City

Mr. Peter Curto, Owner
Curto Construction Company
5502 Connecticut Avenue
La Mesa, CA 91942
P: (619) 961-3156

CONTRACTOR'S NAME:_____
ADDRESS:_____
TELEPHONE NO.:_____
CITY CONTACT: Damian Singleton, Contract Specialist, Email: Dsingleton@sandiego.gov
Phone No. (619) 533-3482, Fax No. (619) 533-3633
L.C.Ritter/NB/egz

COPY

CONTRACT DOCUMENTS

FOR

SILVER WING NEIGHBORHOOD PARK LIGHTING

VOLUME 1 OF 2

BID NO.:	**L-14-5818-DBB-1**
SAP NO. (WBS/IO/CC):	**S-11051**
CLIENT DEPARTMENT:	**1714**
COUNCIL DISTRICT:	**8**
PROJECT TYPE:	**GB**

THIS CONTRACT IS SUBJECT TO THE FOLLOWING:

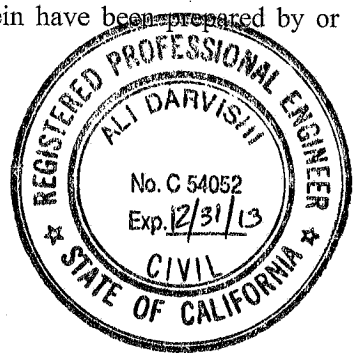
- THE CITY'S SUBCONTRACTING PARTICIPATION REQUIREMENTS FOR SLBE PROGRAM.
- COMPETITION RESTRICTED TO: SLBE-ELBE ☐ or ELBE ☒ FIRMS ONLY.

BID DUE DATE:

1:30 PM
SEPTEMBER 5, 2013
CITY OF SAN DIEGO
PUBLIC WORKS CONTRACTING GROUP
1010 SECOND AVENUE, SUITE 1400, MS 614C
SAN DIEGO, CA 92101

ENGINEER OF WORK

The engineering Specifications and Special Provisions contained herein have been prepared by or under the direction of the following Registered Engineer:



For City Engineer

7/18/13
Date

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CITY OF SAN DIEGO, CALIFORNIA

NOTICE INVITING BIDS

1. **LIMITED COMPETITION:** This contract may only be bid by the Contractors on the City's 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.

2. **RECEIPT AND OPENING OF BIDS:** Bids will be received at the Public Works Contracting Group at the location, time, and date shown on the cover of these specifications for performing work on **Silver Wing Neighborhood Park Lighting** (Project).

3. **DESCRIPTION OF WORK:** The Work involves furnishing all labor, materials, equipment, services, and other incidental works and appurtenances for the construction of the Project as described below:

Replace security lighting in the Silver Wing neighborhood park pathways.

3.1. The Work shall be performed in accordance with:

3.1.1. This Notice Inviting Bids and Plans numbered **36661-1-D** through **36661-10-D**, inclusive.

4. **EQUAL OPPORTUNITY**

4.1. To The WHITEBOOK, Chapter 10, Sections D and E, DELETE in their entirety and SUBSTITUTE with the following:

D. CITY'S EQUAL OPPORTUNITY COMMITMENT.

1. Nondiscrimination in Contracting Ordinance.

1. The Contractor, Subcontractors and Suppliers shall comply with requirements of the City's Nondiscrimination in Contracting Ordinance, San Diego Municipal Code §§22.3501 through 22.3517.

   The Contractor shall not discriminate on the basis of race, gender, religion, national origin, ethnicity, sexual orientation, age, or disability in the solicitation, selection, hiring, or treatment of subcontractors, vendors, or suppliers. The Contractor shall provide equal opportunity for subcontractors to participate in subcontracting opportunities. The Contractor understands and agrees that violation of this clause shall be considered a material breach of the contract and may result in contract termination, debarment, or other sanctions.

   The Contractor shall include the foregoing clause in all contracts between the Contractor and Subcontractors and Suppliers.

2. Disclosure of Discrimination Complaints. As part of its Bid or Proposal, the Bidder shall provide to the City a list of all instances within the past 10 years where a complaint was filed or pending

against 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.

3. Upon the City's request, the Contractor agrees to provide to the City, within 60 days, a truthful and complete list of the names of all Subcontractors and Suppliers that the Contractor has used in the past 5 years on any of its contracts that were undertaken within San Diego County, including the total dollar amount paid by the Contractor for each subcontract or supply contract.

4. The Contractor further agrees to fully cooperate in any investigation conducted by the City pursuant to the City's Nondiscrimination in Contracting Ordinance, Municipal Code §§22.3501 through 22.3517. The Contractor understands and agrees that violation of this clause shall be considered a material breach of the Contract and may result in remedies being ordered against the Contractor up to and including contract termination, debarment and other sanctions for violation of the provisions of the Nondiscrimination in Contracting Ordinance. The Contractor further understands and agrees that the procedures, remedies and sanctions provided for in the Nondiscrimination in Contracting Ordinance apply only to violations of the Ordinance.

E. EQUAL EMPLOYMENT OPPORTUNITY OUTREACH PROGRAM.

1. The Contractor, Subcontractors and Suppliers shall comply with the City's Equal Employment Opportunity Outreach Program, San Diego Municipal Code §§22.2701 through 22.2707.

   The Contractor shall not discriminate against any employee or applicant for employment on any basis prohibited by law. Contractor shall provide equal opportunity in all employment practices. Prime Contractor shall ensure their subcontractors comply with this program. Nothing in this section shall be interpreted to hold a prime contractor liable for any discriminatory practice of its subcontractors.

   The Contractor shall include the foregoing clause in all contracts between the Contractor and Subcontractors and Suppliers.

2. If the Contract is competitively solicited, the selected Bidder shall submit a Work Force Report (Form BB05), 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.

3. If a Work Force Report is submitted, and the City determines there are under-representations when compared to County Labor Force Availability data, the selected Bidder shall submit an Equal Employment Opportunity Plan.

4. If the selected Bidder submits an Equal Employment Opportunity Plan, it shall include the following assurances:

1. The Contractor shall maintain a working environment free of discrimination, harassment, intimidation and coercion at all sites and in all facilities at which the Contractor's employees are assigned to work.

2. The Contractor reviews its EEO Policy, at least annually, with all on-site supervisors involved in employment decisions.

3. The Contractor disseminates and reviews its EEO Policy with all employees at least once a year, posts the policy statement and EEO posters on all company bulletin boards and job sites, and documents every dissemination, review and posting with a written record to identify the time, place, employees present, subject matter, and disposition of meetings.

4. The Contractor reviews, at least annually, all supervisors' adherence to and performance under the EEO Policy and maintains written documentation of these reviews.

5. The Contractor discusses its EEO Policy Statement with subcontractors with whom it anticipates doing business, includes the EEO Policy Statement in its subcontracts, and provides such documentation to the City upon request.

6. The Contractor documents and maintains a record of all bid solicitations and outreach efforts to and from subcontractors, contractor associations and other business associations.

7. The Contractor disseminates its EEO Policy externally through various media, including the media of people of color and women, in advertisements to recruit, maintains files documenting these efforts, and provides copies of these advertisements to the City upon request.

8. The Contractor disseminates its EEO Policy to union and community organizations.

9. The Contractor provides immediate written notification to the City when any union referral process has impeded the Contractor's efforts to maintain its EEO Policy.

10. The Contractor maintains a current list of recruitment sources, including those outreaching to people of color and women, and provides written notification of employment opportunities to these recruitment sources with a record of the organizations' responses.

11. The Contractor maintains a current file of names, addresses and phone numbers of each walk-in applicant, including people of color and women, and referrals from unions, recruitment sources, or community organizations with a description of the employment action taken.

12. The Contractor encourages all present employees, including people of color and women employees, to recruit others.

13. The Contractor maintains all employment selection process information with records of all tests and other selection criteria.

14. The Contractor develops and maintains documentation for on-the-job training opportunities, participates in training programs, or both for all of its employees, including people of color and women, and establishes apprenticeship, trainee, and upgrade programs relevant to the Contractor's employment needs.

15. The Contractor conducts, at least annually, an inventory and evaluation of all employees for promotional opportunities and encourages all employees to seek and prepare appropriately for such opportunities.

16. The Contractor ensures the company's working environment and activities are non-segregated except for providing separate or single-user toilets and necessary changing facilities to assure privacy between the sexes.

5. SUBCONTRACTING PARTICIPATION PERCENTAGES.

5.1. The City has incorporated voluntary subcontractor participation percentage to enhance competition and maximize subcontracting opportunities as follows.

5.2. The following voluntary subcontractor participation percentage for DBE, DVBE, WBE, MBE, SLBE, and ELBE certified Subcontractors shall apply to this contract:

Total voluntary subcontractor participation percentage for this project is 13.6%.

6. PRE-BID MEETING:

6.1. There will be a Pre-Bid Meeting to discuss the scope of the Project, bidding requirements, pre-qualification process, and Equal Opportunity Contracting Program requirements and reporting procedures in the Public Works Contracting Group, Conference Room at 1010 Second Avenue, Suite 1400, San Diego, CA 92101 **at 10:00 AM, on AUGUST 13, 2013.**

6.2. All potential bidders are encouraged to attend.

6.3. To request a copy of the agenda on an alternative format, or to request a sign language or oral interpreter for this meeting, call the Public Works Contracting Group at (619) 533-3450 at least 5 Working Days prior to the Pre-Bid Meeting to ensure availability.

7. CONTRACTOR REGISTRATION AND ELECTRONIC REPORTING SYSTEM:

7.1. **Prior** to the Award of the Contract or each Task Order, you and your Subcontractors and Suppliers **must** register with Prism®, the City's web-based contract compliance portal at:

https://pro.prismcompliance.com/default.aspx.

7.2. The City may not award the contract until registration of all subcontractors and suppliers is complete. In the event this requirement is not met within the time frame specified in the Notice of Intent to Award letter, the City reserves the right to rescind the Notice of Award / Intent to Award and to make the award to the next responsive and responsible bidder / proposer.

8. PRE-BID SITE VISIT: The prospective Bidders are encouraged to visit the Work Site with the Engineer. The purpose of the Site visit is to acquaint Bidders with the Site conditions. To request a sign language or oral interpreter for this visit, call the Public Works Contracting Group at (619) 533-3450 at least 5 Working Days prior to the meeting to ensure availability. A Pre-Bid Site Visit is offered when the details are provided as follows:

Time:	**11:30 AM**
Date:	**AUGUST 13, 2013**
Location:	**Sliver Wing Park, 3735 Arey Drive, San Diego, 92154**

9. CONSTRUCTION COST: The City's estimated construction cost for this contract is **$220,000.**

10. LOCATION OF WORK: The location of the Work is as follows:

3735 Arey Drive, San Diego, CA 92154

11. CONTRACT TIME: The Contract Time for completion of the Work shall be **88 Working Days**.

12. CONTRACTOR'S LICENSE CLASSIFICATION: In accordance with the provisions of California Law, the Contractor shall possess valid appropriate license(s) at the time that the Bid is submitted. Failure to possess the specified license(s) shall render the Bid as **non-responsive** and shall act as a bar to award of the Contract to any Bidder not possessing required license(s) at the time of Bid.

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

- **CLASS C10**

13. JOINT VENTURE CONTRACTORS. Provide a copy of the Joint Venture agreement and the Joint Venture license to the City within 10 Working Days after receiving the Contract forms. See 2-1.1.2, "Joint Venture Contractors" in The WHITEBOOK for details.

14. WAGE RATES: Prevailing wages are not applicable to this contract.

15. INSURANCE REQUIREMENTS:

15.1. All certificates of insurance and endorsements required by the contract are to be provided upon issuance of the City's Notice of Intent to Award letter.

15.2. 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.

16. PREQUALIFICATION OF CONTRACTORS:

16.1. Contractors submitting Bid must be pre-qualified for the total amount proposed, inclusive of all alternate items prior to the date of submittal. 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. Complete information and prequalification questionnaires are available at:

http://www.sandiego.gov/cip/bidopps/prequalification.shtml

16.2. 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 Public Works Department, Prequalification Program, 1010 Second Avenue, Suite 1400, San Diego, CA 92101. For additional information or the answer to questions about the prequalification program, contact David Stucky at 619-533-3474 or dstucky@sandiego.gov.

17. REFERENCE STANDARDS: Except as otherwise noted or specified, the Work shall be completed in accordance with the following standards:

Title	Edition	Document Number
Standard Specifications for Public Works Construction ("The GREENBOOK")	2012	PITS070112-01
City of San Diego Standard Specifications for Public Works Construction ("The WHITEBOOK")*	2012	PITS070112-02
City of San Diego Standard Drawings*	2012	PITS070112-03
Caltrans Standard Specifications	2010	PITS070112-04
Caltrans Standard Plans	2010	PITS070112-05
California MUTCD	2012	PITS070112-06
City Standard Drawings – Standard Drawings Updates Approved For Use*	Varies	Varies
Standard Federal Equal Employment Opportunity Construction Contract Specifications and the Equal Opportunity Clause Dated 09-11-84	1984	769023
NOTE: *Available online under Engineering Documents and References at: http://www.sandiego.gov/publicworks/edocref/index.shtml		

18. 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.

19. **CITY'S RIGHTS RESERVED:** The City reserves the right to cancel the Notice Inviting 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 Notice Inviting Bids shall be the sole responsibility of each bidder. The Notice Inviting Bids creates or imposes no obligation upon the City to enter a contract.

20. **CONTRACT PRICING FORMAT:** This solicitation is for a Lump Sum and Unit Price contract as set forth in the Bid Proposal Form(s), Volume 2.

21. **SUBMITTAL OF "OR EQUAL" ITEMS:** See Section 4-1.6, "Trade Names or Equals" in The WHITEBOOK and as amended in the SSP.

22. **AWARD PROCESS:**

22.1. The Award of this contract is contingent upon the Contractor's compliance with all conditions precedent to Award.

22.2. Upon acceptance of a Bid, the City will prepare contract documents for execution within approximately 21 days of the date of the Bid opening and award the Contract approximately within 7 days of receipt of properly executed Contract, bonds, and insurance documents.

22.3. This contract will be deemed executed, and effective, only upon the signing of the Contract by the Mayor or designee of the City.

23. **SUBCONTRACT LIMITATIONS:** The Bidder's attention is directed to Standard Specifications for Public Works Construction, Section 2-3, "SUBCONTRACTS" in The WHITEBOOK and as amended in the SSP which requires the Contractor to self perform the amount therein stipulated. Failure to comply with these requirements may render the Bid **non-responsive** and ineligible for award.

24. **AVAILABILITY OF PLANS AND SPECIFICATIONS:** Contract Documents may be obtained by visiting the City's website: http://www.sandiego.gov/cip/. Plans and Specifications for this contract are also available for review in the office of the City Clerk or Public Works Contracting Group.

25. **QUESTIONS:**

25.1. The Director (or designee), of the Public Works Department is the officer responsible for opening, examining, and evaluating the competitive Bids submitted to the City for the acquisition, construction and completion of any public improvement except when otherwise set forth in these documents. All questions related to this procurement action shall be addressed to the Public Works Contracting Group, Attention Contract Specialist, 1010 Second Avenue, Suite 1400, San Diego, California, 92101, and Telephone No. (619) 533-3450.

25.2. Questions received less than 14 days prior to the date for opening of Bids may not be answered.

25.3. Interpretations or clarifications considered necessary by the City in response to such questions will be issued by Addenda which will be uploaded to the City's online bidding service.

25.4. 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.

26. ELIGIBLE BIDDERS: No person, firm, or corporation shall be allowed to make, file, or be interested in **more** than one (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. Any Bidder who submits more than one bid will result in the rejection of all bids submitted.

27. SAN DIEGO BUSINESS TAX CERTIFICATE: The Contractor and 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 and submit to the Contract Specialist upon request or as specified in the Contract Documents. Tax Identification numbers for both the Bidder and the listed Subcontractors must be submitted on the City provided forms with the Notice Inviting Bids and Contract forms.

28. 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.

28.1. Bidder shall complete and submit all pages in the "Bidding Document" Section (see Volume 2) as their Bid per the schedule given under “Required Documents Schedule,” (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 entire specifications for the bid package do not need to be submitted with the bid.

28.2. The City may require any Bidder to furnish a statement of experience, financial responsibility, technical ability, equipment, and references.

28.3. Bids and certain other forms and documents as specified in the Volume 2 of 2 of the Contract 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.

28.4. Bids may be withdrawn by the Bidder prior to, but not after, the time fixed for opening of Bids.

29. BIDDERS' GUARANTEE OF GOOD FAITH (BID SECURITY):

29.1. With the exception of the contracts valued $5,000 or less, JOC 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.

29.2. 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.

29.3. A Bid received without the specified bid security will be rejected as being **non-responsive**.

30. AWARD OF CONTRACT OR REJECTION OF BIDS:

30.1. This contract may be awarded to the lowest responsible and reliable Bidder.

30.2. Bidders shall complete the entire Bid schedule (also referred to as "schedule of prices" or Proposal form). Incomplete price schedules will be rejected as being non-responsive.

30.3. 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.

30.4. 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.

30.5. 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 Public Works Contracting Group 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."

30.6. 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.

30.7. 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 Proposal.

30.8. The City reserves the right to evaluate all Bids and determine the lowest Bidder on the basis of any proposed alternates, additive items or options, at its discretion that will be disclosed in the Volume 2 of 2.

31. BID RESULTS:

31.1. The Bid opening by the City shall constitute the public announcement of the Apparent Low Bidder. In the event that the Apparent Low Bidder is subsequently deemed non-responsive or non-responsible, a public announcement will be posted in the City's web page: http://www.sandiego.gov/cip/index.shtml, with the name of the newly designated Apparent Low Bidder.

31.2. 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. Bid results cannot be given over the telephone.

32. THE CONTRACT:

32.1. 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 14 days after receipt by Bidder of a form of contract for execution unless an extension of time is granted to the Bidder in writing.

32.2. If the Bidder takes longer than 14 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.

32.3. 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.

32.4. 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 14 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.

32.5. 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.

33. EXAMINATION OF PLANS, SPECIFICATIONS, AND SITE OF WORK: The Bidder shall examine carefully the Project Site, the Plans and Specifications, other materials as described in the Special Provisions, Section 2-7, and the proposal forms (e.g., Bidding Documents). The submission of a Bid 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.

34. CITY STANDARD PROVISIONS. This contract is subject to the following standard provisions. See The WHITEBOOK for details.

34.1. The City of San Diego Resolution No. R-277952 adopted on May 20, 1991 for a Drug-Free Workplace.

34.2. The City of San Diego Resolution No. R-282153 adopted on June 14, 1993 related to the Americans with Disabilities Act.

34.3. The City of San Diego Municipal Code §22.3004 for Pledge of Compliance.

34.4. The City of San Diego's Labor Compliance Program and the State of California Labor Code §§1771.5(b) and 1776.

34.5. Sections 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.

34.6. The City's Equal Benefits Ordinance (EBO), Chapter 2, Article 2, Division 43 of The San Diego Municipal Code (SDMC).

34.7. The City's Information Security Policy (ISP) as defined in the City's Administrative Regulation 90.63.

35. PRE-AWARD ACTIVITIES:

35.1. The selected contractor by the City to execute a contract for this Work 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.**

35.2. If the Bid is rejected as non-responsive, the selected contractor by the City to execute a contract for this Work shall forfeit the required Bid. The decision that the selected contractor by the City to execute a contract for this Work is non-responsive for failure to provide the information required within the time specified shall be at the sole discretion of the City.

36. REQUIRED DOCUMENT SCHEDULE:

36.1. The Bidder's attention is directed to the City's Municipal Code §22.0807(e), (3)-(5) for important information regarding grounds for debarment for failure to submit required documentation.

36.2. The specified Equal Opportunity Contracting Program (EOCP) forms are available for download from the City's web site at:

http://www.sandiego.gov/eoc/forms/index.shtml

ITEM	WHEN DUE	FROM	DOCUMENT TO BE SUBMITTED
1.	BID SUBMITTAL DATE/TIME	ALL BIDDERS	Bid
2.	BID SUBMITTAL 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 SUBMITTAL DATE/TIME	ALL BIDDERS	Contractors Certification of Pending Actions
4.	BID SUBMITTAL DATE/TIME	ALL BIDDERS	Equal Benefits Ordinance Certification of Compliance
5.	BID SUBMITTAL DATE/TIME	ALL BIDDERS	Form AA35 - List of Subcontractors
6.	BID SUBMITTAL DATE/TIME	ALL BIDDERS	Form AA40 - Named Equipment/Material Supplier List
7.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	APPARENT LOW BIDDER	Names of the principal individual owners of the Apparent Low Bidder
8.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	APPARENT LOW BIDDER	If the Contractor is a Joint Venture: • Joint Venture Agreement • Joint Venture License
9.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	APPARENT LOW BIDDER	Form BB05 - Work Force Report
10.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	APPARENT LOW BIDDER	Contract Forms - Agreement
11.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	APPARENT LOW BIDDER	Contract Forms - Payment and Performance Bond
12.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	APPARENT LOW BIDDER	Certificates of Insurance and Endorsements
13.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	APPARENT LOW BIDDER	Contractor Certification - Drug-Free Workplace

ITEM	WHEN DUE	FROM	DOCUMENT TO BE SUBMITTED
14.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	APPARENT LOW BIDDER	Contractor Certification - American with Disabilities Act
15.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	APPARENT LOW BIDDER	Contractors Standards - Pledge of Compliance

CONTRACT FORMS

AGREEMENT

CONSTRUCTION CONTRACT

This contract is made and entered into between THE CITY OF SAN DIEGO, a municipal corporation, herein called "City", and **CURTO CONSTRUCTION COMPANY**, herein called "Contractor" for construction of **Silver Wing Neighborhood Park Lighting**; Bid No. **L-14-5818-DBB-1**; in the amount of ONE HUNDRED EIGHTY-NINE THOUSAND EIGHT HUNDRED FIFTY DOLLARS AND 00/100 ($189,850.00), which is comprised of the Base Bid alone.

IN CONSIDERATION of the payments to be made hereunder and the mutual undertakings of the parties hereto, City and Contractor agree as follows:

1. The following are incorporated into this contract as though fully set forth herein:

   (a) The attached Faithful Performance and Payment Bonds.

   (b) The attached Proposal included in the Bid documents by the Contractor.

   (c) Reference Standards listed in the Notice Inviting Bids and the Supplementary Special Provisions (SSP).

   (d) That certain documents entitled **Silver Wing Neighborhood Park Lighting** on file in the office of the Public Works Department as Document No. **S-11051**, as well as all matters referenced therein.

2. The Contractor shall perform and be bound by all the terms and conditions of this contract and in strict conformity therewith shall perform and complete in a good and workmanlike manner **Silver Wing Neighborhood Park Lighting**; Bid No. **L-14-5818-DBB-1,** San Diego, California.

3. For such performances, the City shall pay to Contractor the amounts set forth at the times and in the manner and with such additions or deductions as are provided for in this contract, and the Contractor shall accept such payment in full satisfaction of all claims incident to such performances.

4. 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.

5. This contract is effective as of the date that the Mayor or designee signs the agreement.

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 Municipal Code §22.3107 authorizing such execution.

THE CITY OF SAN DIEGO

By: _____
Stephen Samara
Senior Contract Specialist
Public Works Contracting Group

Date: 11/13/13

APPROVED AS TO FORM AND LEGALITY

Jan I. Goldsmith, City Attorney

By _____

Print Name: Mark M. Mercer
Deputy City Attorney

Date: 11/13/13

CONTRACTOR

By _____

Print Name: PETER CURTO

Title: OWNER

Date: 10/14/2013

City of San Diego License No.: B 2011 00124

State Contractor's License No.: 370276

CONTRACT/AGREEMENT

ATTACHMENTS

Bond No.: 024049700
Premium: $5,696

CONTRACT ATTACHMENT
PERFORMANCE BOND AND LABOR AND MATERIALMEN'S BOND

FAITHFUL PERFORMANCE BOND AND LABOR AND MATERIALMEN'S BOND:

CURTO CONSTRUCTION COMPANY, a corporation, as principal, and THE OHIO CASUALTY INSURANCE COMPANY, 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 ONE HUNDRED EIGHTY-NINE THOUSAND EIGHT HUNDRED FIFTY DOLLARS AND 00/100 ($189,850.00) for the faithful performance of the annexed contract, and in the sum of ONE HUNDRED EIGHTY-NINE THOUSAND EIGHT HUNDRED FIFTY DOLLARS AND 00/100 ($189,850.00) for the benefit of laborers and materialmen designated below.

Conditions:

If the Principal shall faithfully perform the annexed contract Silver Wing Neighborhood Park Lighting; Bid No. L-14-5818-DBB-1, 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.

CONTRACT ATTACHMENT (continued)
PERFORMANCE BOND AND LABOR AND MATERIALMEN'S BOND

The Surety shall pay reasonable attorney's fees should suit be brought to enforce the provisions of this bond.

