC-FENC-AES

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Phone: + 31 40 2577 284
Fax: +31 40 2577 330
emea.securitysystems@bosch.com
www.boschsecurity.com

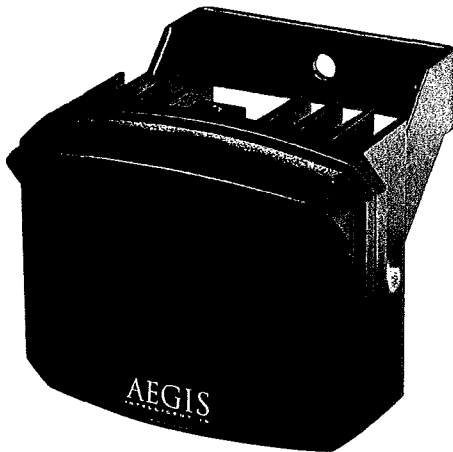
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Fax: +65 6571 2698
apr.securitysystems@bosch.com
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AEGIS UFLED Intelligent-IR Illuminator



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- ▶ **Powered by Black Diamond IR delivering even illumination across the scene**
- ▶ **Micro-refraction lens technology enables beam patterns of 10°, 20°, 30°, 60°, 95° and 120°**
- ▶ **12 VDC / 24 VAC Power-On-Board - no separate PSU required where low voltage supply is available**
- ▶ **High efficiency SMT LEDs for improved thermal management and increased LED life**

AEGIS UFLED, the world's first Intelligent-IR illuminator combines innovations in infrared technology and design to deliver absolute performance in night vision surveillance.

Constant Light technology compensates for LED degradation, a natural occurrence with all LED-based illuminators, to deliver a constant level of lighting performance throughout the life of the illuminator.

Powered by award-winning Black Diamond IR, AEGIS UFLED delivers Even-Illumination which lights the foreground and background of the scene eliminating hotspots and underexposure.

IP67 rated AEGIS UFLED features a 12 VDC / 24 VAC power circuit built into the illuminator to allow direct powering of the unit. Where mains operation is required separate power supplies are available.

Functions

Controlled by Constant Light technology

- Maintains a constant level of infrared performance throughout the life of the illuminator
- Maintains a constant level of infrared performance when operated at varying ambient temperatures
- Continues to deliver the specified range for the life of the illuminator
- Reduces initial input power consumption for a more environmentally-friendly solution

Powered by Black Diamond IR

- Award winning Black Diamond IR eliminates hotspots in the foreground and underexposed backgrounds
- Delivers Even-Illumination for up to 220 m (720 ft) of superior night vision images
- Less camera noise reduces IP video bandwidth requirement
- Fewer dropped frames and less image lag significantly reduces encoder CPU overhead for IP cameras.

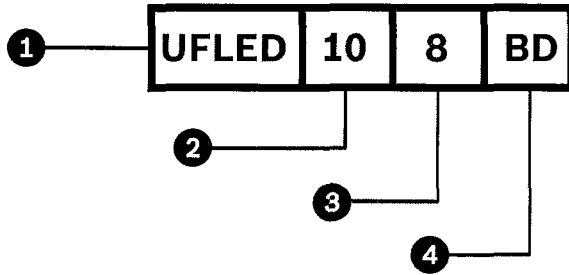
12 VDC / 24 VAC low voltage input

- No separate PSU required where low voltage supply is available; a dedicated mains voltage supply is also available
- Reduces installation time and costs
- Enables easier, more aesthetically pleasing installations
- Energy efficient operation
- Easy connection of remote telemetry and camera day/night switching

High Efficiency Surface Mount LEDs

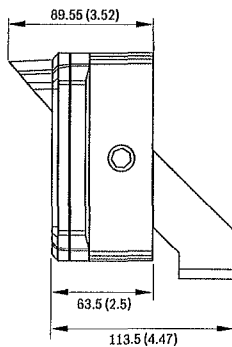
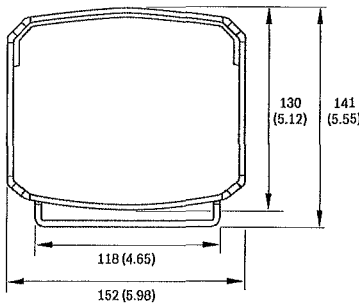
- Cool operation with improved optical output efficiency and thermal management
- Reduced power input and consumption for a more environmentally-friendly solution and lower operating costs for the end user

Installation/Configuration Notes



1. Model	UFLED	AEGIS UFLED
2. Beam Pattern	10	10°
	20	20°
	30	30°
	60	60°
	95	95°
	120	120°
3. Wavelength	8	850 nm
	9	940 nm
4. Type	BD	Black Diamond

Dimensions



mm (in)

Technical Specifications

Illuminator

LEDs	High efficiency LED array with current limited integral power circuit
Number of LEDs	18 high efficiency surface mount LEDs
Beam Patterns	10°, 20°, 30°, 60°, 95°, 120°
Wavelength	850 nm or 940 nm
Power consumption	26 to 45 W (45 W max power) Power consumption will vary over time due to the intelligent IR's optical output control which compensates for LED degradation and ambient temperature fluctuations
Input Voltage	12 to 40 VDC or 24 VAC ±30%
Temperature Range	-50 °C to +50 °C (-58 °F to +122 °F) max on full power
Environment	IP67
Construction	Robust, aluminum construction with acrylic front fascia
Weight	1.4 kg (3.1 lb)
Dimensions	152 x 188 x 115 mm (6.0 x 7.4 x 4.5 in)
Color	Black anodized heat sink with black front fascia
Power Cable	Supplied with IP67 power connector and 5 m (16.4 ft) of connecting lead.
Bracket	Wall mount U-bracket supplied

Performance Ranges

Model	Beam Pattern	Achievable Distance*	HFOV
UFLED10-8BD	10°	220 m (720 ft)	40 m (125 ft)
UFLED20-8BD	20°	150 m (490 ft)	55 m (175 ft)
UFLED30-8BD	30°	110 m (360 ft)	60 m (195 ft)
UFLED60-8BD	60°	70 m (230 ft)	80 m (265 ft)
UFLED95-8BD	95°	50 m (165 ft)	110 m (300 ft)
UFLED120-8BD	120°	35 m (115 ft)	120 m (400 ft)
UFLED10-9BD	10°	135 m (440 ft)	25 m (80 ft)
UFLED20-9BD	20°	80 m (260 ft)	28 m (100 ft)
UFLED30-9BD	30°	65 m (210 ft)	35 m (115 ft)
UFLED60-9BD	60°	40 m (130 ft)	45 m (145 ft)
UFLED95-9BD	95°	30 m (100 ft)	65 m (210 ft)
UFLED120-9BD	120°	20 m (65 ft)	70 m (230 ft)

*Actual illumination distance achieved is dependent on camera and lens characteristics.

Ordering Information

UFLED10-8BD AEGIS Illuminator AEGIS Intelligent-IR UFLED illuminator, 10°, 850 nm	UFLED10-8BD
UFLED20-8BD AEGIS Illuminator AEGIS Intelligent-IR UFLED illuminator, 20°, 850 nm	UFLED20-8BD
UFLED30-8BD AEGIS Illuminator AEGIS Intelligent-IR UFLED illuminator, 30°, 850 nm	UFLED30-8BD
UFLED60-8BD AEGIS Illuminator AEGIS Intelligent-IR UFLED illuminator, 60°, 850 nm	UFLED60-8BD
UFLED95-8BD AEGIS Illuminator AEGIS Intelligent-IR UFLED illuminator, 95°, 850 nm	UFLED95-8BD
UFLED120-8BD AEGIS Illuminator AEGIS Intelligent-IR UFLED illuminator, 120°, 850 nm	UFLED120-8BD
UFLED10-9BD AEGIS Illuminator AEGIS Intelligent-IR UFLED illuminator, 10°, 940 nm	UFLED10-9BD
UFLED20-9BD AEGIS Illuminator AEGIS Intelligent-IR UFLED illuminator, 20°, 940 nm	UFLED20-9BD
UFLED30-9BD AEGIS Illuminator AEGIS Intelligent-IR UFLED illuminator, 30°, 940 nm	UFLED30-9BD
UFLED60-9BD AEGIS Illuminator AEGIS Intelligent-IR UFLED illuminator, 60°, 940 nm	UFLED60-9BD
UFLED95-9BD AEGIS Illuminator AEGIS Intelligent-IR UFLED illuminator, 95°, 940 nm	UFLED95-9BD
UFLED120-9BD AEGIS Illuminator AEGIS Intelligent-IR UFLED illuminator, 120°, 940 nm	UFLED120-9BD
Accessories	
EXMB.020B L-bracket L-Bracket Only, Heavy Duty, black	EXMB.020B
EXPB-3W-KIT Camera and IR Illuminator Wall-mount Kit Wall-mount kit including camera housing for IR illuminators	EXPB-3W-KIT
UFLED-CI-5M Switching Cable 5 m (16.4 ft) remote telemetry or day/night switching cable for AEGIS UFLED	UFLED-CI-5M
UFLED-CL-1M Link Cable 1 m (3.3 ft) telemetry link cable for AEGIS UFLED	UFLED-CL-1M
PSU230-24-100W VAC Power Supply Power Supply, 230 VAC / 24 VAC, 100 W	PSU230-24-100W
UPA-2450-50 Power Supply 220VAC, 50Hz, 24VAC, 50VA Out	UPA-2450-50

Ordering Information

UPA-2450-60 Power Supply 120VAC, 60Hz, 24VAC, 50VA Out	UPA-2450-60
PSU-230-24 Power Supply Power Supply, 230 VAC / 24 VAC, 50 W	PSU230-24
DPB2 Dome and IR 2-way Pole Bracket Dome & IR 2-way Pole Bracket	DPB2
DPB2+ Dome and IR 2-way Pole Bracket Dome & IR 2-way Pole Bracket	DPB2+
DPB4 Dome and IR 4-way Pole Bracket Dome & IR 4-way Pole Bracket	DPB4
DPB4+ Dome and IR 4-way Pole Bracket Dome & IR 4-way Pole Bracket	DPB4+

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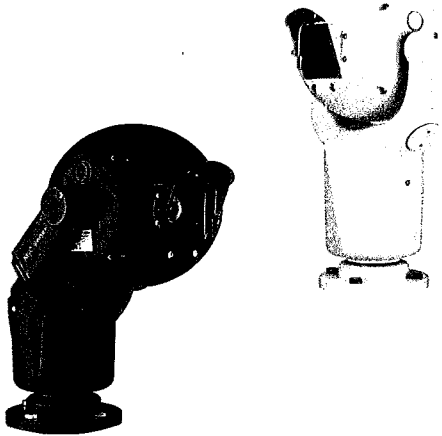
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BOSCH
Invented for life

MIC Series 500 Professional



- ▶ **Rated to an industry leading IP68**
- ▶ **Multiple camera programming through Camset software**
- ▶ **Many mounting and viewing options**
- ▶ **Easy set-up and configuration through the powerful on-screen display**
- ▶ **Multi-protocol operation**
- ▶ **On-site canting ability**
- ▶ **Ultra long-life silicone wiper**
- ▶ **Powerful privacy masking allowing over 900 separate masked zones**

The MIC Series 500 Professional combines cutting-edge technology with the latest production techniques to provide a class-leading feature set in an economical package. The MIC Series 500 Professional range takes high quality surveillance to new levels of excellence.

As a best-fit camera for virtually any security application, it can be installed in the harshest of environments. Thanks to its IP68-rated aluminum casing, the MIC Series 500 Professional functions perfectly in the most demanding conditions. This tough casing provides protection from the elements and physical attack. Coupled with an optically perfect flat viewing window, integrated long life silicone wiper, and a reversible rain shield, ensures high quality images regardless of the installed environment.

The brushless-motor technology offers ultra-reliable, whisper-quiet operation with full 360° continuous rotation pan and 267° tilt control for exceptional viewing capability. Small increment pan/tilt speeds from just 0.2° per second to 120° per second gives the user precise control. This speed control is especially important when used with video analytic systems, particularly for tracking subjects when fully zoomed in.

On-screen menus allow camera set-up from the control room via a remote keyboard. The MIC Series 500 Professional is compatible with all leading control systems and has a wide choice of protocols available.

A choice of true day/night camera modules offering up to 36x optical zoom (12x digital) are available, providing 540 TV lines (PAL) or 520 TV lines (NTSC). Preset positions, preset tours and random tours ensure flexible surveillance options.

The integrated privacy card provides over 900 individual privacy masks, with a choice of mask styles, for use in high density residential applications. Each mask changes size smoothly and quickly to ensure the covered target cannot be seen.

The MIC Series 500 Professional features twist-lock canting functionality. This allows the camera to be securely canted on-site at 45° for pole mount applications allowing the base of the pole to be viewed. The sheer flexibility of mounting options allows the camera to be installed upright, inverted or canted to achieve the perfect field of view.

Functions

Rated to an industry leading IP68

Subjected and certified to rigorous IP68 dust and immersion tests, the MIC Series 500 Professional is perfectly suited for installation in even the most unforgiving environments.

Brushless motor technology

Ultra-reliable brushless motors provide whisper-quiet operation and smooth control.

Host of mounting and viewing options

Faultless operation in upright, inverted or canted positions gives the user a host of mounting and viewing possibilities. The twist-lock canting feature allows the MIC Series 500 Professional to be canted to 45° on site. This allows, for example, the base of the pole to be viewed in upright pole-mounted applications.

Sophisticated privacy masking

The integrated privacy card allows for over 900 individual privacy masks, with a choice of mask styles, to be programmed.

Easy set-up

Camera settings can be adjusted via the on-screen menu from a control room via a remote keyboard.

Multi-protocol operation

Compatible with virtually any control equipment available today, the MIC Series 500 Professional seamlessly integrates with the vast majority of security systems.

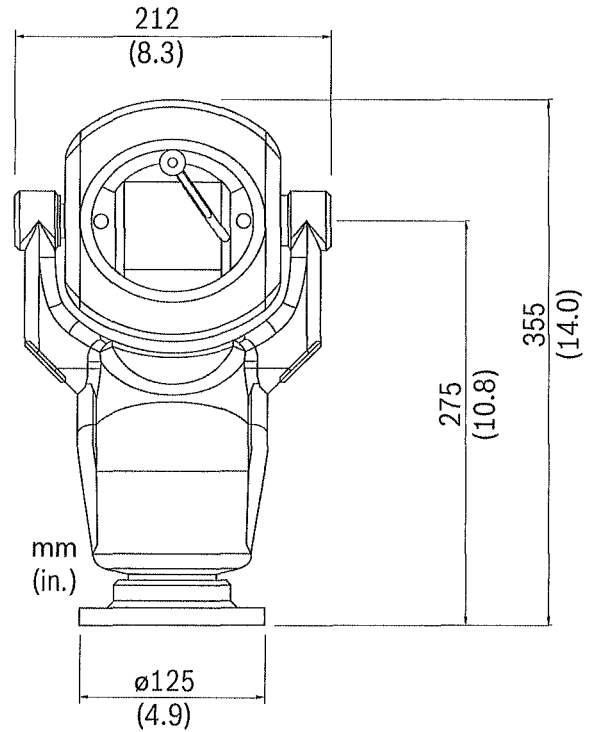
Applications:

- General CCTV
- Town centers
- ANPR systems
- Vandalism prone areas
- Extreme environments
- Rapid deployment
- High security
- Prestigious developments
- Broadcast
- Marine/costal
- Architectural

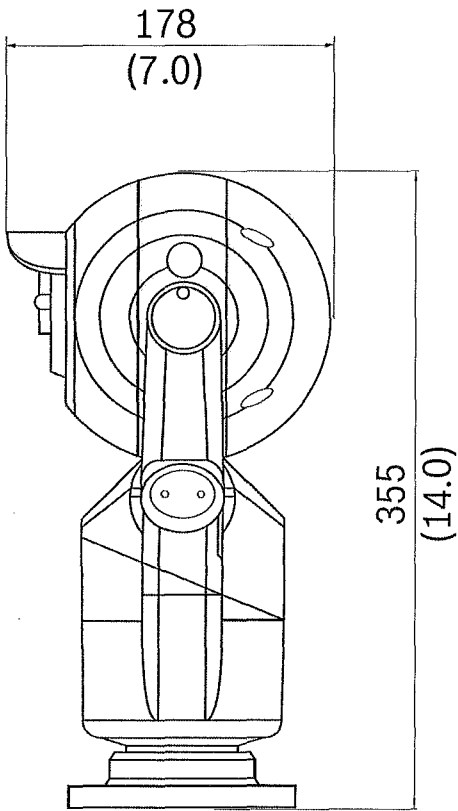
Certifications and Approvals

Electromagnetic Compatibility (EMC)	Complies with FCC Part 15, ICES-003, and CE regulations, including EN50130-4 and EN61000-3-2 & 3-3 and EN55022
Product Safety	Complies with CE regulations, UL, EN, and IEC Standards 60950-1 & 22
Weatherproofing	IP68 (1m submersion for 24 hours)

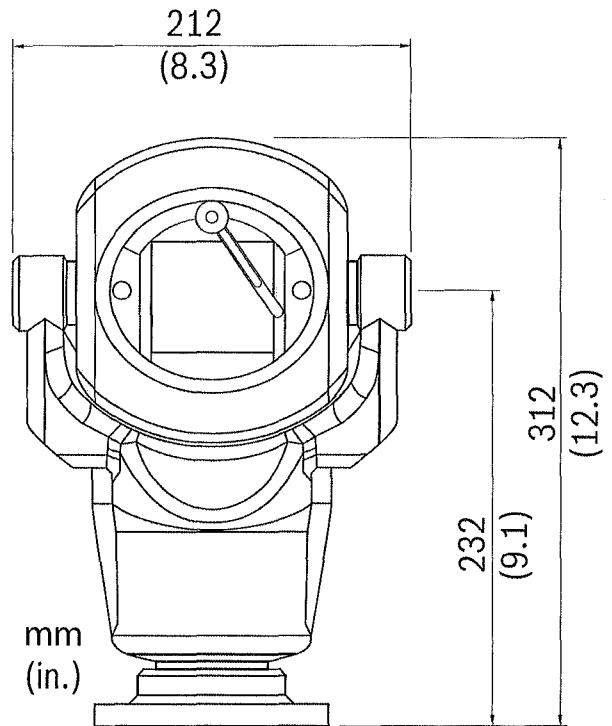
Installation/Configuration Notes



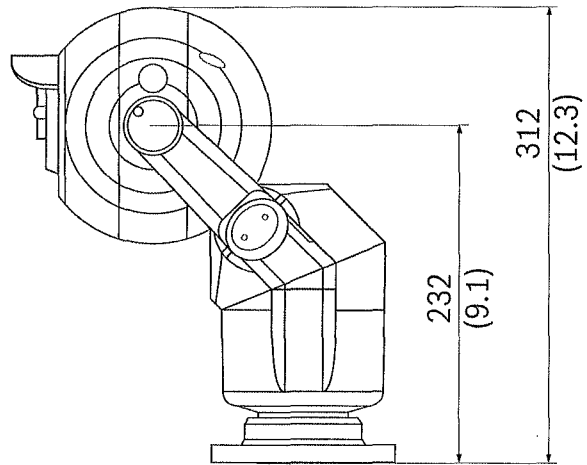
Front Detail, 90° (straight)



Side Detail, 90° (straight)



Front Detail, 45° (canted)



Side Detail, 45° (canted)

Technical Specifications

Camera Module

Image Sensor	1/4 in. Exview CCD (WDR)
Effective Pixel Elements	PAL: Approx. 440,000; 752(H) x 582(V) NTSC: Approx. 380,000; 768 (H) x 494 (V)
Horizontal Resolution	PAL: 540 TVL NTSC: 520 TVL
Filter	Automatic mechanical IR cut filter
Focus System	Auto or manual
Iris	Auto or manual with slow shutter integration modes
Synchronization	Internal / External (V-Lock)
Signal-to-Noise Ratio (SNR)	50 dB or more
Back Light Compensation (BLC)	On/Off
White Balance	Automatic
Automatic Gain Control (AGC)	-3 to 28 dB, 2 dB steps
Aperture Control	16 Steps

18x Optical Zoom Module

Lens	F=4.1 mm (wide) to 73.8 mm (tele), F1.4 to F3.0
Zoom	18x optical (12x digital)
Field of View	48° (wide) to 2.8° (tele)
Minimum Illumination	1/60 s mode, 0.7 lx (typical) (F1.4, 50 IRE) 1/4 s mode, 0.07 lx (typical) (F1.4, 50 IRE)
Shutter Speed	1/4 to 1/10,000 s (20 steps) NTSC, PAL

36x Optical Zoom Module

Lens	F=3.4 mm (wide) to 122.4 mm (tele), F1.6 to F4.5
Zoom	36x optical (12x digital)
Field of View	57.8° (wide) to 1.7° (tele)
Minimum Illumination	1/60 s mode: 1.4 lx (typical) (F1.6, 50 IRE) 1/4 s mode: 0.1 lx (typical) (F1.6, 50 IRE)
Shutter Speed	1/4 to 1/10,000 s (20 steps) NTSC 1/3 to 1/10,000 s (20 steps) PAL

Operational

Auto Flip	Yes
Manual Flip	Yes
E-flip	Yes, E-flip enables the camera module to invert the image
Dynamic Privacy Zones	3-D privacy masking with 959 zones
Presets	64 telemetry presets accurate to 0.08° utilizing resolver technology using the on-screen menu or via Camset, Up to 10 camera module presets (Sony sets) to allow ANPR, color correction etc.
Preset Tours	Four (4) tours each with up to 32 presets
Pattern Tours	Two (2) tours

Sector Titles	64 sectors, 20 characters per title
Preset Titles	20-character caption for each of the 64 presets
Home Position	Preset 1 or tour
On-screen Menu	Most camera functions can be accessed through the on-screen menu

Communication and Protocols

Communication	RS485 / RS422
Control Protocol	FV and Bosch protocols pre-installed. Twin protocol packs including FV/Pelco, FV/VCL, FV/American Dynamics and FV/Kalatel can be loaded using the MIC Universal Camera Setup Software Utility (Camset)

Connectivity

MIC Universal Camera Setup Software Utility (Camset)	Supplied free with each camera, Camset allows direct connection to a USB equipped PC via the MIC Series PSU or over a full duplex or IP network to provide access to all camera functions and useful diagnostic tools
Video	Coaxial via composite cable
Telemetry	Twisted pair. Simplex, half and full duplex operation via composite cable
Power	Via composite cable

Alarms

Alarm Inputs	One (1) tamper input (additional inputs possible with optional alarm card)
Alarm Communication	Tamper switch (ground connection)

Mechanical

Drive Unit	Brushless, integral pan/tilt motor drive
Pan Angle	360° continuous rotation
Pan Speed	Up to 120° per second (variable)
Tilt Angle	270°
Tilt Speed	0.2° to 80° per second (variable)
Speed Control	Closed loop electronics
Preset Accuracy	±0.17°(typical)
Proportional Pan/Tilt to Zoom	Yes

Electrical

Input Voltage	18 VAC
Power Consumption	25 W max. without heater; 36 W max. with heater on

Options

Camera Module	18x camera module or 36x camera module
Camera Color System	NTSC or PAL
Telemetry Control Card	Built-in
Washer Drive	Optional washer kit (MIC-WKT Kit with washer pump drive)
Heater	Standard

Privacy Masking	Privacy card with up to 959 masks, fitted as standard
Alarm Card	Optional, 8-input with washer pump drive function, fits in MIC Series power supply
Biphase Converter	Optional, fits in MIC Series power supply expansion slot (BP-4)
Environmental	
Operating Temperature (with heater)	-30 °C to +60 °C (-22 °F to +140 °F)
Weatherproofing	IP68 (1m submersion for 24 hours)
Construction	
Dimensions (W x H x D)	
Upright and Inverted	212 x 355 x 177 mm (8.35 x 13.98 x 6.97 in.)
Canted	212 x 312 x 255 mm (8.35 x 12.28 x 10.0 in.)
Weight	7 kg (15.43 lb) including 4 in. pitch circle diameter (PCD) base
Viewing Window	Tempered flat glass
Construction Material	Cast solid aluminum
Standard Colors	Black (RAL9005) or white (RAL9010)
Standard Finish	Alocrom 1200 surface treatment with powder coat paint, sand finish
Window Wiper	Standard
Canting	Twist Lock canting secured by two security screws

Ordering Information

MIC-500-ALB18N MIC Series 500 Professional 18x NTSC Camera, Black 18x, NTSC, PTZ camera, black, with an integrated wiper, heater, and privacy function	MIC-500-ALB18N
MIC-500-ALB18P MIC Series 500 Professional 18x PAL Camera, Black 18x, PAL, PTZ camera, black, with an integrated wiper, heater, and privacy function	MIC-500-ALB18P
MIC-500-ALB36N MIC Series 500 Professional 36x NTSC Camera, Black 36x, NTSC, PTZ camera, black, with an integrated wiper, heater, and privacy function	MIC-500-ALB36N
MIC-500-ALB36P MIC Series 500 Professional 36x PAL Camera, Black 36x, PAL, PTZ camera, black, with an integrated wiper, heater, and privacy function	MIC-500-ALB36P
MIC-500-ALW18N MIC Series 500 Professional 18x NTSC Camera, White 18x, NTSC, PTZ camera, white, with an integrated wiper, heater, and privacy function	MIC-500-ALW18N

Ordering Information

MIC-500-ALW18P MIC Series 500 Professional 18x PAL Camera, White 18x, PAL, PTZ camera, white, with an integrated wiper, heater, and privacy function	MIC-500-ALW18P
MIC-500-ALW36N MIC Series 500 Professional 36x NTSC Camera, White 36x, NTSC, PTZ camera, white, with an integrated wiper, heater, and privacy function	MIC-500-ALW36N
MIC-500-ALW36P MIC Series 500 Professional 36x PAL Camera, White 36x, PAL, PTZ camera, white, with an integrated wiper, heater, and privacy function	MIC-500-ALW36P
Accessories	
MIC-24PSU-UL 24 VAC Camera Power Supply 24 VAC, 50/60 Hz power supply for MIC Series cameras	MIC-24PSU-UL
MIC-115PSU-UL 115 VAC Camera Power Supply 115 VAC, 60 Hz power supply for MIC Series cameras	MIC-115PSU-UL
MIC-240PSU-UL 240 VAC Camera Power Supply 240 VAC, 50 Hz power supply for MIC Series cameras	MIC-240PSU-UL
MIC-ALM Alarm and Washer Pump Drive Card 8 Input alarm and washer pump drive card for PSU (Not for IR PSU)	MIC-ALM
MIC-BP4 Biphase Converter Biphase converter for non-IR versions of MIC series power supply units	MIC-BP4
MICUSB485CVTR2 USB to RS485 Signal Converter USB to RS485 signal converter to allow MIC Series cameras to connect to a PC, supplied with each camera	MICUSB485CVTR2
MIC-501KBD Keyboard Controller Keyboard controller with 3-axis joystick for 1 camera (FV PROTOCOL ONLY)	MIC-501KBD
MIC-516KBD Keyboard Controller Keyboard controller with 3-axis joystick for 1 to 16 cameras (FV PROTOCOL ONLY)	MIC-516KBD
MIC-WKT Washer Kit Washer kit for non infrared MIC models (includes washer pump drive card, washer nozzle and mounting brackets for wall and 4 in. PCD base)	MIC-WKT
HAC-WAS05-20 24 VAC Washer 24 VAC washer inst. 5M 25L	HAC-WAS05-20
HAC-WAS05-50 230 VAC Washer 230 VAC washer inst. 5M 25L	HAC-WAS05-50
HAC-WAS30-50 230 VAC Washer 230 VAC washer inst. 30M 25L	HAC-WAS30-50

Ordering Information

MIC-DCA-WD Deep Conduit Adapter, White Deep conduit adapter for 4 in. PCD base - white sand finish, RAL9010	MIC-DCA-WD
MIC-DCA-BD Deep Conduit Adapter, Black Deep conduit adapter for 4 in. PCD base - black sand finish, RAL9005	MIC-DCA-BD
MIC-SCA-WD Shallow Conduit Adapter, White Adapter for a MIC-WMB, a MIC-PMB, or a MIC-SPR mount, white sand finish, RAL9010	MIC-SCA-WD
MIC-SCA-BD Shallow Conduit Adapter, Black Adapter for a MIC-WMB, a MIC-PMB, or a MIC-SPR mount, black sand finish, RAL9005	MIC-SCA-BD
MIC-SPR-WD Spreader Plate, White Aluminum spreader plate suitable for brick-work surface mounting - white sand finish RAL9010	MIC-SPR-WD
MIC-SPR-BD Spreader Plate, Black Aluminum spreader plate suitable for brick-work surface mounting - black sand finish RAL9005	MIC-SPR-BD
MIC-CMB-WD Corner Mount Bracket, White Corner mount bracket - white sand finish RAL9010	MIC-CMB-WD
MIC-CMB-BD Corner Mount Bracket, Black Corner mount bracket - black sand finish RAL9005	MIC-CMB-BD
MIC-WMB-WD Wall Mount Bracket, White Wall mount bracket - white sand finish RAL9010	MIC-WMB-WD
MIC-WMB-BD Wall Mount Bracket, Black Wall mount bracket - black sand finish RAL9005	MIC-WMB-BD
MIC-PMB Pole Mount Bracket Pole mount bracket (includes 2 x 455 mm banding ties for pole diameters 75 to 145 mm)	MIC-PMB
MIC-2M-S 2 m Shielded Composite Cable Shielded Composite 2 m cable that provides power, telemetry and video connection from a MIC Series camera to a MIC Series power supply	MIC-2M-S
MIC-10M-S 10 m Shielded Composite Cable Shielded Composite 10 m cable that provides power, telemetry and video connection from a MIC Series camera to a MIC Series power supply	MIC-10M-S

Ordering Information

MIC-20M-S 20 m Shielded Composite Cable Shielded Composite 20 m cable that provides power, telemetry and video connection from a MIC Series camera to a MIC Series power supply	MIC-20M-S
MIC-25M-S 25 m Shielded Composite Cable Shielded Composite 25 m cable that provides power, telemetry and video connection from a MIC Series camera to a MIC Series power supply	MIC-25M-S
MIC-500-RWAB Replacement Wiper Assembly, Black	MIC-500-RWAB
MIC-500-RWAC Replacement Wiper Assembly, Silver	MIC-500-RWAC

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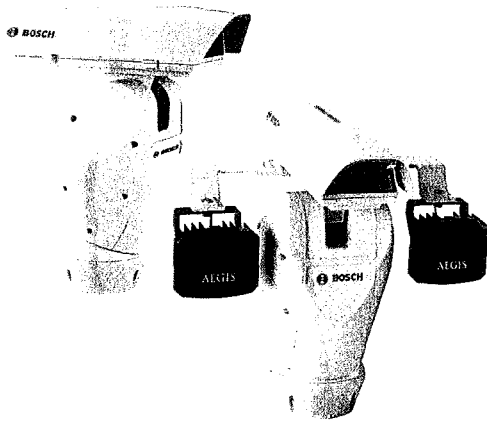
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BOSCH
Invented for life

High-Speed Positioning System (AMEC)



- ▶ Pans up to 100° per second, 360° continuous rotation
- ▶ Tilts up to 40° per second, -90° to +40° range
- ▶ Choice of Dinion^{XF} or Dinion 2X cameras and IR-corrected, motorized zoom lens combinations
- ▶ Multi-protocol including Biphase and Bilinx
- ▶ IP 66 rated, tough, attractive casing with up to 20 kg balanced load
- ▶ Optional Bosch AEGIS UFLED Intelligent IR Illuminator assembly attaches directly to the High-Speed Positioning System.

The Bosch High-Speed Positioning System (HSPS) is a complete solution that is high on quality and performance. It can pan 360° continuously at speeds of up to 100° per second. An extensive range of options lets you tailor the system to your specific requirements. For example, the HSPS offers a variety of Dinion^{XF} and Dinion 2X cameras and lens combinations, and the system can be ordered with two Bosch AEGIS UFLED Intelligent IR illuminators.

Autopan and patrol functions are accurate to within 0.02°, with text labels assigned to presets for added convenience. Insert privacy zones or sector blanking to block private areas from being viewed. Automatic lens scaling, which keeps zoom and speed synchronized, ensures smooth video pictures throughout pan and tilt movement.

A completely self-contained unit, the High-Speed Positioning System is easy to install and maintain. Multi-protocol capabilities, including Bilinx and Biphase, also simplify connections. The tough, protective casing can support a 20 kg balanced load and is IP66-rated – ideal for weathering the outdoor conditions common in traffic and industrial applications. All units have a sunshield and an integrated wiper. The wiper is available with an optional washer.

High-Speed Pan/Tilt with Intelligent Illumination

The IR 360 version of the High-Speed Positioning System comes with a bracket and two Bosch AEGIS UFLED Intelligent IR illuminators, without the need for rotating cables. The IR 360 system features two local alarm inputs, one input for synchronizing the IR lighting and one relay output for an intelligent local alarm.

System Overview

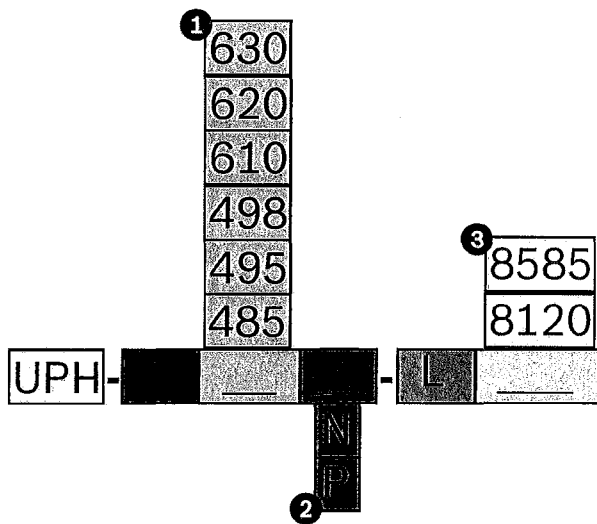
Modular Design

The High-Speed Positioning System is based on four modules: the camera and lens sled assembly, the Main Pan/Tilt unit including the base power supply, the optional mounting hardware and the optional illuminators.

The modular design allows you to customize an HSPS to fit your specific application. To build an HSPS, select one option from **Modules A** and **B**. In addition, you may further customize your HSPS by selecting an optional mounting solution from **Module C** and two optional illuminators from **Module D**.

Module A: Camera and Lens Combination

Choose from a selection of Bosch Dinion cameras and lenses. This module comes pre-assembled and attached to a sled that is installed inside the HSPS housing. Use this ordering chart to construct the Camera/Lens combination:



1 Camera

- 485 LTC 0485 Dinion^{XF} Color Camera, 1/3 in.
- 495 LTC 0495 Dinion^{XF} Day/Night Camera, 1/3 in.
- 498 LTC 0498 Dinion 2X Day/Night Camera, 1/3 in.
- 610 LTC 0610 Dinion^{XF} Color Camera, 1/2 in.
- 620 LTC 0620 Dinion^{XF} Day/Night Camera, 1/2 in.
- 630 LTC 0630 Dinion 2X Day/Night Camera, 1/2 in.

2 Video Format

- N NTSC
- P PAL

3 Lens

- 8120 8-120 mm motorized zoom lens
- 8585 8.5-85 mm IR-corrected motorized zoom lens

Module B: Pan/Tilt System with Power Supply

Choose a main pan/tilt system and power supply combination. The **Standard System** contains a high-performance pan/tilt head, camera housing, and a telemetry receiver. The **IR 360 System** contains all the Standard System features plus a bracket assembly for two (2) illuminators. Both systems feature an integrated wiper for the housing window.

Option	Description
UPH-HWD-120	<ul style="list-style-type: none"> • Standard System • Wiper • 120 VAC, 60 HZ Power Supply
UPH-HWD-24	<ul style="list-style-type: none"> • Standard System • Wiper • 24 VAC, 50/60 HZ Power Supply
UPH-HWDIR-24	<ul style="list-style-type: none"> • IR 360 System • Wiper • 24 VAC, 50/60 Hz Power Supply

Module C: Mounts

Choose an optional mounting solution for the Standard or the IR 360 System.

Option	Description
MTC-PUPH	Pole mount
MTC-WUPH	Wall mount
MTC-CORN-W	Corner adapter for wall mount
MTC-POLE-W	Pole adapter for wall mount

Module D: Illuminators

Choose two (2) optional AEGIS UFLED Intelligent IR Illuminators^{1, 2, 3}.

Option	Description
UFLED10-8BD	10°, 850 nm
UFLED20-8BD	20°, 850 nm
UFLED30-8BD	30°, 850 nm

1. The IR Illuminator option is available only with the UPH-HWDIR-24 (IR 360 Main Pan/Tilt System).
2. You may select two of the same or two different illuminators.
3. The AEGIS UFLEDxx-9BD IR Series and the UFLEDxx-WBD White Light Series Illuminators (with the same beam pattern) are compatible with the HSPS.

Functions

Multi-protocol

The High-Speed Positioning System operates with Bosch hardware platforms – Divar, DiBos, Allegiant – and is fully compatible with control protocols such as Biphase and Billinx. Biphase allows control of pan, tilt, zoom, focus, and the wiper / washer. Billinx offers the same functionality as Biphase, with additional communication capability for making Dinion camera settings.

High-Speed Pan/Tilt with Automatic Scaling

The unit can reach a very fast panning speed of 100° per second with 360° continuous panning in manual mode. Tilt speeds achieve 40° per second in manual mode. It also offers ample scope for changing the horizontal view, with movement ranging between -90° below and +40° above the horizon. To ensure smooth, clear pictures during rapid movement, automatic scaling synchronizes the pan/tilt speed to the amount of zoom.

Dinion^{XF} and Dinion 2X-Dynamic Cameras

The Bosch-High Speed Positioning System comes with a choice of 1/3-Inch or 1/2-Inch Dinion^{XF} or Dinion 2X CCDs with 540 TVL resolution, and outstanding sensitivity. The Dinion cameras deliver the highest possible image quality even in the most difficult lighting conditions.

Using 2X-Dynamic technology, pixel-by-pixel analysis provides the user with the most detailed information. Turn on SmartBLC to automatically compensate the image without the need for complicated set-up or without compromising dynamic range.

XF-Dynamic

The highly accurate 15-bit (Dinion^{XF} cameras) or 20-bit (Dinion 2X) digital signal is automatically processed to optimally capture the detail in both the high and low light areas of the scene simultaneously, maximizing the information visible in the picture.

NightSense and SensUp

Dinion^{XF} Color cameras feature NightSense which increases sensitivity by 9 dB in monochrome mode. NightSense can be automatically activated in low light situations, or remotely using Bilinx.

Dinion^{XF} and Dinion 2X Day/Night cameras make optimal use of the available lighting by utilizing the built-in SensUp feature. By increasing the integration time on the CCD up to 10 times, the effective sensitivity is dramatically enhanced. This is especially useful when relying only on moonlight for illumination.

Default Shutter

When viewing moving objects a fast shutter speed is required. When using a fast shutter speed the lens opening or gain control needs to be increased to maintain the video signal. The camera sensitivity is limited by the fast shutter speed. The default shutter setting offers the best of all worlds, fast shutter speed as long as there is sufficient light, however as the light level falls, when other adjustments have been exhausted, the shutter reverts to the standard setting maintaining the cameras excellent sensitivity.

Auto Black

The automatic black level feature enhances contrast by compensating for reduced contrast (i.e. glare, fog, mist).

Programmable Modes

Dinion cameras support three independent operating modes. The three modes are preprogrammed for typical applications, but are fully programmable for individual situations. Switching between modes is easy via Bilinx or the external alarm input

Intelligent IR Illumination

The Bosch AEGIS UFLED, the world's first Intelligent-IR illuminator, combines innovations in infrared technology and design to deliver absolute performance in night vision surveillance.

Constant Light technology compensates for LED degradation, a natural occurrence with all LED-based illuminators, to deliver a constant level of lighting performance throughout the life of the illuminator.

Powered by award-winning Black Diamond IR, AEGIS UFLED delivers Even-Illumination which lights the foreground and background of the scene eliminating hotspots and underexposure.

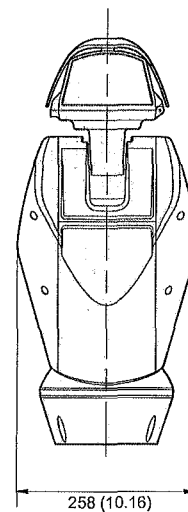
Certifications and Approvals

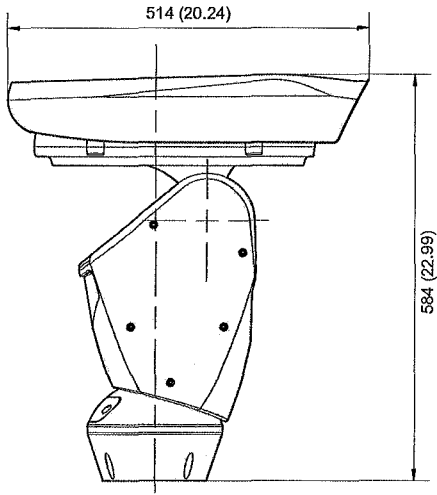
Safety	acc. to EN 60950 (CE)
Immunity	acc. to EN 50130-4 (CE)
	acc. to EN 55022 Class B (CE)
Emission	acc. to EN 61000-3-2 (CE)
	acc. to EN 61000-3-3 (CE)
Water/dust protection	IP 66 acc. to EN 60529

Installation/Configuration Notes

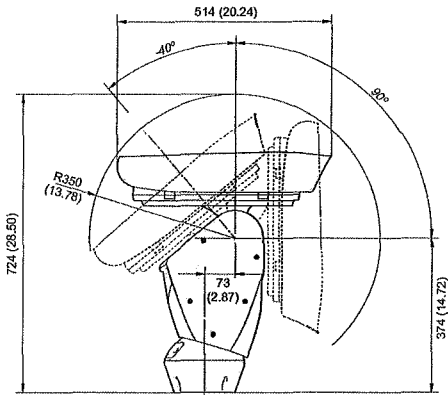
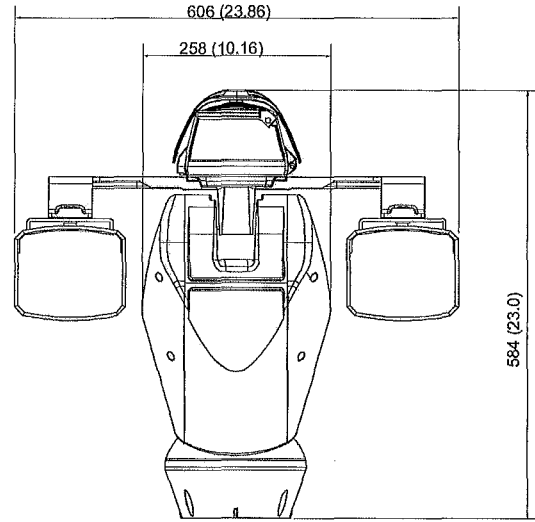
For more information on Dinion cameras (e.g. LTC 0495) and motorized zoom lenses (e.g. LTC 3783/50), please refer to their specific product datasheets.

HSPS Standard System Dimensions

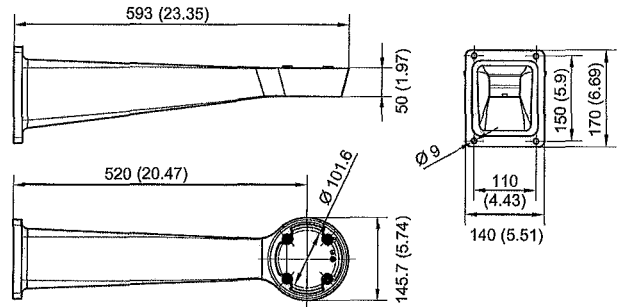




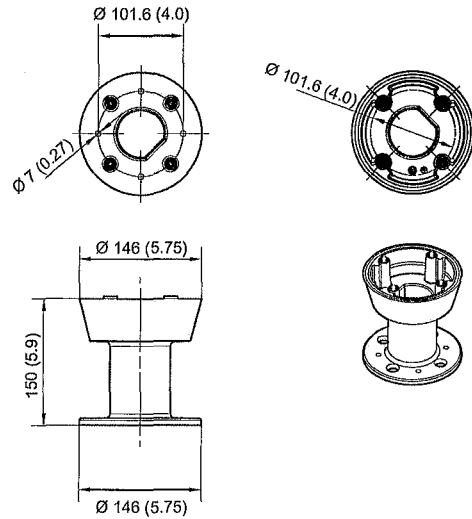
HSPS IR 360 System Dimensions



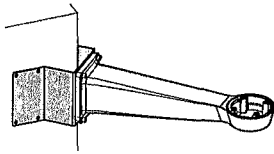
MTC-WUPH



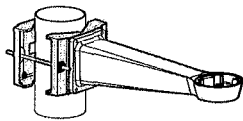
MTC-PUPH



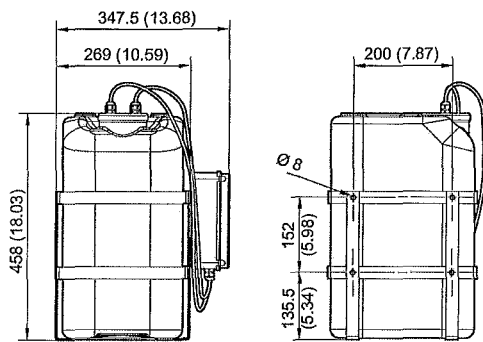
MTC-CORN-W



MTC-POLE-W



HAC-WAS05



Dimensions—mm (in.)

Parts Included

Quantity	Component
1	Main Pan/Tilt System
1	Base unit with power supply
1	Pre-assembled Bosch Dinion ^{XF} or Dinion 2X camera and varifocal lens sled
1	Mounting kit (optional)
1	Illuminator bracket assembly (optional)
2	Bosch AEGIS UFLED Intelligent IR Illuminators (optional)
1	Serial cable
1	Serial adapter
1	Installation manual
1	Set of mounting accessories <ul style="list-style-type: none"> • 4 mm Allen wrench • Bracket with fixing screws • Cable ties • Tube • Label

Technical Specifications

High-Speed Positioning System

Electrical

Input Voltage	<ul style="list-style-type: none"> • Standard System 24 VAC, 5 A • IR 360 System 24 VAC, 8 A
Input Frequency	60 Hz
Integrated Housing Input	Thermostat heater, 24 VAC, 20 W max.
Camera Input	12 VDC, 800 mA
Lens Input	+6 to +15 VDC, 200 mA
Wiper (optional) Input	24 VAC, 400 mA
Illuminator (optional) Input	24 VAC, 2 A + 2 A max.
Tour Control	Autopan; Preset; Patrol
Presets	250 selectable (max. 99 via keyboard)
Preset / Area Names	20-character string
Preset Accuracy	0.02°
Data Set-up	Flash memory
Serial	RS-232, Sub-D for firmware upgrade
Protocols	Billinx, Biphase and third party protocols on RS-485
Supported Platforms	DiBos, Divar, Allegiant
Max. Addressable Units	255 (dipswitch setting)
Firmware Upgrades	RS-232 interface
Configuration Modes	Via PC or OSD
Configuration Interface	RS-485

Mechanical

Dimensions (H x W x D)	584 x 258 x 514 mm (23.0 x 10.2 x 20.2 in.)	
Weight	Approx. 14 kg (31 lb)	
Mounting	Top mount (OTT)	
Color	Light grey (RAL 7035)	
Material	Die cast and extruded aluminum, ABS	

Rotation

Horizontal	360° continuous	
Vertical	-90° to +40°	

Speed	Manual	Patrol / Autopan
Horizontal (pan)		
• Standard System	0.1° to 100°/s	0.1° to 100°/s
• IR 360 System	0.1° to 40°/s	0.1° to 40°/s
Vertical (tilt)		
• Standard System	0.1° to 40°/s	0.1° to 30°/s
• IR 360 System	0.1° to 40°/s	0.1° to 30°/s

Static / dynamic torque

Horizontal	20 Nm
Vertical	20 Nm
Transmission	Toothed belt

Environmental

Operating Temperature	-20 °C to +50 °C (-4 °F to +122 °F)
Storage Temperature	-20 °C to +60 °C (-4 °F to +140 °F)
Humidity	<90% relative humidity (non-condensing)
Enclosure Protection	IP 66

Camera Specifications**UPH-C485 Series**

Camera Model **LTC 0485 Dinion^{XF} Color, 1/3-inch Digital CCD Camera**

Active Pixels

NTSC	768 H x 492 V
PAL	752 H x 582 V

Sensitivity (3200 k)

Sensitivity (full video) ⁴	2.4 lux (0.24 fc)
Sensitivity 50 IRE ⁴	0.59 lux / 0.24 lux (NightSense) (0.059 fc / 0.024 fc (NightSense))
Minimum Illumination ⁴	0.24 lux / 0.10 lux (NightSense) (0.024 fc / 0.01 fc (NightSense))
Minimum Illumination with SensUp	0.024 lux / 0.010 lux (NightSense) (0.0024 fc / 0.0010 fc (NightSense))
Horizontal Resolution	540 TVL
Signal-to-Noise-Ratio	> 50 dB
Video Output	1 Vpp, 75 Ohm
Y/C Output	Y: 1 Vpp / C: 0.3 Vpp
Synchronization	Internal, line lock, HV-lock and genlock (Burst lock) selectable
Electronic Shutter	Auto (1/60 (1/50) to 1/500000), fixed, flickerless, default
Sensitivity up	Off, automatic continuous up to 10x
Auto Black	On, off selectable
Range	32x dynamic range enhancement
Dynamic Noise Reduction	Auto, off selectable
Contour	Sharpness enhancement level selectable
BLC	Off, area and level selectable
Gain	Auto (maximum level selectable to 28 dB) or fixed level selectable
White Balance	ATW (2500–10000 K), AWB hold, manual WB selectable
VMD	Four (4) area, sensitivity selectable
Alarm Output	VMD or Bilinx
Alarm Input (TTL)	Profile switching, +5 V nominal, +40 VDC max.
Alarm Output Relay	Max. 30 VAC or +40 VDC, max. 0.5 A continuous, 10 VA
External Synchronal Input	75 Ohm or High Impedance selectable

Cable Compensation	Up to 1000 m (3000 ft) coax without external amplifiers (automatic set-up in combination with coaxial communication)
Camera ID	16-character editable string, position selectable
Lens Types	Manual, DC- and Video-iris auto-detect with override DC-iris drive: max. 50 mA continuous Video-iris: 11.5 ± 0.5 VDC, max. 50 mA continuous
Remote Control	Bi-directional coaxial communication

4. F1.2, 89% reflection, SensUp Off

UPH-C495 Series

Camera Model **LTC 0495 Dinion^{XF} Day/Night, 1/3-inch Digital CCD Camera**

Active Pixels

NTSC	768 H x 492 V
PAL	752 H x 582 V

Sensitivity (3200 k)

Sensitivity (full video) ⁵	2.4 lux (0.24 fc)
Sensitivity 50 IRE ⁵	0.59 lux / 0.08 lux (Monochrome mode)
Minimum Illumination ⁵	0.24 lux / 0.038 lux (Monochrome mode)
Minimum Illumination with SensUp	0.024 lux / 0.0038 lux (Monochrome mode)
Horizontal Resolution	540 TVL
Signal-to-Noise Ratio	> 50 dB
Video Output	1 Vpp, 75 ohm
Y/C Output	Y: 1 Vpp / C: 0.3 Vpp
Synchronization	Internal, Line Lock, HV-lock and Genlock (Burst lock) selectable
Shutter	Auto (1/60 [1/50] to 1/500000), fixed, flickerless, default
Sensitivity up	Off, Automatic continuous up to 10x
Auto Black	On, Off selectable
Range	32x dynamic range enhancement
Dynamic Noise Reduction	Auto, Off selectable
Contour	Sharpness enhancement level selectable
BLC	Off, Area and Level selectable
Gain	Auto (maximum level selectable to 28 dB) or fixed level selectable
Lens Mount	CS (max lens protrusion 5 mm, 0.2 in.)
White Balance	ATW (2500 - 10000 K), AWB hold, Manual WB selectable
VMD	Four (4) area, sensitivity selectable
Alarm Output	VMD or Bilinx
Alarm Input (TTL)	Profile switching, +5 V nominal, +40 VDC max
Alarm Output Relay	Max. 30 VAC or +40 VDC, max. 0.5 A continuous, 10 VA
External Synchronal Input	75 ohm or High Impedance selectable

Cable Compensation	Up to 1000 m (3000 ft) coax without external amplifiers (automatic set-up in combination with coaxial communication)
Camera ID	16-character editable string, position selectable
Lens Types	Manual, DC- and Video-Iris auto-detect with override DC-iris drive: max. 50 mA continuous Video-iris: 11.5 ± 0.5 VDC, max. 50 mA continuous
Remote Control	Bilinx coaxial communication

5. F/1.2, 89% reflection, SensUp off

UPH-C498 Series

Camera Model	LTC 0498 Dinion 2X Day/Night, 1/3-inch Digital CCD Camera
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Active Pixels			
NTSC	768 H x 494 V		
PAL	752 H x 582 V		

Sensitivity (3200 K, scene reflectivity 89%, F1.2)			
	Full video (100 IRE)	Usable picture (50 IRE)	Usable picture (30 IRE)
Color	2.4 lx (0.24 fc)	0.59 lx (0.059 fc)	0.24 lx (0.024 fc)
Color + SensUp 10x	0.24 lx (0.024 fc)	0.059 lx (0.0059 fc)	0.024 lx (0.0024 fc)
Monochrome	-	0.08 lx (0.008 fc)	0.038 lx (0.0038 fc)
Monochrome + SensUp 10x	-	0.008 lx (0.0008 fc)	0.0038 lx (0.00038 fc)
Horizontal Resolution	540 TVL		
Signal-to-Noise Ratio	>50 dB		
Video Output	Composite video 1 Vpp, 75 ohm		
Synchronization	Internal, Line Lock, HV-lock and Genlock (Burst lock) selectable		
Shutter	Auto (1/50 [1/60] to 1/10000) selectable Auto (1/50 [1/60] to 1/50000) automatic flickerless, fixed selectable		
Sensitivity up	Adjustable from Off up to 10x		
Day/Night	Color, Mono, Auto		
Auto Black	Automatic continuous, Off		
Dynamic engine	XF-Dynamic, 2X-Dynamic, SmartBLC		
Dynamic range	120 dB (20-bit image processing)		
Dynamic Noise Reduction	Auto, On/off selectable		
Sharpness	Sharpness enhancement level selectable		
SmartBLC	On/Off		
AGC	AGC On or Off (0 dB) selectable		
Peak White Invert	On/Off		
White Balance	ATW, ATWhold and manual (2500 to 10000K)		
Alarm Output	VMD or Bilinx		

Alarm Input (TTL)	Profile switching, +3.3 V nominal, +40 VDC max.
Alarm Output Relay	30 VAC or +40 VDC, max. 0.5 A continuous, 10 VA
External Synchronization Input	75 ohm or High Impedance selectable
Cable Compensation	Up to 1000 m (3000 ft) coax without external amplifiers (automatic set-up in combination with Bilinx coaxial communication)
Camera ID	17-character editable string, position selectable
Test Pattern Generator	Color bars 100%, Grayscale 11-step, Sawtooth 2H, Checker board, Cross hatch, UV plane
Lens Types	Manual, DC- and Video-Iris auto-detect with override DC-iris drive: max. 50 mA continuous Video-iris: 11.5 VDC ± 0.5, max. 50 mA continuous
Lens Mount	CS (max lens protrusion 5 mm, 0.2 inch), C-mount compatible with supplied adapter ring
Modes	Six (6) preset programmable modes
Remote Control	Bilinx coaxial bi-directional communication
Video Motion Detection	One area, fully programmable
Privacy Masking	Four (4) independent areas, fully programmable
Controls	OSD with soft-key operation (multi-lingual)

UPH-C610 Series

Camera Model	LTC 0610 Dinion^{XF} Color, 1/2-inch Digital CCD Camera
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Active Pixels	
NTSC	768 H x 492 V
PAL	752 H x 582 V

Sensitivity (3200 k)	
Sensitivity (full video) ⁶	1.4 lx (0.14 fc)
Sensitivity 50 IRE ⁶	0.35 lux / 0.14 lux (NightSense) (0.035 fc / 0.014 fc (NightSense))
Minimum Illumination ⁶	0.18 lux / 0.08 lux (NightSense) (0.018 fc / 0.008 fc (NightSense))
Minimum Illumination with SensUp	0.018 lux / 0.008 lux (NightSense) (0.0018 fc / 0.0008 fc (NightSense))
Horizontal Resolution	540 TVL
Signal-to-Noise-Ratio	> 50dB
Video Output	1Vpp, 75 Ohm
Y/C Output	Y: 1 Vpp / C: 0.3 Vpp
Synchronization	Internal, Line Lock, HV-lock and Genlock (Burst lock) selectable
Shutter	Auto (1/60 (1/50) to 1/500000), fixed, flickerless, default
Night Sense	Auto, forced, off

Sensitivity up	Off, automatic continuous up to 10x
Auto Black	On, off selectable
Dynamic Range	32x dynamic range enhancement
Dynamic Noise Reduction	Auto, off selectable
Contour	Sharpness enhancement level selectable
BLC	Off, area and level selectable
Gain	Auto (maximum level selectable to 28 dB) or fixed level selectable
Lens Mount	C and CS
White Balance	ATW (2500–10000 K), AWB hold, manual WB selectable
VMD	Four (4) area, sensitivity selectable
Alarm Output	VMD or Bilinx
Alarm Input (TTL)	Profile switching, +5 V nominal, +40 VDC max.
Alarm Output Relay	Max. 30 VAC or +40 VDC, max. 0.5 A continuous, 10 VA
External Synchronal Input	75 Ohm or High Impedance selectable
Cable Compensation	Up to 1000 m (3000 ft) coax without external amplifiers (automatic setup in combination with coaxial communication)
Camera ID	16-character editable string, position selectable
Lens Types	Manual, DC- and Video-iris auto-detect with override DC-iris drive: max 50 mA continuous Video-iris: 11.5 ± 0.5 VDC, max. 50 mA continuous
Remote Control	Bi-directional coaxial communication

6. F/1.2, 89% reflection, SensUp off

UPH-C620 Series

Camera Model LTC 0620 Dinion^{XF} Day/Night, 1/2-inch Digital CCD Camera

Active Pixels

NTSC	768 H x 492 V
PAL	752 H x 582 V

Sensitivity (3200 k)

Sensitivity (full video) ⁷	1.4 lux (0.14 fc)
Sensitivity 50 IRE ⁷	0.31 lux / 0.052 lux 0.031 fc / 0.0052 fc) (Monochrome Mode)
Minimum Illumination ⁷	0.18 lux / 0.024 lux (0.018 fc / 0.0025 fc) (Monochrome Mode)
Minimum Illumination with SensUp	0.018 lux / 0.0024 lux (0.0018 fc / 0.00024 fc) (Monochrome Mode)
Horizontal Resolution	540 TVL
Signal-to-Noise-Ratio	> 50 dB
Video Output	1 Vpp, 75 Ohm
Y/C Output	Y: 1 Vpp / C: 0.3 Vpp
Synchronization	Internal, Line Lock, HV-lock and Genlock (Burst lock) selectable

Shutter	Auto (1/60 (1/50) to 1/500000), fixed, flickerless, default
Sensitivity up	Off, automatic continuous up to 10x
Auto Black	On, off selectable
Range	32x dynamic range enhancement
Noise Reduction	Auto, off selectable
Contour	Sharpness enhancement level selectable
BLC	Off, area and level selectable
Gain	Auto (maximum level selectable to 28 dB) or fixed level selectable
Lens Mount	CS (max lens protrusion 5 mm, 0.2 in.)
White Balance	ATW (2500–10000 K), AWB hold, manual WB selectable
VMD	Four (4) area, sensitivity selectable
Alarm Output	VMD or Bilinx
Alarm Input (TTL)	Profile switching, +5 V nominal, +40 VDC max.
Alarm Output Relay	Max. 30 VAC or +40 VDC, max. 0.5 A continuous, 10 VA
External Synchronal Input	75 Ohm or high impedance selectable
Cable Compensation	Up to 1000 m (3000 ft) coax without external amplifiers (automatic set-up in combination with coaxial communication)
Camera ID	16-character editable string, position selectable
Lens Types	Manual, DC- and Video-iris auto-detect with override DC-iris drive: max. 50 mA continuous Video iris: 11.5 ± 0.5 VDC, max. 50 mA continuous
Remote Control	Bilinx coaxial communication

7. F/1.2, 89% reflection, SensUp off

UPH-C630 Series

Camera Model LTC 0630 Dinion 2X Day/Night, 1/2-inch Digital CCD Camera

Active Pixels

NTSC	768 H x 494 V
PAL	752 H x 582 V

Sensitivity (3200 K, scene reflectivity 89%, F1.2)

	Full video (100 IRE)	Usable picture (50 IRE)	Usable picture (30 IRE)
Color	1.4 lx (0.14 fc)	0.31 lx (0.031 fc)	0.18 lx (0.018 fc)
Color + SensUp 10x	0.14 lx (0.014 fc)	0.031 lx (0.0031 fc)	0.018 lx (0.0018 fc)
Monochrome	-	0.052 lx (0.0052 fc)	0.024 lx (0.0024 fc)
Monochrome + SensUp 10x	-	0.0052 lx (0.00052 fc)	0.0024 lx (0.00024 fc)

Horizontal Resolution	540 TVL
Signal-to-Noise Ratio	>50 dB
Video Output	Composite video 1 Vpp, 75 ohm
Synchronization	Internal, Line Lock, HV-lock and Genlock (Burst lock) selectable
Shutter	Auto (1/50 [1/60] to 1/10000) selectable Auto (1/50 [1/60] to 1/50000) automatic flickerless, fixed selectable
Sensitivity up	Adjustable from Off up to 10x
Day/Night	Color, Mono, Auto
Auto Black	Automatic continuous, Off
Dynamic engine	XF-Dynamic, SmartBLC
Dynamic range	96 dB (16-bit image processing)
Dynamic Noise Reduction	Auto, On/off selectable
Sharpness	Sharpness enhancement level selectable
SmartBLC	On/Off
AGC	AGC On or Off (0 dB) selectable
Peak White Invert	On/Off
White Balance	ATW, ATWhold and manual (2500 to 10000K)
Alarm Output	VMD or Bilinx
Alarm Input (TTL)	Profile switching, +3.3 V nominal, +40 VDC max.
Alarm Output Relay	30 VAC or +40 VDC, max. 0.5 A continuous, 10 VA
External Synchronization Input	75 ohm or High Impedance selectable
Cable Compensation	Up to 1000 m (3000 ft) coax without external amplifiers (automatic set-up in combination with Bilinx coaxial communication)
Camera ID	17-character editable string, position selectable
Test Pattern Generator	Color bars 100%, Greyscale 11-step, Sawtooth 2H, Checker board, Cross hatch, UV plane
Lens Types	Manual, DC- and Video-Iris auto-detect with override DC-iris drive: max. 50 mA continuous Video-iris: 11.5 VDC \pm 0.5, max. 50 mA continuous
Lens Mount	CS (max lens protrusion 5 mm, 0.2 in.), C-mount compatible with supplied adapter ring
Modes	Six (6) preset programmable modes
Remote Control	Bilinx coaxial bi-directional communication
Video Motion Detection	One (1) area, fully programmable
Privacy Masking	Four (4) independent areas, fully programmable
Controls	OSD with soft-key operation (multi-lingual)

Lens Specifications

LensModel?