Dated October 7, 2013

Approved as to Form and Legality

CURTO CONSTRUCTION COMPANY
Principal

By _____

PETER CURTO
Printed Name of Person Signing for Principal

Jan I. Goldsmith, City Attorney

By _____
Deputy City Attorney

THE OHIO CASUALTY INSURANCE COMPANY
Surety

By _____
Attorney-in-fact
Blake A Pfister

790 City Drive South #200
Local Address of Surety

Orange CA 92868
Local Address (City, State) of Surety

714-634-5717
Local Telephone No. of Surety

Premium $ 5,696

Bond No. 024049700

Approved:

By: _____
Stephen Samara
Senior Contract Specialist
Public Works Contracting Group

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

CIVIL CODE § 1189

State of California
County of Orange

On October 7, 2013 (Date) before me, Lianne Nahina, Notary Public (Here Insert Name and Title of the Officer),

personally appeared Blake A. Pfister (Name(s) of Signer(s)),

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 of Notary Public)

Place Notary Seal Above

LIANNE NAHINA
COMM. # 1962851
NOTARY PUBLIC-CALIFORNIA
ORANGE COUNTY
MY COMM. EXP. DEC 5, 2015

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: Bond 024049700

Document Date: October 7, 2013 Number of Pages: 2

Signer(s) Other Than Named Above: None

Capacity(ies) Claimed by Signer(s)

Signer's Name: Blake A. Pfister	Signer's Name:
☐ Corporate Officer — Title(s):	☐ Corporate Officer — Title(s):
☐ Individual	☐ Individual
☐ Partner — ☐ Limited ☐ General	☐ Partner — ☐ Limited ☐ General
☒ Attorney in Fact	☐ Attorney in Fact
☐ Trustee	☐ Trustee
☐ Guardian or Conservator	☐ Guardian or Conservator
☐ Other:	☐ Other:
Signer Is Representing: The Ohio Casualty Insurance Company	Signer Is Representing:
RIGHT THUMBPRINT OF SIGNER — Top of thumb here	RIGHT THUMBPRINT OF SIGNER — Top of thumb here

THIS POWER OF ATTORNEY IS NOT VALID UNLESS IT IS PRINTED ON RED BACKGROUND.
This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

Certificate No. 5610462

American Fire and Casualty Company
The Ohio Casualty Insurance Company
West American Insurance Company

Liberty Mutual Insurance Company
Peerless Insurance Company

POWER OF ATTORNEY

Attached to 024049700

KNOWN ALL PERSONS BY THESE PRESENTS: That American Fire & Casualty Company and The Ohio Casualty Insurance Company are corporations duly organized under the laws of the State of Ohio, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, that Peerless Insurance Company is a corporation duly organized under the laws of the State of New Hampshire, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, **BLAKE A. PFISTER,**

all of the city of **DANA POINT**, state of **CA** each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this **12th** day of **OCTOBER**, **2012**.

American Fire and Casualty Company
The Ohio Casualty Insurance Company
Liberty Mutual Insurance Company
Peerless Insurance Company
West American Insurance Company

By: _____
Gregory W. Davenport, Assistant Secretary

STATE OF WASHINGTON ss
COUNTY OF KING

On this **12th** day of **OCTOBER**, **2012**, before me personally appeared Gregory W. Davenport, who acknowledged himself to be the Assistant Secretary of American Fire and Casualty Company, Liberty Mutual Insurance Company, The Ohio Casualty Company, Peerless Insurance Company and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at Seattle, Washington, on the day and year first above written.

By: _____
KD Riley , Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-laws and Authorizations of American Fire and Casualty Company, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, West American Insurance Company and Peerless Insurance Company, which resolutions are now in full force and effect reading as follows:

ARTICLE IV – OFFICERS – Section 12. Power of Attorney. Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

ARTICLE XIII – Execution of Contracts – SECTION 5. Surety Bonds and Undertakings. Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary.

Certificate of Designation – The President of the Company, acting pursuant to the Bylaws of the Company, authorizes Gregory W. Davenport, Assistant Secretary to appoint such attorney-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

Authorization – By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and biding upon the Company with the same force and effect as though manually affixed.

I, David M. Carey, the undersigned, Assistant Secretary, of American Fire and Casualty Company, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, West American Insurance Company and Peerless Insurance Company do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 7th day of October, 20 13.

By: _____
David M. Carey, Assistant Secretary

POA - AFCC, LMIC, OCIC, PIC & WAIC
LMS_12873_041012

Not valid for mortgage, note, loan, letter of credit, bank deposit, currency rate, interest rate or residual value guarantees.

To confirm the validity of this Power of Attorney call 1-610-832-8240 between 9:00 am and 4:30 pm EST on any business day.

CONTRACTOR CERTIFICATION

DRUG-FREE WORKPLACE

PROJECT TITLE: **Silver Wing Neighborhood Park Lighting**

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 the WHITEBOOK, Section 7-13.3, "Drug-Free Workplace", of the project specifications, and that;

Corto Const Co

(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 Peter Corto

Title Owner

CONTRACTOR CERTIFICATION

AMERICAN WITH DISABILITIES ACT (ADA) COMPLIANCE CERTIFICATION

PROJECT TITLE: **Silver Wing Neighborhood Park Lighting**

I hereby certify that I am familiar with the requirements of San Diego City Council Policy No. 100-4 regarding the American With Disabilities Act (ADA) outlined in the WHITEBOOK, Section 7-13.2, "American With Disabilities Act", of the project specifications, and that;

Curto Const Co

(Name under which business is conducted)

has in place 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 the policy as outlined.

Signed _____

Printed Name Peter Curto

Title Owner

CONTRACTOR CERTIFICATION

CONTRACTOR STANDARDS – PLEDGE OF COMPLIANCE

PROJECT TITLE: **Silver Wing Neighborhood Park Lighting**

I declare under penalty of perjury that I am authorized to make this certification on behalf of Curto Const Co, as Contractor, that I am familiar with the requirements of City of San Diego Municipal Code § 22.3224 regarding Contractor Standards as outlined in the WHITEBOOK, Section 7-13.4, ("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 14 Day of Oct, 2013.

Signed _____

Printed Name Peter Curto

Title Owner

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:

Silver Wing Neighborhood Park Lighting
(Name of Project)

as particularly described in said contract and identified as Bid No. **L-14-5818-DBB-1;** SAP No. (WBS/CC/IO) **S-11051** and **WHEREAS**, the specification 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_____.

_____Contractor
by

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 PROVSIONS (SSP)

SUPPLEMENTARY SPECIAL PROVISIONS

The following Supplementary Special Provisions (SSP) modifies the following documents:

1. Standard Specifications for Public Works Construction (The GREENBOOK) currently in effect.

2. The City of San Diego Standard Specifications for Public Works Construction (The WHITEBOOK).

SECTION 2 - SCOPE AND CONTROL OF WORK

2-3.2 **Self Performance.** DELETE in its entirety and SUBSTITUTE with the following:

You must perform, with your own organization, Contract work amounting to at least 50% 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 award.

2-9.2 **Survey Service.**

DELETE in its entirety and SUBSTITUTE with the following:

The Contractor shall be responsible for all surveying services or as may be specified in these special provisions.

The payment for survey services shall be included in the various Bid items unless a Bid item for Survey Service has been provided.

SECTION 4 - CONTROL OF MATERIALS

4-1.6 **Trade Names or Equals.** ADD the following:

You must submit your list of proposed substitutions for "an equal" ("or equal") item(s) **no less than 15 Working Days prior to Bid due date** and on a City form when provided by the City.

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 the Contract.

7-3.1 **Policies and Procedures.**

1. You must procure the insurance described below, at its 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.

2. Insurance coverage for property damage resulting from your operations is on a replacement cost valuation. The market value will not be accepted.

3. 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 the Contract, e.g., your indemnity obligations, is not deemed limited to the insurance coverage required by this contract.

4. 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.

5. 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 the Contract. Your failure to maintain or renew coverage or to provide evidence of renewal during the term of the Contract may be treated by the City as a material breach of the Contract.

7-3.2 Types of Insurance.

7-3.2.1 Commercial General Liability Insurance.

1. 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.

2. 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).

3. 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.

4. All costs of defense must be outside the policy limits. Policy coverage must be in liability limits of not less than the following:

General Annual Aggregate Limit	Limits of Liability
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.

1. 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").

2. All costs of defense must be outside the limits of the policy.

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 Approved Surplus Lines Insurers (LASLI 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.

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.

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.

c) 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.

d) 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 your 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.

7-3.6 **Deductibles and Self-Insured Retentions.** You must pay for all deductibles and self-insured retentions. You must disclose deductibles and self-insured retentions to the City at the time the evidence of insurance is provided.

7-3.7 **Reservation of Rights.** The City reserves 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. The City 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.

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.

7-3.9 **Excess Insurance.** Policies providing excess coverage must follow the form of the primary policy or policies e.g., all endorsements.

7-4 WORKERS' COMPENSATION INSURANCE. DELETE in its entirety and SUBSTITUTE with the following:

7-4.1 Workers' Compensation Insurance and Employers Liability Insurance.

1. In accordance with the provisions of §3700 of the California Labor Code, you must provide at your 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.

2. Limits for this insurance must be not less than the following:

Workers' Compensation	Statutory Employers Liability
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

3. By signing and returning the 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 must 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.

7-8.6 Water Pollution Control. ADD the following:

1. Based on a preliminary assessment by the City, the Contract is subject to WPCP.

7-10.5.3 Steel Plate Covers. Table 7-10.5.3(A), REVISE the plate thickness for 5'-3" trench width to read 1 ¾".

7-15 INDEMNIFICATION AND HOLD HARMLESS AGREEMENT. To the City Supplements, fourth paragraph, last sentence, DELETE in its entirety and SUBSTITUTE with the following:

Your duty to indemnify and hold harmless does not include any claims or liability arising from the established active or sole negligence, or willful misconduct of the City, its officers, or employees.

SECTION 9 - MEASUREMENT AND PAYMENT

9-3.2.5 **Withholding of Payment.** To the City Supplements, item i), DELETE in its entirety and SUBSTITUTE with the following:

i) Your failure to comply with 7-2.3, "PAYROLL RECORDS" and 2-16, "CONTRACTOR REGISTRATION AND ELECTRONIC REPORTING SYSTEM."

ADD:

9-3.7 **Compensation Adjustments for Price Index Fluctuations.** This Contract is subject to the provisions of The WHITEBOOK for Compensation Adjustments for Price Index Fluctuations for the paving asphalt.

SECTION 212-LANDSCAPE AND IRRIGATION MATERIALS

212-1.1 **Topsoil.**

212-1.1.2 **Class "A" Topsoil.** To the City Supplements, Paragraph 3, between the words "the" and "agricultural" ADD the following:

gradation limits, permeability rate, and

Third paragraph, at the end of the test results list, ADD the following:

m) Measurement of sodicity (Sodium Adsorption Ratio).

n) Recommendations for soil leaching.

o) Pounds of pre-plant fertilizer per 1,000 sq. ft. and recommended NPK analysis of fertilizer.

p) Pounds of maintenance fertilizer per 1,000 sq. ft. and recommended NPK analysis of fertilizer.

212-1.1.3 **Class "B" Topsoil.** To the City Supplements, Paragraph 1, before the first sentence, ADD the following:

The soil shall be tested for Part 3, agricultural suitability, in accordance with 212-1.1.2, "Class "A" Topsoil." The soils shall be amended in accordance with the recommendations included in the test results and as approved by the Engineer.

212-1.1.4 **Class "C" Topsoil.** To the City Supplements, Paragraph 1, in the first sentence, after the words "tested for" and before "agricultural suitability", ADD the following:

Part 3,

ADD:

212-1.10 **Herbicide.** Pre-emergent herbicide shall be as determined by Contractor. The purpose of the pre-emergent herbicide is to control the growth of weeds within planter areas below the bark mulch layer. Contractor shall submit a sample label and Material Safety Data Sheet (MSDS) to the Resident Engineer for approval prior to purchase and applications.

Post-emergent herbicide shall be non-selective type for total control of undesirable vegetation, available as Roundup or approved substitution as determined by the Contractor. Contractor shall submit a sample label and Material Safety Data Sheet (MSDS) to the Resident Engineer for approval prior to purchase and applications. Application shall be in accordance with precautions and rates suggested by the manufacturer.

212-2 **IRRIGATION SYSTEM MATERIALS.** ADD the following:

Work included in these specifications shall consist of the furnishing of labor, tools, materials, permits, fees, appliances, taxes and other costs necessary for the installation of an automatic irrigation system in an acceptable operational condition as specified and shown on the project drawings.

Material List: Contractor shall furnish articles, equipment, materials, and processes specified by name in construction documents. No substitution shall be allowed without prior written approval by the City. Complete material list shall be submitted prior to performing work. Material list shall include manufacturer, model number, and description of materials and equipment to be used.

Equipment and materials provided without prior approval of the City may be rejected and Contractor required to remove such materials from the site at his own expense.

Acceptance of items, alternates and substitutes indicates only that the product(s) apparently meets requirements of contract documents based on information or samples submitted to the City.

Manufacturer's warranties shall not relieve Contractor of his liability under the guarantee. Such warranties shall only supplement the guarantee.

212-2.1 **Pipe and Fittings.**

212-2.1.1 **General.** Revise to read as follows:

Contractor shall furnish only new pipe and fittings of types designated on the Plans and in accordance with the specifications.

ADD:

212-2.1.17 **Sand Encasement.** Sand Encasement for all irrigation pipe, direct burial control wire and electrical conduit shall be clean plaster or mortar sand, as per section 200 of the Greenbook, with a minimum sand equivalent of 50.

212-3 ELECTRICAL MATERIALS

ADD:

212-3.2.2.4 Wires in Pull Boxes.

Wires in Pull Boxes shall be loose and shall not come within 3" from lid. Boxes shall be sized accordingly to accommodate this requirement.

ADD:

212-3.2.2.5 Wire Testing. Wire shall be tested for continuity, open circuits, and unintentional grounds prior to connecting to equipment. Any wiring that is defective shall be replaced, at the Contractor's expense.

SECTION 300 – EARTHWORK

300-1 CLEARING AND GRUBBING.

300-1.1 General. ADD the following:

The site shall be cleared of grass and weeds to a depth of at least 6 inches and debris and obstructions including brush, trees, logs, stumps, roots, heavy sod, vegetation, rock, stones larger than 6 inches in any dimension, broken or old concrete and pavement.

The site shall be grubbed to a depth necessary to remove objectionable material including stumps and roots.

300-1.4 Payment. To the City Supplements, paragraph (2), DELETE in its entirety and SUBSTITUTE with the following:

1. Payment for existing pavement removal and disposal of up to 12" thick, within the excavation e.g., trench limits, shall be included in the Bid item for installation of the mains or the Work item that requires pavement removal.

300-2 UNCLASSIFIED EXCAVATION.

ADD:

300-2.1.1 Miscellaneous Grading Conditions. Site Grading: Slope grades to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Lawn or Unpaved Areas: Plus or minus 1 inch.
2. Walks: Plus or minus 1 inch.
3. Pavements: Plus or minus 1/2 inch.

Moisture Control: Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill material on surfaces that are muddy.

2. Remove and replace, or scarify and air-dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

Compaction of Backfill and Fills:

1. Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

2. Place backfill and fill materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

3. Compact soil to not less than the following percentages of maximum density according to ASTM D 1557: Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill material at 95 percent.

SECTION 302 – ROADWAY SURFACING

302-3 **Preparatory Repair Work**. To the City Supplement, DELETE in its entirety and SUBSTITUTE with the following:

302-3 **Preparatory Repair Work**.

1. Prior to roadway resurfacing or the application of slurry, the Contractor shall complete all necessary preparation and repair work to the road segment e.g., tree trimming, weed spray, weed abatement, crack sealing, asphalt repair, hump removal, miscellaneous asphalt patching, removal of raised pavement markers, removal of pavement markings, etc. and as specified in the Special Provisions.

2. Preparatory work shall include, but not be limited to, tree trimming, weed spray, weed abatement, crack sealing, asphalt repair i.e., mill and pave, hump removal, miscellaneous asphalt patching, removal of raised pavement markers, removal of pavement markings, etc.

3. The Contractor shall repair areas of distressed asphalt concrete pavement by milling or removing damaged areas of pavement to a minimum depth of 2” for Residential streets, and a minimum depth of 3” for all others to expose firm and unyielding pavement. The Contractor shall prepare subgrade as needed and install a minimum of 2” for residential streets, and a minimum of 3” for all others, of compacted asphalt concrete pavement over compacted native material as directed by the Engineer.

4. If, in order to achieve the minimum specified depth, the base material is exposed, the material shall be compacted to 95% relative compaction to a depth 10” below the finished grade (dig out). Compaction tests shall be made to ensure compliance with the specifications. The Engineer will determine when and where the test will occur. The City will pay for the soils testing required by the Engineer, which meets the required compaction. The Contractor shall reimburse the City for the cost of retesting failing compaction tests. If additional base

material is required, the Contractor shall use Class 2 Aggregate Base in accordance with 200-2.2, "Crushed Aggregate Base."

5. Recycled base material shall conform to Crushed Miscellaneous Base Material in accordance with 200-2.4, "Crushed Miscellaneous Aggregate Base."

6. Prior to replacing asphalt, the area shall be cleaned by removing all loose and damaged material, moisture, dirt, and other foreign matter and shall be tack coated in accordance with 302-5.4 "Tack Coat."

7. The Contractor shall install new asphalt within the repair area or for patches in accordance with 302-5, "ASPHALT CONCRETE PAVEMENT." Asphalt concrete shall be C2-PG 64-10 in compliance with 400-4, "ASPHALT CONCRETE."

8. No preparatory asphalt work shall be done when the atmospheric temperature is below 50 °F or during unsuitable weather.

9. Following the asphalt placement, the Contractor shall roll the entire area of new asphalt in both directions at least twice. The finished patch shall be level and smooth in compliance with 302-5.6.2 "Density and Smoothness." After placement and compaction of the asphalt patch, the Contractor shall seal all finished edges with a 4" wide continuous band of SS-1H.

10. The minimum dimension for each individual repair shall be 4' x 4' and shall be subject to the following conditions:

    a) If the base material is exposed to achieve the required minimum removal thickness, the base material shall be prepared conforming to 301-1, "SUBGRADE PREPARATION."

    b) When additional base material is required, then the contractor shall use Class 2 Aggregate Base in accordance with 200-2.2, "Crushed Aggregate Base." Recycled base material shall conform to Crushed Miscellaneous Base Material in accordance with 200-2.4, "Crushed Miscellaneous Base."

    c) The Contractor may use grinding as a method for removal of deteriorated pavement when the areas indicated for removal are large enough (a minimum of the machine drum width) and when approved by the Engineer.

    d) For both scheduled and unscheduled base repairs, failed areas may be removed by milling or by excavation provided that the edges are cut cleanly with a saw. The areas shall be cleaned and tack coated in accordance with 302-5.4, "Tack Coat" before replacing the asphalt. The areas for scheduled repairs have been marked on the street.

302-3.1 Asphalt Patching.

1. Asphalt patching shall consist of patching potholes, gutter-line erosion, and other low spots in the pavement that are deeper than ½" per 302-5.6.2, "Density and Smoothness." These areas are generally smaller and more isolated than those areas in need of mill and pave.

2. The areas requiring patching have been identified in the Contract Documents, marked on the streets, or as directed by the Engineer. The Contractor shall identify any new areas that may require patching prior to slurry work to ensure the smoothness and quality of the finished product.

3. The Contractor shall identify and repair any areas that may require patching, prior to the placement of slurry seal for smooth finished product.

4. Asphalt overlay shall not be applied over deteriorated pavement. Preparatory asphalt work shall be completed and approved by the Engineer before proceeding with asphalt overlay.

5. The Contractor shall remove distressed asphalt pavement either by saw cutting or milling, to expose firm and unyielding pavement; prepare subgrade (as needed); and install compacted asphalt concrete pavement over compacted native material as directed by the Engineer.

6. Prior to replacing asphalt, the area shall be cleaned and tack coated per 302-5.4, "Tack Coat".

7. Following the asphalt placement, the Contractor shall roll the entire patch in both directions covering the patch at least twice.

8. After placement and compaction of the asphalt patch, the Contractor shall seal all finished edges with a 4" wide continuous band of SS-1H.

9. Base repairs shall not exceed 20% RAP in content.

302-3.2 Payment.

1. Payment for replacement of existing pavement when required shall be included in the unit bid price for Asphalt Pavement repair for the total area replaced and no additional payment shall be made regardless of the number of replacements completed. No payment shall be made for areas of over excavation or outside trench areas in utility works unless previously approved by the Engineer. No payment for pavement replacement will be made when the damage is due to the Contractor's failure to protect existing improvements. The Contractor shall reimburse the City for the cost of retesting all failing compaction tests.

2. At the end of each day, the Contractor shall submit to the Engineer an itemized list of the asphalt pavement repair work completed. The list shall include the location of the work and the exact square footage of the repair.

3. Preparatory repair work and tack coating will be paid at the Contract unit price per ton for Asphalt Pavement Repair. No payment shall be made for areas of over excavation unless previously approved by the Engineer.

4. Milling shall be included in the Bid item for Asphalt Pavement Repair unless separate Bid item has been provided.

5. Payment for miscellaneous asphalt patching shall be included in the Contract unit price for slurry and no additional payment shall be made therefore.

302-5.1.1 Damaged AC Pavement Replacement. To the City Supplement, DELETE in its entirety.

302-5.1.2 Measurement and Payment. To the City Supplement, DELETE in its entirety.

SECTION 306 – UNDERGROUND CONDUIT CONSTRUCTION

306-1 OPEN TRENCH OPERATIONS. To the City Supplements, CORRECT certain section numbering as follows:

OLD SECTION NUMBER	TITLE	NEW SECTION NUMBER
306-1.8	**House Connection Sewer (Laterals) and Cleanouts**	**306-1.9**
306-1.7.1	**Payment**	**306-1.9.1**
306-1.7.2	**Sewer Lateral with Private Replumbing**	**306-1.9.2**
306-1.7.2.1	**location**	**306-1.9.2-1**
306-1.7.2.2	**Permits**	**306-1.9.2-2**
306-1.7.2.3	**Submittals**	**306-1.9.2-3**
306-1.7.2.4	**Trenchless Construction**	**306-1.9.2-4**
306-1.7.2.5	**Payment**	**306-1.9.2-5**
306-1.7.3.6	**Private Pump Installation**	**306-1.9.2-6**
306-1.7.3.7	**Payment**	**306-1.9.2-7**

306-1.6 Basis of Payment for Open Trench Installations. ADD the following:

Payment for imported backfill when the Contractor elects to import material from a source outside the project limits and when authorized by the Engineer shall be included in the Bid unit price for Imported Backfill. The price shall include the removal and disposal of unsuitable materials.

306-5 ABANDONMENT OF CONDUITS AND STRUCTURES.

306-5.1 Removal and Abandonment of Existing Water Facilities. ADD the following:

The City is responsible for the removal and disposal of any asbestos found in structures scheduled for demolition, prior to commencement of demolition work by the CONTRACTOR.

If, during demolition work, any additional asbestos materials are being discovered, the Contractor shall stop the work immediately and notify the CONSTRUCTION MANAGER for further instructions. Work interruptions caused thereby are subject to the provisions in SECTION 3 – CHANGES IN WORK and SECTION 6 – PROSECUTION, PROGRESS, AND ACCEPTANCE OF WORK.

306-20.8 **Carrier Pipe**. To the City Supplement, DELETE in its entirety and SUBSTITUTE with the following:

Carrier pipe materials shall be approved by the Engineer. The Contractor shall use only HDPE. The Contractor shall furnish and install a structurally sound, leak-proof, fusible high density polyethelene pipe, for all piping identified for installation by horizontal directional drilling. The Contractor shall be responsible for the sizing of the carrier pipe to withstand all installation forces, curvature, and residual forces and final in place loading. The selected material shall have an inside diameter no less than stated on the drawings. Individual pipe lengths shall be assembled by butt-fusion unless otherwise specified.

306-22 **Pipe Fusion.** DELETE in its entirety.

SECTION 308 – LANDSCAPE AND IRRIGTION INSTALLATION

308-2 **EARTHWORK AND TOPSOIL PLACEMENT.**

308-2.1 **General.** After the third paragraph, ADD the following:

Moisture Content: Do not perform soil preparation and earthwork if soil moisture content is such that excessive soil compaction will result. Apply water to control dust, break up soil clods, and provide suitable moisture content for tilling and planting.

ADD:

308-2.1.1 **Equipment.** Equipment necessary for soil preparation, finish grading, and handling and placing of materials shall be available and in good working condition before starting work.

308-2.2 **Trench Excavation and Backfill.** DELETE the last paragraph, and REPLACE with the following:

Trenches shall not be backfilled, except to anchor pipe, until required tests are completed and accepted by the City. Pipe joints shall remain exposed until satisfactory completion of testing. Lateral trenches, and mainline trenches after initial sand backfill, shall be carefully backfilled with approved fine select material, consisting of loam, sandy clay, sand, and other approved materials-free from large clods of earth and stones. Backfill shall be mechanically compacted in landscaped areas to dry density equal to adjacent undisturbed soil in planting areas. Backfill shall conform to adjacent grades without settlement, sunken areas, humps, and other surface irregularities.