10x optical	f=8.5 (wide) to 85.0 mm (tele), F1.6
Angle of view (H)	31.3° (wide) to 3.3° (tele)

LensModel?

15x optical	f=8.0 (wide) to 120.0 mm (tele), F1.6
Angle of view (H)	32.5° (wide) to 2.3° (tele)

AEGIS UFLED Illuminator Specifications

LEDs	High efficiency LED array with current limited integral power circuit
Number of LEDs	18 high-efficiency surface mount LEDs
Beam Patterns	10°, 20°, or 30°
Wavelength	850 nm
Power consumption	26 to 45 W (45 W max. power) Power consumption will vary over time due to the intelligent IR's optical output control which compensates for LED degradation and ambient temperature fluctuations
Input Voltage	12 to 40 VDC or 24 VAC \pm 30%
Temperature Range	-50°C to +50°C (-58°F to +122°F) max. on full power
Environment	IP67
Construction	Robust, aluminum construction with acrylic front fascia
Weight	1.4 kg (3.1 lb)
Dimensions (Single Illuminator)	152 x 188 x 115 mm (6.0 x 7.4 x 4.5 in.)
Color	Black anodized heat sink with black front fascia
Power Cable	Supplied with IP67 power connector and 5 m (16.4 ft) of connecting lead.
Bracket	Wall mount U-bracket supplied

Performance Ranges

Model Combination	Beam Pattern	Achievable Distance ⁸
UFLED10-8BD	10°	308 m (1010 ft)
UFLED10-8BD	10°	
UFLED10-8BD	10°	264 m (866 ft)
UFLED20-8BD	20°	
UFLED10-8BD	10°	251 m (823 ft)
UFLED30-8BD	30°	
UFLED20-8BD	20°	210 m (689 ft)
UFLED20-8BD	20°	
UFLED20-8BD	20°	193 m (633 ft)
UFLED30-8BD	30°	
UFLED30-8BD	30°	154 m (505 ft)
UFLED30-8BD	30°	

8. Actual illumination distance achieved is dependent on camera and lens characteristics.

Ordering Information

UPH-C485N-L8120 Camera/Lens Sled Assembly LTC 0485 Dinion ^{XF} NTSC color camera with an 8-120 mm lens	UPH-C48N-L8120
UPH-C495N-L8120 Camera/Lens Sled Assembly LTC 0495 Dinion ^{XF} NTSC day/night camera with an 8-120 mm lens	UPH-C495N-L8120
UPH-C495N-L8585 Camera/Lens Sled Assembly LTC 0495 Dinion ^{XF} NTSC day/night camera with an 8.5-85 mm IR-corrected lens	UPH-C49N-L8585
UPH-C498N-L8120 Camera/Lens Sled Assembly LTC 0498 Dinion 2X NTSC day/night camera with an 8-120 mm lens	UPH-C498N-L8120
UPH-C498N-L8585 Camera/Lens Sled Assembly LTC 0498 Dinion 2X NTSC day/night camera with an 8.5-85 mm IR-corrected lens	UPH-C498N-L8585
UPH-C610N-L8120 Camera/Lens Sled Assembly LTC 0610 Dinion ^{XF} NTSC color camera with an 8-120 mm lens	UPH-C61N-L8120
UPH-C620N-L8120 Camera/Lens Sled Assembly LTC 0620 Dinion ^{XF} NTSC day/night camera with an 8-120 mm lens	UPH-C620N-L8120
UPH-C620N-L8585 Camera/Lens Sled Assembly LTC 0620 Dinion ^{XF} NTSC day/night camera with an 8.5-85 mm IR-corrected lens	UPH-C62N-L8585
UPH-C630N-L8120 Camera/Lens Sled Assembly LTC 0630 Dinion 2X NTSC day/night camera with an 8-120 mm lens	UPH-C630N-L8120
UPH-C630N-L8585 Camera/Lens Sled Assembly LTC 0630 Dinion 2X NTSC day/night camera with an 8.5-85 mm IR-corrected lens	UPH-C630N-L8585
UPH-HWD-120 Standard High-Speed Positioning System with a wiper; 120 VAC High-performance pan/tilt head, camera housing, telemetry receiver, and wiper, with a 120 VAC, 60 Hz power supply	UPH-HD-230
UPH-HWD-24 Standard High-Speed Positioning System with a wiper; 24 VAC High-performance pan/tilt head, camera housing, telemetry receiver, and wiper, with a 24 VAC, 50/60 Hz power supply	UPH-HWD-24

Ordering Information

UPH-HWDIR-24 IR 360 High-Speed Positioning System with a wiper, 24 VAC High-performance pan/tilt head, camera housing, telemetry receiver, and bracket assembly for IR two illuminators, with a 24 VAC, 50/60 Hz power supply	UPH-HWDIR-24
MTC-WUPH Outdoor Wall Mount for UPH series	MTC-WUPH
MTC-PUPH Outdoor Pole Mount for UPH series	MTC-PUPH
MTC-CORN-W Corner Adapter for MTC-WUPH	MTC-CORN-W
MTC-POLE-W Pole Adapter for MTC-WUPH	MTC-POLE-W
Accessories	
MTC-WUPH Outdoor Wall Mount for UPH series	MTC-WUPH
MTC-PUPH Outdoor Pole Mount for UPH series	MTC-PUPH
MTC-CORN-W Corner Adapter for MTC-WUPH	MTC-CORN-W
MTC-POLE-W Pole Adapter for MTC-WUPH	MTC-POLE-W
UFLED10-8BD AEGIS Illuminator AEGIS Intelligent-IR UFLED illuminator, 10°, 850 nm	UFLED10-8BD
UFLED20-8BD AEGIS Illuminator AEGIS Intelligent-IR UFLED illuminator, 20°, 850 nm	UFLED20-8BD
UFLED30-8BD AEGIS Illuminator AEGIS Intelligent-IR UFLED illuminator, 30°, 850 nm	UFLED30-8BD
HAC-WAS05-20 24 VAC Washer 24 VAC washer inst. 5M 25L	HAC-WAS05

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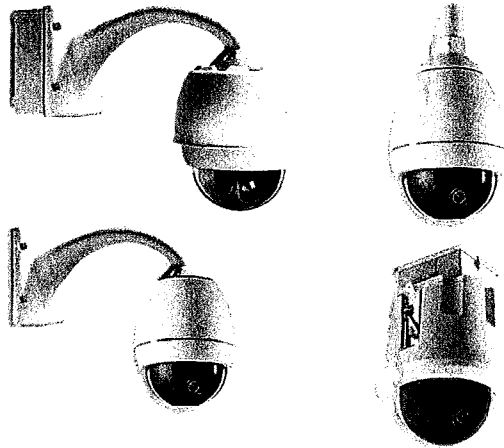
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AutoDome Series Mounts and Accessories



- ▶ 24 VAC, 120 VAC, and 230 VAC power supply boxes
- ▶ Pendant Wall, Corner, Mast, Roof, and Pipe mounts
- ▶ In-ceiling support kits for suspended ceilings and for IP54 certification
- ▶ Analog and IP Fiber Optic Communication Units
- ▶ Rugged polycarbonate and high-resolution acrylic bubble options

The AutoDome Series cameras represent the latest advancements in video surveillance technology. The cameras ship fully assembled in a pendant or an in-ceiling housing.

Bosch offers a host of mounts, power supplier boxes, and accessories so you can tailor your installation for a variety of applications and environments. These items are sold separately so you purchase only the items you need; saving you money and simplifying purchases.

System Overview

Mounting Options and Support Kits

Bosch offers a series of mounting options and support kits to tailor your AutoDome installation to various environments.

Pendant Mounts

The AutoDome indoor/outdoor pendant housings can be connected to an arm, a roof, or to a pipe mount. Pendant arm mounts are available with a connected power supply box or as a separate arm with connected wiring. All pendant arm mounts can be connected to a corner or mast (pole) adapter, extending the installation options.

In addition to the arm mounts, Bosch offers a pipe mount and a roof parapet mount. The pipe mount allows an AutoDome pendant housing to be attached to a 1-1/2 inch (NPS) pipe (user-supplied). The roof parapet mount is an aluminum pole that secures an AutoDome pendant to a roof surface. In addition, accessories are available to secure the parapet mount to a flat roof surface.

In-ceiling Support Kits

AutoDome in-ceiling housings do not require optional accessories when mounting to drywall ceilings, but support kits are available for specific installation needs.

For suspended or drop ceilings, Bosch offers a kit that provides the necessary support to secure the in-ceiling housing to a ceiling tile.

Bosch also offers a kit that offers IP54 ingress protection for in-ceiling installation.

Power Supplies

Bosch offers a variety of stand-alone power supply boxes that are available without a transformer (for 24 VAC power input) and with either a 120 VAC or a 230 VAC transformer. Each power supply box offers 100 W output and the power supply box enclosures are NEMA-rated.

Also available are a trim skirt to improve the aesthetics of the power supply box and a replacement power supply box cover.

Fiber Optic Kits

The VGA-FIBER-AN (multimode) is an analog, fiber optic conversion kit for use with 100 and 600 Series AutoDomes. This module is a video transmitter/data receiver modules designed to be mounted directly into an AutoDome power supply box.

The VG4-SFPSCKT is a unique media converter module for use with 700 and 800 Series AutoDomes. This media converter is designed to accept a wide-range of 10/100 Mbps Small Form-factor Pluggable (SFP) modules for use with Multimode or Singlemode optical fiber with LC or SC connectors. The media converter module along with the SFP module is user-installed directly into the AutoDome's power supply box to provide an integrated fiber optic solution.

Bubbles

Bosch offers a range of bubbles for in-ceiling and pendant housings.

AutoDome impact-resistant rugged polycarbonate bubbles protect your camera from vandalism. Designed to meet stringent strength standards without compromising optical clarity, rugged bubbles can withstand impacts equivalent to a 10 pound (4.5 kilograms) weight dropped from a height of 10 feet (3 meters).

AutoDome low-impact, high-resolution acrylic bubbles offer enhanced image clarity.

Both the rugged polycarbonate and the high-resolution acrylic bubbles are available in clear or tinted versions. The clear bubble offers maximum sensitivity by allowing as much light through as possible. The tinted bubbles offer covertness by making it difficult to see the direction the camera is looking from the outside.

Cold Weather Accessory

The optional VG4-SHTR-XT extreme temperature kit allows an AutoDome 600 outdoor pendant to operate in temperatures down to -60°C (-76°F), ensuring reliable operation in even the harshest environments.

Installation/Configuration Notes

AutoDome Series cameras are available as fully-assembled pendant or in-ceiling units. These units are packaged without mounting hardware or accessories so that you can choose only the parts needed for your application and environment.

Pendant Mounts

Pendant housings must be mounted to an arm or to a pipe using one of the options below. Various mounting accessories are also available to extend these mounting options to a host of applications.

VG4-A-PA0	Arm mount with power supply box, no transformer
VG4-A-PA1	Arm mount with power supply box, 120 VAC transformer
VG4-A-PA2	Arm mount with power supply box, 230 VAC transformer
VGA-PEND-ARM	Arm mount with wiring, no power supply box
VG4-A-9543	Pipe mount for a 1-1/2 inch (NPS) pipe
VG4-A-9230	Roof mount with parapet and VG4-A-9543 pipe mount
VGA-ROOF-MOUNT	Roof mount with parapet only

Pendant Mount Accessories

Accessory	Description	For Use With
VGA-PEND-WPLATE	Mounting plate	VGA-PEND-ARM
VG4-A-9541	Pole mount adapter	VG4-A-PA0 VG4-A-PA1 VG4-A-PA2 VGA-PEND-ARM
VG4-A-9542	Corner mount adapter	VG4-A-PA0 VG4-A-PA1 VG4-A-PA2 VGA-PEND-ARM
LTC 9230/01	Flat roof mount adapter	VG4-A-9230 VGA-ROOF-MOUNT

In-ceiling Support Kits

In-ceiling housings can be mounted to a drywall ceiling out of the box, but Bosch offers various kits to attach an in-ceiling housing to a suspended or to a drop ceiling. Kits are also available to add IP54 environmental protection to these housings.

Support Kit	Description	For Use With
VGA-IC-SP	Bracket for suspended or drop ceilings (AutoDome 100/600 Series)	VG5-161-CT0 VG5-162-CT0 VG5-163-CT0 VG5-164-CT0 VG5-613-CCS VG5-613-CTS
VJR-A3-SP	Bracket for suspended or drop ceilings (AutoDome 700/800 Series)	VG5-723-CCE2 VG5-713-CCE2 VG5-825-CCEV
VGA-IP54K-IC	Gasket kit for IP54 certification (AutoDome 100/600 Series)	VG5-161-CT0 VG5-162-CT0 VG5-163-CT0 VG5-164-CT0 VG5-613-CCS VG5-613-CTS
VGA-IP54K-IC78	Gasket kit for IP54 certification (AutoDome 700/800 Series)	VG5-723-CCE2 VG5-713-CCE2 VG5-825-CCEV

Power Supply Boxes

Bosch offers power supply boxes for all mounting options and power supply accessories to enhance the aesthetics of the boxes.

Power Supply	Description	For Use With
VG4-A-PSU0	No transformer (24 VAC input), 100 W, NEMA-rated	VGA-PEND-ARM VG4-A-9543
VG4-A-PSU1	120 VAC transformer, 100 W, NEMA-rated	VG4-A-9230 VGA-ROOF-MOUNT
VG4-A-PSU2	230 VAC transformer, 100 W, NEMA-rated	

Power Supply Box Accessories

Accessory	Description	For Use With
VG4-A-TSKIRT	Trim skirt	VG4-A-PSU0
VGA-SBOX-COVER	Replacement power supply cover	VG4-A-PSU1 VG4-A-PSU2

Fiber Optic Kits

The fiber optic kits extend the range that the AutoDome camera can receive commands and transmit video and data. Both fiber optic kits are designed to fit inside an AutoDome power supply with all necessary connections.

Kit	Description	For Use With
VGA-FIBER-AN	Analog Multimode Fiber Optic Kit	AutoDome 100/600 Series
VG4-SFPSCKT	Ethernet Media Converter Kit	AutoDome 700/800 Series

AutoDome 600 Series Accessories

These accessories fit inside certain AutoDome 600 Series housings and extend the AutoDome's installation and usage options.

Accessory	Description	For Use With
VG4-SHTR-XF	Extended temperature heater module	VG5-613-ECS VG5-614-ECS VG5-623-ECS VG5-624-ECS
VG4-MTRN-C	Alternative Protocol Communications Module	All AutoDome 600 Series Housings

Bubbles

Bubble	Description	For Use With
In-ceiling		
VGA-BUBBLE-CCLR	Clear rugged	AutoDome 100/600/700 Series
VGA-BUBBLE-CTIR	Tinted rugged	
VGA-BUBBLE-CCLA	Clear high-resolution	AutoDome 800 Series
VGA-BUBBLE-CTIA	Tinted high-resolution	
Pendant		
VGA-BUBBLE-PCLR	Clear rugged	All AutoDome Series pendant housings
VGA-BUBBLE-PTIR	Tinted rugged	
VGA-BUBBLE-PCLA	Clear high-resolution	
VGA-BUBBLE-PTIA	Tinted high-resolution	

Notes:

1. Rugged bubbles are made of impact-resistant polycarbonate.

2. High-resolution bubbles are made of low-impact acrylic.

Technical Specifications

Pendant Mounts

Dimensions

Indoor Pendant Mounts¹ (W x H x D)

VG4-A-PA0	169.5 x 366.4 x 469.1 mm (6.67 x 14.43 x 18.47 in.)
VG4-A-PA1	
VG4-A-PA2	
VGA-PEND-ARM	169.5 x 366.4 x 460.1 mm (6.67 x 14.43 x 18.12 in.)

Outdoor Pendant Mounts¹ (W x H x D)

VG4-A-PA0	224.0 x 366.4 x 549.6 mm (8.82 x 14.43 x 21.64 in.)
VG4-A-PA1	
VG4-A-PA2	
VGA-PEND-ARM	224.0 x 366.4 x 477.6 mm (8.82 x 14.43 x 18.8 in.)

Pendant Mount Accessories

VGA-PEND-WPLATE (W x H)	169.5 x 216.4 mm (6.67 x 8.52 in.)
VG4-A-9541 (W x H x D)	175.0 x 183.0 x 58.9 mm (6.9 x 7.6 x 2.3 in.)
VG4-A-9542 (W x H x D)	219.1 x 236.0 x 216.4 mm (8.63 x 9.3 x 8.52 in.)
VGA-ROOF-MOUNT (W x H)	1,022.4 x 1,190.8 mm (40.25 x 46.88 in.)
LTC 9230/01 (W x H)	254.0 x 254.0 mm (10.0 x 10.0 in.)

1. Dimensions include the mount and the connected pendant housings.

Power Supplies

Model	Input	Output Rating	Input Fuses	Output Fuses	
				Camera	Heater
VG4-A-PA0	24 VAC, 50/60 Hz	24 V @ 96 VA	5.0 A	2.0 A	3.15 A
VG4-A-PSU0					
VG4-A-PA1	120 VAC, 50/60 Hz	24 V @ 96 VA	1.6 A	2.0 A	3.15 A
VG4-A-PSU1					
VG4-A-PA2	230 VAC, 50/60 Hz	24 V @ 96 VA	0.8 A	2.0 A	3.15 A
VG4-A-PSU2					

Mechanical

Certifications	UL, CE, NEMA-rated, Plenum Rated
Dimensions (W x H x D), all models ²	170.0 x 216.4 x 105.0 mm (6.69 x 8.52 x 4.13 in.)
Construction Material	Cast Aluminum
Standard Color	White (RAL9003)
Standard Finish	Powder coated, sand finish

2. Dimensions for power supplies include the cover.

Model	Input	Output Rating	Input Fuses	Output Fuses
Environmental				
Operating Temperature	-60°C to 50°C (-76°F to 122°F)			
Humidity	0% to 100%, condensing			
Environmental Protection	IP 66, IK 8 (IEC 62262)			
Fiber Optic Kits				
VG4-FIBER-AN				
Description	Multimode Fiber Optic Module			
Compatible Receiver	LTC 4629 Series			
Optical Fiber Compatibility	50/125 µm, 62.5/125 µm, low loss multimode glass fiber, rated for a minimum system bandwidth of 20 MHz			
Max. Distance	4.0 km (2.5 miles)			
Optical Budget	14 dB			
Connector	One (1) ST connector			
Wavelength (video/data)	850 nm / 1310 nm			
VG4-SFPCKT				
Description	Fiber Optic Ethernet Media Converter kit. Requires a small form-factor pluggable (SFP) module (sold separately).			
Data Interface	Ethernet			
Data Rate	10/100 Mbps IEEE 802.3 Compliant Full Duplex or Half Duplex Electrical Port Full Duplex Optical Port			
Compatible Receiver	CNFE2MC			
Installation	Installed inside a VG4-A-PA1, VG4-A-PA2, VG4-A-PSU1 or a VG4-A-PSU2 power supply box with supplied mounting hardware			

SFP Modules

Description	Interchangeable modules available for use with MMF or SMF optical fiber.
Data Interface	Ethernet
Data Rate	10/100 Mbps IEEE 802.3 Compliant

Mechanical

Dimensions (W x H x D)	
• SFP-2 and SFP-3	13.5 x 8.5 x 55.5 mm (0.5 x 0.3 x 2.2 in.)
• SFP-23, SFP-24, SFP-25, SFP-26	13.5 x 8.5 x 63.8 mm (0.5 x 0.3 x 2.5 in.)
Weight (all SFP modules)	0.23 kg (.05 lb)

	Type	Connector	Wavelength (transmit/receive)	Max. Distance
SFP-2	MMF	Duplex LC	1310 nm / 1310 nm	2 km (1.2 miles)
SFP-3	SMF	Duplex LC	1310 nm / 1310 nm	20 km (12.4 miles)
SFP-23	SMF	Single SC	1310 nm / 1550 nm	60 km (37.3 miles)
SFP-24	SMF	Single SC	1550 nm / 1310 nm	60 km (37.3 miles)
SFP-25	MMF	Single SC	1310 nm / 1550 nm	2 km (1.2 miles)
SFP-26	MMF	Single SC	1550 nm / 1310 nm	2 km (1.2 miles)

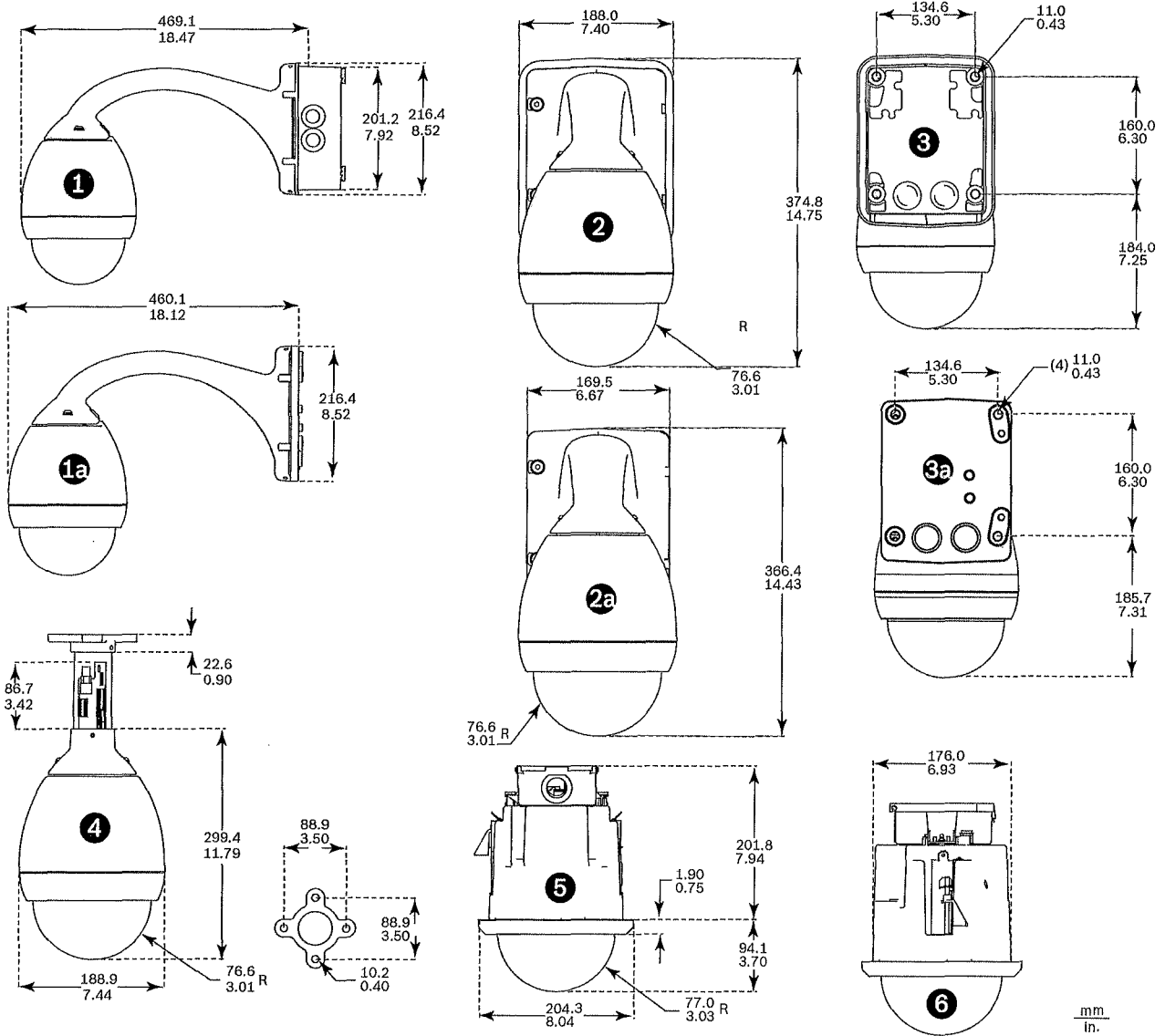
Fiber Compatibility

Optical Fiber Compatibility, MMF	50/125 µm MMF. For 50/125 µm fiber, subtract 4 dB from the specified optical budget value. Must meet or exceed fiber standard ITU-T G.651.
Optical Fiber Compatibility, SMF	8-10/125 µm SMF. Must meet or exceed fiber standard ITU-T G.652.
Optical Distance Specifications	Specified transmission distances are limited to the optical loss of the fiber and any additional loss introduced by connectors, splices, and patch panels. The modules are designed to operate over the entire optical loss budget range, so they do not require a minimum loss in order to operate.

Heating Module

VG4-SHTR-XT	Extended temperature heater module extends temperature range to -60°C (-76°F); for AutoDome 600 Series Outdoor Pendants only
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Dimensions: Indoor AutoDomes with Mounting Options

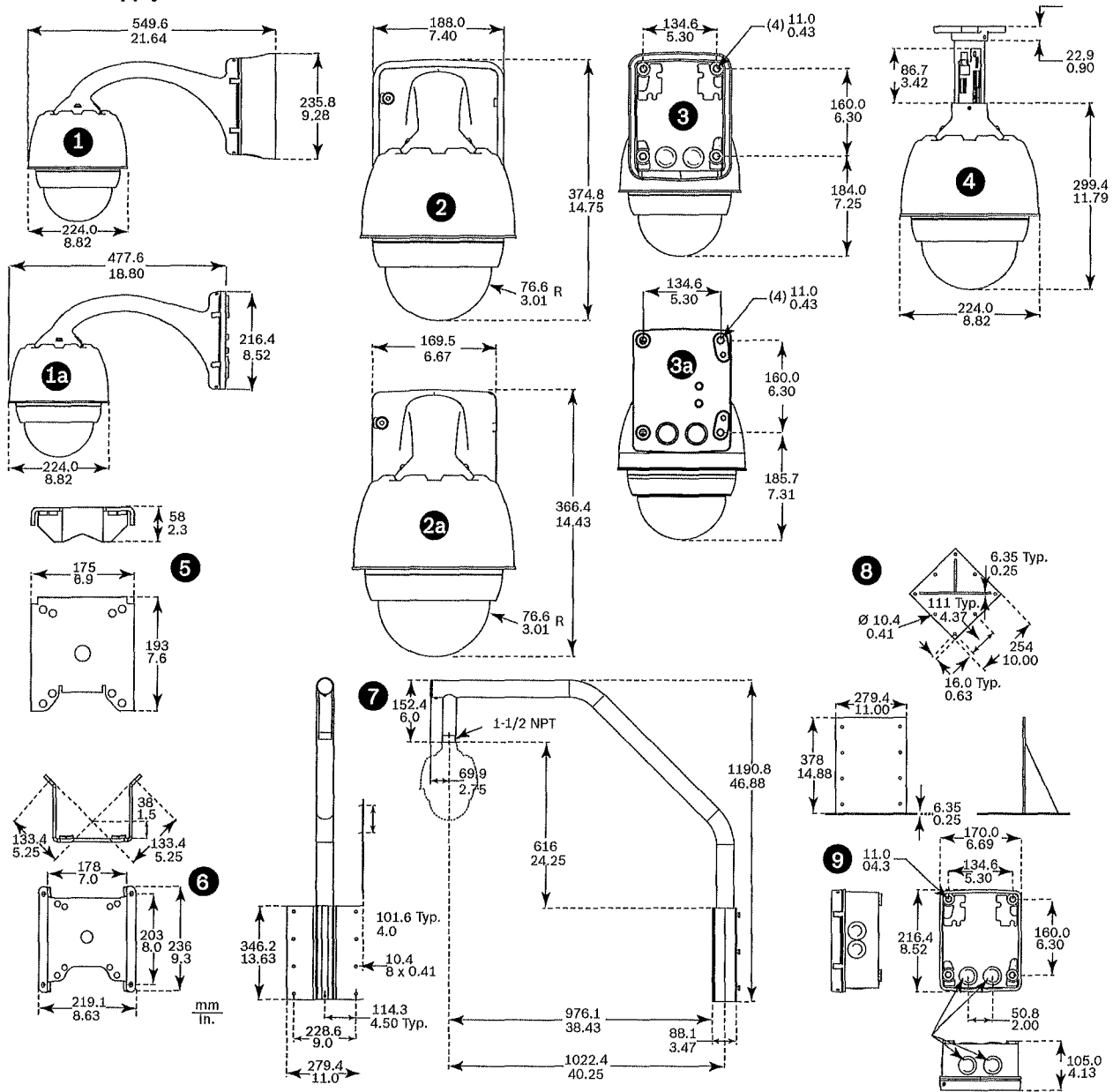


Indoor System Dimensions

Reference	Description
1	Wall Mount – Side with power supply
1a	Wall/Mast Mount – Side with VGA-PEND-WPLATE
2	Wall Mount – Front with power supply and trim skirt
2a	Wall Mount – Front with power supply
3	Wall Mount – Back with power supply and trim skirt

Reference	Description
3a	Wall Mount – Back with power supply
4	Pipe Mount
5	In-ceiling Mount – Front
6	In-ceiling Mount – Side

Dimensions: Outdoor AutoDomes with Mounting Options and Power Supply Box



Outdoor System Dimensions

Reference	Description
1	Wall Mount – Side with power supply and trim skirt
1a	Wall/Mast Mount – Side with VGA-PEND-WPLATE
2	Wall Mount – Front with power supply and trim skirt
2a	Wall Mount – Front with power supply
3	Wall Mount – Back with power supply and trim skirt
3a	Wall Mount – Back with power supply
4	Pipe Mount
5	Mast Mount

Reference	Description
6	Corner Mount
7	Roof Mount
8	Roof Mount Adapter
9	Power Supply for Pipe and Roof Mounts

Ordering Information

VG4-A-PA0 Pendant Arm Mount Pendant arm mount with power supply box for a AutoDome Series cameras, no transformer, white	VG4-A-PA0
VG4-A-PA1 Pendant Arm Mount with 120 VAC Transformer Pendant arm mount with power supply box for AutoDome Series cameras with a 120 VAC transformer, white	VG4-A-PA1
VG4-A-PA2 Pendant Arm Mount with 230 VAC Transformer Pendant arm mount with power supply box for AutoDome Series cameras with a 230 VAC transformer, white	VG4-A-PA2
VGA-PEND-ARM Pendant Arm with Wiring Compatible with an AutoDome Series pendant housing	VGA-PEND-ARM
VGA-PEND-WPLATE Mounting Plate Mounting plate for VGA-PEND-ARM, compatible with an AutoDome Series camera	VGA-PEND-WPLATE
VGA-ROOF-MOUNT Roof Mount Roof parapet mount, white (VG4-A-9543 Pipe Mount Cap required. Available separately.)	VGA-ROOF-MOUNT
LTC 9230/01 Flat Roof Mount Adapter For mounting a unit in an upright position on a flat surface for roof parapet mount VGA-ROOF-MOUNT	LTC 9230/01
VG4-A-9541 Pole Mount Adapter Pole mount adapter for a for an AutoDome Series pendant arm or a VEI-30 or NEI-30 Dinion Infrared Imager, designed for poles with a diameter of 100-380 mm (4-15 in.), white	VG4-A-9541
VG4-A-9542 Corner Mount Adapter Corner mount adapter for an AutoDome Series pendant arm or a VEI-30 or NEI-30 Dinion Infrared Imager	VG4-A-9542
VG4-A-9543 Pipe Mount Pipe mount, white, for an AutoDome Series pendant housing	VG4-A-9543
VGA-IP54K-IC IP54 In-ceiling Gasket Kit for AutoDome 100/600 Series Gasket kit for AutoDome 100 and 600 Series AutoDome In-ceiling mounts required for IP54 environmental rating	VGA-IP54K-IC
VGA-IP54K-IC78 IP54 In-ceiling Gasket Kit for AutoDome 700/800 Series Gasket kit for AutoDome 700 and 800 Series In-ceiling mounts required for IP54 environmental rating	VGA-IP54K-IC78
VGA-IC-SP In-ceiling Support Kit for AutoDome 100/600 Series Suspended ceiling support kit for AutoDome 100 and 600 Series AutoDome In-ceiling mounts	VGA-IC-SP

Ordering Information

VJR-A3-SP In-ceiling Support Kit for AutoDome 700/800 Series and AutoDome Junior HD Suspended ceiling support kit for AutoDome 700 and 800 Series and AutoDome Junior HD In-ceiling mounts	VJR-A3-SP
VG4-A-PSU0 24 VAC Power Supply Unit 24 VAC, 100 W, NEMA-rated, white, for an AutoDome Series camera	VG4-A-PSU0
VG4-A-PSU1 120 VAC Power Supply Unit 120 VAC, 100 W, NEMA-rated, white, for an AutoDome Series camera	VG4-A-PSU1
VG4-A-PSU2 230 VAC Power Supply Unit 230 VAC, 100 W, NEMA-rated, white, for an AutoDome Series camera	VG4-A-PSU2
VGA-SBOX-COVER Cover for AutoDome Power Supply Boxes	VGA-SBOX-COVER
VG4-SFIBER-MM Analog Multimode Fiber Optic Kit Analog multimode video transmitter/data receiver fiber optic kit	VG4-SFIBER-MM
VGA-FIBER-AN Analog Multimode Fiber Optic Kit Analog multimode video transmitter/data receiver fiber optic kit	VGA-FIBER-AN
VG4-SFPSCKT Fiber Optic Ethernet Media Converter Kit Ethernet media converter video transmitter/data receiver fiber optic kit	VG4-SFPSCKT
VG4-A-TSKIRT Trim Skirt for AutoDome Power Supply Boxes Trim skirt for the following AutoDome Series power supply boxes: VG4-A-PSU0F, VG4-A-PSU1, VG4-A-PSU1F, VG4-A-PSU2, VG4-A-PSU2F, VG4-SBOX-24VAC, VG4-SBOX-120VAC, and VG4-SBOX-230VAC	VG4-A-TSKIRT
VG4-SHTR-XT Heating Module Extended temperature heater module extends temperature range to -60°C (-76°F) for EnviroDomes and AutoDome 600 Series Outdoor Pendants only	VG4-SHTR-XT
VGA-BUBBLE-CCLR Clear Rugged Bubble for an In-ceiling Housing Impact resistant polycarbonate bubble	VGA-BUBBLE-CCLR
VGA-BUBBLE-CCLA Clear High-resolution Bubble for an In-ceiling Housing Low-impact acrylic bubble	VGA-BUBBLE-CCLA
VGA-BUBBLE-CTIR Tinted Rugged Bubble for an In-ceiling Housing Impact resistant polycarbonate bubble	VGA-BUBBLE-CTIR
VGA-BUBBLE-CTIA Tinted High-resolution Bubble for an In-ceiling Housing Low-impact acrylic bubble	VGA-BUBBLE-CTIA

Ordering Information

VGA-BUBBLE-PCLR Clear Rugged Bubble for a Pendant Housing Impact resistant polycarbonate bubble	VGA-BUBBLE-PCLR
VGA-BUBBLE-PCLA Clear High-resolution Bubble for a Pendant Housing Low-impact acrylic bubble	VGA-BUBBLE-PCLA
VGA-BUBBLE-PTIR Tinted Rugged Bubble for a Pendant Housing Impact resistant polycarbonate bubble	VGA-BUBBLE-PTIR
VGA-BUBBLE-PTIA Tinted High-resolution Bubble for a Pendant Housing Low-impact acrylic bubble	VGA-BUBBLE-PTIA
VG4-MTRN-C Alternative Protocol Communications Module	VG4-MTRN-C

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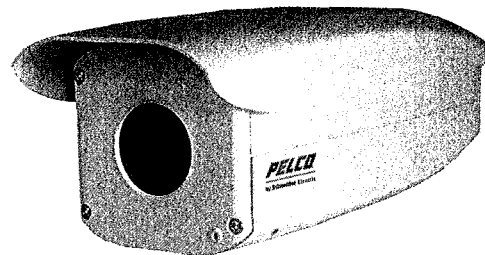
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- H.264 and MJPEG Compression
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- Built-in Analytics
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- Designed for Maximum Environmental Protection
- Compact, Lightweight Aluminum Construction



- Meets NEMA Type 4X and IP66 Standards
- Complete with Sun Shroud and Heater/Defroster

Camera

The **Sarix® TI Series Fixed Thermal IP Camera** is an advanced thermal imaging system designed for easy integration into any new or existing video security application. The system is designed to provide detection, recognition, and identification of people and vehicles in any lighting condition, including complete darkness. Every **Sarix TI Series** features IP or analog outputs in the same package and an integrated environmentally protected IP66 rated enclosure. Additionally, when used in an IP system, the **Sarix TI Series** features a full suite of designed-for-thermal analytics.

At the core of the **Sarix TI Series** is an uncooled sun-safe microbolometer, long-wavelength infrared (LWIR) camera that delivers up to 640 x 480 thermal video. These cameras feature an amorphous silicon detector, which has lower fixed pattern noise and a more uniform response than vanadium oxide detectors, while still maintaining high resolution and sensitivity when exposed directly to the sun during normal daylight hours.

The **Sarix TI Series** provides outstanding sensitivity below 50 mK at f/1.0. It is capable of multiple display formats, including white hot, black hot, and color signatures. The **Sarix TI Series** is available with multiple lens configurations for effective deployment in a wide range of applications.

The **Sarix TI Series** is available in 640 x 480, 384 x 288, or 160 x 120 resolution formats. The fixed camera has an input voltage of 24 VAC or 24 VDC.

In IP installations, the **Sarix TI Series** can support two simultaneous video streams. The two streams can be compressed in MJPEG and H.264 formats across several resolution configurations. The streams can be configured to a variety of frame rates, bit rates, and group of pictures (GOP) structures for additional bandwidth administration. When used in analog installations, the **Sarix TI Series** supports analog video output.

The powder-coated aluminum enclosure makes the **Sarix TI Series** ideal for either indoor or outdoor applications. The system has a sustained operating temperature range of -40° to 50°C (-40° to 122°F). A built-in heater/defroster and sun shroud are standard features on the **Sarix TI Series**.

Built-in Analytics

Pelco® Analytics enhance the flexibility and performance of the **Sarix TI Series** when used in an IP video system. Pelco Analytics are easy to configure for alarm notification when used with Endura® or a third-party system that supports Pelco's Analytics API system.

Web Interface

The **Sarix TI Series** uses a standard Web browser for powerful remote setup and administration.

PELCO

by Schneider Electric

12/14/2011

International Standards
Organization Registered Firm:
ISO 9001 Quality System
ISO 9001
CERTIFIED

C1316 / NEW 9-27-11

TECHNICAL SPECIFICATIONS

PELCO ANALYTICS

The Sarix TI Series includes five user-configurable behaviors. The camera is capable of running up to three behaviors simultaneously; although, the number of behaviors is limited to the available processing power of the camera and the type of analytic being used.

Note: Available processing power is determined by the settings for compression standards, resolution, image rate, bit rate, and analytic configuration. For each behavior, you can create several custom profiles that contain different camera settings. With these profiles, you can set up different scenarios for the behavior, which will automatically detect and trigger alarms when specific activity is detected.

Pelco Analytics are configured and enabled using a standard Web browser, and Pelco behaviors are compatible with Endura or a third-party system that supports Pelco's Analytics API system. Multiple Pelco analytics can be scheduled to work during a certain time or condition. For example, during the day, a camera can be configured with Object Counting to count the number of people that enter a lobby door. At night, the operator can change the profile to Camera Sabotage to trigger an alarm if a camera is moved or obstructed. Each suite includes the following behaviors:

- **Adaptive Motion:** Detects and tracks objects that enter a scene and then triggers an alarm when the objects enter a user-defined zone or cross a trip wire. This behavior is primarily used in outdoor environments with light traffic to reduce the number of false alarms caused by environmental changes.
- **Camera Sabotage:** Detects contrast changes in the field of view. An alarm is triggered if the lens is obstructed with spray paint, a cloth, or covered with a lens cap. Any unauthorized repositioning of the camera also triggers an alarm.
- **Loitering Detection:** Identifies when people or vehicles remain in a defined zone longer than the user-defined time allows. This behavior is effective in real-time notification of suspicious behavior around ATMs, stairwells, and school grounds.
- **Object Counting:** Counts the number of objects that enter a defined zone or cross a trip wire. This behavior might be used to count the number of people at a store entrance/exit or inside a store where the traffic is light. This behavior is based on tracking and does not count people in a crowded setting.
- **Stopped Vehicle:** Detects vehicles stopped near a sensitive area longer than the user-defined time allows. This behavior is ideal for airport curbside drop-offs, parking enforcement, suspicious parking, traffic lane breakdowns, and vehicles waiting at gates.

THERMAL CAMERA/OPTICS

Detector	Sun-safe, uncooled microbolometer, amorphous silicon
Array Format	640 x 480, 384 x 288, or 160 x 120
Pixel Size	
640 x 480	17 µm
384 x 288, 160 x 120	25 µm
Effective Resolution	307,200 (640 x 480); 110,592 (384 x 288); 19,200 (160 x 120)
Spectral Response	7.5 to 13.5 µm, LWIR
Normalization Source	Internal shutter (offset only), 0.3 second video freeze during shutter
Temporal NETD	50 mK at f/1.0
Display Formats	White hot, black hot, and rainbow

LENS

640 x 480 Resolution		
Lens (mm)	F-Number (f)	Field of View (H/V/D)
14.25	1.3	44° x 33° x 54°
35	1.4	18° x 13° x 22°
50	1.7	12° x 9° x 15°
100	1.6	6° x 5° x 8°
384 x 288 Resolution		
14.25	1.3	39° x 29° x 48°
35	1.4	16° x 12° x 19°
50	1.7	11° x 8° x 14°
100	1.6	6° x 4° x 7°
160 x 120 Resolution		
6.30	1.2	55° x 41° x 68°

VIDEO

IP/NETWORK

Video Encoding	H.264 High, Main, or Base profiles and MJPEG
Video Streams	Up to 2 simultaneous streams; the second stream is variable based on the setup of the primary stream
Frame Rate*	Up to 30, 25, 24, 15, 12.5, 12, 10, 8, 7.5, 6, 5, 4, 3, 2.5, 2, 1 (dependent upon stream configuration)
Available Resolutions	640 x 480, 384 x 288, and 160 x 120
Supported Protocols	TCP/IP, UDP/IP (Unicast, Multicast IGMP), UPnP, DNS, DHCP, RTP, RTSP, NTP, IPv4, SNMP, QoS, HTTP, HTTPS, LDAP (client), SSH, SSL, SMTP, FTP, and 802.1x (EAP)
Users	
Unicast	Up to 20 simultaneous users depending on resolution settings (2 guaranteed streams)
Multicast	Unlimited users H.264
Security Access	Password protected
Software Interface	Web browser view and setup
Pelco System Integration	Endura 2.0 (or later) Digital Sentry® 4.2 (or later)

ANALOG

Video Port	75 ohms, unbalanced
Video Modes	NTSC or PAL
Video Level	1 Vp-p

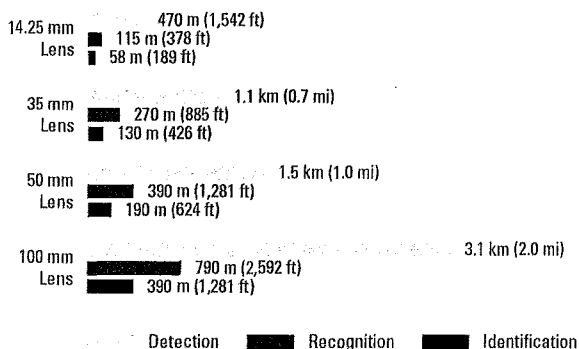
*Some models are limited to 8.33 ips to comply with US government export control regulations.

TECHNICAL SPECIFICATIONS

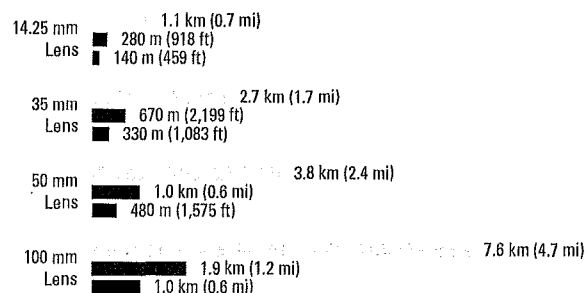
RANGE PERFORMANCE*

640 x 480

Detection, Recognition, and Identification of a Human Target[†]

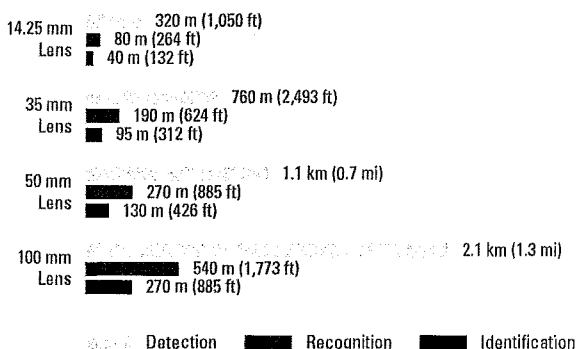


Detection, Recognition, and Identification of a Vehicle Target[†]

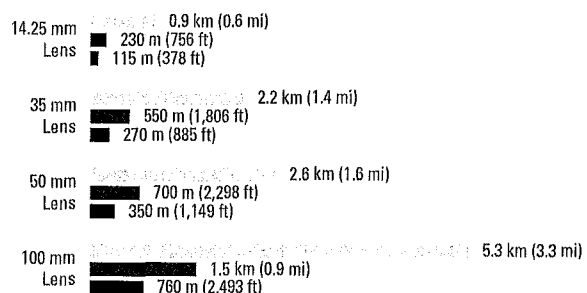


384 x 288

Detection, Recognition, and Identification of a Human Target[†]

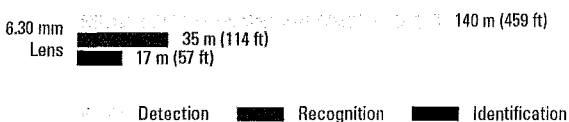


Detection, Recognition, and Identification of a Vehicle Target[†]

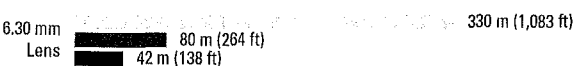


160 x 120

Detection, Recognition, and Identification of a Human Target[†]



Detection, Recognition, and Identification of a Vehicle Target[†]



*Range performance can vary based on camera setup, user experience, environmental conditions, and display type used. Calculations are based on 2°C (36°F) difference, 50 percent probability of target detection, and 0.85/km atmospheric attenuation factor.

[†]The number of pixels on target are assumed to be 1.5 pixels for detection, 6 pixels for recognition, and 12 pixels for identification; the size of a human target is assumed to be 1.8 m (5.9 ft) vertical and 0.5 m (1.6 ft) horizontal; the size of a vehicle target is assumed to be 2.3 m (7.6 ft) vertical and 2.3 m (7.6 ft) horizontal.

TECHNICAL SPECIFICATIONS

MODELS*

Lens	Format	Resolution		
		640 x 480	384 x 288	160 x 120
6.30 mm	NTSC	—	—	T1106
	PAL	—	—	T1106-X
14.25 mm	NTSC	T1614	T1314	—
	PAL	T1614-X	T1314-X	—
	PAL, 8.33 ips	T1614-X1	T1314-X1	—
35 mm	NTSC	T1635	T1335	—
	PAL	T1635-X	T1335-X	—
	PAL, 8.33 ips	T1635-X1	T1335-X1	—
50 mm	NTSC	T1650	T1350	—
	PAL	T1650-X	T1350-X	—
100 mm	NTSC	T16100	T13100	—
	PAL	T16100-X	T13100-X	—
	PAL, 8.33 ips	T16100-X1	T13100-X1	—

*Some models may be subject to US government export control regulations.

ELECTRICAL

Port	RJ-45 connector for 100Base-TX, auto MDI/MDI-X	
Cabling Type	Cat5 or better for 100Base-TX	
Power Input	24 VAC or 24 VDC	
Input Voltage Range	±10%	
Power Consumption	Lens (mm)	Power
24 VAC	6.30, 14.25, 35, 50; 100	1.30 A, 30 VA (22 W); 3.8 A, 90 VA (82 W)
24 VDC	6.30, 14.25, 35, 50; 100	0.90 A (22 W); 3.50 A (85 W)
Current Consumption	<750 mA nominal; <1.2 A maximum	
Local Storage	Micro SD	
Alarm Input	10 VDC maximum, 5 mA maximum	
Alarm Output	0 to 15 VDC maximum, 75 mA maximum	
Audio	Bidirectional, half duplex; line level/external microphone input; 600 Ohm differential; 1 V _{p-p} maximum signal level	
Compression	G.711 PCM 64 kbps	

MECHANICAL

Latching	2 captive Torx™ screws
Cable Entry	2 adjustable 0.5-inch NPT liquid-tight glands

GENERAL

Construction	Aluminum	
Finish	Gray polyester powder coat	
Environment	Indoor/outdoor	
Operating Temperature	-40° to 50°C (-40° to 122°F)	
Storage Temperature	-40° to 60°C (-40° to 140°F)	
Weight	Unit	Shipping
6.30 mm	3.1 kg (6.9 lb)	4 kg (9 lb)
14.25 mm	3.1 kg (6.9 lb)	4 kg (9 lb)
35 mm	3.2 kg (7.2 lb)	4 kg (9 lb)
50 mm	3.3 kg (7.3 lb)	4 kg (9 lb)
100 mm	3.4 kg (7.5 lb)	4 kg (9 lb)

Pelco by Schneider Electric

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www.pelco.com

RECOMMENDED MOUNTS

Ceiling/Pedestal

EM1009U, EM1015U Medium duty ceiling/pedestal mount

Wall

EM1450 Light duty wall mount
 EM1900U Medium duty wall mount

Pipe/Pole

EM1109 Medium duty pedestal mount for horizontal or vertical pipe/pole applications
 EM2000 Medium duty mount for vertical applications

RECOMMENDED POWER SUPPLIES

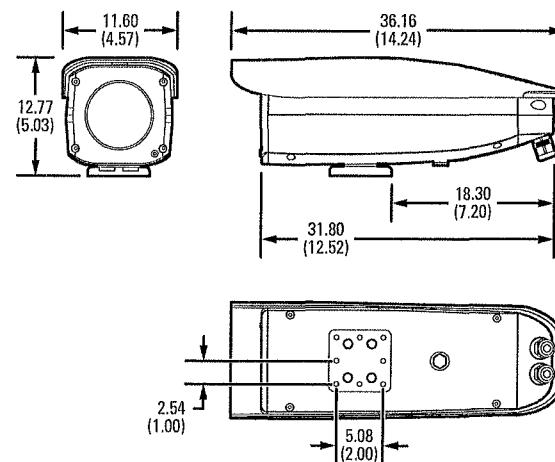
WCS1-4 Outdoor camera power supply, 100/120/240 VAC input; one 24/26/28 VAC output; total current capacity of 4 A (100 VA)
 WCS4-20 Outdoor multiple camera power supply, 120/240 VAC input; four fused 24/28 VAC outputs; total current capacity of 20A(480VA)

CERTIFICATIONS/RATINGS/PATENTS†

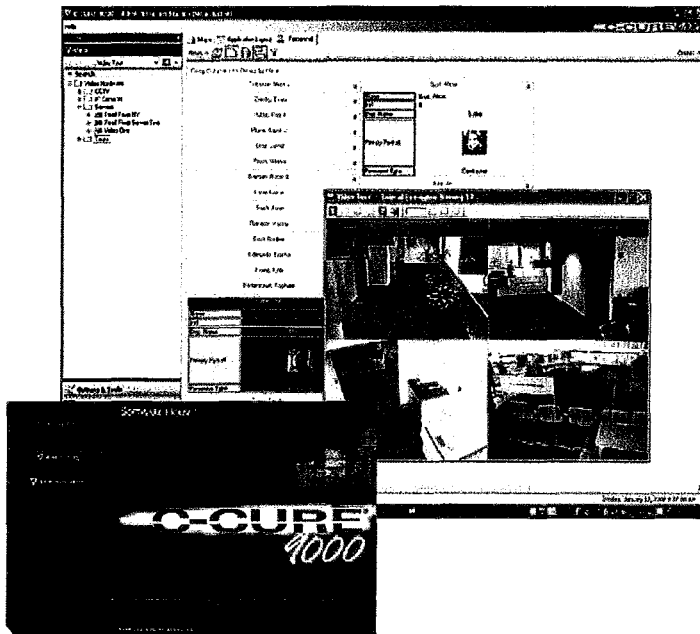
- CE, Class A
- FCC, Class A
- UL Listed
- C-Tick
- Meets NEMA Type 4 and IP66 standards
- Patents are pending
- Shock and Vibration, Meets NEMA TS 2; IEC613736-8, -9, -10

†As of the date of this publication, all certifications are pending. Please consult the factory, our Web site at www.pelco.com, or the most recent B.O.S.S.® update for the current status of certifications.

NOTE: VALUES IN PARENTHESES ARE INCHES; ALL OTHERS ARE CENTIMETERS.



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C•CURE 9000 is a powerful security and event management system that provides IT standard tools and innovative distributed architecture.

Leveraging Microsoft's sophisticated .NET v3.5 technology, the C•CURE 9000 platform offers native encryption and XML data transfer, making it one of the fastest, most secure systems in the industry.

With unsurpassed integration capabilities, advanced alarm routing, and remote access for system administration and monitoring via a light client, C•CURE 9000 provides one of the richest communication platforms in any industry. For extremely effective information management, C•CURE 9000 supports multiple layouts and monitoring station panes in the same windows. This enables you to focus on system activity, while another window displays your live video.

Drawing from the powerful .NET platform, integrating applications with your access system is extremely easy. Integrate an

C•CURE 9000

Security and Event Management System

Features That Make a Difference:

- **NEW!** Control and monitor areas with anti-passback
- **NEW!** Significantly enhance security with intrusion zones and keypad commands
- **NEW!** Manage personnel, access dynamic views, and monitor system activity from any remote location using C•CURE 9000 Web Client
- **NEW!** Supports iSTAR Edge two-reader IP controller
- Control security objects directly from the monitoring station or from graphical CAD-based maps
- Dynamically change views, reorder columns, and modify and filter data from a single screen
- Easily drag and drop cameras directly to the interface
- Share a single database while retaining security and privacy of your own information with partitioning
- Access and leverage LDAP compliant data sources such as Microsoft® Active Directory®
- Create a virtual hub of integrated applications with the industry's most powerful Software Development Kit (SDK)
- Achieve a higher level of system scalability by linking multiple C•CURE 9000 application servers
- Easily create sophisticated badges
- Integrates with American Dynamics Intellex and VideoEdge solutions
- Integrates with Wireless Access System and C•CURE Mobile
- Developed from the ground up using Microsoft .NET framework
- Supports industry-leading Microsoft SQL Server 2005 and Oracle® 10g databases

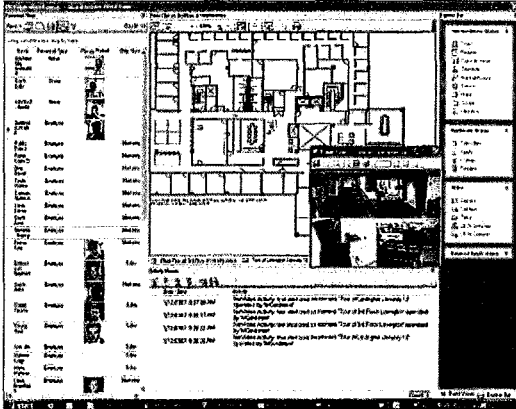
unlimited number of other business applications using the same GUI, navigation, driver interfaces, etc. with the C•CURE 9000 Software Development Kit (SDK). This kit is available through the "Software House Connected" platform integration program. The SDK provides the essential tools to develop hardware and software applications that communicate seamlessly with C•CURE 9000.

C•CURE 9000 provides advanced security with a built-in Lightweight Directory Access Protocol (LDAP) general connection. This allows a user to connect to many external data sources including industry-leading Microsoft Active Directory.

With C•CURE 9000 Web Client, you can manage personnel, display dynamic views, and monitor system activity directly from any PC with a web browser from anywhere in the world. Web Client allows you to perform a wide range of tasks such as creating/modifying cardholders, and monitoring alarms/events while away from the workstation. Refer to the C•CURE 9000 Web Client data sheet on www.swhouse.com for more detailed information.

features

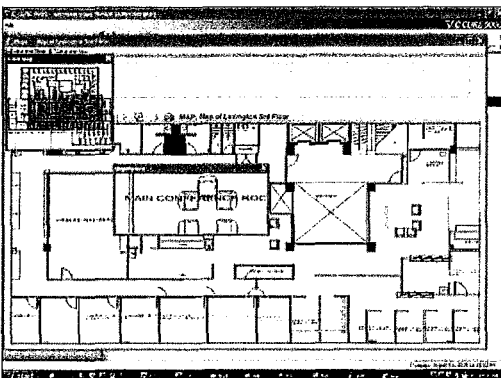
Customizable Integrated Monitoring Station
C•CURE 9000 offers preconfigured layouts or an empty palette for each administrator to customize. Drag and drop different viewers - some that represent objects like video tours and specific types of activities, live camera views, dynamic views of system activity, or configuration data, even the Windows Explorer bar to make navigation very easy.



The most powerful thing about the monitoring station is that each pane is live and interactive. With appropriate permissions, you can manipulate data fields and change views, navigate around maps, launch a video tour, perform quick searches and queries—all in real time, all from one interface.

Scalable, Editable Maps

Import CAD (.dwg, .dxf) or raster files (.bmp, .jpg, etc.) and populate complex floor plans with your security objects. All original CAD layers are immediately visible or can be hidden for easy viewing. Create new layers and drag and drop security objects such as cameras, tours, inputs/outputs, and more directly to your drawing with scalable icons. One-click magnification and tracking views provide the ability to manage and navigate around your floor plans. For expansion projects, easily update or replace your CAD drawings without having to add security icons again.



Area Control and Monitoring with Anti-Passback

With hard or timed anti-passback, you can enhance security by preventing an authorized user from presenting a credential to access an area, and then passing it back to an unauthorized user, who then uses the same credential to access the building. The more secure, hard anti-passback requires both an entry and exit reader to enable the system to determine whether a card is in or out of an anti-passback-protected area while timed anti-passback allows an authorized user to be bound by anti-passback restrictions only for a specific amount of time. You can even configure the system to activate events such as sounding an alarm for anti-passback entry and exit violations.

Intrusion Zones and Keypad Commands Enhance Security

Grouping inputs and doors into intrusion zones allows you to easily arm and disarm alarm monitoring points (inputs) in a defined area. An entire facility or a portion thereof may comprise an intrusion zone. Grouping inputs and doors into intrusion zones allows easy collective arming and disarming of inputs, as well as locking and unlocking groups of doors while displaying their current mode and status. Leveraging the intrusion zone feature, keypad commands allow a user to remotely activate cameras, doors, and other events as well as trigger a duress call right from a reader keypad. Additionally, triggering a duress call, sounding an alarm, and more can be performed all from a reader keypad connected to an iSTAR controller. Keypad commands can be configured to require card presentation and/or a PIN to validate the command.

Highly Secure Database Partitioning

Independent companies can share a single database while, at the same time, partitioning that database to maintain the security and privacy of their individual organization. Users can specify to which multiple partitions they share privileges - doors, clearances, etc. The partitioning of information includes everything from personnel to video and hardware configuration.

Exceptionally Reliable Security

C•CURE 9000 provides FIPS 197-approved encrypted communication between the client and server, while Microsoft Windows single sign-on, field-level audit, and authentication of historical log content feature a digital signature on each event. This allows administrators to detect additions, modifications, or deletions of data which is critical in order to maintain compliance with regulations, such as Sarbanes-Oxley, HIPAA, and 21-CFR Part 11. Distributed

architecture and support for Microsoft SQL Server 2005 and Oracle 10g provide powerful inherent data redundancy.

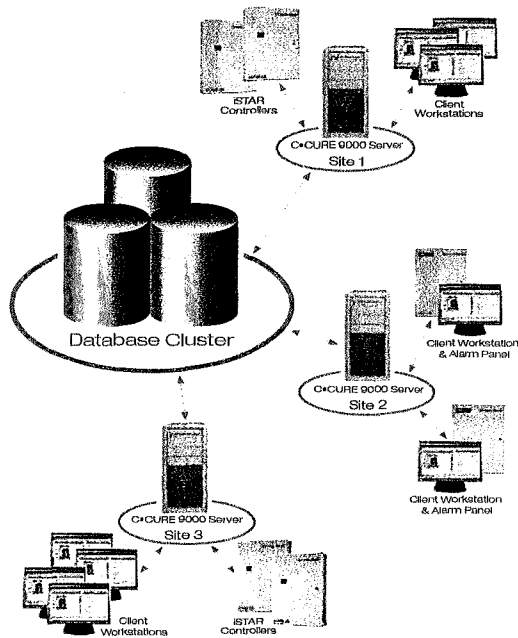
C•CURE 9000 supports extended card numbers which allow users in government applications to comply with certain federal guidelines that require a multi-field CHUID. Additionally, C•CURE 9000 can be used in a TWIC environment.

Complete Flexibility and Scalability Answers the Evolving Needs of an Enterprise

Distributed architecture and cutting edge technology provide efficient communication across a WAN, making it faster and easier to automatically update enterprise-wide systems directly from the application server.

The Multiple Application Server option allows you to configure multiple C•CURE 9000 servers to access the same C•CURE 9000 database, whether grouped locally or distributed regionally. Each application server communicates back to the central Microsoft SQL database. This enables you to better manage a growing volume of controllers, peripheral devices (DVMS, IP cameras, or NVRs), and monitor and administer clients in various locations. This feature also enables central monitoring and reporting across one, any, or all application servers on the system.

Multiple Application Server Diagram



C•CURE 9000 supports the entire suite of Software House iSTAR and apC controllers¹ as well as SimplexGrinnell Ethernet ISC panels.

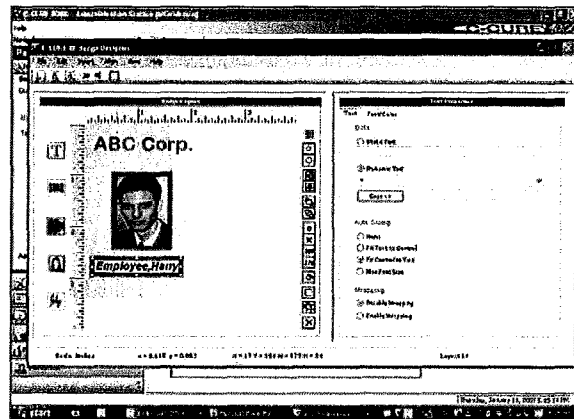
(1) Minimum memory specification for apCs: 512k for apC/L and 1 MB for apC and apC/BX

Easily Migrate C•CURE 800/8000 Data

The C•CURE 9000 optional migration utility allows you to easily bring your important C•CURE 800/8000 data into C•CURE 9000. Data includes: cardholder information (including credentials and images), clearances, time specifications, readers, inputs, outputs, iSTAR and apC panels¹, doors, door groups, events, and actions.