Flooding of trenches will be permitted only with approval of the City, in accordance with subsection 306-1.3.3.

If trench settlement occurs and subsequent adjustments in pipe, valves, sprinkler heads, drip emitters, planting, and other installations are necessary, then Contractor shall make required adjustments at no extra cost to the City.

ADD:

308-2.2.1 **Trenching and Backfilling Under Paving.** PVC Schedule 40 sleeves shall be placed for irrigation pipe installed below paving. Trenches located below paving (asphaltic concrete and concrete) shall be backfilled with sand (six inches above and below the pipe). Compact backfill in layers to 95% relative density (minimum) with manual or mechanical tamping devices.

Trenches shall be flush with adjoining subgrade. Contractor shall set in place, cap and pressure test piping under pavement prior to start of paving work. Install piping under existing walks by jacking or boring. If cutting or breaking of sidewalks is necessary, then Contractor shall replace concrete walks at no extra cost to the City. Permission to cut or break sidewalks shall be obtained from the Resident Engineer. No hydraulic boring shall be permitted under concrete paving.

308-4 PLANTING.

308-4.10 **Root Control Barrier.** ADD the following:

Trees located within 5' of walkways, walls, etc. shall be installed with root barriers. The root barrier shall be installed adjacent to the walkway or wall and not around the rootball. The length of the root barrier shall be minimum of 10' from the center of the trunk in both directions of the tree and 24" deep. Root barrier shall be 'Bio-barrier' root control system or approved equal.

308-5 IRRIGATION SYSTEM INSTALLATION.

308-5.1 **General.** Between the second and third paragraph, ADD the following:

Existing Trees: If excavating adjacent to existing trees, Contractor shall exercise caution to avoid injury to trees and tree roots. Excavation near roots 1-1/2 inches and larger shall be done by hand. Tunnel under roots 1-1/2 inches and larger in diameter, except directly in the path of pipe and conduit. Roots shall be heavily wrapped with burlap to prevent scarring and excessive drying. If a trenching machine is run close to trees with roots smaller than 1-1/2 inches in diameter, wall of the trench adjacent to tree shall be hand trimmed, making clean cuts through roots. Trenches adjacent to trees should be closed within twenty-four hours; if not possible, side of the trench adjacent to the tree shall be kept shaded with burlap or canvas.

DELETE the last paragraph and REPLACE with the following:

Record and As-Built Drawings: Contractor shall provide and keep current complete "as-built" record set of blueline ozalid prints. Record set shall be corrected daily and show every change from original drawings and specifications and precise locations, sizes, and kinds of equipment. Prints for this purpose may be obtained at cost from the City. Drawings shall be kept on site and shall be used only as a record set.

Drawings shall also serve as daily work progress sheets, and Contractor shall make neat and legible annotations as work proceeds, showing work as installed. Drawings shall be available at all times for inspection, and shall be kept in a location on site designated by the City.

Contractor shall provide Resident Engineer with "as-built" record drawings (marked in red) prior to final acceptance. City will prepare final mylar as-built drawings after review and approval of red-lined record set.

Contractor shall dimension from two (2) permanent points of reference (building corners, sidewalk, road intersections, etc.) locations of the following items:

(a) Remote control valves

(b) Routing of control wiring

(c) Quick coupling valves

(d) Ball valves and gate valves

(e) Connection to existing water lines/water meter location Connection to existing electrical power/automatic controller location

(g) Other related equipment as directed by the City

(h) Significant changes in routing of lateral lines from those indicated on the plans

(i) Routing of pressure mainline piping (dimension every 100 feet along route)

On or before the date of final inspection, Contractor shall deliver corrected and completed as-builts to the City. Delivery of final as-builts shall not relieve Contractor of the responsibility of providing required information that may be omitted from the prints.

Controller Charts: As-built record drawings shall be approved by the City before Contractor prepares controller charts.

Provide two controller charts for each controller installed. (Non anticipated) A reduced copy of the approved as-built irrigation plan, color coded by stations and laminated in plastic, shall be provided at 11x17 size (to Park and Recreation Department) and at the maximum size that will fit inside the solar controller enclosure at the time of final acceptance.

Charts shall be reduced plans of as-built systems. If control circuits are not legible when plans are reduced, then they shall be enlarged to a size that will be readable when reduced.

Charts shall be blackline or blueline ozalid prints, and different colors shall be used to indicate area of coverage for each station.

After approval by the City, charts shall be hermetically sealed between two pieces of plastic-minimum 10 mils. thick each.

Charts shall be completed and approved by the City prior to final inspection of irrigation system.

Operation and Maintenance Manuals: Prepare and deliver to the City within ten calendar days prior to completion of construction, two hard cover binders with three rings containing the following information:

(a) Index sheet stating Contractor's address and telephone number, list of equipment with name and address of local manufacturers' representatives.

(b) Catalog and parts sheets on material and equipment installed under this contract.

(c) Guarantee statement (refer to Subsection 308-7, Guarantee).

(d) Complete operating and maintenance instruction manuals on major equipment.

In addition to required maintenance manuals, provide the City's maintenance personnel with instructions for major equipment and show evidence in writing to the City at the conclusion of the project that this service has been rendered.

308-6 MAINTENANCE AND PLANT ESTABLISHMENT.

308-6.1 Tree Maintenance.

ADD:

308-6.1.3 Root Pruning (Sidewalk Replacement). The Contractor shall prune the trees' roots as noted in the Contract Documents. The Contractor shall coordinate the scheduling of root pruning within 1 week of the concrete work to start. The Work includes cutting all roots necessary for satisfactory forming for sidewalk replacement to a depth of 12" (21" on the curb side) along the edge of the new walk or curb for a distance of 10' in each direction from the trunk. If the walk will not be replaced, roots shall be cut in straight line parallel to the walk or the curb. The root cut shall not be more than 3" from edge of existing walk or curb toward tree for a length of 10' in each direction from the trunk.

Roots more than 2" in diameter shall be pre-approved for removal by the Resident Engineer. Roots shall be cut at the nearest node to encourage roots to grow away from the walk. Root cutting shall not impact the trunk flare. Roots shall be cleanly cut 6" minimum away from new walk edge. Backfill excavated areas with Grade A topsoil or decomposed granite per engineer notes to existing grade and compact to walkability so as to not settle when walked upon.

In order to protect existing trees, surface roots in the parkway area (and/or planter strip) are not to be damaged or removed outside of the pruning area and no construction equipment or supplies including spoils shall be placed in or upon this area.

308-6.1.5 Equipment. Cuts shall be made with a root cutting machine such as Vemeer or Doscocil Inc., or equal as approved by the Resident Engineer. Any shredded roots shall be cut clean to nearest root node. Use of a tree stump grinder for root pruning is not acceptable.

308-6.1.6 Root Barrier. The Contractor shall install root barriers at locations where the pruning and walk construction has been completed or as directed by the Resident Engineer. Root barriers installed on either the curb side or walk side shall be a continuous 20' in length, centered on the tree or as directed by the Resident Engineer. Where trees requiring root barriers are 18' or less apart, the barrier shall be installed continuously between trees. The barrier shall be placed 1" below finished grade against the back of the curb or the front edge of the walk. Vertical raised ribs on

barrier shall be faced toward the tree(s). The barrier shall be installed vertically, or if conditions allow, with the top inclined towards the tree. The barrier shall not be installed with the top inclined away from the tree. The root pruning trench shall be backfilled to the top of the barrier. The tree shall be inspected by the Resident Engineer for stability prior to the backfilling of the root pruning trench.

ADD:

308-6.2 **Rodent and Pest Control.** Rodents, insects, and other pests shall be controlled as necessary and by approved means. Restoration and repair of work areas disturbed by pest control -shall be made by Contractor at no additional cost to the City.

Contractor shall immediately establish a program of pest, fungus, and weed control. Applications of pesticides, fungicides, and herbicides shall be made by operators licensed by the State of California Department of

Food and Agriculture to perform such work. Materials used in this work shall be approved by State of California Department of Food and Agriculture and other agencies with jurisdiction.

SECTION 705 – WATER DISCHARGES

705-2.6.3 **Community Health and Safety Plan.** To the City Supplements, DELETE in its entirety and SUBSTITUTE with the following:

705-2.6.3 **Community Health and Safety Plan.** See 703-2, "Community Health and Safety Plan."

705-2.6.1 **General.** Paragraph (3), CORRECT reference to Section 803 to read "Section 703."

SECTION 707 – RESOURCE DISCOVERIES

ADD:

707-1.1 **Environmental Document.** The City of San Diego Environmental Analysis Section (EAS) of the Development Services Department has prepared a Notice of Exemption for Silver Wing Neighborhood Park, Project No. S-11051.02.06 as referenced in the Contract Appendix. You must comply with all requirements of the Notice of Exemption as set forth in the Contract Appendix.

END OF SUPPLEMENTARY SPECIAL PROVISIONS (SSP)

SUPPLEMENTARY SPECIAL PROVISIONS

APPENDICES

APPENDIX A

CEQA Notice of Exemption

NOTICE OF EXEMPTION

(Check one or both)

TO: __X__ RECORDER/COUNTY CLERK
P.O. BOX 1750, MS A-33
1600 PACIFIC HWY, ROOM 260
SAN DIEGO, CA 92101-2422

_____ OFFICE OF PLANNING AND RESEARCH
1400 TENTH STREET, ROOM 121
SACRAMENTO, CA 95814

FROM: CITY OF SAN DIEGO
DEVELOPMENT SERVICES DEPARTMENT
1222 FIRST AVENUE, MS 501
SAN DIEGO, CA 92101

PROJECT NO.: S-11051.02.06 PROJECT TITLE: **SILVER WING NEIGHBORHOOD PARK**

PROJECT LOCATION-SPECIFIC: The project is located at 3735 Arey Drive, between Piccard Ave. and Picador Blvd., within the Otay Mesa-Nestor Community Planning Area.

PROJECT LOCATION-CITY/COUNTY: San Diego/San Diego

DESCRIPTION OF NATURE AND PURPOSE OF THE PROJECT: **- SILVER WING NEIGHBORHOOD PARK. The project would result in the installation of security lighting, sports field lighting, and accessibility/path of travel improvements to meet ADA requirements within the existing 13 acre neighborhood park. There are no sensitive biological resources on the site. Applicant: City of San Diego, Engineering and Capital Projects Department.**

NAME OF PUBLIC AGENCY APPROVING PROJECT: City of San Diego

NAME OF PERSON OR AGENCY CARRYING OUT PROJECT: Clark Ritter
Engineering and Capital Projects Department
600 B Street, San Diego, CA 92101
Phone: 619-533-4601.

EXEMPT STATUS: (CHECK ONE)

( ) MINISTERIAL (SEC. 21080 (B) (1); 15268);
( ) DECLARED EMERGENCY (SEC. 21080 (B) (3); 15269(a));
( ) EMERGENCY PROJECT (SEC. 21080 (B) (4); 15269 (b) (c))
(X) CATEGORICAL EXEMPTION: 15301- Existing Facilities and 15303- New Construction or Conversion of small structures
( ) STATUTORY EXEMPTIONS:

REASONS WHY PROJECT IS EXEMPT: The City of San Diego conducted an environmental review which determined that the project is exempt from CEQA pursuant to CEQA Guidelines Section 15301 and 15303. The project meets the criteria set forth in CEQA Section 15301 which allows for the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing facilities (public or private) involving negligible or no expansion of use beyond that existing at the time of the determination and 15303 which allows for new construction or conversion of small structures. The installation of security lighting, sports field lighting, and accessibility/path of travel improvements to meet ADA requirements is such a project. Additionally, none of the exceptions described in CEQA Guidelines Section 15300.2 apply.

LEAD AGENCY CONTACT PERSON: Anna L. McPherson TELEPHONE: (619) 446-5276

IF FILED BY APPLICANT:

1. ATTACH CERTIFIED DOCUMENT OF EXEMPTION FINDING.
2. HAS A NOTICE OF EXEMPTION BEEN FILED BY THE PUBLIC AGENCY APPROVING THE PROJECT?
   ( ) YES ( ) NO

IT IS HEREBY CERTIFIED THAT THE CITY OF SAN DIEGO HAS DETERMINED THE ABOVE ACTIVITY TO BE EXEMPT FROM CEQA

Anna L. McPherson
SIGNATURE/TITLE

MAY 17, 2012
DATE

CHECK ONE:

(X) SIGNED BY LEAD AGENCY
( ) SIGNED BY APPLICANT

DATE RECEIVED FOR FILING WITH COUNTY CLERK OR OPR:

APPENDIX B

Fire Hydrant Meter Program

CITY OF SAN DIEGO CALIFORNIA DEPARTMENT INSTRUCTIONS	NUMBER **DI** 55.27	DEPARTMENT Water Department
SUBJECT **FIRE HYDRANT METER PROGRAM (FORMERLY: CONSTRUCTION METER PROGRAM)**	**PAGE** 1**OF** 10	**EFFECTIVE DATE** October 15, 2002
	SUPERSEDES **DI** 55.27	**DATED** April 21, 2000

1. **PURPOSE**

1.1 To establish a Departmental policy and procedure for issuance, proper usage and charges for fire hydrant meters.

2. **AUTHORITY**

2.1 All authorities and references shall be current versions and revisions.

2.2 San Diego Municipal Code (NC) Chapter VI, Article 7, Sections 67.14 and 67.15

2.3 Code of Federal Regulations, Safe Drinking Water Act of 1986

2.4 California Code of Regulations, Titles 17 and 22

2.5 California State Penal Code, Section 498B.0

2.6 State of California Water Code, Section 110, 500-6, and 520-23

2.7 Water Department Director

Reference

2.8 State of California Guidance Manual for Cross Connection Programs

2.9 American Water Works Association Manual M-14, Recommended Practice for Backflow Prevention

2.10 American Water Works Association Standards for Water Meters

2.11 U.S.C. Foundation for Cross Connection Control and Hydraulic Research Manual

3. **DEFINITIONS**

3.1 **Fire Hydrant Meter:** A portable water meter which is connected to a fire hydrant for the purpose of temporary use. (These meters are sometimes referred to as Construction Meters.)

3.2 **Temporary Water Use:** Water provided to the customer for no longer than twelve (12) months.

3.3 **Backflow Preventor:** A Reduced Pressure Principal Assembly connected to the outlet side of a Fire Hydrant Meter.

4. POLICY

4.1 The Water Department shall collect a deposit from every customer requiring a fire hydrant meter and appurtenances prior to providing the meter and appurtenances (see Section 7.1 regarding the Fees and Deposit Schedule). The deposit is refundable upon the termination of use and return of equipment and appurtenances in good working condition.

4.2 Fire hydrant meters will have a 2 ½" swivel connection between the meter and fire hydrant. The meter shall not be connected to the 4" port on the hydrant. All Fire Hydrant Meters issued shall have a Reduced Pressure Principle Assembly (RP) as part of the installation. Spanner wrenches are the only tool allowed to turn on water at the fire hydrant.

4.3 The use of private hydrant meters on City hydrants is prohibited, with exceptions as noted below. All private fire hydrant meters are to be phased out of the City of San Diego. All customers who wish to continue to use their own fire hydrant meters must adhere to the following conditions:

a. Meters shall meet all City specifications and American Water Works Association (AWWA) standards.

b. Customers currently using private fire hydrant meters in the City of San Diego water system will be allowed to continue using the meter under the following conditions:

1. The customer must submit a current certificate of accuracy and calibration results for private meters and private backflows annually to the City of San Diego, Water Department, Meter Shop.

2. The meter must be properly identifiable with a clearly labeled serial number on the body of the fire hydrant meter. The serial number shall be plainly stamped on the register lid and the main casing. Serial numbers shall be visible from the top of the meter casing and the numbers shall be stamped on the top of the inlet casing flange.

3. All meters shall be locked to the fire hydrant by the Water Department, Meter Section (see Section 4.7).

4. All meters shall be read by the Water Department, Meter Section (see Section 4.7).

5. All meters shall be relocated by the Water Department, Meter Section (see Section 4.7).

6. These meters shall be tested on the anniversary of the original test date and proof of testing will be submitted to the Water Department, Meter Shop, on a yearly basis. If not tested, the meter will not be allowed for use in the City of San Diego.

7. All private fire hydrant meters shall have backflow devices attached when installed.

8. The customer must maintain and repair their own private meters and private backflows.

9. The customer must provide current test and calibration results to the Water Department, Meter Shop after any repairs.

10. When private meters are damaged beyond repair, these private meters will be replaced by City owned fire hydrant meters.

11. When a private meter malfunctions, the customer will be notified and the meter will be removed by the City and returned to the customer for repairs. Testing and calibration results shall be given to the City prior to any re-installation.

12. The register shall be hermetically sealed straight reading and shall be readable from the inlet side. Registration shall be in hundred cubic feet.

13. The outlet shall have a 2 ½ "National Standards Tested (NST) fire hydrant male coupling.

14. Private fire hydrant meters shall not be transferable from one contracting company to another (i.e. if a company goes out of business or is bought out by another company).

4.4 All fire hydrant meters and appurtenances shall be installed, relocated and removed by the City of San Diego, Water Department. All City owned fire hydrant meters and appurtenances shall be maintained by the City of San Diego, Water Department, Meter Services.

4.5 If any fire hydrant meter is used in violation of this Department Instruction, the violation will be reported to the Code Compliance Section for investigation and appropriate action. Any customer using a fire hydrant meter in violation of the requirements set forth above is subject to fines or penalties pursuant to the Municipal Code, Section 67.15 and Section 67.37.

4.6 **Conditions and Processes for Issuance of a Fire Hydrant Meter**

Process for Issuance

a. Fire hydrant meters shall only be used for the following purposes:

1. Temporary irrigation purposes not to exceed one year.

2. Construction and maintenance related activities (see Tab 2).

b. No customer inside or outside the boundaries of the City of San Diego Water Department shall resell any portion of the water delivered through a fire hydrant by the City of San Diego Water Department.

c. The City of San Diego allows for the issuance of a temporary fire hydrant meter for a period not to exceed 12 months (365 days). An extension can only be granted in writing from the Water Department Director for up to 90 additional days. A written request for an extension by the consumer must be submitted at least 30 days prior to the 12 month period ending. No extension shall be granted to any customer with a delinquent account with the Water Department. No further extensions shall be granted.

d. Any customer requesting the issuance of a fire hydrant meter shall file an application with the Meter Section. The customer must complete a "Fire Hydrant Meter Application" (Tab 1) which includes the name of the company, the party responsible for payment, Social Security number and/or California ID, requested location of the meter (a detailed map signifying an exact location), local contact person, local phone number, a contractor's license (or a business license), description of specific water use, duration of use at the site and full name and address of the person responsible for payment.

e. At the time of the application the customer will pay their fees according to the schedule set forth in the Rate Book of Fees and Charges, located in the City Clerk's Office. All fees must be paid by check, money order or cashiers check, made payable to the City Treasurer. Cash will not be accepted.

f. No fire hydrant meters shall be furnished or relocated for any customer with a delinquent account with the Water Department.

g. After the fees have been paid and an account has been created, the

meter shall be installed within 48 hours (by the second business day). For an additional fee, at overtime rates, meters can be installed within 24 hours (within one business day).

4.7 **Relocation of Existing Fire Hydrant Meters**

a. The customer shall call the Fire Hydrant Meter Hotline (herein referred to as "Hotline"), a minimum of 24 hours in advance, to request the relocation of a meter. A fee will be charged to the existing account, which must be current before a work order is generated for the meter's relocation.

b. The customer will supply in writing the address where the meter is to be relocated (map page, cross street, etc). The customer must update the original Fire Hydrant Meter Application with any changes as it applies to the new location.

c. Fire hydrant meters shall be read on a monthly basis. While fire hydrant meters and backflow devices are in service, commodity, base fee and damage charges, if applicable, will be billed to the customer on a monthly basis. If the account becomes delinquent, the meter will be removed.

4.8 **Disconnection of Fire Hydrant Meter**

a. After ten (10) months a "Notice of Discontinuation of Service" (Tab 3) will be issued to the site and the address of record to notify the customer of the date of discontinuance of service. An extension can only be granted in writing from the Water Department Director for up to 90 additional days (as stated in Section 4.6C) and a copy of the extension shall be forwarded to the Meter Shop Supervisor. If an extension has not been approved, the meter will be removed after twelve (12) months of use.

b. Upon completion of the project the customer will notify the Meter Services office via the Hotline to request the removal of the fire hydrant meter and appurtenances. A work order will be generated

for removal of the meter.

c. Meter Section staff will remove the meter and backflow prevention assembly and return it to the Meter Shop. Once returned to the Meter Shop the meter and backflow will be tested for accuracy and functionality.

d. Meter Section Staff will contact and notify Customer Services of the final read and any charges resulting from damages to the meter and backflow or its appurtenance. These charges will be added on the customer's final bill and will be sent to the address of record. Any customer who has an outstanding balance will not receive additional meters.

e. Outstanding balances due may be deducted from deposits and any balances refunded to the customer. Any outstanding balances will be turned over to the City Treasurer for collection. Outstanding balances may also be transferred to any other existing accounts.

5. EXCEPTIONS

5.1 Any request for exceptions to this policy shall be presented, in writing, to the Customer Support Deputy Director, or his/her designee for consideration.

6. MOBILE METER

6.1 Mobile meters will be allowed on a case by case basis. All mobile meters will be protected by an approved backflow assembly and the minimum requirement will be a Reduced Pressure Principal Assembly. The two types of Mobile Meters are vehicle mounted and floating meters. Each style of meters has separate guidelines that shall be followed for the customer to retain service and are described below:

a) **Vehicle Mounted Meters**: Customer applies for and receives a City owned Fire Hydrant Meter from the Meter Shop. The customer mounts the meter on the vehicle and brings it to the Meter Shop for

inspection. After installation is approved by the Meter Shop the vehicle and meter shall be brought to the Meter Shop on a monthly basis for meter reading and on a quarterly basis for testing of the backflow assembly. Meters mounted at the owner's expense shall have the one year contract expiration waived and shall have meter or backflow changed if either fails.

b) **Floating Meters**: Floating Meters are meters that are not mounted to a vehicle. **(Note: All floating meters shall have an approved backflow assembly attached.)** The customer shall submit an application and a letter explaining the need for a floating meter to the Meter Shop. The Fire Hydrant Meter Administrator, after a thorough review of the needs of the customer, (i.e. number of jobsites per day, City contract work, lack of mounting area on work vehicle, etc.), may issue a floating meter. At the time of issue, it will be necessary for the customer to complete and sign the "Floating Fire Hydrant Meter Agreement" which states the following:

    1) The meter will be brought to the Meter Shop at 2797 Caminito Chollas, San Diego on the third week of each month for the monthly read by Meter Shop personnel.

    2) Every other month the meter will be read and the backflow will be tested. This date will be determined by the start date of the agreement.

If any of the conditions stated above are not met the Meter Shop has the right to cancel the contract for floating meter use and close the account associated with the meter. The Meter Shop will also exercise the right to refuse the issuance of another floating meter to the company in question.

Any Fire Hydrant Meter using reclaimed water shall not be allowed use again with any potable water supply. The customer shall incur the cost of replacing the meter and backflow device in this instance.

7. FEE AND DEPOSIT SCHEDULES

7.1 **Fees and Deposit Schedules:** The fees and deposits, as listed in the Rate Book of Fees and Charges, on file with the Office of the City Clerk, are based on actual reimbursement of costs of services performed, equipment and materials. Theses deposits and fees will be amended, as needed, based on actual costs. Deposits, will be refunded at the end of the use of the fire hydrant meter, upon return of equipment in good working condition and all outstanding balances on account are paid. Deposits can also be used to cover outstanding balances.

All fees for equipment, installation, testing, relocation and other costs related to this program are subject to change without prior notification. The Mayor and Council will be notified of any future changes.

8. UNAUTHORIZED USE OF WATER FROM A HYDRANT

8.1 Use of water from any fire hydrant without a properly issued and installed fire hydrant meter is theft of City property. Customers who use water for unauthorized purposes or without a City of San Diego issued meter will be prosecuted.

8.2 If any unauthorized connection, disconnection or relocation of a fire hydrant meter, or other connection device is made by anyone other than authorized Water Department personnel, the person making the connection will be prosecuted for a violation of San Diego Municipal Code, Section 67.15. In the case of a second offense, the customer's fire hydrant meter shall be confiscated and/or the deposit will be forfeited.

8.3 Unauthorized water use shall be billed to the responsible party. Water use charges shall be based on meter readings, or estimates when meter readings are not available.

8.4 In case of unauthorized water use, the customer shall be billed for all applicable charges as if proper authorization for the water use had been obtained, including but not limited to bi-monthly service charges, installation charges and removal charges.

8.5 If damage occurs to Water Department property (i.e. fire hydrant meter, backflow, various appurtenances), the cost of repairs or replacements will be charged to the customer of record (applicant).