Easily Create Sophisticated Badges

Leveraging a "What You See is What You Get" (WYSIWYG) badge designer, this solution offers superior control over color and easy manipulation of graphics. With a powerful Expression Builder, you can easily create expressions that simplify badge creation. Uncomplicated query features allow you query a common field and then print those cards found by the query in one batch.



With the smart card enrollment solution, you can read and/or reprogram multiple smart card formats such as MIFARE[®] (1K & 4K cards), iCLASS[®], and DESFire[®]. These cards can be programmed with a wide range of data depending on the protocol of each card type for critical security purposes and/or value add-ons such as vending, parking, etc. Refer to the C•CURE ID datasheet on www.swhouse.com for more detailed information.

C•CURE 9000 System Capacities

	SERIES L	SERIES M	SERIES N	SERIES P	SERIES Q	SERIES R	SERIES R PLUS	SERIES S
# of Online Readers	16	32	64	128	256	512	1,000	2,500+
# of Online Inputs	64	128	256	512	1,024	2,500	5,000	10,000+
# of Online Outputs	64	128	256	512	1,024	2,500	5,000	10,000+
# of Credentials	7,000	12,000	40,000	45,000	250,000	250,000	250,000	500,000
# of Simultaneous Clients ²	6	9	12	30	40	70	128	256
# Standard Badging Clients	1	1	1	1	2	3	5	10

Essential Features Included with All C•CURE 9000 Series

- Activity Journal
- Automated Import
- CCTV Integration
- Configuration Templates
- Double Swipe
- Elevator Support
- Extended Card Number Support (Government Cards)³
- Field Level Auditing
- Graphical Maps
- Keypad Commands
- Intrusion Zones
- Multiple Card Support
- Multiple Guard Station GUIs
- Multiple Time Zones
- NetVue Integration with Intellex DVMS and VideoEdge NVR
- Notification by Email
- Oracle 10g Support
- Partitioning
- Push Install of Clients
- Single Sign-On Authentication
- Smart Card Program/Enrollment
- System Backup of Database and Journals

System Options that Expand the Power of C•CURE 9000

- Multiple Application Server⁴
- Tools for In-country Localization⁵
- Web Client⁵
- C•CURE Mobile⁶
- Built-in LDAP Connection
- Migration Tool for Cardholder Data
- "Software House Connected" Program Drivers⁷
- Integration with Wireless Access System

C•CURE 9000 Server

Recommended Minimum Requirements

Processor Intel Pentium IV/Xeon
(3.4 GHz or greater with 64-bit CPU)

Hard Disk Drives

Series L-N Dual drives: primary drive = 80 GB
secondary drive = 80 GB
Series P-S Dual drives: primary drive = 100 GB
secondary drive = 100 GB

Memory

Series L-N 4 GB RAM
Series P-S 4 GB RAM

Network Adapter Card 100/1000 MB/sec
DVD Drive Required

Operating System

Series L-N Windows Server 2008 Standard, Windows Server
2003 Standard SP2, or Windows XP Professional SP3;
32-bit native
Series P-S Windows 2008 Standard Enterprise and Windows 2003
Enterprise Server SP2; 32-bit native
Web Server IIS v6.0 or higher

Database

Series L-N SQL Server 2005 Express Edition
Series P-S SQL Server 2005 Standard Edition,
Oracle 10g (v10.2.0.1 and higher)
Video Card Dedicated 256 MB accelerated video card⁸

C•CURE 9000 Client Workstation

Recommended Minimum Requirements

Processor Intel 3.4 GHz or greater with 64-bit CPU
Hard Disk Drive 100 GB at 7200 RPM
Memory 2 GB RAM
Network Adapter Card 100/1000 MB/sec
DVD Drive Required
Operating System Windows XP Professional SP3 or Windows Vista⁸
Business or Enterprise Editions; 32-bit native
Video Card Dedicated 256 MB accelerated video card⁸

(2) Client License = single monitoring station application OR administration application
(3) Not available with Series L
(4) Maximum of three; not available with Series L, M, N, and P
(5) Included with Series S
(6) C•CURE Mobile requires Windows Server 2003
(7) Contact sales for a complete list of available "Software House Connected" program drivers
(8) For multiple screen display or other display applications, additional video cards may be required

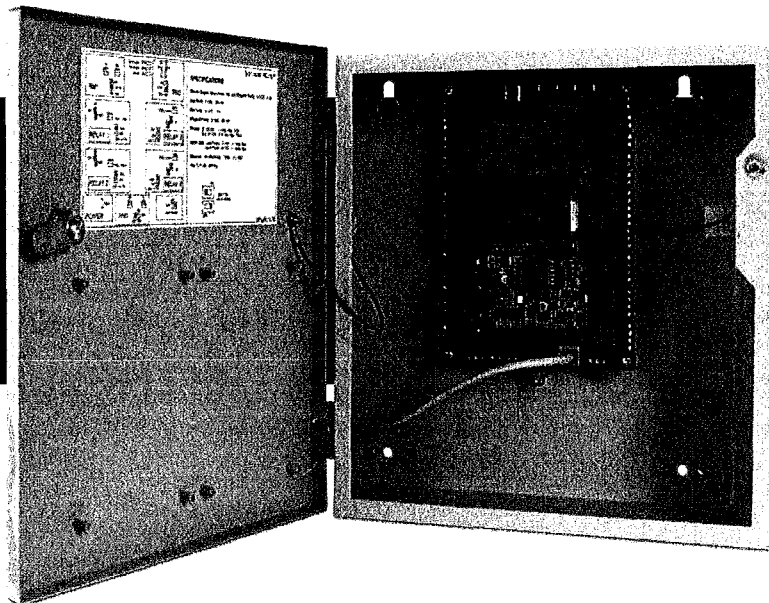
Product offerings and specifications are subject to change without notice. Actual products may vary from photos. Not all products include all features. Availability varies by region; contact your sales representative. Certain product names mentioned herein may be trade names and/or registered trademarks of other companies.

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SOFTWARE HOUSE

A Tyco International Company

iSTAR Edge Two- or Four-Reader IP Edge Device



Features That Make a Difference:

- Controls and powers all access control devices at the door to minimize installation costs
- Optional Power over Ethernet (PoE) plug-in module features PoE (802.3af) and PoE Plus (802.3at) with enough power for two doors
- Powerful iSTAR feature set including anti-passback and advanced peer-to-peer clustering
- Localized access control decision making with storage for over 400,000 personnel records
- Full complement of inputs/outputs for two doors plus optional I/O expansion modules
- Dedicated input for fire alarm interlock releases door locks during fire conditions
- Flash new firmware directly from the host for the latest functionality
- Local LCD and LEDs provide clear startup and troubleshooting information
- Onboard 256-bit AES network encryption
- Fully compatible with C•CURE 9000, and other Software House hardware devices
- C•CURE 800/8000 compatible with two-reader version only

iSTAR Edge is a powerful, two- or four-reader IP edge device that provides a strong feature set to secure any door. These features include advanced iSTAR clustering, peer-to-peer communication, intrusion zones and keypad commands, extended card numbers, advanced door monitoring, and anti-passback. Its optional Power over Ethernet (PoE) module provides ample power for two doors, and allows the iSTAR Edge to leverage existing network infrastructure to reduce installation costs.

iSTAR Edge increases overall system reliability by providing localized decision-making at each door with a robust local cardholder database of over 400,000 and local alarm and event buffering in the event communication to the host is unavailable.

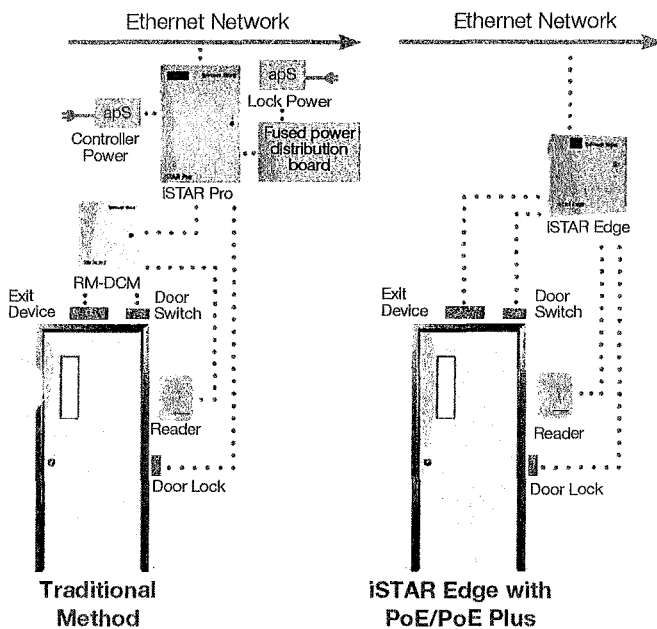
iSTAR Edge communicates with C•CURE systems and other Software House controllers to provide even the most demanding customers with a solution they can use across their entire corporation. Whether installed at the corporate headquarters with thousands of employees, or at the regional sales branches with only a few employees, iSTAR Edge ensures that the same security policies and procedures are implemented at each location.

iSTAR Edge has been designed to drastically lower installation and startup costs. Embedded lock power management, including powered (wet) lock outputs with individual resettable fused protection, eliminates the need for additional power supplies and fused power distribution boards normally required for traditional installations. Combined with removable connectors, a local display for quick troubleshooting, and status LEDs, iSTAR Edge streamlines even the toughest installation. Furthermore, with remote web diagnostics, you can find and fix performance issues anywhere in your facility using a web browser.

The iSTAR Edge enclosure has expansion capability for up to two input/output modules, and is protected with a built-in tamper switch to ensure the controller is not accessed by unauthorized personnel. Security risks are significantly reduced with encrypted communications and denial-of-service protection against network intrusion, making iSTAR Edge a highly secure network device – perfect for even the most cautious IT manager.

PoE Plus and Embedded Power Management Lower Installation Costs

iSTAR Edge features both PoE and PoE Plus capabilities which allows you to use your existing network to power two doors. While PoE provides enough power for one door and one to two readers, PoE Plus allows for up to 25.5W of power, enough for two doors and associated readers, locks, local annunciators, and exit devices. Wiring and equipment costs are lowered dramatically with PoE technology, and since PoE is provided as an optional module, you only pay for PoE when you need it.



By providing powered (wet) lock outputs that power locks and other devices directly, iSTAR Edge eliminates the need for additional interposing relays and distribution boards. Each output is protected with a resettable PTC fuse, transzorb and snubber, and can supply up to 0.75 A of current. When powered through PoE or PoE Plus, the output voltage level is 12 V, and when powered with a local DC source, the output voltage follows the input voltage (12 or 24 VDC). Each output can be switched between wet and dry for ultimate flexibility.

Easy to Setup with DHCP/DNS/WINS

iSTAR Edge supports Dynamic Host Configuration Protocol (DHCP) to simplify installation. For easy setup, iSTAR Edge also support Domain Name System (DNS), which translates domain names into IP addresses, and Windows Internet Naming Service (WINS), a system that determines the IP address associated with a particular computer on the network.

Ensure Effective Communication with Clusters

iSTAR Edge features advanced peer-to-peer cluster communications so that controllers can communicate with each other without requiring host intervention. A single connection from the host supports multiple controllers through a TCP/IP subnet. User-defined groups of up to 16 controllers (clusters) can be created to enhance security by separating a widely dispersed facility into different controlled areas. A cluster is led by a master controller which manages the primary communication between the host computer and the remaining controllers within the cluster. The master controller communicates all event and cardholder data between the cluster and the C•CURE 9000 host.

Additionally, controllers within a cluster can communicate through the master to link events and control anti-passback in the area secured by the cluster. To ensure constant security, clusters also feature a secondary communication path in the event the master controller loses communication with the network.

Keypad Commands and Extended Card Numbers Enhance Security

Keypad commands provide a powerful way to activate events such as triggering a duress call, sounding an alarm, locking and unlocking doors - directly from an RM reader keypad. Commands can be configured to require a card presentation and/or a PIN to validate the command.

iSTAR Edge supports extended card numbers, which help with compliance with certain U.S. federal guidelines (such as FIPS 201) that require a Cardholder Unique Identifier (CHUID). In addition, iSTAR Edge supports card numbers of up to 256 bits, eliminating the need for multiple facility codes, site codes, or offset in order to avoid card duplication. Longer card numbers offer greater protection against card duplication and are especially valuable to customers who require card numbers that exceed ten digits.

Built-in Fire Alarm Interlock Improves Life Safety

A dedicated input for a fire alarm tie-in automatically releases selected door lock outputs in the event of a fire condition. The fire input may be unsupervised or supervised, and the release circuit does not require software programming for operation. In addition, a second input for a manual keyswitch is provided, such that the door lock outputs will not re-energize unless a fire fighter confirms the safety of the building via the keyswitch. The keyswitch functionality is enabled via an onboard dip switch.

Take a closer look

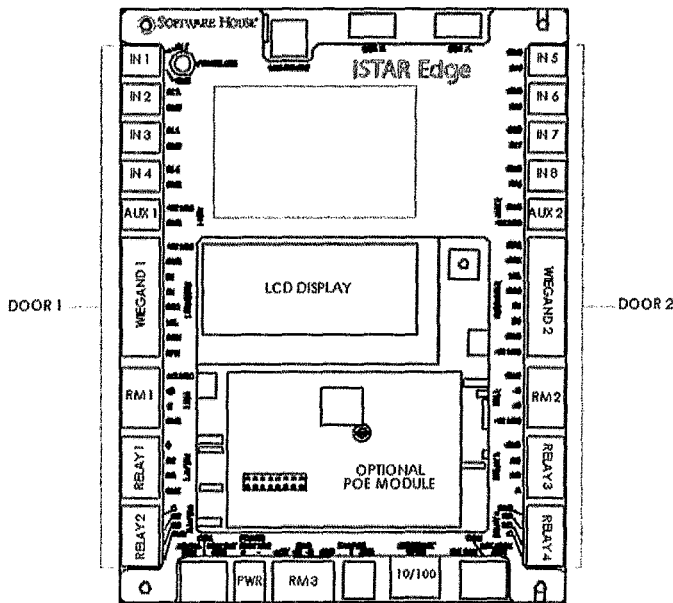
Flexible Card Management

iSTAR Edge allows you to assign up to five cards per cardholder record rather than having to create a separate record for each card. This simplifies the management and maintenance of personnel records. You can assign a PIN as one of the cards for a flexible and secure solution. iSTAR Edge can support up to 128 card formats system-wide and ten card formats per reader including smart cards, and PIV II and TWIC formats. This expanded ability to use multiple card types (such as 26-bit, 37-bit, or Corporate 1000) at a single reader frees you from having to consolidate or re-issue new cards.

Data Security is Critical

iSTAR Edge features strong 256-bit AES network encryption between the controller and host, and between controllers within a cluster. Multi-key and password authentication for real-time communication when used with the local diagnostic configuration utility and built-in denial-of-service protection provide a barrier against intrusion. Additionally, iSTAR Edge addresses the needs of businesses to protect critical security data. With instant database backup and restore capabilities, iSTAR Edge provides a highly reliable security solution and ensures that important data is protected, even during communications failure.

iSTAR Edge Board & Enclosure Layouts



Easily Test and Troubleshoot with Configuration Diagnostics

iSTAR Edge devices include a built-in suite of diagnostics to test and troubleshoot hardware components such as inputs, outputs, reader ports, last card read, and battery voltage. In addition, you can retrieve via the Internet real-time status and diagnostics of:

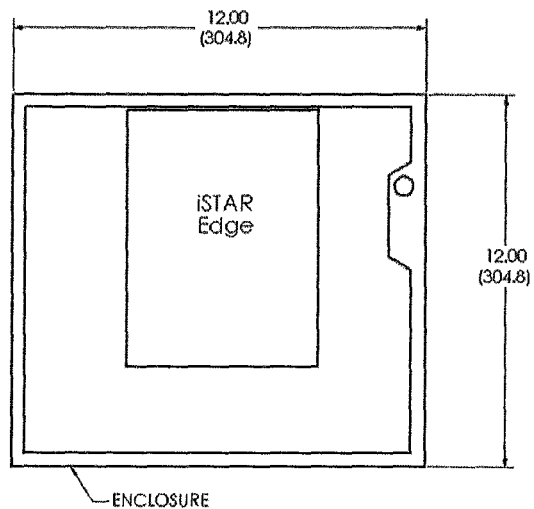
- controller time/boot time
- total/available memory
- connection status
- firmware and OS versions
- hardware (MAC) and IP addresses
- downloaded clearances and cardholders

Plus, iSTAR Edge includes a local LCD and LEDs for easy installation and quick troubleshooting.

Choose an iSTAR Architecture That Makes Sense for Your Application

Providing a security solution that is unsurpassed in the industry for its versatility and security, iSTAR Edge devices can be used together in the same system with iSTAR Pro and iSTAR eX controllers. This provides an enterprise solution that recognizes that even the largest corporations have smaller branches and facilities that may need to use the same security standards without enormous overhead. iSTAR Edge and iSTAR eX controllers may also be part of the same cluster.

The four-reader iSTAR Edge allows expansion to a third and fourth reader using RM-4, RM-4E, or RM readers connected using the RS-485 RM bus. (Note: The two-reader model is not upgradable to a four-reader model).



SOFTWARE HOUSE

A Tyco International Company

Specifications

Physical

Dimensions (H x W x D)	
Enclosure	305 x 305 x 101 mm (12 x 12 x 4 in)
Board	190 x 146 x 25 mm (7.5 x 5.75 x 1 in)
Enclosure Material	18g steel, with lock and tamper
Expansion	Includes mounting standoffs for two point expansion modules (I8, I8-CSI, R8 or RM-4)
Environmental	0° to 50° C (32° to 122° F) 5 to 95% relative humidity, non-condensing
Weight with Enclosure	4.2 kg (9.3 lbs)

Electrical

Power Requirements	12 VDC (-15/+20%) or 24 VDC (-15/+25%), auto-sensing Board only: 400 mA, max 3.8A @ 12 VDC, 3.1A @ 24 VDC for board plus all attached devices
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Optional PoE Plus Module

Standards Supported	PoE (802.3af), 12.95W max; PoE Plus (802.3at), 25.5W max
PoE Standard Selection	Jumper-selectable
Power Available for Attached Devices	PoE: 650 mA@12 V PoE Plus: 1700 mA@12 V
Heat Dissipation	90 BTU/HR typical
Memory and RTC Backup	Four standard AA alkaline batteries provide automatic database backup to flash memory
Battery Life	Five years (estimated – without power interruptions)

Indicators and Switches

LCD for diagnostics	LEDs for power, LAN activity, serial port activity, output status
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System Memory

Memory	64 MB RAM, 128 MB flash EEPROM
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Cardholder capacity

One clearance, one card/person, ten-digit cards	400,000
Ten clearances, one card/person, ten-digit cards	230,000
One clearance, five cards/person, ten-digit cards	130,000
Ten clearances, five cards/person, 40-digit cards	85,000

Note - Memory allocation is dynamic and shared between cardholders, event storage, and configuration information.

Network Communications

Ethernet Ports	One, 10/100Base-T
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Readers

Number of Readers Supported	C•CURE 800/8000 Two C•CURE 9000 Two or Four
Types of Readers Supported	Wiegand and RM (RM only for readers 3 and 4)
Reader Technologies Supported	Multi-Technology, Proximity, Smart Card (incl. PIV II & TWIC), Wiegand and Magnetic Stripe (RM only)
Maximum Distance to Door	RM: 1,219 m (4,000 ft); Wiegand: 150 m (500 ft)
Reader Power Available	12 VDC, 1.5 A total (including aux power and RM port power)
RM Bus Communications	Three ports, RS-485 half duplex, two wire, plus optional two wires for device power

Inputs

Supervised Inputs	Eight, single or double-resistor
Fire Alarm Interlock Inputs	Two, fire alarm input and manual keyswitch override (supervision supported)
Additional Inputs	Tamper switch, power fail, and low battery
Input Expansion	Up to 32 additional Inputs using I8 input modules on RM bus (64 additional with 4-reader model)
Auxiliary Power Available	12 VDC; two (350mA each)

Outputs

Outputs	Four, individually configurable via jumper as power sourcing (wet), or dry contact relay
Output Power, Wet	12V or 24 VDC, 0.75A (If ISTAR Edge powered locally, output voltage follows input voltage. If using PoE/PoE Plus, 12V only)
Output Protection, Per Output	PTC resettable fuse, 0.75A, snubber, tranzorb
Output Rating, Dry	30V AC/DC, 3 A
Output Expansion	Up to 32 additional Form C relay outputs using R8 output modules on RM bus (up to 64 additional with 4-reader model)

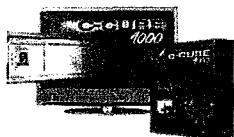
Regulatory

Regulatory	UL 294, UL 1076, UL 2043, cUL 294, cUL 1076 UL 294B (new standard for the use of Power over Ethernet (PoE) in access control systems) IEC 60950 FCC Part 15 Class A (Class B with shielded Ethernet cable) CE, including EN50133 C-Tick RoHS & WEEE
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Model Numbers

ESTAR002	ISTAR Edge, supports two readers, with enclosure
ESTAR002-POE1	ISTAR Edge, supports two readers, with enclosure and PoE/PoE Plus module
ESTAR002-MB	ISTAR Edge motherboard only
ESTAR004	ISTAR Edge, supports four readers, with enclosure
ESTAR004-RM	ISTAR Edge, supports four readers, with enclosure and two RM-4 modules pre-mounted
ESTAR004-MB	ISTAR Edge motherboard (four-reader)
ESTAR-CAN	ISTAR Edge enclosure
ESTAR-POE1	ISTAR Edge PoE/PoE Plus module

Related Products



C•CURE 9000



C•CURE 9000 SiteServer



C•CURE 9000 Web Client



RM Series Card Readers

Approvals



www.swhouse.com



Multi-Technology Readers

Single reader solution for multiple technologies

Features That Make a Difference:

- Reads more than 10 different types of proximity cards and contactless smart cards¹
- Uses encryption and custom keys for secure transmission of card data
- Download new functionality or enhancements for a future-proof solution
- GSA certified for FIPS 201 making it ideal for U.S. government applications
- Reads TWIC cards from the U.S. Transportation Worker Identification Credential program
- Choose single-gang or multi-gang mounting style
- Optional keypad for two-factor verification
- Mount on metal with isolation spacer
- Indoor/outdoor use
- Built-in tamper switch provides secure installation (single-gang, keypad models only)
- Plug-in screw terminals reduce installation time (single-gang, keypad models only)
- Configurable Wiegand output
- ISO compliant
- Lifetime warranty

Software House® Multi-Technology Readers are the industry's most versatile card readers with their ability to read serial numbers from multiple 13.56 MHz smart card technologies, MIFARE® encrypted sectors, TWIC cards, PIV II cards from the U.S. government's Federal Information Processing Standard (FIPS) 201 program, and most of the common 125 KHz proximity cards – all with one reader. This cost-effective solution enables you to transition from proximity to smart cards over time or to utilize both smart cards and proximity cards concurrently in your facility.

Multi-Technology Readers can be updated at any time with flash firmware. This saves significant time and money by allowing you to simply flash new card protocols or formats directly to the reader. These readers are configurable to read encrypted MIFARE sectors using standard or custom MIFARE read keys and can also simultaneously support PIV II smart cards.

Multi-Technology Readers also feature a keypad model which outputs keypad commands and a PIN in 8-bit burst Wiegand data. For higher-security applications, the keypad reader also supports a PIN-on-smart-card feature for secure token exchange. In this scenario, the reader matches the PIN entered on the keypad against a PIN stored on the card and, if successful, transmits only the card data to the controller. The PIN is not transmitted and the overall level of security is increased since a copy of the PIN is not stored anywhere other than on the card.

Important features such as a built-in tamper switch, two-piece connectors and isolation spacers help reduce installation time. Coupled with robust environmental ratings and a lifetime warranty, Software House Multi-Technology Readers are the clear choice for companies looking for a powerful, cost-effective way to use various card technologies.

⁽¹⁾ Reader continuously cycles between 125 KHz and 13.56 MHz and, depending on the frequency cycle when card is presented, the reader will either output the proximity card number or the unencrypted smart card serial number.

Physical

Dimensions

Model SWH-4000	120 x 45 x 25 mm (4.73 x 1.77 x 0.98 in), mullion
Model SWH-4100	111 x 84 x 28 mm (4.37 x 3.31 x 1.10 in), single-gang
Model SWH-4200 ²	111 x 84 x 28 mm (4.37 x 3.31 x 1.10 in), single-gang with keypad
Minimum Wiring	5 conductors including one LED control line
Cable Recommendations	22 AWG [60 m (200 ft) max] or 18 AWG [50 m (500 ft) max], stranded
Wiring Terminations	Plug-in screw terminals (single-gang, keypad) One-piece screw terminals (mullion)
Wiring Details	Power and ground Two-wire Wiegand (includes keypad data) External green and red LED control External beeper control Two-wire tamper (single-gang, keypad model only)
Color	Black or light gray (custom colors & patterns available)
Accessories	European surface mount kit Isolation spacer

Environmental

Environment	UL listed for interior or exterior
Operating Temperature	-35° to 67°C (-31° to 151°F)
Humidity Range	0 to 100%
Index of Protection	IP65

Electrical

Power Supply	.8 to 16 VDC 125 mA max @ 12 VDC
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Regulatory

Agency Certifications	FCC Part 15 CE UL 294 full outdoor (except mullion)
U.S. GSA Certification	U.S. GSA approved products list for FIPS 201
Compliance	ISO 14443A ISO 14443B ISO 15693

Operational

Read Range	Up to 102 mm (4 in) depending on technology of card
Read Time	Technology dependent (typically < 300 msec)

Programming and Format Information

Card Technologies Supported

HID proximity
 CASI® ProxLite®
 Delster proximity
 ISO 14443A serial number
 MIFARE® serial number
 DESFire serial number
 ISO 14443B serial number
 ISO 15693 serial number
 ICLASS® serial number
 MIFARE sectors
 U.S. FIPS 201 PIV II
 U.S. Transportation Worker Identification Credential (TWIC)

Controller Communications

Wiegand
 Flashable via RS-485

Configurable Using Program Card

Pass-through³
 Fixed length⁴ (26-bit, 32-bit, 35-bit, 37-bit, 64-bit)
 CASI ProxLite 44-bit pass-through
 MIFARE sectors
 Select a sector (0-15)
 Customize encryption keys
 Specify data format (number of bits output)
 Enable PIN-on-smart-card functionality
 FIPS 201 PIV II and TWIC
 Customize FASC-N Wiegand
 BCD output
 75-bit GSA format
 64-bit
 128-bit
 200-bit
 Customize the HMAC by changing the site key
 Output HMAC
 Output expiration date

Wiring Connector Pinouts

PIN	Description
1	External beeper control
2	Ground
3	Power (8 to 16 VDC)
4	D1 Wiegand
5	D0 Wiegand
6	Reserved for future use
7	External green LED control
8	External red LED control
9	A – RS485 – used for Flash upgrade
10	B – RS485 – used for Flash upgrade
11	Tamper (normally closed; single-gang, keypad model only)
12	Tamper (normally closed; single-gang, keypad model only)

(2) Enabling PIN-on-smart-card functionality will disable 125 KHz Prox read functionality.
 (3) Pass-through – the default setting for Software House Multi-Technology Readers that allows the reader to send all the data on the card.
 (4) Fixed length – the reader can be configured to output a fixed length by padding or truncating data on the card.

Product offerings and specifications are subject to change without notice. Actual products may vary from photos. Not all products include all features. Availability varies by region; contact your sales representative. Certain product names mentioned herein may be trade names and/or registered trademarks of other companies.

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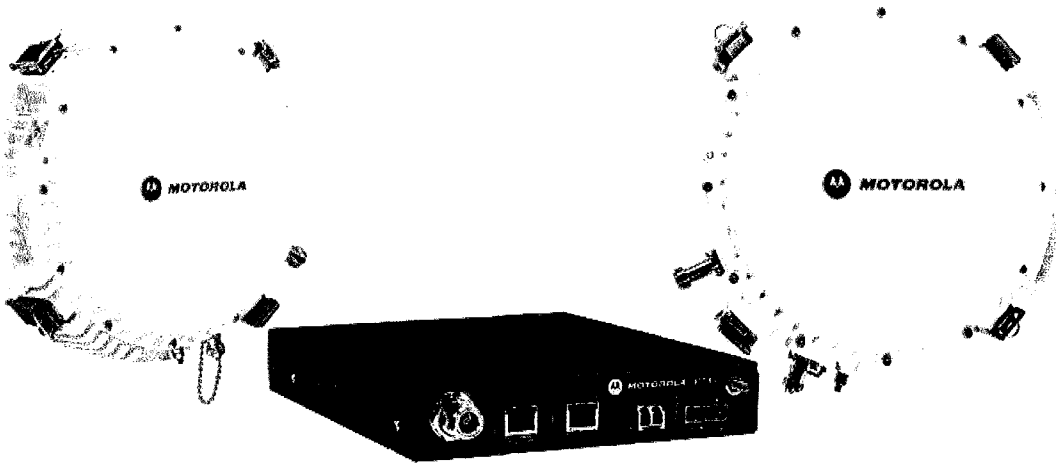
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ISV/Software Solutions
 Networking Infrastructure Solutions



tyco



HIGH-THROUGHPUT COMMUNICATIONS FOR MULTI-SERVICE NETWORKS

MOTOROLA PTP 800 LICENSED ETHERNET MICROWAVE

PTP 800 solutions can efficiently and affordably transport the data, voice and video that your bandwidth-intensive applications require without having to contend with other communicators in your radio-frequency (RF) band.

HIGH-PERFORMANCE, SCALABLE

Our Point-to-Point (PTP) 800 Licensed Ethernet Microwave solutions operate in the 6 to 38 GHz licensed bands, at up to 368 Mbps throughput¹ (full duplex) and with user-configured channel bandwidths from 7 to 56 MHz. With upgradeable capacity from 10 Mbps to full capacity via software key, the systems offer exceptional cost efficiency and scalability. Whether your organization is a corporate enterprise, carrier, service provider, school, hospital, utility company, municipality or government agency, our PTP 800 radios will provide you with high-performance, ultra-reliable connectivity.

We have added a High Performance ODU-B which is available in the 11, 18 and 23 GHz bands and compliant with Federal Communications Commission (FCC) and Industry Canada (IC) regulations. For FCC and IC

deployments in 11, 18 or 23 GHz, you now have the option of choosing the Standard ODU-A or the High Performance ODU-B. The ODU-B offers higher transmit power, lower power consumption and lighter weight when compared with the ODU-A. In addition, our NTIA-compliant 7 and 8 GHz models support DoD and non-DoD applications within the U.S. Federal Government.

EXTREME DURABILITY

PTP systems have logged more than two billion field hours. As a result, our radios are proven to withstand the rigors of outdoor use. Radios perform steadfastly in winds up to 150 miles per hour (242 kph) and temperatures from -27° to 131° F (-33° to 55° C).

WIRELESS NETWORK SOLUTIONS

At Motorola, our unrivaled wireless network solutions include indoor WLAN, outdoor wireless mesh, point-to-multipoint and point-to-point networks as well as voice over WLAN systems, giving you the agility and seamless connectivity you need to grow your business or better protect and serve the public. Combined with powerful software for wireless network design, security and management, our solutions deliver trusted networking and anywhere access to organizations worldwide.

¹ 368 Mbps maximum throughput requires a 56 MHz channel and 256 QAM which may not be available in certain regions due to regulatory restrictions.

PRODUCT SPEC SHEET
PTP 800 04-00 ODU-A/B

RADIO TECHNOLOGY

ODU-A RF bands ²	L6 GHz Band:	5.925 – 6.425 GHz
	U6 GHz Band:	6.425 – 7.100 GHz
	7 GHz Band:	7.125 – 7.9 GHz
	8 GHz Band:	7.725 – 8.5 GHz
	11 GHz Band:	10.7 – 11.7 GHz
	13 GHz Band:	12.75 – 13.25 GHz
	15 GHz Band:	14.4 – 15.35 GHz
	18 GHz Band:	17.7 – 19.7 GHz
	23 GHz Band:	21.2 – 23.6 GHz
	26 GHz Band:	24.25 – 26.5 GHz
	28 GHz Band:	27.5 – 29.5 GHz
	32 GHz Band:	31.8 – 33.4 GHz
	38 GHz Band:	37.0 – 40.0 GHz
ODU-B RF bands ²	11 GHz Band:	10.7 – 11.7 GHz
	18 GHz Band:	17.7 – 19.7 GHz
	23 GHz Band:	21.2 – 23.6 GHz
	Channel size	Configurable from 7 to 56 MHz
Maximum Tx power ³	30 dBm	
Best Rx sensitivity ⁴	-90.9 dBm	
Modulation	QPSK, 8PSK, 16/32/64/128/256 QAM Fixed mode or Adaptive Coding and Modulation (ACM)	
Error correction	Low Density Parity Check (LDPC) code	
Duplex scheme	FDD	
Security and encryption	Proprietary air interface	
	Optional FIPS-197 compliant 128/256-Bit AES Encryption	
	Optional FIPS 140-2 ⁵	

ETHERNET BRIDGING

Protocol	IEEE 802.3 802.1p/1Q (served by 8 queues) 802.1ad (Q-in-Q)
Frame size	Up to 9600 bytes
User data throughput ⁶	10 to 368 Mbps at the Ethernet (full duplex); use PTP LINKPlanner to determine actual throughput for the deployment
Latency	To < 115 µs @ full capacity with 64 bytes
User traffic interface	100 / 1000 Base T (RJ-45) – auto MDI/MDIX, 1000 Base SX and LX options

MANAGEMENT & INSTALLATION

Network management	Inband and out-of-band
Protocol	SNMP v1, v2c and v3
EMS	Web access via browser using HTTP or HTTPS/TLS ⁷ Motorola Wireless Manager Your existing network management system ASTRO® UEM (Unified Event Manager) Remote authentication using RADIUS
Out-of-band interface	10 / 100 Base T (RJ-45)

Installation	ODU – RSSI output assistance for link alignment
Connection	IF cable between outdoor unit (ODU) and compact modem unit (CMU); distance up to 1000 ft. (300 meters) using the LMR600 cable; 630 ft. (190 meters) is achievable with the CNT400 IF cable available from Motorola

PHYSICAL

Physical configuration	Split mount – Compact Modem Unit (CMU) and Outdoor Unit (ODU)
Dimensions	ODU: Diameter 10.5" (26.7 cm), Depth 3.5" (8.9 cm)
	CMU: Width 7.1" (18.0 cm), Height 1.4" (3.5 cm), Depth 8.7" (22.0 cm)
	Weight
Weight	ODU-A: 10.1 lbs (4.6 kg) ODU-B: 8.6 lbs (3.9 kg) CMU: 2.4 lbs (1.1 kg)
Wind speed survival	ODU: 150 mph (242 kph)
Power source	-48V DC (-40.5V DC to -60V DC)
Power consumption	ODU-A – 1+0 Configuration (per end) 6 ~ 11 GHz: 71 Watts maximum 13 ~ 38 GHz: 62 Watts maximum
	ODU-A – 1+1 Configuration (2-ODUs + 2-CMUs per end) 6 ~ 11 GHz: 122 Watts maximum 13 ~ 38 GHz: 114 Watts maximum
	ODU-B – 1+0 Configuration (per end) 11 GHz: 58 Watts maximum 18, 23 GHz: 56 Watts maximum
	ODU-B – 1+1 Configuration (2-ODUs + 2-CMUs per end) 11 GHz: 98 Watts maximum 18, 23 GHz: 98 Watts maximum
	ENVIRONMENTAL & REGULATORY
	Operating temperature
Humidity	Outdoor Unit: Up to 100% Compact Modem Unit: Up to 95%, non-condensing
Safety	UL 60950; IEC 60950; EN 60950; CSA 22.2 No. 60950
EMC	USA: FCC Part 15, Class B Europe: EN 301 489-1 and EN 301 489-4
Radio standard	ETSI Harmonized Standard EN 302 217-2-2 FCC Regulation Title 47, Part 101 Industry Canada Specification RSS-GEN and relevant SRSP Specifications

² Regulatory conditions for RF bands may vary by geographic location and should be confirmed prior to system purchase.

³ Transmit power depends on frequency, modulation and regulations (ETSI/FCC).

⁴ Receive sensitivity depends on frequency, channel bandwidth and modulation (-90.9 dBm is based on an 11 GHz model with 7 MHz channel bandwidth and the QPSK mode).

⁵ FIPS 140-2 certification status may be confirmed at: <http://csrc.nist.gov/groups/STM/cmvp/inprocess.html>

⁶ User throughput depends on the configuration of channel bandwidth, modulation and capacity license key. Radios ship with factory-set 10 Mbps throughput capacity cap; additional capacity may be purchased at time of order or anytime after deployment. Full capacity is not available for all combinations of bands and regulations.

⁷ Web access via HTTPS/TLS is available on AES-enabled radios.

PRODUCT SPEC SHEET
PTP 800 04-00 ODU-A/B

Radio Configuration														
Frequency (GHz)	L6	U6	7	8	11	13	15	18	23	26	28	32	38	
Standard	ETSI / FCC	ETSI / FCC	ETSI / NTIA	ETSI / NTIA	ETSI / FCC	ETSI	ETSI	ETSI / FCC	ETSI / FCC	ETSI / FCC	ETSI	ETSI	ETSI / FCC	
Frequency Range (GHz)	5.925 ~ 6.425	6.425 ~ 7.100	7.125 ~ 7.9	7.725 ~ 8.50	10.7 ~ 11.7	12.75 ~ 13.25	14.4 ~ 15.35	17.7 ~ 19.7	21.2 ~ 23.6	24.25 ~ 26.5	27.5 ~ 29.5	31.8 ~ 33.4	37.0 ~ 40.0	
FCC	T/R Spacing (MHz)	252.04	160 170	300	360	490 500		1560	1200	800			700	
	Channel Bandwidth (MHz)	10 30	10 30	10 20 30 40 50	10 20 30 40 50	10 30 40		10 20 30 40 50 80 ^a	10 20 30 40 50	10 20 40			10 50	
ETSI	T/R Spacing (MHz)	252.04	340	154 161 168 196 245	119 126 208 266 311.32	490 530	266	420 490 728 315 322 644	1008 1010	1008 1232	1008	1008	812	1260
	Channel Bandwidth (MHz)	29.65	7 14 30 40 60	7 14 28	7 14 28 29.65	40	7 14 28	7 14 28 56	7 13.75 27.5 55	7 14 28 56	7 14 28 56	7 14 28 56	7 14 28 56	7 14 28 56
RF Channel Selection	Via Web GUI													
System Configuration	1+ 0, 1+1 HSB and 2+0													
ATPC Range (dB)	Transmit Power Control – Adaptive, lower power limit varies with RF band down to 1dBm minimum.													

PTP 800 Family of Products	
PTP L6800	L6 GHz
PTP U6800	U6 GHz
PTP 07800	7 GHz
PTP 08800	8 GHz
PTP 11800	11 GHz
PTP 13800	13 GHz
PTP 15800	15 GHz
PTP 18800	18 GHz
PTP 23800	23 GHz
PTP 26800	26 GHz
PTP 28800	28 GHz
PTP 32800	32 GHz
PTP 38800	38 GHz

User Ethernet Data Throughput – ODU-A and ODU-B													
Modulation	Maximum Throughput – Mbps (1518 Bytes/Frame)												
	Channel Bandwidth (MHz)												
	7	13.75	14	27.5	28/29.65 ^a	55	56/60/80	10	20	30	40	50	
256 QAM-H	N/A	N/A	N/A	N/A	N/A	364.9	368.6	N/A	N/A	N/A	N/A	N/A	N/A
256 QAM-L	N/A	N/A	N/A	166.9	170.4	343.6	347.2	N/A	113.6	177.4	236.7	301.6	
128 QAM	34.4	69.8	71.0	148.0	151.1	300.4	303.5	50.9	102.2	155.1	206.9	258.6	
64 QAM	30.0	60.7	61.8	122.7	125.3	252.6	255.2	42.8	84.9	130.4 / 135.5 ¹⁰	181.9	217.4	
32 QAM	24.6	49.9	50.7	99.1	101.2	200.7	202.8	33.7	67.8	103.6	150.7	178.6	
16 QAM	20.0	40.6	41.3	73.3	74.8	150.9	152.4	29.1	58.5	77.9	103.9	150.5	
8PSK	14.7	29.9	30.4	55.7	56.8	114.6	115.8	20.4	40.3	59.1	78.9	103.7	
QPSK	10.1	20.0	20.3	37.0	37.8	76.3	77.1	13.8	28.5	39.4	52.6	65.7	

Transmit Power – ODU-A																
Modulation	Maximum Transmit Power – ETSI (dBm)								Maximum Transmit Power – FCC (dBm)							
	Frequency (GHz)								Frequency (GHz)							
	6, 7, 8	11	13, 15	18	23, 26	28	32	38	L6	7, 8	11	18	23, 26	38		
QPSK	30.0	28.0	26.0	25.5	25.0	25.0	23.0	23.0	22.0	22.0	19.0	23.0	23.0	20.0		
8PSK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	22.0	22.0	19.0	22.0	22.0	19.0		
16 QAM	28.0	26.0	23.0	22.0	22.0	22.0	21.0	20.0	22.0	22.0	19.0	22.0	22.0	19.0		
32 QAM	28.0	26.0	23.0	22.0	22.0	20.0	19.0	20.0	22.0	22.0	19.0	22.0	22.0	19.0		
64 QAM	24.0	21.0	18.0	17.0	17.0	17.0	16.0	16.0	22.0	22.0	19.0	17.0	17.0	15.0		
128 QAM	24.0	21.0	18.0	17.0	17.0	17.0	16.0	16.0	22.0	22.0	19.0	17.0	17.0	15.0		
256 QAM	22.0	19.0	16.0	15.0	15.0	15.0	14.0	14.0	22.0	22.0	19.0	15.0	15.0	13.0		

⁸ The 80 MHz channel width is available only on the 18 GHz ODU-B.

⁹ For Upper 6 GHz only, 30 MHz capacity is equal to 28 MHz capacity.

¹⁰ 135.5 Mbps is available in Lower 6 GHz.

Receive Sensitivity – ODU-A									
BER = 1e-6	Modulation	Frequency (GHz)							
		6-7.8	11	13-15	18	23-25	28	32	33
Receive Sensitivity @ 56/60 MHz channel (dBm)	256 QAM-H	-63.2	N/A	-63.7	N/A	-63.2	-62.7	-62.2	-61.2
	256 QAM-L	-65.1	N/A	-65.6	N/A	-65.1	-64.6	-64.1	-63.1
	128 QAM	-67.8	N/A	-68.3	N/A	-67.8	-67.3	-66.8	-65.8
	64 QAM	-70.8	N/A	-71.3	N/A	-70.8	-70.3	-69.8	-68.8
	32 QAM	A	N/A	A	N/A	A	-72.9	-72.4	A
	16 QAM	A	N/A	-77.7	N/A	-77.2	-76.7	-76.2	-75.2
	8PSK	A	N/A	A	N/A	A	A	A	A
	QPSK	A	N/A	-83.5	N/A	-83.0	-82.5	-82.0	-81.0
Receive Sensitivity @ 55 MHz channel (dBm)	256 QAM-H	N/A	N/A	N/A	-63.8	N/A	N/A	N/A	N/A
	256 QAM-L	N/A	N/A	N/A	-65.7	N/A	N/A	N/A	N/A
	128 QAM	N/A	N/A	N/A	-68.4	N/A	N/A	N/A	N/A
	64 QAM	N/A	N/A	N/A	-71.4	N/A	N/A	N/A	N/A
	32 QAM	N/A	N/A	N/A	A	N/A	N/A	N/A	N/A
	16 QAM	N/A	N/A	N/A	-77.8	N/A	N/A	N/A	N/A
	8PSK	N/A	N/A	N/A	A	N/A	N/A	N/A	N/A
	QPSK	N/A	N/A	N/A	-83.6	N/A	N/A	N/A	N/A
Receive Sensitivity @ 50 MHz channel (dBm)	256 QAM	-65.3	N/A	N/A	-65.8	-65.3	N/A	N/A	-62.3
	128 QAM	-68.5	N/A	N/A	-69.0	-68.5	N/A	N/A	-65.5
	64 QAM	-71.5	N/A	N/A	-72.0	-71.5	N/A	N/A	-68.5
	32 QAM	-73.8	N/A	N/A	-74.3	-73.8	N/A	N/A	-70.8
	16 QAM	-75.8	N/A	N/A	-76.3	-75.8	N/A	N/A	-72.8
	8PSK	-79.1	N/A	N/A	-79.6	-79.1	N/A	N/A	-76.1
	QPSK	-83.7	N/A	N/A	-84.2	-83.7	N/A	N/A	-80.7
Receive Sensitivity @ 40 MHz channel (dBm)	256 QAM	-66.8	-67.3	N/A	-67.3	-66.8	N/A	N/A	N/A
	128 QAM	-69.5	-70.0	N/A	-70.0	-69.5	N/A	N/A	N/A
	64 QAM	-71.9	-72.4	N/A	-72.4	-71.9	N/A	N/A	N/A
	32 QAM	-74.0	-74.5	N/A	-74.5	-74.0	N/A	N/A	N/A
	16 QAM	-78.9	-79.4	N/A	-79.4	-78.9	N/A	N/A	N/A
	8PSK	-81.1	-81.6	N/A	-81.6	-81.1	N/A	N/A	N/A
	QPSK	-84.7	-85.2	N/A	-85.2	-84.7	N/A	N/A	N/A
Receive Sensitivity @ 30 MHz channel (dBm)	256 QAM	-67.8	-68.5	N/A	-68.5	-68.0	N/A	N/A	N/A
	128 QAM	-70.7	-71.2	N/A	-71.2	-70.7	N/A	N/A	N/A
	64 QAM	-73.0	-74.2	N/A	-74.2	-73.7	N/A	N/A	N/A
	32 QAM	-76.3	-76.8	N/A	-76.8	-76.3	N/A	N/A	N/A
	16 QAM	-80.1	-80.6	N/A	-80.6	-80.1	N/A	N/A	N/A
	8PSK	-82.3	-82.8	N/A	-82.8	-82.3	N/A	N/A	N/A
	QPSK	-85.9	-86.4	N/A	-86.4	-85.9	N/A	N/A	N/A
Receive Sensitivity @ 28/29.65 ¹⁾ MHz channel (dBm)	256 QAM	-68.2	N/A	-68.7	N/A	-68.2	-67.7	-67.2	-66.2
	128 QAM	-70.9	N/A	-71.4	N/A	-70.9	-70.4	-69.9	-68.9
	64 QAM	-73.9	N/A	-74.4	N/A	-73.9	-73.4	-72.9	-71.9
	32 QAM	-76.4	N/A	-76.9	N/A	-76.4	-75.9	-75.4	-74.4
	16 QAM	-80.3	N/A	-80.8	N/A	-80.3	-79.8	-79.3	-78.3
	8PSK	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	QPSK	-86.1	N/A	-86.6	N/A	-86.1	-85.6	-85.1	-84.1

NOTE:
"A" indicates frequencies that are supported only in the ACM mode.

¹⁾ For Upper 6 GHz only, 30 MHz capacity is equal to 28 MHz capacity.

PRODUCT SPEC SHEET
PTP 800 04-00 ODU-A/B

Receive Sensitivity – ODU-A (continued)									
BER = 1e-6	Modulation	Frequency (GHz)							
		6/7/8	11	13/15	18	23/26	28	32	38
Receive Sensitivity @ 27.5 MHz channel (dBm)	256 QAM	N/A	N/A	N/A	-68.8	N/A	N/A	N/A	N/A
	128 QAM	N/A	N/A	N/A	-71.5	N/A	N/A	N/A	N/A
	64 QAM	N/A	N/A	N/A	-74.5	N/A	N/A	N/A	N/A
	32 QAM	N/A	N/A	N/A	-77.0	N/A	N/A	N/A	N/A
	16 QAM	N/A	N/A	N/A	-80.9	N/A	N/A	N/A	N/A
	8PSK	N/A	N/A	N/A	A	N/A	N/A	N/A	N/A
	QPSK	N/A	N/A	N/A	-86.7	N/A	N/A	N/A	N/A
Receive Sensitivity @ 20 MHz channel (dBm)	256 QAM	-69.9	N/A	N/A	-70.4	-69.9	N/A	N/A	N/A
	128 QAM	-72.0	N/A	N/A	-72.5	-72.0	N/A	N/A	N/A
	64 QAM	-75.4	N/A	N/A	-75.9	-75.4	N/A	N/A	N/A
	32 QAM	-77.8	N/A	N/A	-78.3	-77.8	N/A	N/A	N/A
	16 QAM	-80.1	N/A	N/A	-80.6	-80.1	N/A	N/A	N/A
	8PSK	-83.1	N/A	N/A	-83.6	-83.1	N/A	N/A	N/A
	QPSK	-87.1	N/A	N/A	-87.6	-87.1	N/A	N/A	N/A
Receive Sensitivity @ 14 MHz channel (dBm)	128 QAM	-73.5	N/A	-74.0	N/A	-73.5	-73.0	-72.5	-71.5
	64 QAM	-75.8	N/A	-76.3	N/A	-75.8	-75.3	-74.8	-73.8
	32 QAM	-77.8	N/A	-78.3	N/A	A	-77.3	-76.8	A
	16 QAM	-80.7	N/A	-81.2	N/A	-80.7	-80.2	-79.7	-78.7
	8PSK	A	A	A	N/A	A	A	A	A
	QPSK	-87.4	N/A	-87.9	N/A	-87.4	-86.9	-86.4	-85.4
Receive Sensitivity @ 13.75 MHz channel (dBm)	128 QAM	N/A	N/A	N/A	-74.0	N/A	N/A	N/A	N/A
	64 QAM	N/A	N/A	N/A	-76.4	N/A	N/A	N/A	N/A
	32 QAM	N/A	N/A	N/A	-78.4	N/A	N/A	N/A	N/A
	16 QAM	N/A	N/A	N/A	-81.3	N/A	N/A	N/A	N/A
	8PSK	N/A	N/A	N/A	A	N/A	N/A	N/A	N/A
	QPSK	N/A	N/A	N/A	-88.0	N/A	N/A	N/A	N/A
Receive Sensitivity @ 10 MHz channel (dBm)	128 QAM	-74.2	-74.6	N/A	-74.6	-74.1	N/A	N/A	-71.2
	64 QAM	-77.4	-77.9	N/A	-77.9	-77.4	N/A	N/A	-74.4
	32 QAM	-80.0	-79.9	N/A	-79.8	-79.4	N/A	N/A	-77.0
	16 QAM	-82.5	-82.8	N/A	-82.8	-82.3	N/A	N/A	-79.5
	8PSK	-85.1	-85.1	N/A	-85.1	-84.6	N/A	N/A	-82.1
	QPSK	-90.0	-89.5	N/A	-89.5	-89.0	N/A	N/A	-87.0
Receive Sensitivity @ 7 MHz channel (dBm)	128 QAM	-76.5	N/A	-77.0	-77.0	-76.5	-76.0	-75.5	-74.5
	64 QAM	-78.8	N/A	-79.3	-79.3	-78.8	-78.3	-77.8	-76.8
	32 QAM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	16 QAM	-83.7	N/A	-84.2	-84.2	-83.7	-83.2	-82.7	-81.7
	8PSK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	QPSK	-90.4	N/A	-90.9	-90.9	-90.4	-89.9	-89.4	-88.4

PRODUCT SPEC SHEET
PTP 800 04-00 ODU-A/B

Transmit Power – ODU-B			
Modulation	Maximum Transmit Power – FCC (dBm)		
	Frequency (GHz)		
	11	18	23
QPSK	20.0	24.0	23.0
8PSK	20.0	23.0	23.0
16 QAM	20.0	23.0	23.0
32 QAM	20.0	23.0	23.0
64 QAM	20.0	19.0	19.0
128 QAM	20.0	19.0	19.0
256 QAM	20.0	17.0	17.0

Receive Sensitivity – ODU-B				
BER – 1e-6	Modulation	Frequency (GHz)		
		11	18	23
Receive Sensitivity @ 80 MHz channel (dBm)	256 QAM-H	N/A	-83.7	N/A
	256 QAM-L	N/A	-65.6	N/A
	128 QAM	N/A	-68.3	N/A
	64 QAM	N/A	-71.3	N/A
	32 QAM	N/A	-74.1	N/A
	16 QAM	N/A	-77.3	N/A
	8PSK	N/A	-79.9	N/A
	QPSK	N/A	-83.5	N/A
Receive Sensitivity @ 50 MHz channel (dBm)	256 QAM	N/A	-65.8	-65.3
	128 QAM	N/A	-69.1	-68.6
	64 QAM	N/A	-72.1	-71.6
	32 QAM	N/A	-74.5	-74.0
	16 QAM	N/A	-76.7	-76.2
	8PSK	N/A	-79.9	-79.4
Receive Sensitivity @ 40 MHz channel (dBm)	256 QAM	-67.1	-67.1	-66.6
	128 QAM	-70.1	-70.1	-69.6
	64 QAM	-72.6	-72.6	-72.1
	32 QAM	-74.5	-74.5	-74.0
	16 QAM	-79.1	-79.1	-78.6
	8PSK	-81.4	-81.4	-80.9
Receive Sensitivity @ 30 MHz channel (dBm)	256 QAM	-68.2	-68.2	-67.7
	128 QAM	-71.4	-71.4	-70.9
	64 QAM	-73.6	-73.6	-73.1
	32 QAM	-77.2	-77.2	-76.7
	16 QAM	-80.3	-80.3	-79.8
	8PSK	-82.6	-82.6	-82.1
Receive Sensitivity @ 20 MHz channel (dBm)	256 QAM	-86.3	-86.3	-85.8
	256 QAM	N/A	-70.2	-69.7
	128 QAM	N/A	-72.7	-72.2
	64 QAM	N/A	-75.9	-75.4
	32 QAM	N/A	-78.4	-77.9
	16 QAM	N/A	-80.6	-80.1
Receive Sensitivity @ 10 MHz channel (dBm)	8PSK	N/A	-83.7	-83.2
	QPSK	N/A	-88.0	-87.5
	128 QAM	-74.7	-74.7	-74.2
	64 QAM	-77.9	-77.9	-77.4
	32 QAM	-80.5	-80.5	-80.0
	16 QAM	-83.0	-83.0	-82.5
	8PSK	-85.6	-85.6	-85.1
	QPSK	-90.5	-90.5	-90.0

NOTE:

While the information presented herein is, to the best of our knowledge, true and accurate, the information provided in this document is subject to change without notice.

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3-23-140 WNS PTP 800 04-00 ODU-A/B SS 073011



4.9 - 6.1 GHz High Gain Dual Polarized Antenna

MA-WA56-DP28

MARS 5 GHz Dual Polarized Antenna designed to provide full coverage for the 5 GHz frequency band.

Additional Features:

- efficient and stable performance
- high gain/size ratio
- durable construction

UV protected radome made of polycarbonate allowing for harsh weather installations

Specifications:

Electrical

	4.9 - 5.15 GHz	5.15 - 5.875 GHz	5.875 - 6.1 GHz
Frequency range	4.9 - 5.15 GHz	5.15 - 5.875 GHz	5.875 - 6.1 GHz
Gain	28 dBi V-Pol: $28.5\hat{A}\pm 0.5$ dBi ; H-Pol: $28\hat{A}\pm 0.5$ dBi	29 dBi V-Pol: $29\hat{A}\pm 0.5$ dBi ; H-Pol: $28.5\hat{A}\pm 0.5$ dBi	28 dBi V-Pol: $28.5\hat{A}\pm 0.5$ dBi ; H-Pol: $28\hat{A}\pm 1$ dBi
VSWR, max.	2:1	1.7:1	2:1
3 dB Beam-Width, H-Plane, typ.	5.2 °	4.7 °	4.4 °
3 dB Beam-Width, E-Plane, typ.	5.2 °	4.7 °	4.4 °
Side Lobes, min.	ETSI TS3	ETSI TS3	ETSI TS3
Polarization	Dual Pole, Vertical and Horizontal		
Port to Port Isolation	- 30 dB		
Front to Back Ratio, min.	ETSI TS3		
Input power, max	10 Watt		
Input Impedance	50 Ohm		
Lightning Protection	DC Grounded		

Mechanical

Dimensions (HxWxD)	600 x 600 x 22 mm (23.5"x 23.5"x0.9")
Weight	4.7 kg
Connector	2xN-Type Female
Back Plane	Aluminum ; protected through chemical passivation
Radome	UV Protected, Polycarbonate
Mount	MNT-60

Environmental

Operating Temperature Range	- 40°C to + 65°C
Vibration	According to IEC 60721-3-4
Wind Load	200 km/h (Survival)
Flammability	UL94
Water Proofing	IP-67
Humidity	ETS 300 019-1-4, EN 302 085 (Annex A.1.1)
Salt Fog	According to IEC 68-2-11

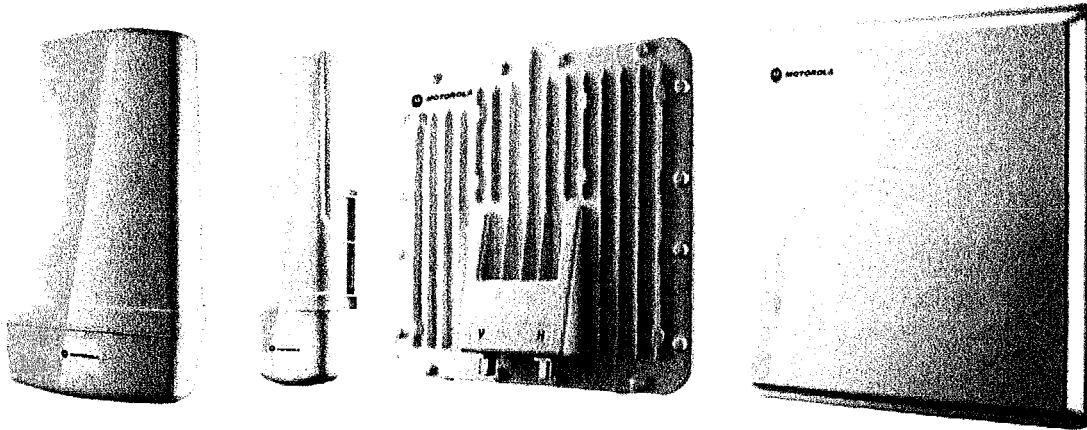
Ordering Options

Antenna 12142011t

MA-WA56-DP28 B

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implementing such changes to prior supplied products. Product images are representative and indicative only. Warranty terms and general conditions of sale are applicable on any purchase of any product and are available in the "Policies" section.



ACCELERATE SPEED AFFORDABLY

MOTOROLA PTP 200 SERIES SOLUTIONS

Our Point-to-Point (PTP) 200 Series Wireless Ethernet Solutions are designed to give you high-throughput, reliable broadband communications on a tight budget. With a PTP 200 Series solution, enterprises, government organizations and service providers with limited resources can establish and extend backhaul communications affordably.

MEETING YOUR NEEDS

Within our PTP 200 Series family of products¹, you can choose among three line-of-sight (LOS) and near-line-of-sight (nLOS) solutions – two new systems, plus our existing PTP 49200 system which operates in the 4.9 GHz public safety band at data rates up to 21 Mbps. The new PTP 58230 operates in the 5.8 GHz license-exempt band and at data rates up to 50 Mbps, while the new PTP

5X250 system is a dual-band² radio operating in the 5.4 and 5.8 GHz license-exempt bands at data rates up to 220 Mbps. Having an array of value-priced, high-quality communication options makes it easy to obtain the right combination of features to meet your specific application, infrastructure and environmental requirements.

WIRELESS NETWORK SOLUTIONS

PTP 200 Series solutions are included in our Wireless Network Solutions portfolio. This portfolio delivers seamless connectivity that puts real-time information in the hands of users, giving you the agility you need to grow your business or better protect and serve the public. Our unrivaled wireless network solutions include indoor WLAN, outdoor wireless mesh, point-to-multipoint and point-to-point networks as well as voice over WLAN solutions. Combined with powerful software for wireless network design, security, management and troubleshooting, our solutions deliver trusted networking and anywhere access to organizations across the globe.

¹ Because PTP 200 Series products are based on three different platforms, upgrades between platforms are not available.

² In the first release, only the 5.8 GHz band will be available in the U.S. and Canada.