Larry Gardner
Water Department Director

Tabs:
1. Fire Hydrant Meter Application
2. Construction & Maintenance Related Activities With No Return To Sewer
3. Notice of Discontinuation of Service

APPENDIX

Administering Division: Customer Support Division

Subject Index:
Construction Meters
Fire Hydrant
Fire Hydrant Meter Program
Meters, Floating or Vehicle Mounted
Mobile Meter
Program, Fire Hydrant Meter

Distribution: DI Manual Holders

Application for Fire Hydrant Meter (EXHIBIT A)

City of San Diego PUBLIC UTILITIES Water & Wastewater

(For Office Use Only)

NS REQ	FAC#
DATE	BY

METER SHOP (619) 527-7449

Application Date	Requested Install Date:

Meter Information

Fire Hydrant Location: (Attach Detailed Map//Thomas Bros. Map Location or Construction drawing.) Zip:	T.B.	G.B. (CITY USE)
Specific Use of Water:		
Any Return to Sewer or Storm Drain, If so , explain:		
Estimated Duration of Meter Use: ☐ Check Box if Reclaimed Water		

Company Information

Company Name:			
Mailing Address:			
City:	State:	Zip:	Phone: ( )
*Business license#	*Contractor license#		
A Copy of the Contractor's license OR Business License is required at the time of meter issuance.			
Name and Title of Billing Agent: (PERSON IN ACCOUNTS PAYABLE)			Phone: ( )
Site Contact Name and Title:			Phone: ( )
Responsible Party Name:			Title:
Cal ID#			Phone: ( )
Signature:		Date:	

Guarantees Payment of all Charges Resulting from the use of this Meter. Insures that employees of this Organization understand the proper use of Fire Hydrant Meter

☐ Fire Hydrant Meter Removal Request	Requested Removal Date:	
Provide Current Meter Location if Different from Above:		
Signature:	Title:	Date:
Phone: ( )	Pager: ( )	

☐ City Meter	☐ Private Meter		
Contract Acct #:	Deposit Amount: $ 936.00	Fees Amount: $ 62.00	
Meter Serial #	Meter Size: 05	Meter Make and Style: 6-7	
Backflow #	Backflow Size:	Backflow Make and Style:	
Name:	Signature:	Date:	

WATER USES WITHOUT ANTICIPATED CHARGES FOR RETURN TO SEWER

Auto Detailing
Backfilling
Combination Cleaners (Vactors)
Compaction
Concrete Cutters
Construction Trailers
Cross Connection Testing
Dust Control
Flushing Water Mains
Hydro Blasting
Hydro Seeing
Irrigation (for establishing irrigation only; not continuing irrigation)
Mixing Concrete
Mobile Car Washing
Special Events
Street Sweeping
Water Tanks
Water Trucks
Window Washing

Note:

1. If there is any return to sewer or storm drain, then sewer and/or storm drain fees will be charges.

Date

Name of Responsible Party
Company Name and Address
Account Number:_____

Subject: Discontinuation of Fire Hydrant Meter Service

Dear Water Department Customer:

The authorization for use of Fire Hydrant Meter #_____, located at *(Meter Location Address)* ends in 60 days and will be removed on or after *(Date Authorization Expires)*. Extension requests for an additional 90 days must be submitted in writing for consideration 30 days prior to the discontinuation date. If you require an extension, please contact the Water Department, or mail your request for an extension to:

City of San Diego
Water Department
Attention: Meter Services
2797 Caminito Chollas
San Diego, CA 92105-5097

Should you have any questions regarding this matter, please call the Fire Hydrant Hotline at (619)_____-_____.

Sincerely,

Water Department

APPENDIX C

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 D

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											

APPENDIX E

Technical Specifications

TABLE OF CONTENTS

VOLUME I - Division 2 through 16

** END OF TABLE OF CONTENTS **

SECTION 02050 - DEMOLITION

PART 1 -- GENERAL

1.1 WORK OF THIS SECTION

A. The WORK of this Section includes furnishing materials, equipment and labor necessary to perform the demolition work for the Silverwing Park Security Lighting Upgrades project.

B. In areas indicated to be renovated and upgraded, protect in place all identified trees, shrubs and vegetation; relocate all identified trees, shrubs and vegetation; protect in place all underground water conduits, meters, concrete, AC paving and chain link fences; protect in place any other utilities that may be affected by the renovation and upgrades. All other items shall be removed as shown.

1.2 STANDARD SPECIFICATIONS

A. Except as otherwise indicated in this Section of the Specifications, the CONTRACTOR shall comply with the most current edition of the Standard Specifications for Public Works Construction (SSPWC), “GREENBOOK” .

1.3 CODES

A. The WORK of this Section shall comply with the current editions of the following codes as adopted by the City of San Diego Municipal Code:

California Building Code

1.4 SUBMITTALS

A. The following shall be submitted:

1. **Demolition Schedule:** The CONTRACTOR shall submit a complete coordination schedule for demolition work including shut-off and continuation of utility services prior to start of the WORK. The schedule shall indicate proposed methods and operations of facility demolition, and provide a detailed sequence of demolition and removal work to ensure uninterrupted operation of occupied areas.

1.5 ASBESTOS REMOVAL

A. The OWNER is responsible for the removal and disposal of any asbestos found in structures scheduled for demolition, prior to commencement of demolition work by the CONTRACTOR.

B. If, during demolition work, any additional asbestos materials are being discovered, the CONTRACTOR shall stop the work immediately and notify the CONSTRUCTION MANAGER for further instructions. Work interruptions caused thereby are subject to the provisions in SECTION 3 – CHANGES IN WORK and SECTION 6 – PROSECUTION, PROGRESS, AND ACCEPTANCE OF WORK.

PART 2 -- PRODUCTS (Not Used)

PART 3 -- EXECUTION

3.1 GENERAL

A. Structures shall be demolished and removed in compliance with SSPWC subsection 306-5 and the requirements indicated herein.

3.2 POLLUTION CONTROL

A. Water sprinkling, temporary enclosures, chutes, and other suitable methods shall be used for dust suppression.

B. Water shall not be used when it creates hazardous or objectionable conditions such as flooding, erosion, sedimentation, or pollution.

3.3 PROTECTION

A. Safe passage of persons around the area of demolition shall be provided. Operations shall be conducted to prevent injury to people and damage to adjacent buildings, structures, and other facilities.

B. Interior and exterior shoring, bracing, or supports shall be provided to prevent movement, settlement or collapse of structures to be demolished.

C. Existing landscaping materials, structures, and appurtenances which are not to be demolished shall be protected and maintained as necessary.

D. Unless otherwise indicated, the CONTRACTOR shall protect and maintain all utilities in the proximity of the facilities to be demolished.

E. The CONTRACTOR shall protect the nearby existing equipment such as control panels and others from dust caused by demolition activities by covering, drop-curtains and other similar methods.

3.4 STRUCTURE DEMOLITION

A. Building structures and appurtenances shall be demolished, as shown and required to complete work, in compliance with governing regulations.

B. Small structures may be removed intact when approved by authorities having jurisdiction.

C. Demolition shall proceed in a systematic manner, from top of structure to ground.

D. Concrete and masonry shall be demolished in small sections. Use bracing and shoring to prevent collapse.

E. Demolition equipment shall be dispersed throughout structure and demolished materials removed to prevent excessive loads on supporting walls, floors or framing.

3.5 BELOW-GRADE DEMOLITION

A. Footings, foundation walls, below-grade construction and concrete slabs on grade shall be demolished and removed to a depth which will not interfere with new construction, but not less than 12 inches below existing ground surface or future ground surface, whichever is lower. All floors of basements, vaults, and other underground structures shall be broken up.

B. Below-grade areas and voids resulting from demolition of structures shall be completely filled to a minimum compaction of 95%.

C. All fill and compaction shall be in accordance with Section 02200.

D. After fill and compaction, surfaces shall be graded to meet adjacent contours and to provide flow to surface drainage structures, or as indicated.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

A. Demolition and removal of debris shall be conducted to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities which shall not be closed or obstructed without permission from the OWNER. Alternate routes shall be provided around closed or obstructed traffic ways.

B. Site debris, rubbish, and other materials resulting from demolition operations shall be removed and disposed of in compliance all laws and regulations. Burning of removed materials from demolished structures shall not be permitted.

3.7 PATCHING AND REPAIRING

A. The CONTRACTOR shall provide patching, replacing, repairing, and refinishing of damaged areas involved in demolition as necessary to match the existing adjacent surfaces.

B. The CONTRACTOR shall repair all damages caused to adjacent facilities by demolition at no additional cost to the OWNER.

C. After patching and repairing has been completed, the CONTRACTOR shall carefully remove splatterings of mortar from adjoining work (plumbing fixtures, trim, tile, and finished metal surfaces) and repair any damage caused by such cleaning operations.

3.8 CLEANING

A. During and upon completion of work, the CONTRACTOR shall promptly remove unused tools and equipment, surplus materials, rubbish, debris, and dust and shall leave areas affected by work in a clean condition.

B. Clean adjacent structures and facilities of dust, dirt, and debris caused by demolition and return adjacent areas to condition existing prior to start of work.

C. The CONTRACTOR shall clean and sweep the affected portions of roads, streets, sidewalks and passageways daily.

** END OF SECTION **

SECTION 02100 - SITE PREPARATION

PART 1 -- GENERAL

1.1 WORK OF THIS SECTION

A The WORK of this Section includes site preparation, clearing and grubbing.

1.2 RELATED SECTIONS

A. The WORK of the following Sections applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.

Section 02050 Demolition

Section 16400 Low Voltage Electrical Service and Distribution

1.3 STANDARD SPECIFICATIONS

A. Except as otherwise indicated in this Section of the Specifications, the CONTRACTOR shall comply with the current edition of the Standard Specifications for Public Works Construction (SSPWC), "GREENBOOK".

PART 2 -- PRODUCTS (Not Used)

PART 3 -- EXECUTION

3.1 GENERAL

A. **Existing Conditions:** The site shall be examined and the CONSTRUCTION MANAGER notified of any conditions which affect the WORK of this Section.

B. **Utility Interference:** Where existing utilities interfere with the WORK of this Section, the CONSTRUCTION MANAGER shall be notified of interferences.

3.2 CLEARING AND GRUBBING

A. Clearing and grubbing shall comply with SSPWC Subsection 300-1 and the following:

1. The site shall be cleared of grass and weeds to a depth of at least 6 inches and debris and obstructions including brush, trees, logs, stumps, roots, heavy sod, vegetation, rock, stones larger than 6 inches in any dimension, broken or old concrete and pavement.

2. The site shall be grubbed to a depth necessary to remove objectionable material including stumps and roots.

3.3 SALVAGE AND DISPOSAL

A. **Salvage:** Topsoil shall be salvaged and stored at a location which will not interfere with the WORK.

B. **Disposal:** Waste material shall be disposed of in accordance with SSPWC Subsection 300-1.3.

** END OF SECTION **

SECTION 02200 - EARTHWORK

PART 1 -- GENERAL

1.1 WORK OF THIS SECTION

A The WORK of this Section includes all earthwork required for construction of the WORK. Such earthwork shall include the loosening, removing, loading, transporting, depositing, and compacting in its final location of all materials wet and dry, as required for the purposes of completing the WORK.

B Fill material is defined as material used to raise the level of a portion of the site to the line and grade indicated. Backfill material is defined as material used to refill an excavation.

1.2 RELATED SECTIONS

A. The WORK of the following Sections applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.

1.3 STANDARD SPECIFICATIONS

A. Except as otherwise indicated in this Section of the Specifications, the CONTRACTOR shall comply with the current edition of the Standard Specifications for Public Works Construction (SSPWC) “GREENBOOK”.

1.4 REGULATORY REQUIREMENTS

A. The WORK of this Section shall comply with current versions, with revisions, of the following:

1. Construction Safety Orders, Division of Industrial Safety, State of California.

2. California Department of Transportation Traffic Manual.

1.5 SHOP DRAWINGS AND SAMPLES

A. The following shall be submitted:

1. The CONTRACTOR shall comply with the provisions for "Shoring and Bracing Drawings" in Section 6705 of the California Labor Code. The CONTRACTOR, prior to beginning any trench or structure excavation 5 feet deep or over shall submit to the OWNER and shall be in possession of the OWNER's written acceptance of the CONTRACTOR's detailed plan showing design of all shoring, bracing, sloping of the sides of excavation, or other provisions for worker protection against the hazard of caving ground during the excavation of such trenches or structure excavation. If such plan varies from the shoring system established in the Construction Safety Orders of the State of California, such alternative system plans shall be prepared by a civil or structural engineer licensed in the State of California.

2. Copy of the excavation permit issued by the California Department of Industrial Safety.

3. Samples of imported material. Samples shall be submitted in accordance with SSPWC, Subsection 306-1.3.7.

4. Such other samples of materials as the CONSTRUCTION MANAGER may require.

1.6 SOIL TESTING

A. **General:** All soils testing shall be done in accordance with SSPWC, Section 211, and by a testing laboratory of the OWNER's choice at the OWNER's expense.

B. **Compaction Tests:** Where soil material is required to be compacted to a percentage of maximum density, the maximum density shall be determined in accordance with the requirements of SSPWC, Subsection 211-1. In case the tests of the fill or backfill show non-compliance with the required density, the CONTRACTOR shall accomplish such remedy as may be required to insure compliance. Subsequent testing to show compliance shall be by a testing laboratory selected by the OWNER and shall be at the CONTRACTOR's expense.

PART 2 -- PRODUCTS

2.1 FILL AND BACKFILL MATERIALS

A. **General:** Fill and backfill material shall consist of select material obtained from the excavation, imported material, granular bedding material, or unclassified material. The CONTRACTOR shall import at his expense materials in excess of the approved material obtained from excavation as required to complete the fill, backfill, and grading WORK as indicated.

B. **Select Material:** Select material shall consist of primarily granular material encountered in the excavation which is free of vegetation, organic matter, debris, rocks larger than 4 inches in diameter and other unsuitable material, and shall have an expansion index less than 30 (less than 20 for footings and floor slabs) as determined by UBC Standard No. 29-2, plasticity index of 10 or less, a liquid limit of 30 or less and shall be approved as select material by the CONSTRUCTION MANAGER.

C. **Imported Material:** Imported material shall conform to the same specifications as select material defined above. In addition, the imported materials shall have a minimum sand equivalent of 15 as determined by California Test Method No. 217. Imported material placed in areas to be planted shall be able to support normal plant growth. Obtain approval by the CONSTRUCTION MANAGER prior to transporting imported material.

D. **Bedding Material:** Bedding material, defined as that material supporting, surrounding and extending to 1 foot above the top of a pipe, shall be in accordance with SSPWC, Subsection 306-1.2.1.

E. **Unclassified Material:** Unclassified material shall conform to SSPWC, Subsection 300-4.

2.2 ROCK PRODUCTS

A. Rock products, consisting of crushed rock, rock dust, gravel, sand, and stone for riprap shall be clean, hard, sound, durable, uniform in quality and free of disintegrated material, organic matter, oil alkali, or other deleterious substance, and shall, unless otherwise specified, conform with the requirements of SSPWC, Subsection 200-1.

2.3 UNTREATED BASE MATERIALS

A. Untreated base materials shall conform with the requirements of SSPWC, Subsection 200-2.

B. Materials for use as untreated base or subbase shall be:

1. Crushed Aggregate Base

2.4 TOPSOIL

A. Topsoil shall be designated as Class A (imported), Class B (selected), or Class C (unclassified), and shall conform with the requirements of SSPWC, Subsection 212-1.1. The CONSTRUCTION MANAGER shall determine the suitability of topsoil prior to use.

PART 3 -- EXECUTION

3.1 GENERAL

A. The CONTRACTOR shall perform earthwork as necessary to complete the WORK as shown on the Contract Drawings and specified herein. The CONTRACTOR shall take the necessary precautionary measures to prevent dust or other nuisances which might be created by reason of his activities. The necessary precautionary measures shall conform to the requirements of SSPWC, Subsection 7-8. The requirements specified in Subsection 7-8 shall be extended to include paved surfaces.

B. All types of earthwork, including trench, structural and general excavation, fill, backfill and compaction, shall conform to applicable requirements of the SSPWC. Section 300, and to the requirements specified herein.

3.2 SITE PREPARATION

A. Areas to be excavated, filled, graded, and to be occupied by permanent construction or embankments shall be prepared by clearing and grubbing. Clearing and grubbing shall conform to the applicable requirements of SSPWC, Subsection 300-1.

3.3 EXCAVATION

A. **General:** Except when specifically provided to the contrary, excavation shall include the removal of all materials of whatever nature encountered, including all obstructions of any nature that would interfere with the proper execution and completion of the work. Unless otherwise directed, the removal of said materials shall conform to the lines and grades shown. Unless otherwise provided, the entire construction site shall be stripped of all vegetation and debris, and such material shall be removed from the site prior to performing any excavation or placing any fill. The CONTRACTOR shall furnish, place, and maintain all supports and shoring that may be required for the sides of the excavations, and all pumping, ditching, or other measures for the removal or exclusion of water as required. Excavations shall be sloped or otherwise supported in a safe manner in accordance with the rules, orders, and regulations of the Division of Industrial Safety of the State of California.

B. **Unclassified Excavation:** Unclassified excavation shall consist of all excavation, including roadways, unless separately designated.

1. Unsuitable material shall be excavated and disposed of in accordance with the requirements of SSPWC, Subsection 300-2.2.

2. Wet material, if unsatisfactory for the specified use on the project solely because of high moisture content, may be processed to reduce the moisture content, or may be required to be removed and replaced with suitable material in accordance with the requirements of SSPWC, Subsection 300-2.2.2.

3. The removal and disposal of slide and slipout material shall be in accordance with SSPWC, Subsection 300-2.4.

4. Excavation slopes shall be finished in conformance with the lines and grades shown, and in accordance with SSPWC, Subsection 300-2.5.

5. Surplus material shall be disposed of off-site, and in accordance with SSPWC, Subsection 300-2.6.

C. **Structure Excavation:** Structure excavation shall consist of the removal of material for the construction of foundations for bridges, retaining walls, headwalls, culverts, buildings, or other structures, and shall be in accordance with SSPWC, Subsection 300-3.

1. Cofferdams for foundation construction shall be constructed in accordance with SSPWC, Subsection 300-3.2.

2. The treatment of foundation material shall be in accordance with SSPWC, Subsection 300-3.3**.**

D. **Underground Conduit Excavation:**

1. General: Excavation for underground conduits shall be in accordance with SSPWC, Subsection 306-1.1 and the requirements contained herein. Unless otherwise shown or ordered, excavation for pipelines and utilities shall be open-cut trenches. Trench widths shall be kept as narrow as is practical for the method of pipe zone densification selected by the CONTRACTOR, but shall have a minimum width at the bottom of the trench equal to the outside diameter of the pipe plus 24 inches for mechanical compaction methods and 18 inches for water consolidation methods. The maximum width at the top of the pipe shall be equal to the outside diameter of the pipe plus 36 inches for pipe diameters 18 inches and larger and to the outside diameter of the pipe plus 24 inches for pipe diameters less than 18 inches.

2. Bracing Excavations: The manner of bracing excavations shall be as set forth in the rules, orders and regulations of the Division of Industrial Safety of the State of California, and in accordance with the requirements of SSPWC, Subsection 306-1.1.6.

3. Trench Bottom: Except when pipe bedding is required, the bottom of the trench shall be excavated uniformly to the grade of the bottom of the pipe. The trench bottom shall be given a final trim, using a string line for establishing grade, such that each pipe section when first laid will be continually in contact with the ground along the extreme bottom of the pipe. Rounding out the trench to form a cradle for the pipe will not be required.

4. Open Trench: The maximum amount of open trench permitted in any one location shall be 500 feet, or the length necessary to accommodate the amount of pipe installed in a single day, whichever is greater. All trenches shall be fully backfilled at the end of each

day or, in lieu thereof, shall be covered by heavy steel plates adequately braced and capable of supporting vehicular traffic in those locations where it is impractical to backfill at the end of each day. The above requirements for backfilling or use of steel plate will be waived in cases where the trench is located further than 100 feet from any traveled roadway or occupied structure. In such cases, however, barricades and warning lights conforming to requirements set forth in the California Department of Transportation Traffic Manual shall be provided and maintained.

5. Trench Over-Excavation: Where the Drawings indicate that trenches shall be over-excavated, they shall be excavated to the depth required, and then backfilled to the grade of the bottom of the pipe.

6. Where pipelines are to be installed in embankment fills, the fill shall be constructed to a level at least one foot above the top of the pipe before the trench is excavated.

E. **Over-Excavation Ordered by CONSTRUCTION MANAGER:**

1. Trenches shall be over-excavated beyond the depth shown when required by the CONSTRUCTION MANAGER. Such over-excavation shall be to the depth ordered. The trench shall then be backfilled to the grade of the bottom of the pipe. All work specified in this Section shall be performed by the CONTRACTOR at no additional cost to the OWNER when the over-excavation ordered by the CONSTRUCTION MANAGER is less than 6 inches below the limits shown. When the over-excavation ordered by the CONSTRUCTION MANAGER is 6 inches or greater below the limits shown, additional payment will be made to the CONTRACTOR for that portion of the work which is located below said 6-inch distance.

F. **Over-Excavation not Ordered or Indicated:**

1. Any over-excavation carried below the grade ordered or indicated shall be backfilled to the required grade with the specified material and compacted. Such work shall be performed by the CONTRACTOR at no additional cost to OWNER.

G. **Excavation in Lawn Areas:**

1. Where excavation occurs in lawn areas, the sod shall be carefully removed and stockpiled to preserve it for replacement. Excavated material may be placed on the lawn; provided, that a drop cloth or other suitable method is employed to protect the lawn from damage. The lawn shall not remain covered for more than 72 hours. Immediately after completion of backfilling, the sod shall be replaced in a manner so as to restore the lawn as near as possible to its original condition. CONTRACTOR shall provide new sod if removed sod has remained stockpiled for more than 72 hours.

2. The CONTRACTOR shall restore the lawn irrigation system removed or damaged due to excavation operations to a condition equal to the previous condition.

H. **Excavation in Vicinity of Trees:**

1. Except where trees are shown to be removed, trees shall be protected from injury during construction operations. No tree roots over 2 inches in diameter shall be cut without written permission of the CONSTRUCTION MANAGER. Trees shall be supported during excavation by means previously reviewed by the CONSTRUCTION MANAGER.

I. **Rock Excavation:**

1. Rock excavation shall include removal and disposal of the following: (1) all boulders measuring 1/3 of a cubic yard or more in volume; (2) all rock material in ledges, bedding deposits, and unstratified masses which cannot be removed without systematic drilling and blasting; (3) concrete or masonry structures which have been abandoned; and (4) conglomerate deposits which are so firmly cemented that they possess the characteristics of solid rock and which cannot be removed without systematic drilling and blasting.

2. Said rock excavation shall be performed by the CONTRACTOR; provided, that should the quantity of rock excavation be affected by any change in the scope of the WORK, an appropriate adjustment of the contract price will be made.

3.4 FILL AND BACKFILL

A. **General:**

1. Fill and Backfill shall be placed in accordance with the applicable provisions of SSPWC, Section 300, and the requirements stated herein.

2. Backfill shall not be dropped directly upon any structure or pipe. Backfill shall not be placed around or upon any structure until the concrete has been properly cured in accordance with the requirements of Section 03300 and has attained sufficient strength to withstand the loads imposed. Backfill around water retaining structures shall not be placed until the structures have been tested, and the structures shall be full of water while backfill is being placed.

3. Except for drainrock materials being placed in over-excavated areas or trenches, backfill shall not be placed until all water is removed from the excavation.

B. **Placing and Spreading of Materials:**

1. Materials shall be placed and spread evenly in layers. When compaction is achieved using mechanical equipment the layers shall be evenly spread so that when compacted each layer shall not exceed 8 inches in thickness. When compaction is achieved using flooding and jetting methods, each layer shall not exceed 3 feet in thickness after compaction.

2. During spreading, each layer shall be thoroughly mixed as necessary to promote uniformity of material in each layer. Bedding materials shall be brought up evenly around the pipe so that when compacted the material will provide uniform bearing and side support.

3. Where the material moisture content is below the optimum moisture content water shall be added before or during spreading until the proper moisture content is achieved.

4. Where the material moisture content is too high to permit the specified degree of compaction the material shall be dried until the moisture content is satisfactory.

C. **Compaction Requirements**

1. Compaction tests shall be performed in accordance with SSPWC, Subsection 211-2.

2. The relative compaction of fill, backfill, and base material shall be in accordance with SSPWC, Section 300, with the following exceptions:

a.	Subgrade where trench has been overexcavated	95%
b.	One foot layer of crushed aggregate backfill in overexcavated trench. Where trench is overexcavated more than 2 feet, minimum of 2 layers shall be compacted.	95%
c.	Pipe zone for flexible and rigid pipe :	95%
d.	Fill beneath structures, including water containing structures:	95%
e.	Backfill on underground structure roof:	90%

D. **Unclassified Fill:**

1. All fill shall be of unclassified material unless separately designated. Construction of unclassified fill, including preparing the area on which fill is to be placed, and the depositing, conditioning, and compacting of fill material shall be in accordance with SSPWC, Subsection 300-4.