PRODUCT SPEC SHEET
PTP 200 SERIES

RADIO TECHNOLOGY

RF bands ³	Defined-Use Licensed Band: 49200: 4.940 – 4.990 GHz License-Exempt Bands: 58230: 5.725 GHz – 5.875 GHz 5X250: 5.470 GHz – 5.725 GHz 5.725 GHz – 5.850 GHz
Channel size	In all cases, channel sizes depend on region code. 49200: 10 MHz 58230: Configurable to 10 or 20 MHz 5X250: Configurable to 20 or 40 MHz
Channel selection	49200, 58230: Manual selection 5X250: Automatic selection on start-up, with manual override
Transmit power ⁴	49200: Auto transmit power control by Master up to 18 dBm 58230: -30 to +19 dBm to EIRP limit by region (1 dBm interval) 5X250: Up to 22 dBm; varies with modulation mode and settings
System gain ⁴	49200: Integrated – Up to 141 dB using Integrated antenna 58230: Integrated – Up to 125 dB using Integrated antenna LENS – Up to 137 dB using passive LENS Reflector – Up to 155 dB using passive reflector 5X250: Integrated – Up to 158 dB using 23 dBi Integrated antenna System gain will vary with modulation mode and antenna type.
Receiver sensitivity	49200: Up to -89 dBm (with FEC) 58230: Up to -86 dBm (with FEC) 5X250: Adaptive, varying between -93 dBm and -71 dBm
Modulation	49200: Adaptive between QPSK, 16 QAM and 64 QAM 58230: Adaptive between QPSK, 16 QAM and 64 QAM 5X250: Dynamic; adapting between BPSK and 64 QAM with single and dual payload
Error correction	49200: ARQ, FEC (3/4 Reed-Solomon block coding) 58230: ARQ, FEC (3/4 Reed-Solomon block coding) 5X250: ARQ, FEC (based on IEEE 802.11n)
Duplex scheme	49200: Time Division Duplex (TDD) 58230: Time Division Duplex (TDD) 5X250: Time Division Duplex (TDD)
Antenna	In all cases, check local regulations prior to antenna purchase. 49200: Varies with antenna type; can operate with a selection of separately-purchased antennas, 50 ohm N-type 58230: Integrated – 10 dBi (55° antenna), can be enhanced with passive LENS or reflector dish

Antenna (continued)	5X250: Integrated flat plate 23 dBi / 7° Connectorized: Can operate with a selection of separately-purchased single and dual polar antennas through 2 x N-type female connectors
Maximum Range	49200: Integrated – Up to 15 mi (24 km) 58230: Integrated – Up to 4.5 mi (7.2 km) LENS – Up to 18 mi (29 km), Reflector – Up to 80 mi (128.7 km) 5X250: 20 MHz Channel – Up to 34 mi (54 km) 40 MHz Channel – Up to 17 mi (27 km) Models vary with modulation mode and antenna type and size.
Security and encryption	49200: DES, FIPS 197 128-bit AES Encryption 58230: DES, FIPS 197 128-bit AES Encryption 5X250: Proprietary encryption

ETHERNET BRIDGING

Protocol	49200: Proprietary OFDM 58230: Proprietary OFDM 5X250: Proprietary, based on IEEE 802.11n
User data throughput	49200: Up to 21 Mbps (aggregate) 58230: 10 MHz Channel – Up to 24 Mbps 20 MHz Channel – Up to 50 Mbps 5X250: Up to 220 Mbps at the Ethernet (aggregate): 20 MHz Channel – Up to 110 Mbps 40 MHz Channel – Up to 220 Mbps
Latency (typical)	49200: 5 to 7 ms round trip 58230: 5 to 7 ms round trip 5X250: 4 ms round trip
QoS	49200: DiffServ QoS 58230: DiffServ QoS
Ethernet Interface	49200: 10/100 Base T (RJ-45) 58230: 10/100 Base T (RJ-45) 5X250: 1000 Base T (RJ-45), auto MDI/MDIX
VLAN	49200: 802.1Q with 802.1p priority 58230: 802.1ad (DVLAN Q-in-Q), 802.1Q with 802.1p priority, dynamic port VID

MANAGEMENT & INSTALLATION

LED indicators	49200: Power, GPS, Sync, Session, Link and Activity indicators 58230: Power, GPS, Sync, Session, Link and Activity indicators 5X250: Power status LED on Power Supply Unit (PSU)
System management	49200: HTTP, Telnet, FTP, SNMPv2c; compatible with Prizm 3.2 or later and CNUT 3.1 or later 58230: HTTP, Telnet, FTP, SNMPv2c; Wireless Manager, version 3.0 or higher 5X250: Web access via browser using proprietary PTP MIB
Installation	49200: Audio and LED indicators for link optimization 58230: Audio and LED indicators for link optimization 5X250: Built-in audio and graphical assistance for link optimization

³ Regulatory conditions for RF bands should be confirmed prior to system purchase. Certain bands may not be available in all geographic regions.

⁴ Gain, maximum transmit power and effective radiated power may vary based on regulatory domain.

PRODUCT SPEC SHEET
PTP 200 SERIES

Connection	49200: Distance between outdoor unit and primary network connection: up to 330 ft. (100 meters)
	58230: Distance between outdoor unit and primary network connection: up to 330 ft. (100 meters)
	5X250: Distance between outdoor unit and primary network connection: up to 330 ft. (100 meters)

PHYSICAL

Dimensions	49200: H-13.25" (33.6 cm), W-8.25" (21 cm), D-4.38" (11.1 cm)
	58230: H-11.75" (29.9 cm), W-3.4" (8.6 cm), D-3.4" (8.6 cm)
	5X250: Integrated ODU: W-14.5" (370 mm), H-14.5" (370 mm), D-3.75" (95 mm) Connectorized ODU: W-12.2" (309 mm), H-12.2" (309 mm), D-4.1" (105 mm) PoE Power Supply: W-6.5" (165 mm), H-2.0" (50 mm), D-3.5" (88 mm)
Weight	49200: 2.8 lbs (1.3 kg)
	58230: 1 lb (0.6 kg)
	5X250: Integrated ODU: 12.1 lbs (5.5 kg) including bracket Connectorized ODU: 9.1 lbs (4.3 kg) including bracket PoE power supply: 0.83 lbs (378 g)
Operating temperature	49200: -40° to +131° F (-40° to +55° C)
	58230: -40° to +131° F (-40° to +55° C)
	5X250: -40° to +140° F (-40° to +60° C), including solar radiation
Wind speed survival	49200: 118 mph (190 kph)
	58230: 118 mph (190 kph)
	5X250: 150 mph (240 kph)

Power supply	49200: PoE power supply unit
	58230: PoE power supply unit
	5X250: PoE power supply unit
Power source	49200: 100-240 VAC, 50-60 Hz
	58230: 100-240 VAC, 50-60 Hz
	5X250: 100-240 VAC, 50-60 Hz
Power consumption	49200: 22 W max at 56 VDC
	58230: 9 W max at 30 VDC
	5X250: 35 W max

ENVIRONMENTAL & REGULATORY

Protection and safety	49200: UL60950; IEC60950; EN60950; CSA-C22.2 No. 60950; CB Approval for Global
	58230: UL60950; IEC60950; EN60950; CSA-C22.2 No. 60950; CB Approval for Global
	5X250: UL60950-1; CSA-C22.2 No. 60950-1 IEC60950-1:2005; EN60950-1:2006 + A11:2009 CB Approval for Global
Radio	49200: FCC -- ABZ89FT7631, IC -- 109W-4940
	58230: FCC -- TBD, IC -- 109W-5784, CE -- EN302 502
	5X250: 5.4 GHz: EN301 893 5.8 GHz: FCC CFR 47, Part 15, sub-part C, 15.247; IC RSS210, Annex 8; EN 302 502
EMC	FCC CFR 47, 15.209 & 207, Class B; IC RSS210 Annex 8.5 & RSS Gen Para 7.2.2, Class B; EN301 489-1 & EN301 489-4, Class B

Note:
The PTP 5X250 device has not been authorized in the 5.4 GHz band as required by the rules of the Federal Communications Commission and Industry Canada. This device is not, and may not be, offered for sale or lease, or sold or leased, as a dual-band device in the U.S. and Canada until authorization is obtained.

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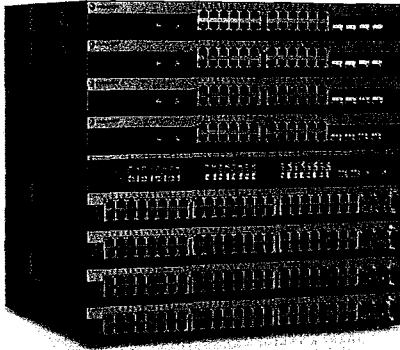
123-128 WNS PTP 200 Series SS 020811



12/14/2011

C-Series C5

Gigabit Ethernet Stackable L2/L3/L4 Switch



Future-proofed with 802.3at high-power PoE and IPv6 routing support

Automatic discovery and deployment of VoIP services

High-availability stacking assures reliable network operations

Automated management features reduce operational costs

Investment protection via comprehensive lifetime warranty

2.11Tbps capacity and 809.5Mpps

Product Overview

The Enterasys C5 is a scalable, high-performance Gigabit Ethernet switch that provides support for the bandwidth-intensive and latency-sensitive requirements of today's demanding business applications. The C5 is an excellent choice for environments that require complete multi-layer switching capabilities and support for high density 10/100/1000 Ethernet ports and 10GE uplinks. The C5 also includes dynamic IPv4 and IPv6 routing and switching built into the hardware and policy-based automation capabilities for advanced edge deployments.

The C5 incorporates the new 802.3at high-power PoE on all ports, which translates into increased power provisioning for power-hungry devices such as Pan/Tilt/Zoom (PTZ) IP surveillance cameras, IP videophones, third party 802.11n access points and virtual desktops. Built-in high-power PoE support is a cost effective alternative for customers in place of purchasing separate PoE midspans, which can take away valuable rack space, add cost and contribute more cabling to the wiring closet.

The C5 provides high port density in a 1U footprint and is environmentally friendly by design. The C5's overall energy efficiency is further enhanced by a low current draw and an extreme tolerance for high environmental temperatures. A highly-scalable architecture and a comprehensive lifetime warranty ensure that a C5 network investment will sustain a secure, feature-rich and cost-effective network well into the future.

The C5's highly customizable Layer 2/3/4 packet classification capabilities work together with the 8 hardware-based priority queues associated with each Ethernet port to support a suite of differentiated services with as many as 8 distinct priority levels to provide guaranteed Quality of Service (QoS) for critical voice and video network traffic. In conjunction with its non-blocking L2 switching and L3 routing architecture, the C5's intelligent queuing mechanisms ensure that mission-critical applications receive prioritized access to network resources.

Benefits

Business Alignment

- Aligns network resource utilization with business goals and priorities
- Reliable network operation for mission-critical applications

Operational Efficiency

- Management automation capabilities reduce network operational expenses
- Automatic discovery and deployment of VoIP services

Security

- Ability to audit network for adherence to compliance regulations, such as PCI or HIPAA
- Network resources securely allocated according to user roles
- Network security maintained concurrently with user mobility

Support and Service

- Industry-leading customer satisfaction and first call resolution rates
- Personalized services, including site surveys, network design, installation, and training
- Comprehensive lifetime warranty, including feature upgrades and more

**There is nothing more important
than our customers.**

Reliability and Availability

The C5 design incorporates redundancy and failure protection mechanisms complete with automatic failover and recovery capabilities to provide a reliable network. An integral power supply is the primary source of power for the C5 and complete power redundancy is provided by an optional external power supply. The C5 redundant power supply provides load sharing, backup, or additive PoE power to a C5 stackable switch. With the power supply connected, the power requirement for the switch is equally shared by the two power supplies thereby stressing the power supplies less and increasing the lifetime and reliability of the power supplies.

A virtual switch can be created by interconnecting as many as eight C5s in a single stack, which can be managed via a single IP address with redundant management connections. The C5's closed-loop stacking capability utilizes bi-directional switch interconnects to maintain connectivity within the virtual switch despite any physical failures, which includes switches, cables and connections. Up to eight Ethernet ports can be grouped together to create a multi-link aggregation group (LAG). A LAG's Ethernet ports can be co-located on a single C5 or they can be distributed across multiple C5s within a stack to prevent a switch-level failure from disrupting data communications. The C5 also supports equal cost multipath protocol (ECMP) and virtual router redundancy protocol (VRRP) to strengthen its ability to quickly recover from a network failure. The C5 also includes Host CPU Protection support to help prevent Denial of Service (DoS) and BPDU attacks.

Advanced Quality of Service

Robust Quality of Service features enable strong support for integrated multimedia networks, as well as all types of data-intensive applications. The C5 is a standards-based solution optimized for multimedia applications, including VoIP, videoconferencing and real-time collaboration. The C5 uses multiple standards-based discovery methods with Enterasys policy capabilities to automatically identify and provision VoIP services for IP phones from all major vendors. C5 switches provide dynamic mobility for VoIP clients and reduce operating costs; when an IP phone moves and plugs in elsewhere in the enterprise network, its VoIP service provisioning, security and traffic priority settings move with it, with no manual administration required.

Advanced packet buffering on the C5 means less jitter on the network and a greater level of QoS for time-sensitive applications, such as VoIP and IP video, resulting in better network performance.

Security

The C5 enables strong network security by utilizing its authentication and security features, which can be applied at the port level or at the user level. Making use of the Enterasys Network Management Suite's Policy Manager or a standard CLI, the Enterasys role-based architecture enables

a network administrator to define distinct roles or profiles that represent operational groups within a business (e.g., employee, executive, guest, etc). Multiple users/devices per port can be authenticated via IEEE 802.1X, MAC address, or web authentication, and then assigned a pre-defined operational role.

Administrators can easily transition from RFC 3580 and complex access control list (ACL) deployments to the Enterasys role-based policy framework in a seamless fashion, without the need to make changes to their RADIUS infrastructure (e.g., adding filter-ID). In addition, the C5 also supports ACLs for supplementary network security. Network operations can be easily tailored to meet business-oriented requirements by providing each role with individualized access to network services and applications (e.g., a guest should have different network access privileges than an employee). Utilizing Enterasys role-based policy, administrators are able to manipulate DSCP and 802.1p rewrite for classification and prioritization of network traffic.

The C5 allows administrators even more network visibility, with the ability to audit their network for adherence to compliance regulations, such as PCI or HIPAA. The C5 is able to segment roles down to specific business functions, such as marketing, finance, HR or corporate, tailoring employee access to sensitive information.

Investment Protection

The C5 is a cost-effective, feature-rich, stackable switch that provides a broad set of features today and will continue to deliver benefits well into the future. All C-Series products include a lifetime warranty that includes warranty and support services for which many competitors charge additional fees – adding up to 10% of initial deployment costs on an annual basis. Included benefits, such as advanced hardware return, firmware feature upgrades (which most vendors cover at most for 90 days) and telephone support (which most don't include or severely limit) combine to significantly decrease operational costs for customers over the life of their network. For more information regarding warranty terms and conditions please go to <http://www.enterasys.com/support/warranty.aspx>.

Performance & Scalability

The C5, with support for 32,000 MAC addresses, provides scalable, wire-rate performance in support of the bandwidth-intensive and delay-sensitive requirements of today's demanding applications. Along with a switch capacity of 264 Gbps, the C5 provides up to 48 10/100/1000 Ethernet ports as well as 2 SFP+ ports, with the ability to support both 1GE and 10GE uplinks on the same port. Leveraging the C5's stacking capability, as many as 8 C5s (both 24-port and 48-port combinations) can be interconnected in a single stack to create a virtual switch that provides 2.11 Tbps of capacity and up to 384 10/100/1000 Ethernet ports as well as 16 10GE uplink ports.

Features / Standards and Protocols

MAC Address Table Size

32,000

VLANs

4,094 VLAN IDs

1,024 VLAN Entries per Stack

Switching Services Protocols

IEEE 802.1AB – LLDP

ANSI/TIA-1057 – LLDP-MED

IEEE 802.1D – MAC Bridges

IEEE 802.1s – Multiple Spanning Trees

IEEE 802.1t – 802.1D Maintenance

IEEE 802.1w – Rapid Spanning Tree

Reconvergence

IEEE 802.3 – Ethernet

IEEE 802.3ab – GE over Twisted Pair

IEEE 802.3ad – Link Aggregation

IEEE 802.3ae – 10 Gigabit Ethernet (fiber)

IEEE 802.3af – PoE

IEEE 802.3at – High Power PoE

(up to 30W per port)

IEEE 802.3i – 10Base-T

IEEE 802.3u – 100Base-T, 100Base-FX

IEEE 802.3z – GE over Fiber

Full/half duplex auto-sense support on all ports

IGMP Snooping v1/v2/v3

Jumbo Frame support (9,216 bytes)

Loop Protection

One-to-One and Many-to-One Port Mirroring

Port Description

Protected Ports

Selectable LAG Configuration Ready (6 x 8, 12 x 4, 24 x 2)

Host CPU Protection – Broadcast/ Multicast/

Unknown Unicast Suppression

Spanning Tree Backup Root

STP Pass Thru

VLAN Support

Generic Attribute Registration Protocol (GARP)

Generic VLAN Registration Protocol (GVRP)

IEEE 802.1p – Traffic classification

IEEE 802.1Q – VLAN Tagging

Protocol-based VLANs with Enterasys Policy

IEEE 802.3ac – VLAN Tagging Extensions

Port-based VLAN (private port/private VLAN)

Tagged-based VLAN

VLAN Marking of Mirror Traffic

Security

ARP Spoof Protection

DHCP Spoof Protection

IEEE 802.1X Port Authentication

MAC-based Port Authentication

RADIUS Accounting for network access

RADIUS Client

RFC 3580 – IEEE 802.1X RADIUS Usage

Guidelines

Multi-user Authentication

Password Protection (encryption)

Secure Networks Policy

Secured Shell (SSHv2)

Secured Socket Layer (SSL)

User and IP Phone Authentication

Web-based Port Authentication

IPv4 Routing

Standard Access Control List (ACLs)

Extended ACLs

VLAN-based ACLs

ARP & ARP Redirect

DVMRP

IP Helper Address

RFC 826 – Ethernet ARP

RFC 1058 – RIP v1

RFC 1256 – ICMP Router Discovery Messages

RFC 1519 Classless Inter-Domain Routing

RFC 1724 – RIPv2 MIB Extension

RFC 2236 – IGMPv2

RFC 2328 – OSPF version 2

RFC 2338 – IP Redundancy VRRP

RFC 2362 – PIM-SM

RFC 2453 – RIP v2

RFC 3046 – DHCP/BootP Relay

RFC 3376 – IGMPv3

RFC 3768 – VRRP – Virtual Router

Redundancy Protocol Static Routes

IPv6 Routing

RFC 1981 – Path MTU for IPv6

RFC 2373 – IPv6 Addressing

RFC 2460 – IPv6 Protocol Specification

RFC 2461 – Neighbor Discovery

RFC 2462 – Stateless Autoconfiguration

RFC 2463 – ICMPv6

RFC 2464 – IPv6 over Ethernet

RFC 2473 – Generic Packet Tunneling in IPv6

RFC 2271 – SNMP Framework MIB

RFC 2711 – IPv6 Router Alert

RFC 2740 – OSPFv3

RFC 2893 – Transition Mechanisms for

IPv6 Hosts and Routers (6 over 4 configured)

RFC 3315 – DHCPv6 (stateless + relay)

RFC 3484 – Default Address Selection for IPv6

RFC 3493 – Basic Socket Interface for IPv6

RFC 3513 – Addressing Architecture for IPv6

RFC 3542 – Advanced Sockets API for

RFC 3587 – IPv6 Global Unicast Address Format

RFC 3736 – Stateless DHCPv6

Dual IPv4/IPv6 TCP/IP Stack

MIB Support

Enterasys Entity MIB

Enterasys Policy MIB

Enterasys VLAN Authorization MIB

ANSI/TIA-1057 – LLDP-MED MIB

IEEE 802.1AB – LLDP MIB

IEEE 802.1X MIB – Port Access

IEEE 802.3ad MIB – LAG MIB

RFC 826 – ARP and ARP Redirect

RFC 951, RFC 1542 – DHCP/

BOOTP Relay

RFC 1213 – MIB/MIB II

RFC 1493 – BRIDGE-MIB

RFC 1643 – Ethernet-like MIB

RFC 1724 – RIPv2 MIB Extension

RFC 1850 – OSPF MIB

RFC 2096 – IP Forwarding Table MIB

RFC 2131, RFC 3046 – DHCPClient/Relay

RFC 2233 – IF-MIB

RFC 2465 – IPv6 MIB

RFC 2466 – ICMPv6 MIB

RFC 2571 – SNMP Framework MIB

RFC 2618 – RADIUS Authentication Client MIB

RFC 2620 – RADIUS Accounting Client MIB

RFC 2668 – Managed Object Definitions

for 802.3 MAUs

RFC 2674 – P-BRIDGE-MIB

RFC 2674 – QBRIDGE-MIB VLAN Bridge MIB

RFC 2737 – Entity MIB (physical branch only)

RFC 2787 – VRRP-MIB

RFC 2819 – RMON-MIB

RFC 2933 – IGMP MIB

RFC 2934 – PIM MIB for IPv4

RFC 3413 – SNMP v3 Applications MIB

RFC 3414 – SNMP v3 User-based

Security Module (USM) MIB

RFC 3584 – SNMP Community MIB

RFC 3621 – Power over Ethernet MIB

Quality of Service

8 Priority Queues per Port

802.3x Flow Control

Class of Service (CoS)

Ingress Rate Limiting

IP ToS/DSCP Marking/Remarking

IP Precedence

IP Protocol

Layer 2/3/4 Classification

Multi-layer Packet Processing

Queuing Control – Strict and Weighted

Round Robin

Source/Destination IP Address

Source/Destination MAC Address

Dynamic and Static MAC Locking

EAP Pass-Thru

RFC 2474 Definition of Differentiated Services

Field

Features / Standards and Protocols (cont.)

Management	RFC 792 – ICMP	RFC 3415 – View-based Access Control Model for SNMP
Alias Port Naming	RFC 793 – TCP	RFC 3826 – Advanced Encryption Standard (AES) for SNMP
Command Line Interface (CLI)	RFC 826 – ARP	RMON (Stats, History, Alarms, Events, Filters, Packet Capture)
Configuration Upload/Download	RFC 854 – Telnet	Secure Copy (SCP)
Dual IPv4/IPv6 Management Support	RFC 951 – BootP	Secure FTP (SFTP)
Editable Text-based Configuration File	RFC 1157 – SNMP	Simple Network Management Protocol (SNMP) v1/v2c/v3
TFTP Client	RFC 1321 – The MD5 Message-Digest Algorithm	SSHv2
Multi-configuration File Support	RFC 1901 – Community-based SNMPv2	RFC 3164 – The BSD Syslog Protocol
NMS Automated Security Manager	RFC 2030 Simple Network Time Protocol (SNTP)	TACACS+ support
NMS Console	RFC 2933 – IGMP MIB	Authentication, Authorization and Auditing
NMS Inventory Manager	RFC 3176 – sFlow	Web-based Management
NMS Policy Manager	RFC 3413 – SNMPV3 Applications	Webview via SSL Interface
Node/Alias Table	RFC 3414 – User-based Security	
RFC 768 – UDP	Module (USM) for SNMPv3	
RFC 783 – TFTP		
RFC 791 – IP		

Switch Model Specifications

	C5G124-24	C5G124-24P2	C5G124-48	C5G124-48P2
Performance				
Throughput Capacity wire-speed Mpps (switch / stack)	35.7 Mpps / 285.7 Mpps	35.7 Mpps / 285.7 Mpps	71.4 Mpps / 571.4 Mpps	71.4 Mpps / 571.4 Mpps
Switching Capacity (switch / stack)	48 Gbps (35.7 Mpps) / 384 Gbps (285.7 Mpps)	48 Gbps (35.7 Mpps) / 384 Gbps (285.7 Mpps)	96 Gbps (71.4 Mpps) / 768 Gbps (571.4 Mpps)	96 Gbps (71.4 Mpps) / 768 Gbps (571.4 Mpps)
Stacking Capacity (switch / stack)	128 Gbps (95.2 Mpps) / 1,024 Gbps (761.8 Mpps)	128 Gbps (95.2 Mpps) / 1,024 Gbps (761.8 Mpps)	128 Gbps (95.2 Mpps) / 1,024 Gbps (761.8 Mpps)	128 Gbps (95.2 Mpps) / 1,024 Gbps (761.8 Mpps)
Aggregate Throughput Capacity (switch / stack)	176 Gbps (130.9 Mpps) / 1,408 Gbps (1,047.5 Mpps)	176 Gbps (130.9 Mpps) / 1,408 Gbps (1,047.5 Mpps)	224 Gbps (166.6 Mpps) / 1,792 Gbps (1,333.2 Mpps)	224 Gbps (166.6 Mpps) / 1,792 Gbps (1,333.2 Mpps)
PoE Specifications				
802.3af Interoperable	N/A	Yes	N/A	Yes
802.3at Interoperable	N/A	Yes	N/A	Yes
System Power	N/A	850 watts per switch with up to 30 watts per port Per-port switch power monitor: • Enable/disable • Priority safety • Overload & short circuit protection	N/A	850 watts per switch with up to 30 watts per port Per-port switch power monitor: • Enable/disable • Priority safety • Overload & short circuit protection
Physical Specifications				
Dimensions (H x W x D)	H: 4.4 cm (1.73") W: 44.1 cm (17.36") D: 36.85 cm (14.51")	H: 4.4 cm (1.73") W: 44.1 cm (17.36") D: 36.85 cm (14.51")	H: 4.4 cm (1.73") W: 44.1 cm (17.36") D: 36.85 cm (14.51")	H: 4.4 cm (1.73") W: 44.1 cm (17.36") D: 36.85 cm (14.51")
Net Weight	5.03 kg (11.10 lb)	6.21 kg (13.70 lb)	5.42 kg (11.95 lb)	6.60 kg (14.55 lb)
MTBF	395,557 hours	289,425 hours	311,897 hours	229,532 hours
Physical Ports	<ul style="list-style-type: none"> • (24) 10/100/1000 auto-sensing, auto-negotiating MDI/MDI-X RJ45 ports • (4) Combo SFP ports • (2) dedicated stacking ports • (1) DB9 console port • (1) RPS port 	<ul style="list-style-type: none"> • (24) 10/100/1000 PoE (.af+.at) auto-sensing, auto-negotiating MDI/MDI-X RJ45 ports • (4) Combo SFP ports • (2) dedicated stacking ports • (1) DB9 console port • (1) RPS port 	<ul style="list-style-type: none"> • (48) 10/100/1000 auto-sensing, auto-negotiating MDI/MDI-X RJ45 ports • (4) Combo SFP ports • (2) dedicated stacking ports • (1) DB9 console port • (1) RPS port 	<ul style="list-style-type: none"> • (48) 10/100/1000 PoE (.af+.at) auto-sensing, auto-negotiating MDI/MDI-X RJ45 ports • (4) Combo SFP ports • (2) dedicated stacking ports • (1) DB9 console port • (1) RPS port
Power Requirements				
Normal Input Voltage	100 - 240 VAC	100 - 240 VAC	100 - 240 VAC	100 - 240 VAC
Input Frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Input Current	2 A Max	12 A Max	2 A Max	12 A Max
Power Consumption	65 watts	125 watts	101 watts	150 watts

Switch Model Specifications (cont.)

	C5G124-24	C5G124-24P2	C5G124-48	C5G124-48P2	
Temperature					
IEC 6-2-1 Standard Operating Temperature	0° to 50° C (32° to 122° F)	0° to 50° C (32° to 122° F)	0° to 50° C (32° to 122° F)	0° to 50° C (32° to 122° F)	
IEC 6-2-14 Non-Operating Temperature	-40° to 70° C (-40° to 158° F)	-40° to 70° C (-40° to 158° F)	-40° to 70° C (-40° to 158° F)	-40° to 70° C (-40° to 158° F)	
Heat Dissipation	222 BTUs/Hr	428 BTUs/Hr	345 BTUs/Hr	513 BTUs/Hr	
Humidity					
Operating Humidity	5% - 95% non-condensing	5% - 95% non-condensing	5% - 95% non-condensing	5% - 95% non-condensing	
Vibration					
	IEC 68-2-6, IEC68-2-36	IEC 68-2-6, IEC68-2-36	IEC 68-2-6, IEC68-2-36	IEC 68-2-6, IEC68-2-36	
Shock					
	IEC 68-2-29	IEC 68-2-29	IEC 68-2-29	IEC 68-2-29	
Drop					
	IEC 68-2-32	IEC 68-2-32	IEC 68-2-32	IEC 68-2-32	
Acoustics					
Front of switch (normal operation)	44 dB	45.5 dB	46 dB	45.5 dB	
Altitude					
Operating	10,000 ft (3,048 m)	10,000 ft (3,048 m)	10,000 ft (3,048 m)	10,000 ft (3,048 m)	
Non-operating	15,000 ft (4,572 m)	15,000 ft (4,572 m)	15,000 ft (4,572 m)	15,000 ft (4,572 m)	
Agency and Regulatory Standard Specifications					
Safety	UL 60950-1, CSA 22.1 60950, EN 60950-1, and IEC 60950-1	UL 60950-1, CSA 22.1 60950, EN 60950-1, and IEC 60950-1	UL 60950-1, CSA 22.1 60950, EN 60950-1, and IEC 60950-1	UL 60950-1, CSA 22.1 60950, EN 60950-1, and IEC 60950-1	
EMC	FCC Part 15 (Class A), ICES-003 (Class A), BSMI, VCCI V-3, AS/NZS CISPR 22 (Class A), EN 55022 (Class A), EN 55024, EN 61000-3-2, and EN 61000-3-3	FCC Part 15 (Class A), ICES-003 (Class A), BSMI, VCCI V-3, AS/NZS CISPR 22 (Class A), EN 55022 (Class A), EN 55024, EN 61000-3-2, and EN 61000-3-3	FCC Part 15 (Class A), ICES-003 (Class A), BSMI, VCCI V-3, AS/NZS CISPR 22 (Class A), EN 55022 (Class A), EN 55024, EN 61000-3-2, and EN 61000-3-3	FCC Part 15 (Class A), ICES-003 (Class A), BSMI, VCCI V-3, AS/NZS CISPR 22 (Class A), EN 55022 (Class A), EN 55024, EN 61000-3-2, and EN 61000-3-3	
Environmental	2002/95/EC (RoHS Directive), 2002/96/EC (WEEE Directive), Ministry of Information Order #39 (China RoHS)	2002/95/EC (RoHS Directive), 2002/96/EC (WEEE Directive), Ministry of Information Order #39 (China RoHS)	2002/95/EC (RoHS Directive), 2002/96/EC (WEEE Directive), Ministry of Information Order #39 (China RoHS)	2002/95/EC (RoHS Directive), 2002/96/EC (WEEE Directive), Ministry of Information Order #39 (China RoHS)	
	C5K125-24	C5K125-24P2	C5K125-48	C5K125-48P2	C5K175-24
Performance					
Throughput Capacity wire-speed Mpps (switch / stack)	65.5 Mpps / 523.8 Mpps	65.5 Mpps / 523.8 Mpps	101.2 Mpps / 809.5 Mpps	101.2 Mpps / 809.5 Mpps	65.5 Mpps / 523.8 Mpps
Switching Capacity (switch / stack)	88 Gbps (65.5 Mpps) / 704 Gbps (523.8 Mpps)	88 Gbps (65.5 Mpps) / 704 Gbps (523.8 Mpps)	136 Gbps (101.2 Mpps) / 1,088 Gbps (809.5 Mpps)	136 Gbps (101.2 Mpps) / 1,088 Gbps (809.5 Mpps)	88 Gbps (65.5 Mpps) / 704 Gbps (523.8 Mpps)
Stacking Capacity (switch / stack)	128 Gbps (95.2 Mpps) / 1,024 Gbps (761.8 Mpps)	128 Gbps (95.2 Mpps) / 1,024 Gbps (761.8 Mpps)	128 Gbps (95.2 Mpps) / 1,024 Gbps (761.8 Mpps)	128 Gbps (95.2 Mpps) / 1,024 Gbps (761.8 Mpps)	128 Gbps (95.2 Mpps) / 1,024 Gbps (761.8 Mpps)
Aggregate Throughput Capacity (switch / stack)	216 Gbps (160.7 Mpps) / 1,728 Gbps (1,285.6 Mpps)	216 Gbps (160.7 Mpps) / 1,728 Gbps (1,285.6 Mpps)	264 Gbps (196.4 Mpps) / 2,112 Gbps (1,571.3 Mpps)	264 Gbps (196.4 Mpps) / 2,112 Gbps (1,571.3 Mpps)	216 Gbps (160.7 Mpps) / 1,728 Gbps (1,285.6 Mpps)
PoE Specifications					
802.3af Interoperable	N/A	Yes	N/A	Yes	N/A
802.3at Interoperable	N/A	Yes	N/A	Yes	N/A

Switch Model Specifications (cont.)

	C5K125-24	C5K125-24P2	C5K125-48	C5K125-48P2	C5K175-24
System Power	N/A	850 watts per switch with up to 30 watts per port Per-port switch power monitor: • Enable/disable • Priority safety • Overload & short circuit protection	N/A	850 watts per switch with up to 30 watts per port Per-port switch power monitor: • Enable/disable • Priority safety • Overload & short circuit protection	N/A
Physical Specifications					
Dimensions (H x W x D)	H: 4.4 cm (1.73") W: 44.1 cm (17.36") D: 36.85 cm (14.51")	H: 4.4 cm (1.73") W: 44.1 cm (17.36") D: 36.85 cm (14.51")	H: 4.4 cm (1.73") W: 44.1 cm (17.36") D: 36.85 cm (14.51")	H: 4.4 cm (1.73") W: 44.1 cm (17.36") D: 36.85 cm (14.51")	H: 4.4 cm (1.73") W: 44.1 cm (17.36") D: 36.85 cm (14.51")
Net Weight	4.92 kg (10.85 lb)	6.10 kg (13.45 lb)	5.31 kg (11.70 lb)	6.49 kg (14.30 lb)	4.97 kg (10.95 lb)
MTBF	365,615 hours	273,083 hours	284,345 hours	213,965 hours	395,839 hours
Physical Ports	<ul style="list-style-type: none"> • (24) 10/100/1000 auto-sensing, auto-negotiating MDI/MDI-X RJ45 ports • (2) Combo SFP ports • (2) SFP+ ports • (2) dedicated stacking ports • DB9 console port • (1) RPS port 	<ul style="list-style-type: none"> • (24) 10/100/1000 PoE (.af + .at) auto-sensing, auto-negotiating MDI/MDI-X RJ45 ports • (2) Combo SFP ports • (2) SFP+ ports • (2) dedicated stacking ports • DB9 console port • (1) RPS port 	<ul style="list-style-type: none"> • (48) 10/100/1000 auto-sensing, auto-negotiating MDI/MDI-X RJ45 ports • (2) Combo SFP ports • (2) SFP+ ports • (2) dedicated stacking ports • (1) DB9 console port • (1) RPS port 	<ul style="list-style-type: none"> • (48) 10/100/1000 PoE (.af + .at) auto-sensing, auto-negotiating MDI/MDI-X RJ45 ports • (2) Combo SFP ports • (2) SFP+ ports • (2) dedicated stacking ports • (1) DB9 console port • (1) RPS port 	<ul style="list-style-type: none"> • (24) SFP • (2) SFP+ ports • (2) dedicated stacking ports • (1) DB9 console port • (1) RPS port
Power Requirements					
Normal Input Voltage	100 - 240 VAC	100 - 240 VAC	100 - 240 VAC	100 - 240 VAC	100 - 240 VAC
Input Frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Input Current	2 A Max	12 A Max	2 A Max	12 A Max	2 A Max
Power Consumption	74 watts	130 watts	120 watts	165 watts	69 watts
Temperature					
IEC 6-2-1 Standard Operating Temperature	0° to 50° C (32° to 122° F)	0° to 50° C (32° to 122° F)	0° to 50° C (32° to 122° F)	0° to 50° C (32° to 122° F)	0° to 50° C (32° to 122° F)
IEC 6-2-14 Non-Operating Temperature	-40° to 70° C (-40° to 158° F)	-40° to 70° C (-40° to 158° F)	-40° to 70° C (-40° to 158° F)	-40° to 70° C (-40° to 158° F)	-40° to 70° C (-40° to 158° F)
Heat Dissipation	253 BTUs/Hr	445 BTUs/Hr	408 BTUs/Hr	565 BTUs/Hr	234 BTUs/Hr
Humidity					
Operating Humidity	5% - 95% non-condensing	5% - 95% non-condensing	5% - 95% non-condensing	5% - 95% non-condensing	5% - 95% non-condensing
Vibration					
	IEC 68-2-6, IEC68-2-36	IEC 68-2-6, IEC68-2-36	IEC 68-2-6, IEC68-2-36	IEC 68-2-6, IEC68-2-36	IEC 68-2-6, IEC68-2-36
Shock					
	IEC 68-2-29	IEC 68-2-29	IEC 68-2-29	IEC 68-2-29	IEC 68-2-29
Drop					
	IEC 68-2-32	IEC 68-2-32	IEC 68-2-32	IEC 68-2-32	IEC 68-2-32
Acoustics					
Front of switch (normal operation)	45 dB	45.5 dB	47 dB	46 dB	46 dB
Altitude					
Operating	10,000 ft (3,048 m)	10,000 ft (3,048 m)	10,000 ft (3,048 m)	10,000 ft (3,048 m)	10,000 ft (3,048 m)
Non-operating	15,000 ft (4,572 m)	15,000 ft (4,572 m)	15,000 ft (4,572 m)	15,000 ft (4,572 m)	15,000 ft (4,572 m)

Agency and Regulatory Standard Specifications					
Safety	UL 60950-1, CSA 22.1 60950, EN 60950-1, and IEC 60950-1	UL 60950-1, CSA 22.1 60950, EN 60950-1, and IEC 60950-1	UL 60950-1, CSA 22.1 60950, EN 60950-1, and IEC 60950-1	UL 60950-1, CSA 22.1 60950, EN 60950-1, and IEC 60950-1	UL 60950-1, CSA 22.1 60950, EN 60950-1, and IEC 60950-1
EMC	FCC Part 15 (Class A), ICES-003 (Class A), BSMI, VCCI V-3, AS/NZS CISPR 22 (Class A), EN 55022 (Class A), EN 55024, EN 61000-3-2, and EN 61000-3-3	FCC Part 15 (Class A), ICES-003 (Class A), BSMI, VCCI V-3, AS/NZS CISPR 22 (Class A), EN 55022 (Class A), EN 55024, EN 61000-3-2, and EN 61000-3-3	FCC Part 15 (Class A), ICES-003 (Class A), BSMI, VCCI V-3, AS/NZS CISPR 22 (Class A), EN 55022 (Class A), EN 55024, EN 61000-3-2, and EN 61000-3-3	FCC Part 15 (Class A), ICES-003 (Class A), BSMI, VCCI V-3, AS/NZS CISPR 22 (Class A), EN 55022 (Class A), EN 55024, EN 61000-3-2, and EN 61000-3-3	FCC Part 15 (Class A), ICES-003 (Class A), BSMI, VCCI V-3, AS/NZS CISPR 22 (Class A), EN 55022 (Class A), EN 55024, EN 61000-3-2, and EN 61000-3-3
Environmental	2002/95/EC (RoHS Directive), 2002/96/EC (WEEE Directive), Ministry of Information Order #39 (China RoHS)	2002/95/EC (RoHS Directive), 2002/96/EC (WEEE Directive), Ministry of Information Order #39 (China RoHS)	2002/95/EC (RoHS Directive), 2002/96/EC (WEEE Directive), Ministry of Information Order #39 (China RoHS)	2002/95/EC (RoHS Directive), 2002/96/EC (WEEE Directive), Ministry of Information Order #39 (China RoHS)	2002/95/EC (RoHS Directive), 2002/96/EC (WEEE Directive), Ministry of Information Order #39 (China RoHS)

Redundant Power Supply Equipment Specifications

STK-RPS-1005CH3 Power Shelf

Power Supply Slots

3

Dimensions (H x W x D)*

5.5 cm (2.2") x 44.0 cm (17.3") x 35.1 cm (13.8")

Weight

0.95 kg (2.09 lbs)

STK-RPS-150CH2 Power Shelf

Power Supply Slots

2

Dimensions (H x W x D)*

5.5 cm (2.2") x 44.0 cm (17.3") x 18.0 cm (7.0")

Weight

5.27 kg (11.6 lbs)

STK-RPS-150CH8 Power Shelf

Power Supply Slots

8

Dimensions (H x W x D)*

22.26 cm (8.77") x 44.0 cm (17.3") x 26.4 cm (10.4")

Weight

5.27 kg (11.6 lbs)

**Note: dimensions include integrated rack mount ears*

STK-RPS-150PS Power Supply

Dimensions (H x W x D)

19.6 cm (7.7") x 5.2 cm (2.04") x 25.7 cm (10.1")

Net Weight (Unit Only)

1.75 kg (3.85 lbs)

Gross Weight (Packaged Unit)

3.20 kg (7.04 lbs)

MTBF

300,000 hours

Operating Temperature

0° C to 50° C (32° F to 122° F)

Storage Temperature

-30° C to 73° C (-22° F to 164° F)

Operating Relative Humidity

5% to 95%

AC Input Frequency Range

50 – 60 Hz

AC Input Voltage Range

100 – 240 VAC

Maximum Output Power

156 W continuous

STK-RPS-1005PS Power Supply

Dimensions (H x W x D)*

4.3 cm (1.7") x 15.4 cm (6.06") x 34.0 cm (13.39")

Net Weight (Unit Only)

2.1 kg (4.63 lb)

Gross Weight (Packaged Unit)

3.53 kg (7.77 lb)

MTBF

800,000 hours

Operating Temperature

0° C to 50° C (32° F to 122° F)

Storage Temperature

-40° C to 70° C (-40° F to 158° F)

Operating Relative Humidity

5% to 95%

AC Input Frequency Range

50-60 Hz

AC Input Voltage Range

100 - 240 VAC

Maximum Output Power

1005 W continuous

Ordering Information

Part Number	Description
C5 Switches	
C5G124-24	(24) 10/100/1000 RJ45 ports, (4) combo SFP ports, (2) dedicated high-speed stacking ports and external RPS connector. Total active ports per switch: (24) Gigabit ports
C5G124-24P2	(24) 10/100/1000 PoE (.at + .af) RJ45 ports, (4) combo SFP ports, (2) dedicated high-speed stacking ports and external RPS connector. Total active ports per switch: (24) Gigabit ports
C5G124-48	(48) 10/100/1000 RJ45 ports, (4) combo SFP ports, (2) dedicated high-speed stacking ports and external RPS connector. Total active ports per switch: (48) Gigabit ports
C5G124-48P2	(48) 10/100/1000 PoE (.at + .af) RJ45 ports, (4) combo SFP ports, (2) dedicated high-speed dedicated stacking ports and external RPS connector. Total active ports per switch: (48) Gigabit ports
C5K125-24	(24) 10/100/1000 RJ45 ports, (2) combo SFP ports, (2) SFP+, (2) dedicated high-speed stacking ports and external RPS connector. Total active ports per switch: (24) Gigabit ports + (2) 1GE or 10GE SFP+ ports
C5K125-24P2	(24) 10/100/1000 PoE (.at + .af) RJ45 ports, (2) combo SFP ports, (2) SFP+, (2) dedicated high-speed stacking ports and external RPS connector. Total active ports per switch: (24) Gigabit ports + (2) 1GE or 10GE SFP+ ports
C5K125-48	(48) 10/100/1000 RJ45 ports, (2) combo SFP ports, (2) SFP+, (2) dedicated high-speed stacking ports and external RPS connector. Total active ports per switch: (48) Gigabit ports + (2) 1GE or 10GE SFP+ ports
C5K125-48P2	(48) 10/100/1000 PoE (.at + .af) RJ45 ports, (2) combo SFP ports, (2) SFP+, (2) dedicated high-speed stacking ports and external RPS connector. Total active ports per switch: (48) Gigabit ports + (2) 1GE or 10GE SFP+ ports
C5K175-24	(24) SFP, (2) SFP+ ports, (2) dedicated high-speed stacking ports and external RPS connector. Total active ports per switch: (24) SFP, (2) 1GE or 10GE SFP+ ports
Optional Software Licenses	
C5L3-LIC	C5 advanced IPv4 (OSPF, PIM-SM, DVMRP and VRRP) and IPv6 routing licensing (OSPF) (per switch)
Cables	
STK-CAB-SHORT	Stacking cable for connecting adjacent B5/C5 switches (30cm)
STK-CAB-LONG	Stacking cable for connecting top switch to bottom switch in a B5 or C5 stack (1m)
STK-CAB-2M	Stacking cable for B5/C5 models (2m)
STK-CAB-5M	Stacking cable for B5/C5 models (5m)
S5CON-CAB	Spare DB9 Console Cable
Redundant Power Supplies	
STK-RPS-1005CH3	3-slot modular power supply chassis (power supply STK-RPS-1005PS sold separately)
STK-RPS-1005PS	1005W 802.3at PoE redundant power supply with load-balancing support
STK-RPS-150CH2	2-slot modular power supply shelf (power supply STK-RPS-150PS sold separately)
STK-RPS-150CH8	8-slot modular power supply shelf (power supply STK-RPS-150PS sold separately)
STK-RPS-150PS	150W non-PoE redundant power supply

Transceivers

Enterasys transceivers provide connectivity options for Ethernet over twisted pair copper and fiber optic cables with transmission speeds from 100 Megabits per second to 10 Gigabits per second. The Enterasys C5 includes SFP+ transceivers that can support both 10GE and 1GE transceivers. All Enterasys transceivers meet the highest quality for extended life cycle and the best possible return on investment. For detailed specifications, compatibility and ordering information please go to <http://www.enterasys.com/products/transceivers-ds.pdf>.

Warranty

As a customer-centric company, Enterasys is committed to providing quality products and solutions. In the event that one of our products fails due to a defect, we have developed a comprehensive warranty that protects you and provides a simple way to get your products repaired or media replaced as soon as possible.

C-Series switches come with the Enterasys lifetime warranty against manufacturing defects. For full warranty terms and conditions please go to: www.enterasys.com/support/warranty.aspx.

Service and Support

Enterasys Networks provides comprehensive service offerings that range from Professional Services to design, deploy and optimize customer networks, customized technical training, to service and support tailored to individual customer needs. Please contact your Enterasys account executive for more information about Enterasys Service and Support.

Contact Us

For more information, call Enterasys Networks toll free at 1-877-801-7082, or +1-978-684-1000 and visit us on the Web at enterasys.com



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Delivering on our promises. On-time. On-budget.

SNMPc OnLine 2009

"The new SNMPc Online provides a clean, professional-looking and intuitive web interface that is easy to access, easy to customize and easy to understand. With SNMPc and SNMPc Online you have your total solution."

Shaun Sturby, Technical Services Manager - Optrics Engineering

SNMPc OnLine is an advanced reporting engine for the SNMPc Enterprise Network Management System. With a dynamic web based console and flexible presentation options including Microsoft Visio Graphics, pre-canned reports, and custom dashboards, SNMPc Online gives you unprecedented network visibility.

► Support for Microsoft Visio Graphics

Create highly customized graphical map representations with the Microsoft Visio drawing application. Maps are updated automatically to show device and network status.

► Specialized Reporting

Get "out-of-the-box" results with optimized report formats for network availability and latency, router and switch performance, server CPU and disk metrics, and for selected vendor's devices.

► High Level Overviews

Display multiple reports in a single Top N dashboard view. Concise one screen interface delivers network overview and "to do list" for potential network issues.

► Custom Dashboards

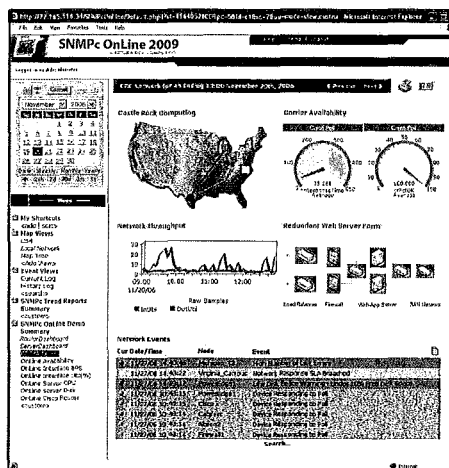
Mix and match information from multiple reports and devices on personalized web pages with versatile graphic elements including dials, 3d-graphs, tables, charts, event views and node lists.

► Scalable Architecture

Manage large global networks with geographic or organization based report grouping and SNMPc's distributed polling capabilities.

► Multi-User Security

Restrict capabilities and reports available to each user based on their needs and responsibilities. An ideal solution for Management Service Providers.



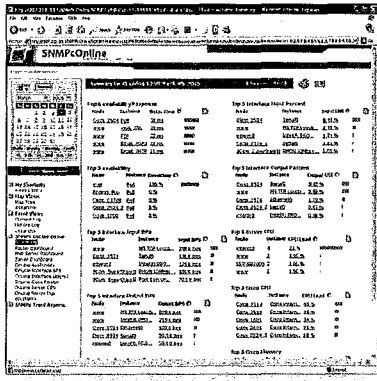
► Multi-Vendor Support

Monitor performance metrics and SNMP alerts from any SNMP v1, v2, or v3 enabled device, regardless of vendor. A future proof solution that adapts to your requirements as your network evolves.

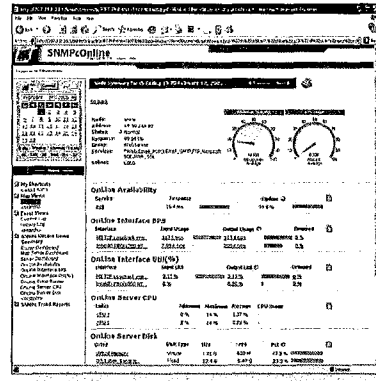
► Seamless Integration

SNMPc Enterprise node information, event logs, and existing trend reports are immediately available and updated in real time.

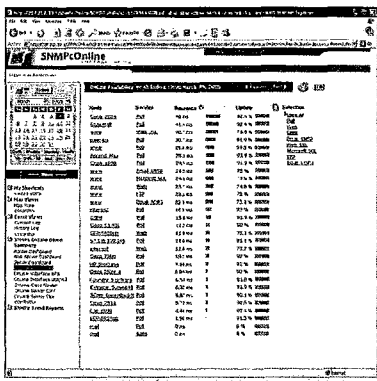
Sample Report Styles



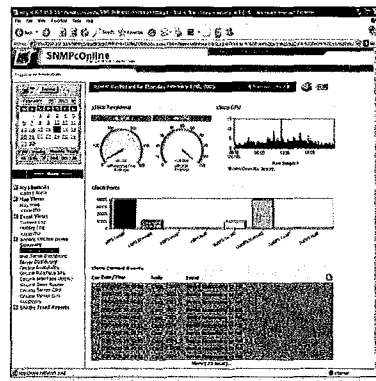
Top-N Report Summary



Detailed Device View



Network Availability



Custom Router Dashboard

System Requirements

Management Platform	SNMPc Enterprise 7.1.5 or above
WebServer:	Apache (included) or Microsoft IIS
Database:	Microsoft SQL Server 2005 (Express Edition included)
Platform:	Windows Vista, XP, 2008, 2003, 2000
Graphics Application:	Microsoft Visio 2003 or 2007 (optional)
CPU:	PIII 1Ghz
Memory:	1GB RAM
Disk Space:	100Gb



12930 Saratoga Ave, Saratoga, CA 95070 USA

SNMPc 8

"SNMPc Enterprise Edition's polling feature allows us to verify the availability and reachability of critical network components resulting in increased uptime/network availability"

Michael Innocentini - Ticketmaster

Visualize, monitor and pro-actively manage your network. SNMPc is a secure distributed network management system that will monitor your entire network infrastructure. With support for SNMP v3, IPv6, unparalleled ease of use, and versions for both small and large networks, it is easy to see why over 100,000 copies of SNMPc have been deployed.

► Secure

Safely manage devices with SNMP V3 Authentication and Encryption. Tailor views and capabilities to each management user.

► Scalable

Use distributed polling and server components for workgroup, large Intranet or Management Service Provider configurations.

► Connected

Catch problems quickly with Email and Pager event notifications. Forward events to helpdesk or domain management systems.

► Accessible

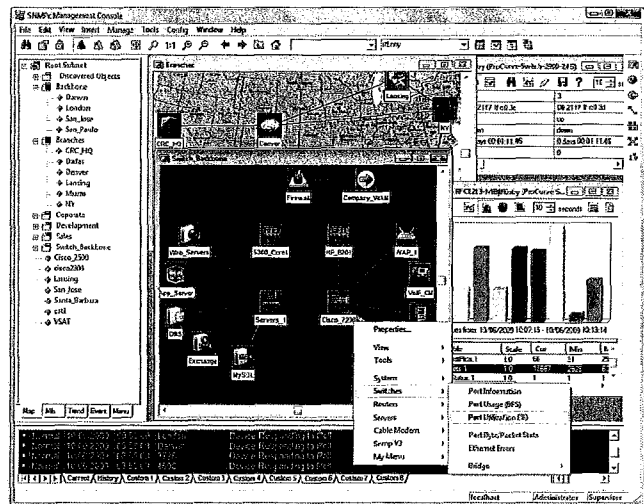
Monitor and manage your network from remote locations with the SNMPc Windows Client and JAVA WEB Consoles.

► Pro-Active

Monitor LAN/WAN performance and Service availability with scheduled WEB reports to effectively plan upgrades and reduce wasted bandwidth.

► Integrated

Automatically export map topology, trend statistics, and event log entries to industry standard databases.



► Multi-Vendor

View and modify standard and private information on routers, switches, servers and other devices from any vendor. Operates over IPv4 and IPv6.

► Customizable

Simplify tasks with custom Expressions, Data Tables, and Menus. Develop Graphical Device Views with the BitView scripting tool and a variety of programming and scripting interfaces.

"Castle Rock's depth of knowledge in the network arena is extremely impressive. With our OEM agreement in place, we are confident that we can now offer our customers the very best in network management functionality."

Doug Elsley, ITSM Product Manager - Touchpaper Software plc.

SNMPc 8

General Information

Feature Specification

Internet Addressing:	IPv4 and IPv6
SNMP Protocols:	V1, V2c, V3 with SHA/MD5, AES-128bit Authentication and DES Encryption
Device Discovery:	Automatically discovers and polls SNMP and ICMP (Ping) devices.
Service Discovery:	Performs service discovery on each device, including SNMP, ICMP, Telnet, FTP, HTTP, SMTP, and four user-specified TCP ports.
Service Polling:	Up to 16 user defined TCP ports per icon. Each with configurable send/reply string. External polling with custom applications
Topology Layout:	Multiple Level Hierarchies. Segmented by Polling Agent. Tree, Ring, or Snaked Bus networks.
Event Notification:	Ignore, Ignore Duplicates, Forward, Email, SMS, Display Alarm Box, or Execute Application.
Reporting:	Graph, Bar Chart, Distribution, and Summary. Printed and WEB Export.
Backup:	Live/Standby server support with automated failover.
External Interfaces:	ODBC and Text Export. Event Forwarding using SNMP Traps.
Customization:	Private MIB Import. Custom Tables, Expressions, and Menus. Execute applications from map double-click, on event reception, and during custom polling.
Programming Interfaces:	Proprietary object-oriented interface for C/C++ applications. SNMPc 4.0 DDE Interface. WinSNMP de-facto standard interface. Utilities for Scripting language support.

Product Options

Enterprise Edition:	Base system for a scalable multi-user environment. Enterprise Edition includes the SNMPc Server license, unlimited JAVA Console support, unlimited Remote Console licenses, and ten Remote Poller licenses.
Workgroup Edition:	Single user version for managing small to medium sized networks. All components run on a single system and support one user. The map database size is limited to 1000 objects. The Workgroup Edition does not include advanced reporting functions.

Requirements

Parameter	Enterprise	WorkGroup
CPU:	Intel 2GHz	Intel 1GHz
Memory:	4 GB	2 GB
Disk:	10 GB	5 GB
Operating Systems: Windows 7, 2008R2, Vista, 2003, XP, 2000	



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NiceVision Net Smart Video Recorder (SVR)

Scale 100% of cameras, bandwidth, video recording and management

Control 100% of cameras with 100% of bandwidth and storage

The NiceVision Net Smart Video Recorder (SVR) is a scalable, high-performance, and easy-to-deploy video recording and management solution. It is designed to handle large numbers of cameras and provides high-quality video recording and management. The SVR is a scalable solution that can handle up to 1000 cameras and provides high-quality video recording and management. The SVR is a scalable solution that can handle up to 1000 cameras and provides high-quality video recording and management.

The SVR is a scalable solution that can handle up to 1000 cameras and provides high-quality video recording and management. The SVR is a scalable solution that can handle up to 1000 cameras and provides high-quality video recording and management. The SVR is a scalable solution that can handle up to 1000 cameras and provides high-quality video recording and management.

Comprehensive family of SVRs

Full range of video servers accommodating various performance and storage requirements

- Turnkey (hardware and software) and software-kit options
- Built-in video analytics in all platforms

High Availability of All System Elements Fully reliable IP-based solution for non-stop operation

- Seamless change-over to backup SVR in the event of failure

Ensured 24x7 Video Operation and Quality

- Camera Tampering Detection alerting when video integrity is compromised
- Visual Parameter Optimizer (VPO) achieves higher quality video in a continuous process
- Advanced mechanisms to guarantee video authenticity in exported files and recorded playbacks

Efficient Video Transmission to Remote Users Delivering optimal video streams to multiple viewers simultaneously is key for quick event resolution

- Multicast support
- Level of Service (LoS) provides optimized viewing aligned with end-station resources

Accurate Video Analytics (VA)

- The SVR combines video recording and a full set of field-proven VA applications in a single integrated platform
- Flexible activation of any VA application for any channel
- Compatible with wide range of 3rd-party edge devices

Open Architecture

- APIs for easy integration of 3rd-party security systems
- Seamless integration with a wide range of edge devices (IP cameras and encoders)

- Native support in virtualization environments for software kits

Smart Usage of System Resources

- Resolution and frame rate change upon event provides optimal viewing of events while reducing storage space
- Video analytics-driven recording saves storage space by recording only event-related data

Improved Situational Awareness

High video quality and bi-directional audio communication provide security personnel with accurate information about the incident scene and streamline the investigation process.

Intuitive Video Management

- Remote management, configuration and viewing via the ControlCenter intuitive user interface or web browser
- Distributed client/server architecture for managing multiple users and sites

* Recording performance with VA processing is lower compared to standard recording
 ** All EMC certificates for SVR9100 are Class B

PLATFORM	SVR9100	SVR9200	SVR9210	SVR9410	SVR9420	SVR9610	SVR9620
Network video recorder specs							
Maximum supported number of channels	128 channels						
Maximal Recording Performance (with simultaneous playback & live video)	32Mbps	128Mbps	128Mbps	256Mbps	256Mbps	256Mbps	256Mbps
Camera Tampering Detection (CT) and Video Parameter Optimizer (VPO) - (# of supported channels)	128						
Max Number of VA Channels (CIF@HRT)*	2	6	6	12	12	40	40
Supported resolutions	WQXGA (2560x1600) • QXGA (2048x1536) • HD 1080 (1920x1080) • UXGA (1600x1200) • SXGA (1280x1024) • WXGA (1280x960) • HD 720 (1280x720) • Full D1 (720x480, 720x576) • 4CIF (704x576, 704x480) • 2CIF (704x288, 704x240) • CIF (352x288, 352x240) • VGA (640x480) • QVGA (320x240)						
Video compression	Standard channels H.264, MPEG4, H.263, H.263+, MJPEG, MxPEG • VA channels - H.264, MPEG4						
Audio compression	G.711						
Audio support	Bi-Directional support (Audio in, Audio out and Bi-directional)						
Inputs	Broad range of IP cameras and encoders						
PTZ support	Network PTZ camera, Analog camera through encoder or analog expansion board						
Maximal Storage capacity	4TB	4TB	32TB	88TB	22TB	88TB	22TB
Storage options	Internal un-raid	internal un-raid	External RAID		Internal RAID	External RAID	Internal RAID
Advanced storage options	CSS (NiceVision Central Storage Server)						
Triggers interface	Software API or via edge devices						
Video analytics							
Video analytics	✓						
Technical specifications							
Operating system	Windows 7 Embedded Standard, installed on HDD	windows 2008 R2 Standard edition, installed on HDD	Windows 2008 R2 Standard edition, installed on RAID-1	Windows 2008 R2 Standard edition, installed on RAID-1	Windows 2008 R2 Standard edition, installed on RAID-5	Windows 2008 R2 Standard edition, installed on RAID-1	Windows 2008 R2 Standard edition, installed on RAID-5
CPU	Intel Dual Core (E5300)	Intel Quad Core 2.53GHz (X3440)	Intel Quad Core 2.53GHz (X3440)	Intel Xeon Quad Core 2.4GHz (E5620)	Intel Xeon Quad Core 2.4GHz (E5620)	Two Intel Xeon CPU of Quad Core 2.4GHz	Two Intel Xeon CPU of Quad Core 2.4GHz
RAM	4GB	4GB	4GB	3GB	3GB	6GB	6GB
Power consumption (maximal)	100/240V 300 Watt	110/220V 250 Watt	110/220V 250 Watt	110/220V 717 Watt	110/220V 750 Watt	110/220V 717 Watt	110/220V 750 Watt
Heat Dissipation (BTU/H)	1204	518.7	518.7	601.4	1012.7	879.8	1283.3
Dimensions							
H x W x D (with bezel attached)	10.93 x 39.65 x 34.91 (cm) 4.30" x 15.61" x 13.75"	4.26 x 43.1 x 39.37 (cm) 1.68 x 16.97 x 15.47 (in) 1 rack unit	4.26 x 43.1 x 39.37 (cm) 1.68 x 16.97 x 15.47 (in) 1 rack unit	4.26 x 48.24 x 77.2 (cm) 1.68 x 18.99 x 30.39 (in) 1 rack unit	8.64 x 43.66 x 61.02 (cm) 3.40 x 17.19 x 24.09 (in) 2 rack units	4.26 x 48.24 x 77.2 (cm) 1.68 x 18.99 x 30.39 (in) 1 rack unit	8.64 x 43.66 x 61.02 (cm) 3.40 x 17.19 x 24.09 (in) 2 rack units
Weight (maximum configuration)	9.38 Kg (20.60 lbs)	8.1 Kg (17.85 lbs)	8.1 Kg (17.85 lbs)	25.9 Kg (57.1 lbs)	34.5 Kg (76.06 lbs)	25.9 Kg (57.1 lbs)	34.5 Kg (76.06 lbs)
Environmental data							
Operating temperature	10° - 45°C (50° - 113°F)			10° - 35°C (50° - 95°F)			
Operating humidity	20% - 80% (non-condensing)						
Electromagnetic compatibility**	ACMA or C-Tick (Australia/New Zealand) class A • BELLIS (Belarus) Class A • KVALITET (Bosnia & Herzegovina, Montenegro, Serbia) Class A • ICES (Canada) class A • CNCA or CCC (China) class A • KONCAR (Croatia) Class A • CE (EU) class A • SII (Israel) class A • VCCI (Japan) class A • OTAN - CKT (Kazakhstan) Class A • INSM (Moldova) Class A • NEMKO (Norway) class A • GOST (Russia) Class A • SABS (South Africa) Class A • KCC (South Korea) Class A • BSMI (Taiwan) class A • UKRTEST (Ukraine) Class A • FCC (United States) Class A • STZ (Uzbekistan) Class A • ICT (Vietnam) Class A						
Product safety	IRAM (Argentina) • BELLIS (Belarus) • SCC (Canada) • CNCA or CCC (China) • KONCAR (Croatia) • CE (EU) • TUV (Germany) • IECEE CB • SII (Israel) • OTAN - CKT (Kazakhstan) • KEBS (Kenya) • NYCE or NOM (Mexico) • INSM (Moldova) • SONCAP (Nigeria) • NEMKO (Norway) • GOST (Russia) • KSA ICCP (Saudi Arabia) • NRCS (South Africa) • BSMI (Taiwan) • UKRTEST (Ukraine) • NRTL (USA) • STZ (Uzbekistan)						
Environmental	RoHS • REACH • China RoHS • EU Directive 2006/66/ EC						
Ergonomics, acoustics and hygienics	GS (Germany) • GOST (Russia)						
Accessories							
Rack mount kit	-	-	-	✓	✓	✓	✓
Redundant power supply	-	-	-	-	✓	✓	✓

ABOUT NICE

NICE is a leading provider of software solutions for the worldwide market of contact centers. Our solutions help contact centers improve their performance and reduce costs. We provide a comprehensive suite of solutions, including contact center software, analytics, and training. Our solutions are designed to help contact centers improve their customer service, increase productivity, and reduce costs. We are a global company with offices in Israel, the United States, and Europe. We are committed to providing the highest quality products and services to our customers.

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