E. **Structure Backfill:**

1. Backfill at structure shall be select material placed in accordance with SSPWC, Subsections 300-3.5 and 300-4.5.

F. **Underground Conduit Backfill:**

1. Bedding around pipe shall be bedding material placed in accordance with the requirements of SSPWC, Subsection 306-1.2.

2. Backfill above shall be considered as starting 1 foot above the pipe or conduit, or at the subgrade for cast-in-place structures such as manholes, transition structures, junction structures, vaults, and valve boxes.

3. Backfill at underground conduits shall be select material placed and densified according to SSPWC, Subsection 306-1.3.

3.5 PREPARATION OF SUBGRADE UNDER IMPROVEMENT

A. The preparation of subgrade for pavement, curbs and gutters, driveways, sidewalks and other roadway structures shall be in accordance with SSPWC, Subsection 301-1.

3.6 UNTREATED BASE

A. **Spreading and Compacting:**

1. Aggregate base material shall be spread and compacted in accordance with SSPWC, Subsection 301-2.

** END OF SECTION **

SECTION 02575 - PAVEMENT REHABILITATION

PART 1 -- GENERAL

1.1 WORK OF THIS SECTION

A. The WORK of this Section includes removal and rehabilitation of pavement affected by CONTRACTOR'S operations such as trenching, modification to facilities or as otherwise indicated.

1.2 RELATED SECTIONS

A. The WORK of the following Sections applies to the WORK of this Section. Other Sections of the specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.

1. Section 03280 Joints in Concrete Pavement

2. Section 03310 Cast-in-Place Sitework Concrete

1.3 STANDARD SPECIFICATIONS

A. Except as otherwise indicated in this Section of the Specifications, the CONTRACTOR shall comply with the latest adopted edition of the Standard Specifications for Public Works Construction (SSPWC), "GREENBOOK", together with the latest adopted editions of the Regional and City of San Diego Supplement Amendments.

PART 2 – PRODUCTS

2.1 ASPHALT CONCRETE

A. Asphalt concrete shall conform to the requirements of SSPWC subsection 203-6. Composition and grading of the asphalt concrete mixture shall conform to SSPWC subsection 203-6.4.3, class F.

B. Tack coat shall comply with subsection 302-5.4 of SSPWC.

2.2 PORTLAND CEMENT CONCRETE

A. Portland cement concrete shall comply with the requirements of subsection 201-1 of SSPWC; class 560-C-3250 per subsection 201-1.1.2 of SSPWC.

B. Curing compound for concrete that is to be topped by an asphaltic wearing course shall comply with SSPWC subsection 201-4 and shall be asphaltic type. Pigmentation is not required.

PART 3 -- EXECUTION

3.1 REMOVAL OF PAVEMENT

A. Existing AC pavement shall be sawcut to a minimum depth of 1-1/2 inches or 25 percent of its thickness, whichever is greater.

B. Removal of the existing cement concrete pavement for trench excavation shall be done in accordance with subsection 300-1.3 of SSPWC.

3.2 PLACEMENT OF PORTLAND CEMENT CONCRETE PAVEMENT

A. Subgrade preparation shall be done in accordance with subsection 301-1 of the SSPWC.

B. Prior to placing concrete, pavement edges shall be trimmed to neat horizontal and vertical lines. In case of AC pavement, a tack coat shall be applied to the existing pavement prior to placing cement concrete; while in the case of concrete pavement, the surface of edges shall be thoroughly wetted with water.

C. Portland cement concrete pavement shall be reconstructed in accordance with the applicable provisions of SSPWC subsection 302-6.

3.3 PLACEMENT OF WEARING SURFACE COURSE FOR AC PAVEMENT

A. In the case of rehabilitation of AC pavement, use only asphaltic type concrete curing compound.

B. Apply tack coat, to cement concrete pavement surface after it has cured, in accordance with SSPWC subsection 302-5.4.

C. Install asphaltic concrete, Class F, wearing course in accordance with the applicable provisions of SSPWC subsection 302-5.

** END OF SECTION **

SECTION 03100 - CONCRETE FORMWORK

PART 1 -- GENERAL

1.1 WORK OF THIS SECTION

A The WORK of this Section includes providing concrete formwork, bracing, shoring, and supports.

1.2 RELATED SECTIONS

A. The WORK of the following Sections applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of the WORK.

Section 03280 Joints in Sitework Concrete

Section 03310 Cast-In-Place Sitework Concrete

Section 03315 Grout

1.3 STANDARD SPECIFICATIONS

A. Except as otherwise indicated in this Section of the Specifications, the CONTRACTOR shall comply with the current edition of the Standard Specifications for Public Works Construction (SSPWC), “GREENBOOK”.

1.4 SPECIFICATIONS AND STANDARDS

A. Except as otherwise indicated, the current editions of the following apply to the WORK of this Section:

PS 1	U.S. Product Standard for Concrete Forms, Class I.
ACI 117	Standard Tolerances for Concrete Construction and Materials
ACI 347	Recommended Practice for Concrete Formwork

1.5 SHOP DRAWINGS AND SAMPLES

A. The following shall be submitted:

B. **Falsework Calculations and Drawings:** The CONTRACTOR's attention is directed to the provisions of Section 1717 of the Division of Industrial Safety, Construction Safety Orders, as revised November 1973, which requires that all falsework or vertical shoring installations where the height of the falsework or vertical shoring, as measured from the top of the sills to the soffit of the superstructure, exceeds 14 feet, or where individual horizontal span lengths exceed 16 feet, or provision for vehicular or railroad traffic through falsework or vertical shoring is made, shall be approved and signed by a civil engineer, registered in the State of California; provided further, that a copy of the falsework plan or shoring layout shall be available on the job site at all times.

C. Detailed plans of the falsework proposed to be used. Such plans shall be in sufficient detail to indicate the general layout, sizes of members, anticipated stresses, grade of materials to be used in the falsework, means of protecting existing construction which supports falsework, and typical soil conditions.

D. Catalog information on:

1. Form ties and all related accessories, including taper tie plugs, if used.

2. Form gaskets.

PART 2 -- PRODUCTS

2.1 GENERAL

A. Materials for concrete forms and falsework shall conform to SSPWC Subsection 303-1.3 and the requirements herein.

B. Except as otherwise expressly accepted, all lumber brought on the job site for use as forms, shoring, or bracing shall be new material. All forms shall be smooth surface forms and shall be of the following materials:

Walls	-	Steel or plywood panel
Columns	-	Steel, plywood, or fiber glass
Roof and floor	-	Plywood
All other work	-	Steel panels, plywood or tongue and groove lumber

C. Form materials which may remain or leave residues on or in the concrete shall be classified as acceptable for potable water use by the Environmental Protection Agency within 30 days of application or use.

2.2 FORM AND FALSEWORK MATERIALS

A. Materials for concrete forms, formwork, and falsework shall conform to the following requirements:

1. Lumber shall be Douglas Fir or Southern Pine, construction grade or better, in conformance with U.S. Product Standard PS20.

2. Plywood for concrete formwork shall be new, waterproof, synthetic resin bonded, exterior type Douglas Fir or Southern Pine plywood manufactured especially for concrete formwork and shall conform to the requirements of PS 1 for Concrete Forms, Class I, and shall be edge sealed.

3. Form materials shall be metal, wood, plywood, or other approved material that will not adversely affect the concrete and will facilitate placement of concrete to the shape, form, line, and grade shown. Metal forms shall be an approved type that will accomplish such results. Wood forms for surfaces to be painted shall be Medium Density Overlaid plywood, MDO Ext. Grade.

B. Unless otherwise indicated, exterior corners in concrete members shall be provided with 3/4-inch chamfers. Re-entrant corners in concrete members shall not have fillets unless otherwise indicated.

C. Forms and falsework to support the roof and floor slabs shall be designed for the total dead load, plus a live load of 30 psf (minimum).

2.3 FORM TIES

A. Form ties with integral waterstops shall be provided with a plastic cone or other suitable means for forming a conical hole to insure that the form tie may be broken off back of the face of the concrete. The maximum diameter of removable cones for rod ties, or of other removable form-tie fasteners having a circular cross-section, shall not exceed 1-1/2 inches; and all such fasteners shall be such as to leave holes of regular shape for reaming.

B. Form ties for water-retaining structures shall have integral waterstops. Removable taper ties may be used when approved. A preformed neoprene or polyurethane tapered plug sized to seat at the center of the wall shall be inserted in the hole left by the removal of the taper tie.

2.4 MANUFACTURERS

A. Products of the type indicated shall be manufactured by one of the following (or equal):

1. **Form Ties:**

Burke Penta - Tie System by the Burke Company
Richmond Snap Tys by the Richmond Screw Anchor Company

2. **Form ties with Integral Waterstops:**

Burke Taper - Tie System by the Burke Company
Taper Ty by the Richmond Screw Anchor Company

PART 3 -- EXECUTION

3.1 GENERAL

A. Forms and falsework shall be designed and constructed in accordance with ACI 347 and SSPWC Subsections 303-1.3, 303-1.6, and 303-5.2, and the requirements herein, except that the submittal of detailed falsework will not be required.

B. **Tolerances:** The variation from established grade or lines shall not exceed 1/4-inch in 10 feet and there shall be no offsets or visible waviness in the finished surface. All other tolerances shall be within the tolerances of ACI 117.

C. Forms to confine the concrete and shape it to the required lines shall be used wherever necessary. The CONTRACTOR shall assume full responsibility for the adequate design of all forms, and any forms which are unsafe or inadequate in any respect shall promptly be removed from the WORK and replaced at the CONTRACTOR's expense. A sufficient number of forms of each kind shall be provided to permit the required rate of progress to be maintained. The design and inspection of concrete forms, falsework, and shoring shall comply with applicable local, state and

Federal regulations. Plumb and string lines shall be installed before concrete placement and shall be maintained during placement. Such lines shall be used by CONTRACTOR's personnel and by the ENGINEER and shall be in sufficient number and properly installed. During concrete placement, the CONTRACTOR shall continually monitor plumb and string line form positions and immediately correct deficiencies.

D. Concrete forms shall conform to the shape, lines, and dimensions of members as called for on the Drawings, and shall be substantial, free from surface defects, and sufficiently tight to prevent leakage. Forms shall be properly braced or tied together to maintain their position and shape under a load of freshly-placed concrete. If adequate foundation for shores cannot be secured, trussed supports shall be provided.

3.2 FORM DESIGN

A. All forms shall be true in every respect to the required shape and size, shall conform to the established alignment and grade, and shall be of sufficient strength and rigidity to maintain their position and shape under the loads and operations incident to placing and vibrating the concrete. Suitable and effective means shall be provided on all forms for holding adjacent edges and ends of panels and sections tightly together and in accurate alignment so as to prevent the formation of ridges, fins, offsets, or similar surface defects in the finished concrete. Plywood, 5/8-inch and greater in thickness, may be fastened directly to studding if the studs are spaced close enough to prevent visible deflection marks in the concrete. The forms shall be tight so as to prevent the loss of water, cement and fines during placing and vibrating of the concrete. Specifically, the bottom of wall forms that rest on concrete footings or slabs shall be provided with a gasket to prevent loss of fines and paste during placement and vibration of concrete. Such gasket may be a 1- to 1-1/2-inch diameter polyethylene rod held in position to the underside of the wall form. Adequate clean-out holes shall be provided at the bottom of each lift of forms. The size, number, and location of such clean-outs shall be as acceptable to the CONSTRUCTION MANAGER. Whenever concrete cannot be placed from the top of a wall form in a manner that meets the requirements of the Contract Documents, form windows shall be provided in the size and spacing needed to allow placement of concrete to the requirements of Section 03300. The size, number, and location of such form windows shall be acceptable to the CONSTRUCTION MANAGER.

3.3 CONSTRUCTION

A. **Vertical Surfaces:** All vertical surfaces of concrete members shall be formed, except where placement of the concrete against the ground is shown. Not less than 1-inch of concrete shall be added to the thickness of the concrete member as shown where concrete is permitted to be placed against trimmed ground in lieu of forms. Such permission will be granted only for members of comparatively limited height and where the character of the ground is such that it can be trimmed to the required lines and will stand securely without caving or sloughing until the concrete has been placed.

B. **Construction Joints:** Concrete construction joints will not be permitted at locations other than those shown or specified, except as may be acceptable to the CONSTRUCTION MANAGER. When a second lift is placed on hardened concrete, special precautions shall be taken in the way of the number, location, and tightening of ties at the top of the old lift and bottom of the new to prevent any unsatisfactory effect whatsoever on the concrete. Pipe stubs and anchor bolts shall be set in the forms where required.

C. **Form Ties:**

1. Embedded Ties: Holes left by the removal of form tie cones shall be reamed with suitable toothed reamers so as to leave the surface of the holes clean and rough before being filled with mortar as indicated in Section 03300. Wire ties for holding forms will not be permitted. No form-tying device or part thereof, other than metal, shall be left embedded in the concrete. Ties shall not be removed in such manner as to leave a hole extending through the interior of the concrete members. The use of snap-ties which cause spalling of the concrete upon form stripping or tie removal will not be permitted. If steel panel forms are used, rubber grommets shall be provided where the ties pass through the form in order to prevent loss of cement paste. Where metal rods extending through the concrete are used to support or to strengthen forms, the rods shall remain embedded and shall terminate not less than 1-inch back from the formed face or faces of the concrete.

2. Removable Ties: Where taper ties are approved for use, the larger end of the taper tie shall be on the wet side of walls in water retaining structures. After the taper tie is removed, the hole shall be thoroughly cleaned and roughened for bond. A precast neoprene or polyurethane tapered plug shall be located at the wall centerline. The hole shall be completely filled with non-shrink grout for water bearing and below-grade walls. The hole shall be completely filled with non-shrink or regular cement grout for above-grade walls which are dry on both sides. Exposed faces of walls shall have the outer 2 inches of the exposed face filled with a cement grout which shall match the color and texture of the surrounding wall surface.

3.4 REUSE OF FORMS

A. Forms may be reused only if in good condition and only if acceptable to the CONSTRUCTION MANAGER. Light sanding between uses will be required wherever necessary to obtain uniform surface texture on all exposed concrete surfaces. Exposed concrete surfaces are defined as surfaces which are permanently exposed to view. In the case of forms for the inside wall surfaces of hydraulic/water retaining structures, unused tie rod holes in forms shall be covered with metal caps or shall be filled by other methods acceptable to the CONSTRUCTION MANAGER.

3.5 REMOVAL OF FORMS

A. Careful procedures for the removal of forms shall be strictly followed, and this work shall be done with care so as to avoid injury to the concrete. No heavy loading on green concrete will be permitted. In the case of roof slabs and above-ground floor slabs, forms shall remain in place until test cylinders for the roof concrete attain a minimum compressive strength of 75 percent of the 28-day strength specified in Section 03300; provided, that no forms shall be disturbed or removed under an individual panel or unit before the concrete in the adjacent panel or unit has attained 75 percent of the specified 28-day strength and has been in place for a minimum of 7 days. The time required to establish said strength shall be as determined by the CONSTRUCTION MANAGER who will make several test cylinders for this purpose from concrete used in the first group of roof panels placed. If the time so determined is more than the 7-day minimum, then that time shall be used as the minimum length of time. Forms for all vertical walls and columns shall remain in place at least 2 days after the concrete has been placed. Forms for all parts of the WORK not specifically mentioned herein shall remain in place for periods of time as determined by the CONSTRUCTION MANAGER.

3.6 MAINTENANCE OF FORMS

A. Forms shall be cleaned, treated with a releasing agent, and maintained in accordance with SSPWC Subsection 303-1.3 and the following. The form surfaces shall be treated with a nonstaining mineral oil or other lubricant [compatible with the waterproofing membrane material and] acceptable to the CONSTRUCTION MANAGER. Any excess lubricant shall be satisfactorily removed before placing the concrete. Where field oiling of forms is required, the CONTRACTOR shall perform the oiling at least two weeks in advance of their use. Care shall be exercised to keep oil off the surfaces of steel reinforcement and other metal items to be embedded in concrete.

3.7 FALSEWORK

A. Falsework, including staging, walkways, forms, ladders, and similar appurtenances, shall be designed, engineered, constructed, and maintained according to the applicable requirements of the provisions of the OSHA Safety and Health Standards for Construction, and the requirements of the Construction Safety Orders of the California Division of Industrial Safety.

** END OF SECTION **

SECTION 03280 - JOINTS IN SITEWORK CONCRETE

PART 1 -- GENERAL

1.1 WORK OF THIS SECTION

A The WORK of this Section includes providing expansion joints, contact joints, and weakened plane joints in concrete pavement, sidewalk, curb and gutter.

1.2 RELATED SECTIONS

A. The WORK of the following Sections applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.

Section 03100 Concrete Formwork
Section 03310 Cast-in-Place Sitework Concrete

1.3 STANDARD SPECIFICATIONS

A. Except as otherwise indicated in this Section of the Specifications, the CONTRACTOR shall comply with the current edition of the Standard Specifications for Public Works Construction (SSPWC), "GREENBOOK".

1.4 SPECIFICATIONS AND STANDARDS

A. Except as otherwise indicated, the current editions of the following apply to the WORK of this Section:

ASTM D 1751	Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
ASTM D 994	Preformed Expansion Joint Filler for Concrete (Bituminous Type)

1.5 SHOP DRAWINGS AND SAMPLES

A. The following shall be submitted:

1. Placement shop drawings showing the location and type of all joints.

2. Catalog cuts and samples of the preformed expansion joint filler material including complete product data.

1.6 OWNER'S MANUAL

A. The following shall be included in the OWNER'S MANUAL:

1. Manufacturer's certification indicating that the preformed expansion joint material meets or exceeds the requirements of these Specifications.

PART 2 -- PRODUCTS

2.1 PREMOLDED JOINT FILLER

A. Premolded joint filler shall be in conformance with SSPWC subsection 201-3.2 and shall be either Preformed Expansion Joint Filler (ASTM D994) or Nonextruding and Resilient Filler (ASTM D 1751) as indicated.

2.2 STEEL BARS AND DOWELS

A. Steel bars used in construction joints or contact joints shall conform to SSPWC subsection 201-2.2.

2.3 CONCRETE CURING COMPOUND

A. Curing compound shall comply with SSPWC subsection 201-4.

PART 3 -- EXECUTION

3.1 EXPANSION JOINTS

A. Expansion joints in sitework concrete shall be constructed in accordance with SSPWC subsection 302-6.5.3 except that the configuration of the joint shall be as indicated on the drawings.

B. Expansion joints in concrete curbs, sidewalk and gutter shall comply with SSPWC subsection 303-5.4.2 except that the joint configuration shall be as indicated on the drawings.

3.2 CONSTRUCTION JOINTS

A. Construction joints in sitework concrete shall comply with SSPWC subsection 302-6.5.2.

3.3 WEAKENED PLANE JOINTS

A. Weakened plane joints in sitework concrete shall comply with SSPWC subsection 302-6.5.4 except that the configuration of the joint shall be as indicated on the drawings.

B. Weakened plane joints in concrete curbs, sidewalks and gutters shall comply with SSPWC subsection 303-5.4.3 except that the joint configuration shall be as indicated on the drawings.

3.4 CONTACT JOINTS

A. Contact joints in concrete pavement shall be made by placing fresh concrete against hardened concrete. A moisture barrier consisting of curing compound conforming to SSPWC subsection 201-4 shall be applied to the face of any contact joint and allowed to dry prior to placing fresh concrete against that joint face. This provision is also applicable to existing portland cement concrete pavement not constructed as part of the WORK performed under the contract. Application rate shall be as specified in SSPWC subsection 302-6.6 for the compound used.

** END OF SECTION **

SECTION 03300 - CAST-IN-PLACE STRUCTURAL CONCRETE

PART 1 -- GENERAL

1.1 WORK OF THIS SECTION

A The WORK of this Section includes providing finished cast-in-place structural concrete including forming, mixing, placing, curing, repairing, and finishing.

B. The following types of concrete shall be covered in this Section:

1. Structural Concrete: Concrete to be used in all cases except where indicated otherwise.

2. Lean Concrete: Concrete to be used for thrust blocks, pipe trench cut-off blocks and cradles, where the preceding items are indicated as unreinforced. Lean concrete shall be used as protective cover for dowels intended for future connection.

C. The term "hydraulic structure" used in these specifications shall refer to environmental engineering concrete structures for the containment, treatment, or transmission of water, wastewater, or other fluids.

1.2 RELATED SECTIONS

A. The WORK of the following Sections applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.

1. Section 03100 Concrete Formwork
2. Section 03280 Joints in Sitework Concrete
3. Section 03315 Grout

1.3 SPECIFICATIONS AND STANDARDS

A. Except as otherwise indicated, the current editions of the following apply to the WORK of this Section.

B. Federal Specifications:

UU-B-790A (Int.Amd. 1)	Building Paper, Vegetable Fiber (Kraft, Waterproofed, Water Repellant and Fire Resistant).

C. Commercial Standards:

ACI 117	Standard Tolerances for Concrete Construction and Materials
ACI 214	Recommended Practice for Evaluation of Strength Test Results of Concrete

ACI 301	Specifications for Structural Concrete for Buildings
ACI 309	Consolidation of Concrete
ACI 315	Details and Detailing of Concrete Reinforcement
ACI 318	Building Code Requirements for Structural Concrete
ASTM C 31	Practices for Making and Curing Concrete Test Specimens in the Field
ASTM C 33	Specification for Concrete Aggregates
ASTM C 39	Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C40	Test Method for Organic Impurities in Fine Aggregates for Concrete
ASTM C 88	Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C 94	Specification for Ready-Mixed Concrete
ASTM C 131	Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C 143	Test Method for Slump of Portland Cement Concrete
ASTM C 150	Specification for Portland Cement
ASTM C 157	Test Method for Length Change of Hardened Hydraulic Cement Mortar and Concrete
ASTM C 172	Standard Method of Sampling Freshly Mixed Concrete
ASTM C 192	Method of Making and Curing Concrete Test Specimens in the Laboratory
ASTM C 260	Specification for Air-Entraining Admixtures for Concrete
ASTM C 289	Test Method for Potential Reactivity of Aggregates (Chemical Method)
ASTM C 309	Specifications for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C 494	Specification for Chemical Admixtures for Concrete

ASTM C 535	Test Method for Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C 1077	Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for use in Construction & Criteria for Laboratory Evaluation
ASTM D 175	Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types)
ASTM D 2419	Test Method for Sand Equivalent Value of Soils and Fine Aggregate
ASTM E 119	Method for Fire Tests of Building Construction and Materials

1.4 SHOP DRAWINGS AND SAMPLES

A. The following shall be submitted in compliance with the current edition of the Standard Specifications for Public Works Construction (SSPWC), "GREENBOOK":

1. **Mix Designs:** Prior to beginning the WORK and within 14 days of the notice to proceed, preliminary concrete mix designs which shall show the proportions and gradations of all materials proposed for each class and type of concrete. The mix designs shall be checked by an independent testing laboratory acceptable to the CONSTRUCTION MANAGER. All costs related to such checking shall be borne by the CONTRACTOR.

2. Provide the following submittals in accordance with ACI-301:

   a. Mill tests for cement.
   b. Admixture certification. Chloride ion content must be included.
   c. Aggregate gradation and certification.
   d. Materials and methods for curing.

3. Certified Delivery Tickets: Where ready-mix concrete is used, the CONTRACTOR shall provide certified weighmaster delivery tickets at the time of delivery of each load of concrete. CONTRACTOR'S certificate with each delivery ticket shall show the public weighmaster's signature, and the total quantities, by weight of cement, sand, each class of aggregate, admixtures, and the amounts of water in the aggregate and added at the batching plant as well as the amount of water allowed to be added at the site for the specific design mix. Each certificate shall, in addition, state the mix number, total yield in cubic yards, and the time of day, to the nearest minute, corresponding to when the batch was dispatched, when it left the plant, when it arrived at the job, the time that unloading began, and the time that unloading was finished.

1.5 CONCRETE CONFERENCE

A. A meeting to review the detailed requirements of the CONTRACTOR's proposed concrete design mixes and to determine the procedures for producing proper concrete construction shall be held no later than 14 days after the notice to proceed.

B. All parties involved in the concrete work shall attend the conference, including the following:

CONTRACTOR's representative
Testing laboratory representative
Concrete subcontractor
Reinforcing steel subcontractor and detailer
Concrete supplier
Admixture manufacturer's representative

C. The conference shall be held at a mutually agreed upon time and place. The CONSTRUCTION MANAGER shall be notified no less than 5 days prior to the date of the conference.

3.5 TESTING

A. **General**

1. Tests on component materials and for compressive strength and shrinkage of concrete will be performed as specified herein. Test for determining slump will be in accordance with the requirements of ASTM C 143.

2. The cost of all laboratory tests on cement, aggregates, and concrete, will be borne by the OWNER. However, the CONTRACTOR shall be charged for the cost of any additional tests and investigation on work performed which does not meet the specifications. The laboratory must meet or exceed the requirements of ASTM C 1077.

3. Concrete for testing shall be supplied by the CONTRACTOR at no cost to the OWNER, and the CONTRACTOR shall provide assistance to the CONSTRUCTION MANAGER in obtaining samples, and disposal and cleanup of excess material.

B. **Field Compression Tests:**

1. Compression test specimens will be taken during construction from the first placement of each class of concrete specified herein and at intervals thereafter as selected by the CONSTRUCTION MANAGER to insure continued compliance with these specifications. Each set of test specimens will be a minimum of 4 cylinders.

2. Compression test specimens for concrete will be made and cured in accordance with ASTM C 31. Specimens will be 6-inch diameter by 12-inch high cylinders.

3. Compression tests will be performed in accordance with ASTM C 39. One test cylinder will be tested at 7 days and 2 at 28 days. The remaining cylinder will be held to verify test results, if needed.

C. **Evaluation and Acceptance of Concrete:**

1. Evaluation and acceptance of the compressive strength of concrete shall be according to the requirements of ACI 318, Chapter 5 "Concrete Quality," and as specified herein.

2. A statistical analysis of compression test results will be performed according to the requirements of ACI 214. The standard deviation of the test results shall not exceed 640 psi.

3. If any concrete fails to meet these requirements, immediate corrective action shall be taken to increase the compressive strength for all subsequent batches of the type of concrete affected.

4. When the standard deviation of the test results exceeds 640 psi, the average strength for which the mix is designed shall be increased by an amount necessary to satisfy the statistical requirement that the probability of any test being more than 500 psi below or the average of any 3 consecutive tests being below the specified compressive strength is 1 in 100. The required average strength shall be calculated by Criterion No. 3 of ACI 214 using the actual standard of deviation.

5. All concrete which fails to meet the ACI requirements and these specifications, is subject to removal and replacement at no additional cost to the OWNER.

D. **Shrinkage Tests:**

1. Drying shrinkage tests will be made for the trial batch indicated below, the first placement of each class of concrete, and during construction to insure continued compliance with these Specifications.

2. Drying shrinkage specimens shall be 4-inch by 4-inch by 11-inch prisms with an effective gauge length of 10 inches, fabricated, cured, dried and measured in accordance with ASTM C 157 modified as follows: specimens shall be removed from molds at an age of 23 ∀1 hours after trial batching, shall be placed immediately in water at 70 degrees F ∀3 degrees F for at least 30 minutes, and shall be measured within 30 minutes thereafter to determine original length and then submerged in saturated lime water at 73 degrees F ∀3 degrees F. Measurement to determine expansion expressed as a percentage of original length shall be made at age 7 days. This length at age 7 days shall be the base length for drying shrinkage calculations ("0" days drying age). Specimens then shall be stored immediately in a humidity control room maintained at 73 degrees F ∀3 degrees F and 50 percent ∀4 percent relative humidity for the remainder of the test. Measurements to determine shrinkage expressed as percentage of base length shall be made and reported separately for 7, 14, 21, and 28 days of drying after 7 days of moist curing.

3. The drying shrinkage deformation of each specimen shall be computed as the difference between the base length (at "0" days drying age) and the length after drying at each test age. The average drying shrinkage deformation of the specimens shall be computed to the nearest 0.0001 inch at each test age. If the drying shrinkage of any specimen departs from the average of that test age by more than 0.0004-inch, the results obtained from that specimen shall be disregarded. Results of the shrinkage test shall be reported to the nearest 0.001 percent of shrinkage. Compression test specimens shall be taken in each case from the same concrete used for preparing drying shrinkage specimens. These tests shall be considered a part of the normal compression tests for the project. Allowable shrinkage limitations shall be as indicated below.

E. **Construction Tolerances:** The CONTRACTOR shall set and maintain concrete forms and perform finishing operations so as to ensure that the completed work is within the tolerances specified herein. Surface defects and irregularities are defined as finishes and are to be distinguished from tolerances. Tolerance is the specified permissible variation from lines, grades, or dimensions shown. Where tolerances are not stated in the specifications, permissible deviations will be in accordance with ACI 117.

1. The following construction tolerances are hereby established and apply to finished walls and slab unless otherwise shown:

Item	Tolerance
Variation of the constructed linear outline from the established position in plan.	In 10 feet: 1/4-inch; In 20 feet or more: 1/2-inch
Variation from the level or from the grades shown.	In 10 feet: 1/4-inch; In 20 feet or more: 1/2-inch
Variation from the plumb	In 10 feet: 1/4-inch; In 20 feet or more: 1/2-inch
Variation in the thickness of slabs and walls.	Minus 1/4-inch; Plus 1/2-inch
Variation in the locations and sizes of slabs and wall openings	Plus or minus 1/4-inch

PART 2 -- PRODUCTS

2.1 CONCRETE MATERIALS

A. **General:**

1. All materials specified herein shall be classified as acceptable for potable water use by the Environmental Protection Agency within 30 days of application.

2. Materials shall be delivered, stored, and handled so as to prevent damage by water or breakage. Only one brand of cement shall be used. Cement reclaimed from cleaning bags or leaking containers shall not be used. All cement shall be used in the sequence of receipt of shipments.

B. All materials furnished for the work shall comply with the requirements of Sections 201, 203, and 204 of ACI 301, as applicable.

C. Storage of materials shall conform to the requirements of Section 205 of ACI 301.

D. Materials for concrete shall conform to the following requirements:

1. Cement shall be standard brand portland cement conforming to ASTM C 150 for Type II or Type V, including Table 1A optional requirements. A minimum of 85 percent of cement by weight shall pass a 325 screen. A single brand of cement shall be used

throughout the work, and prior to its use, the brand shall be acceptable to the CONSTRUCTION MANAGER. The cement shall be suitably protected from exposure to moisture until used. Cement that has become lumpy shall not be used. Sacked cement shall be stored in such a manner so as to permit access for inspection and sampling. Certified mill test reports, including fineness, for each shipment of cement to be used shall be submitted to the CONSTRUCTION MANAGER if requested regarding compliance with these Specifications.

2. Water for mixing and curing shall be potable, clean, and free from objectionable quantities of silty organic matter, alkali, salts and other impurities. The water shall be considered potable, for the purposes of this Section only, if it meets the requirements of the local governmental agencies. Agricultural water with high total dissolved solids (over 1000 mg/l TDS) shall not be used.

3. Aggregates shall be obtained from pits acceptable to the CONSTRUCTION MANAGER, shall be non-reactive, and shall conform to ASTM C 33. Maximum size of coarse aggregate shall be as specified herein. Lightweight sand for fine aggregate will not be permitted.

    a. Coarse aggregates shall consist of clean, hard, durable gravel, crushed gravel, crushed rock or a combination thereof. The coarse aggregates shall be prepared and handled in two or more size groups for combined aggregates with a maximum size greater than 3/4-inch. When the aggregates are proportioned for each batch of concrete the two size groups shall be combined. See the requirements below for the use of the size groups.

    b. Fine aggregates shall be natural sand or a combination of natural and manufactured sand that are hard and durable. When tested in accordance with ASTM D2419, the sand equivalency shall not be less than 75 percent for an average of three samples, nor less than 70 percent for an individual test. Gradation of fine aggregate shall conform to ASTM C 33, with 15 to 30 percent passing the number 50 screen and 5 to 10 percent passing the number 100 screen. The fineness modulus of sand used shall not be over 3.00.

    c. Combined aggregates shall be well graded from coarse to fine sizes, and shall be uniformly graded between screen sizes to produce a concrete that has optimum workability and consolidation characteristics. Where a trial batch is required for a mix design, the final combined aggregate gradations will be established during the trial batch process.

    d. When tested in accordance with ASTM C 289, the ratio of silica released to reduction in alkalinity shall not exceed 1.0.

    e. When tested in accordance with ASTM C 40, the fine aggregate shall produce a color in the supernatant liquid no darker than the reference standard color solution.

    f. When tested in accordance with ASTM C 131 or ASTM C 535 , the coarse aggregate shall show a loss not exceeding 42 percent after 500 revolutions, or 10.5 percent after 100 revolutions.

g. When tested in accordance with ASTM C 88, the loss resulting after five cycles shall not exceed 10 percent for fine or coarse aggregate when using sodium sulfate.

4. Ready-mix concrete shall conform to the requirements of ASTM C 94.

5. Admixtures: All admixtures shall be compatible and by a single manufacturer capable of providing qualified field service representation. Admixtures shall be used in accordance with manufacturer's recommendations. If the use of an admixture is producing an inferior end result, the CONTRACTOR shall discontinue use of the admixture. Admixtures shall not contain thiocyanates nor more than 0.05 percent chloride ion, and shall be non-toxic after 30 days.

   a. Air-entraining agent meeting the requirements of ASTM C 260 shall be used. Sufficient air-entraining agent shall be used to provide a total air content of 3 to 5 percent. The OWNER reserves the right, at any time, to sample and test the air-entraining agent received on the job by the CONTRACTOR. The air-entraining agent shall be added to the batch in a portion of the mixing water. The solution shall be batched by means of a mechanical batcher capable of accurate measurement. Air content shall be tested at the point of placement.

   b. Set controlling and water reducing admixtures: Admixtures may be added at the CONTRACTOR's option to control the set, effect water reduction, and increase workability. The addition of an admixture shall be at the CONTRACTOR's expense. The use of an admixture shall be subject to acceptance by the CONSTRUCTION MANAGER. Concrete containing an admixture shall be first placed at a location determined by the CONSTRUCTION MANAGER. Admixtures specified herein shall conform to the requirements of ASTM C 494. The required quantity of cement shall be used in the mix regardless of whether or not an admixture is used.

      (1) Concrete shall not contain more than one water reducing admixture. Concrete containing an admixture shall be first placed at a location determined by the CONSTRUCTION MANAGER.

      (2) Set controlling admixture shall be either with or without water-reducing properties. Where the air temperature at the time of placement is expected to be consistently over 80 degrees F, a set retarding admixture shall be used.

      (3) Normal range water reducer shall conform to ASTM C 494, Type A. The quantity of admixture used and the method of mixing shall be in accordance with the Manufacturer's instructions and recommendations.

      (4) High range water reducer shall conform to ASTM C 494, Type F or G. High range water reducer shall be added to the concrete after all other ingredients have been mixed and initial slump has been verified. No more than 14 ounces of water reducer per sack of cement shall be used. Water reducer shall be considered as part of the mixing water when calculating water cement ratio.

(5) If the high range water reducer is added to the concrete at the job site, it may be used in conjunction with the same water reducer added at the batch plant. Concrete shall have a slump of 3 inches ∀ 1/2-inch prior to adding the high range water reducing admixture at the job site. The high range water reducing admixture shall be accurately measured and pressure injected into the mixer as a single dose by an experienced technician. A standby system shall be provided and tested prior to each day's operation of the job site system.

(6) Concrete shall be mixed at mixing speed for a minimum of 30 mixer revolutions after the addition of the high range water reducer.

(7) Flyash shall not be used.

2.2 CURING MATERIALS

A. Materials for curing concrete as specified herein shall conform to the following requirements and ASTM C 309:

1. All curing compounds shall be white pigmented, resin based; Sodium silicate compounds shall not be allowed. Only water based resin curing compounds shall be used.

2. Polyethylene sheet for use as concrete curing blanket shall be white, and shall have a nominal thickness of 6 mils. The loss of moisture when determined in accordance with the requirements of ASTM C 156 shall not exceed 0.055 grams per square centimeter of surface.

3. Polyethylene-coated waterproof paper sheeting for use as concrete curing blanket shall consist of white polyethylene sheeting free of visible defects, uniform in appearance, having a nominal thickness of 2 mils and permanently bonded to waterproof paper conforming to the requirements of Federal Specification UU-B-790A (Int. Amd. 1). The loss of moisture, when determined in accordance with the requirements of ASTM C 156, shall not exceed 0.055 gram per square centimeter of surface.

4. Polyethylene-coated burlap for use as concrete curing blanket shall be 4-mil thick, white opaque polyethylene film impregnated or extruded into one side of the burlap. Burlap shall weigh not less than 9 ounces per square yard. The loss of moisture, when determined in accordance with the requirements of ASTM C 156, shall not exceed 0.055 grams per square centimeter of surface.

5. Curing mats for use in Curing Method 6 as specified herein, shall be heavy shag rugs or carpets or cotton mats quilted at 4 inches on center. Curing mats shall weigh a minimum of 12 ounces per square yard when dry.

2.3 NON-WATERSTOP JOINT MATERIALS

A. Materials for non-waterstop joints in concrete shall conform to the following requirements:

1. Preformed joint filler for non-water retaining applications shall be a non-extruding, resilient, bituminous type conforming to the requirements of ASTM D 1751.

2. Elastomeric joint sealer shall conform to the requirements of Section 07920.

3. Mastic joint sealer shall be a material that does not contain evaporating solvents; that will tenaciously adhere to concrete surfaces; that will remain permanently resilient and pliable; that will not be affected by continuous presence of water and will not in any way contaminate potable water; and that will effectively seal the joints against moisture infiltration even when the joints are subject to movement due to expansion and contraction. The sealer shall be composed of special asphalts or similar materials blended with lubricating and plasticizing agents to form a tough, durable mastic substance containing no volatile oils or lubricants.

2.4 MISCELLANEOUS MATERIALS

A. Dampproofing agent shall be an asphalt emulsion.

B. Bonding agents shall be epoxy adhesives.

2.5 CONCRETE DESIGN REQUIREMENTS

A. **General:** Concrete shall be composed of cement, admixtures, aggregates and water. These materials shall be of the qualities specified. The exact proportions in which these materials are to be used for different parts of the work will be determined during the trial batch. In general, the mix shall be designed to produce a concrete capable of being deposited so as to obtain maximum density and minimum shrinkage and, where deposited in forms, to have good consolidation properties and maximum smoothness of surface. In mix designs, the percentage of sand of the total weight of fine and coarse aggregate shall not exceed 41 for hydraulic structures or 50 for all other structures, unless noted otherwise. The aggregate gradations shall be formulated to provide fresh concrete that will not promote rock pockets around reinforcing steel or embedded items. The proportions shall be changed whenever necessary or desirable to meet the required results at no additional cost to the OWNER. All changes shall be subject to review by the CONSTRUCTION MANAGER.

B. **Water-Cement Ratio and Compressive Strength:** The minimum compressive strength and cement content of concrete shall be not less than that specified in the following tabulation.

Type of Work	Min 28-Day Compr. Strength (psi)	Max Size Aggregate (in)	Minimum Cement per cu yd (lbs)	Max W/C Ratio (by weight)
Structural Concrete:				
Roof, floor slabs, columns, walls and all other concrete items not specified elsewhere.	4,000	1	564	0.45
12" and thicker walls, slabs on grade and footings. (optional)	4,000	1-1/2	564	0.45

Pea Gravel Mix. Thin sections and areas with congested reinforcing, at the CONTRACTOR'S option and with the written approval of the CONSTRUCTION MANAGER for the specific location. Maximum fine aggregate 50% by weight of aggregate.	4,000	3/8	752	0.40
Lean concrete	2,000	1	376	0.60

Note: The CONTRACTOR is cautioned that the limiting parameters specified above are not a mix design. Additional cement or water reducing agent may be required to achieve workability demanded by the CONTRACTOR'S construction methods and aggregates. The CONTRACTOR is responsible for any costs associated with furnishing concrete with the required workability.

C. **Adjustments to Mix Design:** The mixes used shall be changed whenever such change is necessary or desirable to secure the required strength, density, workability, and surface finish and the CONTRACTOR shall be entitled to no additional compensation because of such changes.

2.6 CONSISTENCY

A. The quantity of water entering into a batch of concrete shall be just sufficient, with a normal mixing period, to produce a concrete which can be worked properly into place without segregation, and which can be compacted by the vibratory methods herein specified to give the desired density, impermeability and smoothness of surface. The quantity of water shall be changed as necessary, with variations in the nature or moisture content of the aggregates, to maintain uniform production of a desired consistency. The consistency of the concrete in successive batches shall be determined by slump tests in accordance with ASTM C 143. The slumps shall be as follows:

Part of Work	Slump (in)
All concrete, unless noted otherwise	3 inches ∀ 1 inch
With high range water reducer added	7 inches ∀ 2 inches
Pea gravel mix	7 inches ∀ 2 inches
Ductbanks	5 inches ∀ 1 inch

2.7 TRIAL BATCH AND LABORATORY TESTS

A. Before placing any concrete, a testing laboratory designated by the CONSTRUCTION MANAGER shall prepare a trial batch of each class of structural concrete, based on the preliminary concrete mixes submitted by the CONTRACTOR. During the trial batch the aggregate proportions may be adjusted by the testing laboratory using the two coarse aggregate size ranges to obtain the required properties. If one size range produces an acceptable mix, a second size range need not be used. Such adjustments shall be considered refinements to the mix design and shall not be the basis for extra compensation to the CONTRACTOR. All concrete shall conform to the requirements of this Section, whether the aggregate proportions

are from the CONTRACTOR's preliminary mix design, or whether the proportions have been adjusted during the trial batch process. The trial batch shall be prepared using the aggregates, cement and admixture proposed for the project. The trial batch materials shall be of a quantity such that the testing laboratory can obtain 3 drying shrinkage, and 6 compression test specimens from each batch. The cost of not more than 3 laboratory trial batch tests for each specified concrete strength will be borne by the OWNER but the CONTRACTOR shall furnish and deliver the materials in steel drums at no cost. Any additional trial batch testing required shall be performed at the expense of the CONTRACTOR at no increase in cost to the OWNER.

B. The determination of compressive strength will be made by testing 6-inch diameter by 12-inch high cylinders; made, cured and tested in accordance with ASTM C 192 and ASTM C 39. Three compression test cylinders will be tested at 7 days and 3 at 28 days. The average compressive strength for the 3 cylinders tested at 28 days for any given trial batch shall not be less than 125 percent of the specified compressive strength.

C. A sieve analysis of the combined aggregate for each trial batch shall be performed according to the requirements of ASTM C 136. Values shall be given for percent passing each sieve.

2.8 SHRINKAGE LIMITATION

A. The maximum concrete shrinkage for specimens cast in the laboratory from the trial batch, as measured at 21-day drying age or at 28-day drying age shall be 0.036 percent or 0.042 percent, respectively. The CONTRACTOR shall only use a mix design for construction that has first met the trial batch shrinkage requirements. Shrinkage limitations apply only to structural concrete.

B. The maximum concrete shrinkage for specimens cast in the field shall not exceed the trial batch maximum shrinkage requirement by more than 25 percent.

C. If the required shrinkage limitation is not met during construction, the CONTRACTOR shall take any or all of the following actions, at no additional cost to the OWNER, for securing the specified shrinkage requirements. These actions may include changing the source or aggregates, cement and/or admixtures; reducing water content; washing of aggregate to reduce fines; increasing the number of construction joints; modifying the curing requirements; or other actions designed to minimize shrinkage or the effects of shrinkage.

2.9 MEASUREMENT OF CEMENT AND AGGREGATE

A. The amount of cement and of each separate size of aggregate entering into each batch of concrete shall be determined by direct weighing equipment furnished by the CONTRACTOR and acceptable to the CONSTRUCTION MANAGER.

B. Weighing tolerances:

Material	Percent of total weight
Cement	1
Aggregates	3
Admixtures	3

2.10 MEASUREMENT OF WATER

A. The quantity of water entering the mixer shall be measured by a suitable water meter or other measuring device of a type acceptable to the CONSTRUCTION MANAGER and capable of measuring the water in variable amounts within a tolerance of one percent. The water feed control mechanism shall be capable of being locked in position so as to deliver constantly any specified amount of water to each batch of concrete. A positive quick-acting valve shall be used for a cut-off in the water line to the mixer. The operating mechanism must be such that leakage will not occur when the valves are closed.

2.11 READY-MIXED CONCRETE

A. At the CONTRACTOR'S option, ready-mixed concrete may be used meeting the requirements as to materials, batching, mixing, transporting, and placing as specified herein and in accordance with ASTM C 94, including the following supplementary requirements.

B. Ready-mixed concrete shall be delivered to the site of the work, and discharge shall be completed within one hour after the addition of the cement to the aggregates or before the drum has been revolved 250 revolutions, whichever is first.

C. Truck mixers shall be equipped with electrically-actuated counters by which the number of revolutions of the drum or blades may be readily verified. The counter shall be of the resettable, recording type, and shall be mounted in the driver's cab. The counters shall be actuated at the time of starting mixers at mixing speeds.

D. Each batch of concrete shall be mixed in a truck mixer for not less than 70 revolutions of the drum or blades at the rate of rotation designated by the manufacturer of equipment. Additional mixing, if any, shall be at the speed designated by the manufacturer of the equipment as agitating speed. All materials including mixing water shall be in the mixer drum before actuating the revolution counter for determining the number of revolutions of mixing.

E. Truck mixers and their operation shall be such that the concrete throughout the mixed batch as discharged is within acceptable limits of uniformity with respect to consistency, mix, and grading. If slump tests taken at approximately the 1/4 and 3/4 points of the load during discharge give slumps differing by more than one inch when the specified slump is 3 inches or less, or if they differ by more than 2 inches when the specified slump is more than 3 inches, the mixer shall not be used on the work unless the causing condition is corrected and satisfactory performance is verified by additional slump tests. All mechanical details of the mixer, such as water measuring and discharge apparatus, condition of the blades, speed of rotation, general mechanical condition of the unit, and clearance of the drum, shall be checked before a further attempt to use the unit will be permitted.

F. Each batch of ready-mixed concrete delivered at the job site shall be accompanied by a delivery ticket furnished to the CONSTRUCTION MANAGER.

G. The use of non-agitating equipment for transporting ready-mixed concrete will not be permitted. Combination truck and trailer equipment for transporting ready-mixed concrete will not be permitted. The quality and quantity of materials used in ready-mixed concrete and in batch aggregates shall be subject to continuous inspection at the batching plant by the CONSTRUCTION MANAGER.

2.12 MANUFACTURERS

A. Products shall be manufactured by one of the following (or equal):

1. Air Entraining Agent

   Micro-Air by Master Builders
   Daravair by W.R. Grace
   Sika AEA-15 by Sika Corporation

2. Set Retarding Admixture

   Plastocrete by Sika Corporation
   Pozzolith 300R by Master Builders
   Daratard by W.R. Grace

3. Set Accellerating Admixture

   Plastocrete 161FL by Sika Corporation
   Pozzutec 20 by Master Builders
   Daraset by W.R. Grace

4. Normal Range Water Reducer

   WRDA 79 by W.R. Grace
   Pozzolith 322-N by Master Builders
   Plastocrete 161 by Sika Corporation

5. High Range Water Reducer

   Daracem 100 or WRDA 19 by W.R. Grace
   Sikament FF or Sikament 86 by Sika Corporation
   Rheobuild 1000 or Rheobuild 716 by Master Builders

6. Curing Compound

   Aqua Resincure by Burke
   Aqua-cure by Euclid Chemical Company
   Masterkure-W by Master Builders

7. Evaporation Retardant

   Confilm by Master Builders
   Eucobar by Euclid Chemical Company

8. Dampproofing Agent

   Hydrocide 600 by Sonneform
   Sealmastic by W.R. Meadows
   Damp proofing Asphalt Coating by Euclid Chemical Company

9. Agents for Bonding Freshly-Mixed Plastic Concrete to Hardened Concrete

   Sikadur 32 Hi-Mod Epoxy Adhesive by Sika Corporation
   Concresive liquid (LPL) by Master Builders
   BurkEpoxy MV by Burke

10. Agents for Bonding Hardened Concrete to Steel

    Sikadur 31 Hi-Mod Gel by Sika Corporation
    BurkEpoxy NS by Burke
    Concresive Paste (LPL) by Master Builders

11. White Portland Cement

    Atlas White

PART 3 -- EXECUTION

3.1 PROPORTIONING AND MIXING

A. **Proportioning:** Proportioning of the concrete mix shall conform to the requirements of Chapter 3 "Proportioning" of ACI 301.

B. **Mixing:** Mixing of concrete shall conform to the requirements of Chapter 7 of ACI 301.

C. **Slump:** Maximum slumps shall be as indicated.

D. **Retempering:** Retempering of concrete or mortar which has partially hardened shall not be permitted.

3.2 PREPARATION OF SURFACES FOR CONCRETING

A. **General:** Earth surfaces shall be thoroughly wetted by sprinkling, prior to the placing of any concrete, and these surfaces shall be kept moist by frequent sprinkling up to the time of placing concrete thereon. The surface shall be free from standing water, mud, and debris at the time of placing concrete.

B. **Joints in Concrete up to 60 Days Old:** Concrete surfaces upon or against which concrete is to be placed, where the placement of the concrete has been stopped or interrupted so that, as determined by the CONSTRUCTION MANAGER, the new concrete cannot be incorporated integrally with that previously placed, are defined as construction joints. The surfaces of horizontal joints shall be given a compacted, roughened surface for good bond. Except where the Drawings call for joint surfaces to be coated, the joint surfaces shall be cleaned of all laitance, loose or defective concrete, foreign material, and roughened to a minimum 1/4-inch amplitude. Such cleaning and roughening shall be accomplished by hydroblasting or sandblasting (exposing aggregate) followed by thorough washing. All pools of water shall be removed from the surface of construction joints before the new concrete is placed.

C. After the surfaces have been prepared all approximately horizontal construction joints shall be covered with a 6-inch lift of the pea gravel mix indicated above. The mix shall be placed and spread uniformly. Wall concrete shall follow immediately and shall be placed upon the fresh pea gravel mix.

D. **Placing Interruptions:** When placing of concrete is to be interrupted long enough for the concrete to take a set, the working face shall be given a shape by the use of forms or other means, that will secure proper union with subsequent work; provided that construction joints shall be made only where acceptable to the CONSTRUCTION MANAGER.

E. **Embedded Items:** No concrete shall be placed until all formwork, installation of parts to be embedded, reinforcement steel, and preparation of surfaces involved in the placing have been completed and accepted by the CONSTRUCTION MANAGER at least 4 hours before placement of concrete. All surfaces of forms and embedded items that have become encrusted with dried grout from concrete previously placed shall be cleaned of all such grout before the surrounding or adjacent concrete is placed.

F. All inserts or other embedded items shall conform to the requirements herein.

G. All reinforcement, anchor bolts, sleeves, inserts, and similar items shall be set and secured in the forms where shown or by shop drawings and shall be acceptable to the CONSTRUCTION MANAGER before any concrete is placed. Accuracy of placement is the responsibility of the CONTRACTOR.

H. **Casting New Concrete Against Concrete over 60 Days Old:** Where concrete is to be cast against old concrete (any concrete which is greater than 60 days of age), the surface of the old concrete shall be thoroughly cleaned and roughened by hydro-blasting or sandblasting (exposing aggregate). The joint surface shall be coated with an epoxy bonding agent unless indicated otherwise by the CONSTRUCTION MANAGER.

I. No concrete shall be placed in any structure until all water entering the space to be filled with concrete has been properly cut off or has been diverted by pipes, or other means, and carried out of the forms, clear of the work. No concrete shall be deposited underwater nor shall the CONTRACTOR allow still water to rise on any concrete until the concrete has attained its initial set. Water shall not be permitted to flow over the surface of any concrete in such manner and at such velocity as will injure the surface finish of the concrete. Pumping or other necessary dewatering operations for removing ground water, if required, will be subject to the review of the CONSTRUCTION MANAGER.

J. **Corrosion Protection:** Pipe, conduit, dowels, and other ferrous items required to be embedded in concrete construction shall be so positioned and supported prior to placement of concrete that there will be a minimum of 2 inches clearance between said items and any part of the concrete reinforcement. Securing such items in position by wiring or welding them to the reinforcement will not be permitted.

K. Openings for pipes, inserts for pipe hangers and brackets, and the setting of anchors shall, where practicable, be provided for during the placing of concrete.

L. Anchor bolts shall be accurately set, and shall be maintained in position by templates while being embedded in concrete.

M. **Cleaning:** The surfaces of all metalwork to be in contact with concrete shall be thoroughly cleaned of all dirt, grease, loose scale and rust, grout, mortar, and other foreign substances immediately before the concrete is placed.

3.3 HANDLING, TRANSPORTING, AND PLACING

A. **General:** Placing of concrete shall conform to the applicable requirements of Chapter 8 of ACI 301 and the requirements of this Section. No aluminum materials shall be used in conveying any concrete.

B. **Non-Conforming Work or Materials:** Concrete which upon or before placing is found not to conform to the requirements specified herein shall be rejected and immediately removed from the work. Concrete which is not placed in accordance with these Specifications, or which is of inferior quality, shall be removed and replaced by the CONTRACTOR at no additional cost to the OWNER.

C. **Unauthorized Placement:** No concrete shall be placed except in the presence of duly authorized representative of the CONSTRUCTION MANAGER. The CONTRACTOR shall notify the CONSTRUCTION MANAGER in writing at least 24 hours in advance of placement of any concrete.

D. **Placement in Wall Forms:** Concrete shall not be dropped through reinforcement steel or into any deep form, nor shall concrete be placed in any form in such a manner as to leave accumulation of mortar on the form surfaces above the placed concrete. In such cases, some means such as the use of hoppers and, if necessary, vertical ducts of canvas, rubber, or metal shall be used for placing concrete in the forms in a manner that it may reach the place of final deposit without separation. In no case shall the free fall of concrete exceed 4 feet below the ends of ducts, chutes, or buggies. Concrete shall be uniformly distributed during the process of depositing and in no case after depositing shall any portion be displaced in the forms more than 6 feet in horizontal direction. Concrete in forms shall be deposited in uniform horizontal layers not deeper than 2 feet; and care shall be taken to avoid inclined layers or inclined construction joints except where such are required for sloping members. Each layer shall be placed while the previous layer is still soft. The rate of placing concrete in forms shall not exceed 5 feet of vertical rise per hour. Sufficient illumination shall be provided in the interior of all forms so that the concrete at the places of deposit is visible from the deck or runway.

E. **Conveyor Belts and Chutes:** All ends of chutes, hopper gates, and all other points of concrete discharge throughout the CONTRACTOR'S conveying, hoisting and placing system shall be so designed and arranged that concrete passing from them will not fall separated into whatever receptacle immediately receives it. Conveyor belts, if used, shall be of an acceptable type. Chutes longer than 50 feet will not be permitted. Minimum slopes of chutes shall be such that concrete of the specified consistency will readily flow in them. If a conveyor belt is used, it shall be wiped clean by a device operated in such a manner that none of the mortar adhering to the belt will be wasted. All conveyor belts and chutes shall be covered.

F. **Placement in Slabs:** Concrete placed in sloping slabs shall proceed uniformly from the bottom of the slab to the top, for the full width of the placement. As the work progresses, the concrete shall be vibrated and carefully worked around the slab reinforcement, and the surface of the slab shall be screeded in an up-slope direction.

G. **Temperature of Concrete:** The temperature of concrete when it is being placed shall be not more than 90 degrees F nor less than 55 degrees F for sections less than 12 inches thick nor less than 50 degrees for all other sections. Concrete ingredients shall not be heated to a temperature higher than that necessary to keep the temperature of the mixed concrete, as placed, from falling below the specified minimum temperature. When the temperature of the

concrete is 85 degrees F or above, the time between the introduction of the cement to the aggregates and discharge shall not exceed 45 minutes. If concrete is placed when the weather is such that the temperature of the concrete would exceed 90 degrees F, the CONTRACTOR shall employ effective means, such as precooling of aggregates and mixing water using ice or placing at night, as necessary to maintain the temperature of the concrete, as it is placed, below 90 degrees F. The CONTRACTOR shall be entitled to no additional compensation on account of the foregoing requirements.

H. **Cold Weather Placement**: Remove all snow, ice and frost from the surfaces, including reinforcement, against which concrete is to be placed. Before beginning concrete placement, thaw the subgrade to a minimum depth of 6 inches. All reinforcement and embedded items shall be warmed to above 32 degrees F prior to concrete placement.

3.4 PUMPING OF CONCRETE

A. **General:** If the pumped concrete does not produce satisfactory end results, the CONTRACTOR shall discontinue the pumping operation and proceed with the placing of concrete using conventional methods.

B. **Pumping Equipment:** The pumping equipment must have 2 cylinders and be designed to operate with one cylinder only in case the other one is not functioning. In lieu of this requirement, the CONTRACTOR may have a standby pump on the site during pumping.

C. The minimum diameter of the hose (conduits) shall be in accordance with ACI 304.2R.

D. Pumping equipment and hoses (conduits) that are not functioning properly, shall be replaced.

E. Aluminum conduits for conveying the concrete shall not be permitted.

F. **Field Control:** Concrete samples for slump, air content, and test cylinders will be taken at the placement (discharge) end of the line.

3.5 ORDER OF PLACING CONCRETE

A. The order of placing concrete in all parts of the work shall be acceptable to the CONSTRUCTION MANAGER. In order to minimize the effects of shrinkage, the concrete shall be placed in units as bounded by construction joints shown. The placing of units shall be done by placing alternate units in a manner such that each unit placed shall have cured at least 7 days for hydraulic structures and 3 days for all other structures before the contiguous unit or units are placed, except that the corner sections of vertical walls shall not be placed until the 2 adjacent wall panels have cured at least 14 days for hydraulic structures and 7 days for all other structures.

B. The surface of the concrete shall be level whenever a run of concrete is stopped. To insure a level, straight joint on the exposed surface of walls, a wood strip at least 3/4-inch thick shall be tacked to the forms on these surfaces. The concrete shall be carried about 1/2-inch above the underside of the strip. About one hour after the concrete is placed, the strip shall be removed and any irregularities in the edge formed by the strip shall be leveled with a trowel and all laitance shall be removed.

3.6 TAMPING AND VIBRATING

A. As concrete is placed in the forms or in excavations, it shall be thoroughly settled and compacted, throughout the entire depth of the layer which is being consolidated, into a dense, homogeneous mass, filling all corners and angles, thoroughly embedding the reinforcement, eliminating rock pockets, and bringing only a slight excess of water to the exposed surface of concrete during placement. Vibrators shall be Group 3 (per ACI 309) high speed power vibrators (8000 to 12,000 rpm) of an immersion type in sufficient number and with (at least one) standby units as required. Group 2 vibrators may be used only at specific locations when accepted by the CONSTRUCTION MANAGER.

B. Care shall be used in placing concrete around waterstops. The concrete shall be carefully worked by rodding and vibrating to make sure that all air and rock pockets have been eliminated. Where flat-strip type waterstops are placed horizontally, the concrete shall be worked under the waterstops by hand, making sure that all air and rock pockets have been eliminated. Concrete surrounding the waterstops shall be given additional vibration, over and above that used for adjacent concrete placement to assure complete embedment of the waterstops in the concrete.

C. Concrete in walls shall be internally vibrated and at the same time rammed, stirred, or worked with suitable appliances, tamping bars, shovels, or forked tools until it completely fills the forms or excavations and closes snugly against all surfaces. Subsequent layers of concrete shall not be placed until the layers previously placed have been worked thoroughly as specified. Vibrators shall be provided in sufficient numbers, with standby units as required, to accomplish the results herein specified within 15 minutes after concrete of the prescribed consistency is placed in the forms. The vibrating head shall be kept from contact with the surfaces of the forms. Care shall be taken not to vibrate concrete excessively or to work it in any manner that causes segregation of its constituents.

3.7 FINISHING CONCRETE SURFACES

A. **General:** Surfaces shall be free from fins, bulges, ridges, offsets, honeycombing, or roughness of any kind, and shall present a finished, smooth, continuous hard surface. Allowable deviations from plumb or level and from the alignment, profiles, and dimensions shown are defined as tolerances and were indicated above. Tolerances are to be distinguished from irregularities in finish as described below. Aluminum finishing tools shall not be used.

B. **Formed Surfaces:** No treatment is required after form removal except for curing, repair of defective concrete, and treatment of surface defects. Where architectural finish is required, it shall be as indicated.

C. **Unformed Surfaces**: After proper and adequate vibration and tamping, all unformed top surfaces of slabs, floors, walls, and curbs shall be brought to a uniform surface with suitable tools. Immediately after the concrete has been screeded, it shall be treated with a liquid evaporation retardant. The retardant shall be used again after each work operation as necessary to prevent drying shrinkage cracks. The classes of finish specified for unformed concrete surfaces are designated and defined as follows:

1. Finish U1 - Sufficient leveling and screeding to produce an even, uniform surface with surface irregularities not to exceed 3/8-inch. No further special finish is required.

2. Finish U2 - After sufficient stiffening of the screeded concrete, surfaces shall be float finished with wood or metal floats or with a finishing machine using float blades. Excessive floating of surfaces while the concrete is plastic and dusting of dry cement and sand on the concrete surface to absorb excess moisture will not be permitted. Floating shall be the minimum necessary to produce a surface that is free from screed marks and is uniform in texture. Surface irregularities shall not exceed 1/4-inch. Joints and edges shall be tooled where shown or as determined by the CONSTRUCTION MANAGER.

3. Finish U3 - After the floated surface (as specified for Finish U2) has hardened sufficiently to prevent excess of fine material from being drawn to the surface, steel troweling shall be performed with firm pressure such as will flatten the sandy texture of the floated surface and produce a dense, uniform surface free from blemishes, ripples, and trowel marks. The finish shall be smooth and free of all irregularities.

4. Finish U4 - Steel trowel finish (as specified for Finish U3) without local depressions or high points. In addition, the surface shall be given a light hairbroom finish with brooming perpendicular to drainage unless otherwise shown. The resulting surface shall be rough enough to provide a nonskid finish.

D. **Unformed surfaces shall be finished according to the following schedule:**

UNIFORMED SURFACE FINISH SCHEDULE

Area	Finish
Grade slabs and foundations to be covered with concrete or fill material	U1
Floors to be covered with grouted tile or topping grout	U2
Slabs which are water bearing with slopes 10 percent and less	U3
Sloping slabs which are water bearing with slopes greater than 10 percent	U4
Slabs not water bearing	U4
Slabs to be covered with built-up roofing	U2
Interior slabs and floors to receive architectural finish	U3
Top surface of walls	U3

E. **Floor Sealer/Hardener (Surface Applied):**

1. Floors to receive hardener shall be cured, cleaned, and dry with all work above them completed. Not less than 60 days shall have elapsed between casting floors and application of sealer/hardener. Apply zinc and/or magnesium fluosilicate evenly, using 3 coats, allowing 24 hours between coats.

2. The first coat shall be 1/3 strength, second coat 1/2 strength, and third coat 2/3 strength. Each coat shall be applied so as to remain wet on the concrete surface for 15 minutes. If sodium silicate is used, it shall be applied evenly, using 3 coats, allowing 24 hours between coats, and the material shall be applied full strength at the rate of one gallon per 300 square feet. Approved proprietary hardeners shall be applied in conformance with the manufacturer's instruction. After the final coat is completed and dry, surplus hardener shall be removed from the surface by scrubbing and mopping with water.

3. Floor hardener shall be applied where shown.

3.8 ARCHITECTURAL FINISH

A. **General:** Architectural finishes shall be required only where specifically indicated. In all other cases the requirements above shall apply.

1. Immediately after the forms have been stripped, the concrete surface shall be inspected and any poor joints, voids, rock pockets, or other defective areas shall be repaired and all form-tie holes filled as specified herein.

2. Architectural finishes shall not be applied until the concrete surface has been repaired as required and the concrete has cured at least 14 days.

3. All architecturally treated concrete surfaces shall conform to the accepted sample required herein in texture, color, and quality. It shall be the CONTRACTOR's responsibility to maintain and protect the concrete finish.

B. **Smooth Concrete Finish**

1. The concrete surface shall be wetted, and a grout shall be applied with a brush. The grout shall be made by mixing one part portland cement and one part of fine sand that will pass a No. 16 sieve with sufficient water to give it the consistency of thick paint. The cement used in said grout shall be 1/2 gray and 1/2 white portland cement, as determined by the CONSTRUCTION MANAGER. Calcium chloride in the amount of 5 percent by volume of the cement shall be used in the brush coat. The freshly applied grout shall be vigorously rubbed into the concrete surface with a wood float filling all small air holes. After all the surface grout had been removed with a steel trowel, the surface shall be allowed to dry and, when dry, shall be vigorously rubbed with burlap to remove completely all surface grout so that there is no visible paint-like film of grout on the concrete. The entire cleaning operation for any area shall be completed the day it is started, and no grout shall be left on the surface overnight.

2. Cleaning operations for any given day shall be terminated at panel joints. It is essential that the various operations be carefully timed to secure the desired effect which is a light-colored concrete surface of uniform color and texture without any appearance of a paint or grout film.

3. In the event that improper manipulation results in an inferior finish, the CONTRACTOR shall rub such inferior areas with carborundum bricks.

4. Before beginning any of the final treatment on exposed surfaces, the CONTRACTOR shall treat in a satisfactory manner a trial area of at least 200 square feet in some inconspicuous place selected by the CONSTRUCTION MANAGER and shall preserve said trial area undisturbed until the completion of the job.

C. **Sandblasted Concrete Finish**

1. Sandblasting shall be done in a safe manner acceptable to local authorities and per OSHA requirements. The sandblasting shall be a light sandblast to remove laitance and to produce a uniform fine aggregate surface texture with approximately 1/32- to 1/16-inch of surface sandblasted off. Corners, patches, form panel joints, and soft spots shall be sandblasted with care.

2. A 3-sq ft sample panel of the sandblasted finish shall be provided by the CONTRACTOR for acceptance prior to starting the sandblasting work. The sample panel shall include a corner, plugs, and joints and shall be marked after approval. All other sandblasting shall be equal in finish to the sample panel.

3. Protection against sandblasting shall be provided on all surfaces and materials not requiring sandblasting but within or adjacent to areas being sandblasted. After sandblasting, the concrete surfaces shall be washed with clean water and excess sand removed.

3.9 CURING AND DAMPPROOFING

A. **General:** All concrete shall be cured for not less than 14 days after placing, in accordance with the methods specified herein for the different parts of the work, and described in detail in the following paragraphs:

Surface to be Cured or Dampproofed	Method
Unstripped forms	1
Wall sections with forms removed	4 or 6
Construction joints between footings and walls, and between floor slab and columns	2
Encasement concrete and thrust blocks	3
All concrete surfaces not specifically provided for elsewhere in this Paragraph	4
Floor slabs on grade in hydraulic structures	5
Slabs not on grade	6

B. **Method 1:** Wooden forms shall be wetted immediately after concrete has been placed and shall be kept wet with water until removed. If steel forms are used the exposed concrete surfaces shall be kept continuously wet until the forms are removed. If forms are removed within 14 days of placing the concrete, curing shall be continued in accordance with Method 6, herein.

C. **Method 2:** The surface shall be covered with burlap mats which shall be kept wet with water for the duration of the curing period, until the concrete in the walls has been placed. No curing compound shall be applied to surfaces cured under Method 2.

D. **Method 3**: The surface shall be covered with moist earth not less than 4 hours, nor more than 24 hours, after the concrete is placed. Earthwork operations that may damage the concrete shall not begin until at least 7 days after placement of concrete.

E. **Method 4:** The surface shall be sprayed with a liquid curing compound.

1. Curing compound shall not be used on concrete surfaces to be coated, waterproofed, moistureproofed, or where any coverings are to be bonded.

2. It shall be applied in accordance with the manufacturer's printed instructions at a maximum coverage rate of 200 square feet per gallon and in such a manner as to cover the surface with a uniform film which will seal thoroughly.

3. Where the curing compound method is used, care shall be exercised to avoid damage to the seal during the curing period. Should the seal be damaged or broken before the expiration of the curing period, the break shall be repaired immediately by the application of additional curing compound over the damaged portion.

4. Wherever curing compound may have been applied by mistake to surfaces against which concrete subsequently is to be placed and to which it is to adhere, said compound shall be entirely removed by wet sandblasting just prior to the placing of new concrete.

5. Where curing compound is specified, it shall be applied as soon as the concrete has hardened enough to prevent marring on unformed surfaces, and within 2 hours after removal of forms from contact with formed surfaces. Repairs required to be made to formed surfaces shall be made within the said 2-hour period; provided, however, that any such repairs which cannot be made within the said 2-hour period shall be delayed until after the curing compound has been applied. When repairs are to be made to an area on which curing compound has been applied, the area involved shall first be wet-sandblasted to remove the curing compound, following which repairs shall be made as specified herein.

6. At all locations where concrete is placed adjacent to a panel which has been coated with curing compound, the previously coated panel shall have curing compound reapplied to an area within 6 feet of the joint and to any other location where the curing membrane has been disturbed.

7. Prior to final acceptance of the WORK, all visible traces of curing compound shall be removed from all surfaces in such a manner that does not damage surface finish.

F. **Method 5:**

1. Until the concrete surface is covered with curing compound, the entire surface shall be kept damp by applying water using nozzles that atomize the flow so that the surface is not marred or washed. The concrete shall be given a coat of curing compound in accordance with Method 4, herein. Not less than one hour nor more than 4 hours after the coat of curing compound has been applied, the surface shall be wetted with water delivered through a fog nozzle, and concrete-curing blankets shall be placed on the slabs. The curing blankets shall be polyethylene sheet, polyethylene-coated waterproof

paper sheeting or polyethylene-coated burlap. The blankets shall be laid with the edges butted together and with the joints between strips sealed with 2-inch wide strips of sealing tape or with edges lapped not less than 3 inches and fastened together with a waterproof cement to form a continuous watertight joint.

2. The curing blankets shall be left in place during the 14-day curing period and shall not be removed until after concrete for adjacent work has been placed. Should the curing blankets become torn or otherwise ineffective, the CONTRACTOR shall replace damaged sections. During the first 3 days of the curing period, no traffic of any nature and no depositing, temporary or otherwise, of any materials shall be permitted on the curing blankets. During the remainder of the curing period, foot traffic and temporary depositing of materials that impose light pressure will be permitted only on top of plywood sheets 5/8-inch minimum thickness, laid over the curing blanket. The CONTRACTOR shall add water under the curing blanket as often as necessary to maintain damp concrete surfaces at all times.

G. **Method 6:**

1. The concrete shall be kept continuously wet by the application of water for a minimum period of at least 14 consecutive days beginning immediately after the concrete has reached final set or forms have been removed.

2. Until the concrete surface is covered with the curing medium, the entire surface shall be kept damp by applying water using nozzles that atomize the flow so that the surface is not marred or washed.

3. Heavy curing mats shall be used as a curing medium to retain the moisture during the curing period. The curing medium shall be weighted or otherwise held in place to prevent being dislodged by wind or any other causes and to be substantially in contact with the concrete surface. All edges shall be continuously held in place.

4. The curing blankets and concrete shall be kept continuously wet by the use of sprinklers or other means both during and after normal working hours.

5. Immediately after the application of water has terminated at the end of the curing period, the curing medium shall be removed, any dry spots shall be rewetted, and curing compound shall be immediately applied in accordance with Method 4, herein.

6. The CONTRACTOR shall dispose of excess water from the curing operation to avoid damage to the work.

H. **Dampproofing**

1. The exterior surface of all buried roof slabs shall be dampproofed as follows.

2. Immediately after completion of curing the surface shall be sprayed with a dampproofing agent consisting of an asphalt emulsion. Application shall be in 2 coats. The first coat shall be diluted to 1/2 strength by the addition of water and shall be sprayed on so as to provide a maximum coverage rate of 100 square feet per gallon of dilute solution. The second coat shall consist of an application of the specified material, undiluted, and shall be sprayed on so as to provide a maximum coverage rate of 100 square feet per gallon. Dampproofing material shall be as specified herein.

3. As soon as the asphalt emulsion, applied as specified herein, has taken an initial set, the entire area thus coated shall be coated with whitewash. Any formula for mixing the whitewash may be used which produces a uniformly coated white surface and which so remains until placing of the backfill. Should the whitewash fail to remain on the surface until the backfill is placed, the CONTRACTOR shall apply additional whitewash

3.10 PROTECTION

A. The CONTRACTOR shall protect all concrete against injury until final acceptance by the OWNER.

B. Fresh concrete shall be protected from damage due to rain. The CONTRACTOR shall provide such protection while the concrete is still plastic and whenever such precipitation is imminent or occurring.

3.11 CURING AND THERMAL PROTECTION IN COLD WEATHER

A. The CONTRACTOR shall be prepared to protect all concrete against freezing. After the first frost or when the mean daily temperature in the vicinity of the worksite falls below 40 degrees F for more than one day, the concrete shall be maintained at a temperature not lower than 50 degrees F for at least 72 hours after it is placed.

B. Water curing of concrete may be reduced to 6 days during periods when the mean daily temperature in the vicinity of the worksite is less than 40 degrees F. The concrete shall be maintained at not less than 50 degrees F for the entire curing period.

C. Discontinuance of protection against freezing temperatures shall be such that the drop in temperature of any portion of the concrete will be gradual and will not exceed 40 degrees F in 24 hours. In the spring, when the mean daily temperature rises above 40 degrees F for more than 3 successive days, the specified 72-hour protection at a temperature not lower than 50 degrees F may be discontinued for as long as the mean daily temperature remains above 40 degrees F; provided, that the concrete shall be protected against freezing temperatures for not less than 48 hours after placement.

D. Where artificial heat is employed, special care shall be taken to prevent the concrete from drying. Use of unvented heaters will be permitted only when unformed surfaces of concrete adjacent to the heaters are protected for the first 24 hours from an excessive carbon dioxide atmosphere by application of curing compound; provided, that the use of curing compound for such surfaces is otherwise permitted by these Specifications.]

3.12 TREATMENT OF SURFACE DEFECTS

A. As soon as forms are removed, all exposed surfaces shall be carefully examined and any irregularities shall be immediately rubbed or ground in a satisfactory manner in order to secure a smooth, uniform, and continuous surface. Plastering or coating of surfaces to be smoothed will not be permitted. No repairs shall be made until after inspection by the CONSTRUCTION MANAGER. In no case will extensive patching of honeycombed concrete be permitted. Concrete containing minor voids, holes, honeycombing, or similar depression defects shall have them repaired as specified herein. Concrete containing extensive voids, holes, honeycombing, or similar depression defects, shall be completely removed and replaced. All repairs and replacements herein specified shall be promptly executed by the CONTRACTOR at its own expense.

B. Defective surfaces to be repaired shall be cut back from trueline a minimum depth of 1/2-inch over the entire area. Feathered edges will not be permitted. Where chipping or cutting tools are not required in order to deepen the area properly, the surface shall be prepared for bonding by the removal of all laitance or soft material, and not less than 1/32-inch depth of the surface film from all hard portions, by means of an efficient sandblast. After cutting and sandblasting, the surface shall be wetted sufficiently in advance of shooting with shotcrete or with cement mortar so that while the repair material is being applied, the surfaces under repair will remain moist, but not so wet as to overcome the suction upon which a good bond depends. The material used for repair proposed shall consist of a mixture of one sack of cement to 3 cubic feet of sand. For exposed walls, the cement shall contain such a proportion of Atlas white portland cement as is required to make the color of the patch match the color of the surrounding concrete.

C. Holes left by tie-rod cones shall be reamed with suitable toothed reamers so as to leave the surfaces of the holes clean and rough. These holes then shall be repaired in an approved manner with dry-packed cement grout. Holes left by form-tying devices having a rectangular cross-section, and other imperfections having a depth greater than their least surface dimension, shall not be reamed but shall be repaired in an approved manner with dry-packed cement grout.

D. All repairs shall be built up and shaped in such a manner that the completed work will conform to the requirements of this Section, as applicable, using approved methods which will not disturb the bond, cause sagging, or cause horizontal fractures. Surfaces of said repairs shall receive the same kind and amount of curing treatment as required for the concrete in the repaired section.

E. Prior to filling any structure with water, all cracks that may have developed shall be "vee'd" as shown and filled with sealant. This repair method shall be done on the water bearing face of members. Prior to backfilling, faces of members in contact with fill, which are not covered with a waterproofing membrane, shall also have cracks repaired.

3.13 PATCHING HOLES IN CONCRETE

A. **Patching Small Holes:**

1. Holes which are less than 12 inches in their least dimension and extend completely through concrete members, shall be filled as specified herein.

2. Small holes in members which are water-bearing or in contact with soil or other fill material, shall be filled with non-shrink grout. Where a face of the member is exposed to view, the non-shrink grout shall be held back 2 inches from the finished surface. The remaining 2 inches shall then be patched according to the Paragraph above.

3. Small holes through all other concrete members shall be filled with non-shrink grout, with exposed faces treated as above.

B. Patching Large Holes:

1. Holes which are larger than 12 inches in their least dimension, shall have a keyway chipped into the edge of the opening all around, unless a formed keyway exists. The holes shall then be filled with concrete as specified herein.

2. Holes which are larger than 24 inches in their least dimension and which do not have reinforcing steel extending from the existing concrete, shall have reinforcing steel set in grout in drilled holes. The reinforcing added shall match the reinforcing in the existing wall unless indicated otherwise.

3. Large holes in members which are water bearing or in contact with soil or other fill, shall have a bentonite type waterstop material placed around the perimeter of the hole unless there is an existing waterstop in place.

3.14 CARE AND REPAIR OF CONCRETE

A. The CONTRACTOR shall protect all concrete against injury or damage from excessive heat, lack of moisture, overstress, or any other cause until final acceptance by the OWNER. Particular care shall be taken to prevent the drying of concrete and to avoid roughening or otherwise damaging the surface. Any concrete found to be damaged, or which may have been originally defective, or which becomes defective at any time prior to the final acceptance of the completed work, or which departs from the established line or grade, or which, for any other reason, does not conform to the requirements of the Contract Documents, shall be satisfactorily repaired or removed and replaced with acceptable concrete at the CONTRACTOR'S expense.

** END OF SECTION **

SECTION 03310 - CAST-IN-PLACE SITEWORK CONCRETE

PART 1 -- GENERAL

1.1 WORK OF THIS SECTION

A The WORK of this Section includes providing finished cast-in-place lean concrete, sitework concrete, minor non-hydraulic concrete structures, air placed concrete, including formwork, steel reinforcement, mixing, placing curing, and repairing, all in conformance with SSPWC.

B. Sitework concrete includes curbs, gutters, catch basins, sidewalks, pavements, fence and guard post embedment, underground duct bank encasement, and all concrete WORK indicated to be sitework concrete.

1.2 RELATED SECTIONS

A. The WORK of the following Sections applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.

Section 03280 Joints in Sitework Concrete

1.3 STANDARD SPECIFICATIONS

A. Except as otherwise indicated in this Section of the Specifications, the CONTRACTOR shall comply with the current edition of the Standard Specifications for Public Works Construction (SSPWC), “GREENBOOK”.

1.4 SHOP DRAWINGS AND SAMPLES

A. Submittals shall be made in compliance in accordance with the requirements of SSPWC, Section 201.

1.4 TESTS

A. Tests on component materials, for the compressive strength of concrete, and for construction tolerances shall be performed in accordance with the requirements of SSPWC, Section 201.

PART 2 -- PRODUCTS

2.1 CONCRETE MATERIALS

A. Concrete component materials, including curing materials and joint materials shall be in accordance with SSPWC, Subsections 201-1, 201-4, and 201-5.

2.2 FORMWORK

A. Concrete formwork shall comply with SSPWC Subsection 204-1.

2.3 STEEL REINFORCEMENT

A. Reinforcing steel shall conform to SSPWC Subsection 201-2.

PART 3 -- EXECUTION

3.1 GENERAL

A. Proportioning and mixing, preparation of surfaces for concreting, handling, transporting and placing concrete, finishing and curing concrete surfaces and related procedures shall be performed in accordance with SSPWC, Subsections 303-1 and 303-5.

3.2 AIR-PLACED CONCRETE

A. Air-placed concrete construction (Gunite and Shotcrete) shall be in accordance with SSPWC, Subsection 303-2 and the applicable provisions of Subsection 303-1.

** END OF SECTION **

SECTION 03315 - GROUT

PART 1 -- GENERAL

1.1 WORK OF THIS SECTION

A. The WORK of this Section includes providing grout other than that required for masonry work, complete.

B. The following types of grout are included in the WORK of this Section:

1. **Non-Shrink Grout:** This type of grout shall be used wherever grout is required, unless another type is specifically indicated.

2. Cement Grout

3. Epoxy Grout

4. Topping Grout and Concrete Fill

1.2 RELATED SECTIONS

A. The WORK of the following Sections applies to the WORK of this Section. Other Sections of the Specifications not referenced below, shall also apply to the extent required for proper performance of this WORK.

Section 03310 Cast-In-Place Sitework Concrete

1.3 SPECIFICATIONS AND STANDARDS

A. Except as otherwise indicated, the current versions of the following apply to the WORK of this Section:

CRD-C 621	Corps of Engineers Specification for Non-shrink Grout
ASTM C 109	Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in or 50-mm Cube Specimens)
ASTM C 531	Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical- Resistant Mortars, Grouts, and Monolithic Surfacings
ASTM C 579	Test Methods for Compressive Strength of Chemical-Resistant Mortars and Monolithic Surfacings
ASTM C 827	Test Method for Early Volume Change of Cementitious Mixtures
ASTM D 696	Test Method for Coefficient of Linear Thermal Expansion of Plastics

1.4 SHOP DRAWINGS AND SAMPLES

A. The following shall be submitted:

1. Manufacturer's literature containing instructions and recommendations on the mixing, handling, placement, and appropriate uses for each type of non-shrink and epoxy grouts proposed for use in the WORK.

2. Certified test results verifying the compressive strength, shrinkage, and expansion properties for proposed non-shrink and epoxy grouts.

1.5 TESTING DURING CONSTRUCTION

A. **Field Tests:**

1. Compression test specimens will be taken during construction from the first placement of each type of grout, and at intervals thereafter as selected by the CONSTRUCTION MANAGER to insure continued compliance with these specifications. The specimens will be made by the CONSTRUCTION MANAGER or its representative.

2. Compression tests and fabrication of specimens for cement grout and non-shrink grout will be performed as specified in ASTM C 109 at intervals during construction as selected by the CONSTRUCTION MANAGER. A set of three specimens will be made for testing at 7 days, 28 days, and each additional time period as appropriate.

3. Compression tests and fabrication of specimens for epoxy grout will be performed as specified in ASTM C 579, Method B, at intervals during construction as selected by the CONSTRUCTION MANAGER. A set of three specimens will be made for testing at 7 days, and each earlier time period as appropriate.

4. All grout, already placed, which fails to meet the requirements of these specifications, is subject to removal and replacement at the cost of the CONTRACTOR.

5. The cost of all laboratory tests on grout will be borne by the OWNER, but the CONTRACTOR shall assist the CONSTRUCTION MANAGER in obtaining specimens for testing. However, the CONTRACTOR shall be charged for the cost of any additional tests and investigation on work performed which does not meet the specifications. The CONTRACTOR shall supply all materials necessary for fabricating the test specimens.

PART 2 -- PRODUCTS

2.1 CEMENT GROUT

A. **Cement Grout:** Cement grout shall be composed of one part cement, three parts sand, and the minimum amount of water necessary to obtain the desired consistency. Where needed to match the color of adjacent concrete, white portland cement shall be blended with regular cement as needed. The minimum compressive strength at 28 days shall be 4000 psi.

B. Cement grout materials shall be as indicated in Section 03310.

2.2 PREPACKAGED GROUTS

A. **Non-Shrink Grout:**

1. Non-shrink grout shall be a prepackaged, inorganic, non-gas-liberating, non-metallic, cement-based grout requiring only the addition of water. Manufacturer's instructions shall be printed on each bag or other container in which the materials are packaged. The specific formulation for each class of non-shrink grout indicated herein shall be that recommended by the manufacturer for the particular application.

2. Class A non-shrink grouts shall have a minimum 28 day compressive strength of 5000 psi; shall have no shrinkage (0.0 percent) and a maximum 4.0 percent expansion in the plastic state when tested in accordance with ASTM C 827; and shall have no shrinkage (0.0 percent) and a maximum of 0.2 percent expansion in the hardened state when tested in accordance with CRD C 621.

3. Class B non-shrink grouts shall have a minimum 28 day compressive strength of 5000 psi and shall meet the requirements of CRD C 621.

4. **Application:**

a. Class A non-shrink grout shall be used for the repair of all holes and defects in concrete members which are water bearing or in contact with soil or other fill material, grouting under all equipment base plates, and at all locations where grout is specified in the contract documents; except, for those applications for Class B non-shrink grout and epoxy grout indicated herein. Class A non-shrink grout may be used in place of Class B non-shrink grout for all applications.

b. Class B non-shrink grout shall be used for the repair of all holes and defects in concrete members which are not water-bearing and not in contact with soil or other fill material, grouting under all base plates for structural steel members, and grouting railing posts in place.

B. **Epoxy Grout:**

1. Epoxy grout shall be a pourable, non-shrink, 100 percent solids system. The epoxy grout system shall have three components: resin, hardener, and specially blended aggregate, all premeasured and prepackaged. The resin component shall not contain any non-reactive diluents. Resins containing butyl glycidyl ether (BGE) or other highly volatile and hazardous reactive diluents are not acceptable. Variation of component ratios is not permitted unless specifically recommended by the manufacturer. Manufacturer's instructions shall be printed on each container in which the materials are packaged.

2. The chemical formulation of the epoxy grout shall be that recommended by the manufacturer for the particular application.

3. The mixed epoxy grout system shall have a minimum working life of 45 minutes at 75 degree F.

4. The epoxy grout shall develop a compressive strength of 5000 psi in 24 hours and 10,000 psi in seven days when tested in accordance with ASTM C 579, Method B. There shall be no shrinkage (0.0 percent) and a maximum 4.0 percent expansion when tested in accordance with ASTM C 827.

5. The epoxy grout shall exhibit a minimum effective bearing area of 95 percent. This shall be determined by a test consisting of filling a 2-inch diameter by 4-inch high metal cylinder mold covered with a glass plate coated with a release agent. A weight shall be placed on the glass plate. At 24 hours after casting, the weight and plate shall be removed and the area in plan of all voids measured. The surface of the grout shall be probed with a sharp instrument to locate all voids.

6. The peak exotherm of a 2-inch diameter by 4-inch high cylinder shall not exceed 95 degrees F when tested with 75 degree F material at laboratory temperature. The epoxy grout shall exhibit a maximum thermal coefficient of 30 x 10^{-6} inches/inch/degree F when tested according to ASTM C 531 or ASTM D 696.

7. **Application:** Epoxy grout shall be used to embed all anchor bolts and reinforcing steel required to be set in grout, and for all other applications required in the Contract Documents.

2.3 TOPPING GROUT AND CONCRETE FILL

A. Grout for topping of slabs and concrete fill for built-up surfaces of tank, channel, and basin bottoms shall be composed of cement, fine aggregate, coarse aggregate, water, and admixtures proportioned and mixed as indicated herein. All materials and procedures specified for concrete in Section 03310 shall apply except as indicated otherwise herein.

B. Topping grout and concrete fill shall contain a minimum of 564 pound of cement per cubic yard with a maximum water cement ratio of 0.45. Where concrete fill is thicker than 3 inches, sitework concrete as indicated in Section 03310 may be used when accepted by the CONSTRUCTION MANAGER.

C. Coarse aggregate shall be graded as follows:

U.S. STANDARD SIEVE SIZE	PERCENT BY WEIGHT PASSING
1/2"	100
3/8"	90-100
No. 4	20-55
No. 8	5-30
No. 16	0-10
No. 30	0

D. Final mix design shall be as determined by trial mix design under supervision of the approved testing laboratory.

E. **Strength:** Minimum compressive strength of topping grout and concrete fill at the end of 28 days shall be 3000 psi.

2.4 CURING MATERIALS

A. Curing materials shall be as indicated in Section 03300 for cement grout and as recommended by the manufacturer of prepackaged grouts.

2.5 CONSISTENCY

A. The consistency of grouts shall be that necessary to completely fill the space to be grouted for the particular application. Dry pack consistency is such that the grout is plastic and moldable but will not flow. Where "dry pack" is called for in the Contract Documents, it shall mean a grout of that consistency; the type of grout to be used shall be as required for the particular application.

B. The slump for topping grout and concrete fill shall be adjusted to match placement and finishing conditions but shall not exceed 4 inches.

2.6 MEASUREMENT OF INGREDIENTS

A. Measurements for cement grout shall be made accurately by volume using containers. Shovel measurement shall not be allowed.

B. Prepackaged grouts shall have ingredients measured by means recommended by the manufacturer.

2.7 MANUFACTURERS

A. Products shall be of the following manufacture (or equal):

1. **Epoxy Grout:** BurkEpoxy Anchoring Grout by the Burke Company

PART 3 -- EXECUTION

3.1 GENERAL

A. All surface preparation, curing, and protection of cement grout shall be as specified in Section 03300. The finish of the grout surface shall match that of the adjacent concrete.

B. The manufacturer of Class A non-shrink grout and epoxy grout shall provide on-site technical assistance upon request.

C. Base concrete or masonry must have attained its design strength before grout is placed, unless authorized by the CONSTRUCTION MANAGER.

3.2 GROUTING PROCEDURES

A. **Prepackage Grouts:** All mixing, surface preparation, handling, placing, consolidation, curing, and other means of execution for prepackaged grouts shall be done according to the instructions and recommendations of the manufacturer.

B. **Base Plate Grouting:**

1. For base plates, the original concrete shall be blocked out or finished off a sufficient distance below the plate to provide for a one-inch thickness of grout or a thickness as indicated.

2. After the base plate has been set in position at the proper elevation by steel wedges or double nuts on the anchor bolts, the space between the bottom of the plate and the original pour of concrete shall be filled with non-shrink-type grout. The mixture shall be of a trowelable consistency and tamped or rodded solidly into the space between the plate and the base concrete. A backing board or stop shall be provided at the back side of the space to be filled with grout. Where this method of placement is not practical or where required by the CONSTRUCTION MANAGER, alternate grouting methods shall be submitted for acceptance.

C. **Topping Grout:**

1. All mechanical, electrical, and finish work shall be completed prior to placement of topping or concrete fill. The base slab shall be given a roughened textured surface by sandblasting or hydroblasting exposing the aggregates to ensure bonding to the base slab.

2. The minimum thickness of grout topping and concrete fill shall be one inch. Where the finished surface of concrete fill is to form an intersecting angle of less than 45 degrees with the concrete surface it is to be placed against, a key shall be formed in the concrete surface at the intersection point. The key shall be a minimum of 3-1/2-inches wide by 1-1/2-inches deep.

3. The base slab shall be thoroughly cleaned and wetted prior to placing topping and fill. No topping concrete shall be placed until the slab is complete free from standing pools or ponds of water. A thin coat of neat Type II cement grout shall be broomed into the surface of the slab just before topping of fill placement. The topping and fill shall be compacted by rolling or tamping, brought to established grade, and floated. Grouted fill for tank and basin bottoms where scraping mechanisms are to be installed shall be screeded by blades attached to the revolving mechanism of the equipment in accordance with the procedures outlined by the equipment manufacturer after the grout is brought to the established grade.

4 Topping grout placed on sloping slabs shall proceed uniformly from the bottom of the slab to the top, for the full width of the placement.

5. The surface shall be tested with a straight edge to detect high and low spots which shall be immediately eliminated. When the topping and fill has hardened sufficiently, it shall be steel troweled to a smooth surface free from pinholes and other imperfections. An approved type of mechanical trowel may be used as an assist in this operation, but the last pass over the surface shall be by hand-troweling. During finishing, no water, dry cement or mixture of dry cement and sand shall be applied to the surface.

3.3 CONSOLIDATION

A. Grout shall be placed in such a manner, for the consistency necessary for each application, so as to assure that the space to be grouted is completely filled.

** END OF SECTION **

SECTION 16030 - ELECTRICAL TESTS

PART 1 -- GENERAL

1.1 WORK OF THIS SECTION

A. The WORK of this Section includes testing, commissioning and demonstrating electrical WORK.

B. The WORK of this Section includes circuit activation, equipment running and installation of temporary jumpers.

C. The WORK of this Section includes correction of defects and retesting.

1.2 RELATED SECTIONS

A. The WORK of the following Sections applies to the WORK of this Section. Other Sections of the specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.

Section 16050 Electrical Materials and Methods

1.3 CODES

A. The WORK of this Section shall comply with the current editions, with revisions, of the following codes and City of San Diego Supplements:

National Electrical Code

1.4 SPECIFICATIONS AND STANDARDS

A. Except as otherwise indicated, the current editions of the following apply to the WORK of this Section:

NETA National Electrical Testing Association, Latest Edition

1.5 SEQUENCE AND SCHEDULING

A. Electrical testing including functional testing of power and controls shall be completed before commencement of the 7-day test.

1.6 SHOP DRAWINGS AND SAMPLES

A. The following shall be submitted:

1. Report of testing of electrical WORK.

PART 2 -- PRODUCTS

2.1 TEST EQUIPMENT AND MATERIALS

A. Test instruments shall be calibrated to references traceable to the National Bureau of Standards and shall have a current sticker showing date of calibration, deviation from standard, name of calibration laboratory and technician, and date recalibration is required.

PART 3 -- EXECUTION

3.1 TESTING

A. In addition to indicated testing requirements and acceptance criteria, testing shall include the following:

1. **Lighting:** Switching, including remote control. Circuitry in accordance with panel schedules. Lighting fixtures located to minimize obstruction of illumination by mechanical equipment or building structural elements.

2. Functional test and testing of electrical components shall be performed prior to subsystem testing and commissioning. Compartments and equipment shall be cleaned before commencement of functional testing. Functional testing shall include:

   Visual and physical check of cables, busswork, circuit breakers, and connections associated with new and modified equipment.

3.2 COMMISSIONING

A. Commissioning during the 7-day test shall not be attempted until all subsystems have been found to operate satisfactorily.

** END OF SECTION **

SECTION 16050 - BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 -- GENERAL

1.1 WORK OF THIS SECTION

A The WORK of this Section includes providing the following:

1. Raceways, Fittings and Supports
2. Concrete Pads, Underground Ducts, Manholes and Pull-Boxes
3. Conductors, Wire and Cable
4. Wiring Devices
5. Lighting and Power Distribution Panelboards
6. Disconnect Switches
7. Electrical Identification
8. Time Clocks
9. Cabinets and Enclosures

1.2 RELATED SECTIONS

A. The WORK of the following Sections applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.

1. Section 02200 Earthwork
2. Section 05500 Miscellaneous Metalwork
3. Section 16030 Electrical Tests
4. Section 16170 Grounding System
5. Section 16400 Low Voltage Electrical Service and Distribution

1.3 STANDARD SPECIFICATIONS

A. Except as otherwise indicated in this Section of the Specifications, the CONTRACTOR shall comply with the current edition of the current edition of the Standard Specifications for Public Works Construction (SSPWC), “GREENBOOK”.

1.4 CODES

A. The WORK of this Section shall comply with the current editions of the following codes as adopted by the City of San Diego Municipal Code:

1. California Building Code
2. National Electrical Code

1.5 SPECIFICATIONS AND STANDARDS

A. Except as otherwise indicated, the current editions of the following apply to the WORK of this Section:

1. **Federal Specifications:**

FS W-C-596E/GEN(1)	Connector, Plug, Receptacle and Cable Outlet, Electrical Power
FS W-S-896E/GEN(1)	Switches, Toggle (Toggle and Lode), Flush Mounted (ac)
FS WW-C-581E	Conduit, Metal, Rigid, And Intermediate; And Coupling, Elbow, and Nipple, Electrical Conduit: Steel, Zinc Coated
WW-C-581E	Intermediate; and Coupling, Elbow, and Nipple, Electrical Conduit; Zinc Coated

2. **Commercial Standards:**

ANSI B16.5	Pipe Flanges and Flanged Fittings, Steel, Nickel Alloy, and Other Special Alloys
ANSI C80.1	Rigid Steel Conduit, Zinc Coated, Specification For
ANSI Z55.1	Gray Finishes for Industrial Apparatus and Equipment
ANSI C80.1	Rigid Steel Conduit-Zinc Coated
ANSI C80.3	Electrical Metallic Tubing-Zinc Coated
ANSI C37.46	Specifications for Power Fuses and Fused Disconnecting Switches
NEMA VE-1	Ventilated Cable Tray
NEMA TC2	Electrical Plastic Tubing (EPT) and Conduit (EPC 40 and EPC 80)
NEMA ICS 6	Enclosures for Industrial Controls and Systems
NEMA 250	Enclosures for Electrical Equipment (1000 volts maximum)
NEMA WC7	Cross-Linked-Thermosetting Insulated Wire and Cable for the Transmission and Distribution of Electric Energy
IPCEA S-61-402	Thermoplastic - Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy
IPCEA S-19	Rubber - Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy
JIC EMP-1-67	Electrical Standards for Mass Production Equipment
ASTM B3	Soft or Annealed Copper Wire
ASTM B8	Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
ASTM B33	Tinned Soft or Annealed Copper Wire for Electrical Purposes
ASTM B189	Lead Coated and Lead-Alloy-Coated Soft Copper Wire for Electrical Purposes

ASTM A193/A193M	Alloy-Steel and Stainless Steel Bolting Materials for High Temperature Service
ICEA S-68-516	Ethylene-Propylene-Rubber-Insulated Wire
IEEE 383	Type Test of Class IE Electric Cables, Field Splices, and Connections for Nuclear Power Generating StationsUL 1242 Intermediate Metal Conduit
UL 44	Rubber-Insulated Wires and Cable
UL 83	Thermoplastic-Insulated Wires and Cable
UL 67	Underwriters Laboratories, Electric Panelboards
UL 489	Molded-Case Circuit Breakers and Circuit Breaker Enclosures
UL 50	Cabinets and Boxes

1.6 SHOP DRAWINGS AND SAMPLES

A. The following shall be submitted:

1. **General:**

Shop drawings including the following:

Manufacturers' equipment drawings.

Component data.

Connection, terminal and internal wiring diagrams, and conductor sizes.

Manufacturer's product data including the following:

Catalogue cuts, bulletins, brochures, or photocopies of applicable pages for mass produced, non-custom manufactured products stamped to indicate the project name, applicable Specification section and paragraph, model number, ratings and options.

Lists of the following:

Materials, equipment, apparatus and fixtures proposed for use; with the list including sizes, names of manufacturers, catalog numbers, and such other information required to identify the items.

Test reports of the following:

Factory-fabricated products.

2. **Lighting and Power Distribution Panelboards:**

Manufacturer's data as follows:

Manufacturer's certification that bus bracing is capable of withstanding the specified short circuit condition.

Quantity and rating of circuit breakers provided with each panelboard.

1.7 OWNER'S MANUAL

A. The following shall be included in the OWNER'S MANUAL:

1. Manufacturer's installation instructions.

2. Manufacturer's maintenance procedures.

1.8 PROJECT RECORD DRAWINGS

A. The following shall be included in the PROJECT RECORD DRAWINGS:

1. Accurate location of conductors including depths and routing of concealed below-grade electrical WORK.

2. Accurate location of electrical WORK (raceway and conductors) where the location differs substantially from the locations indicated.

1.9 AREA DESIGNATIONS

A. **General:** For purposes of delineating electrical enclosure and installation requirements, certain areas are classified as defined below. Electrical installations within these areas shall conform to the indicated code requirements for the area indicated.

B. **General Purpose Locations**: WORK installed in areas which are not otherwise specifically classified shall be "General Purpose." Enclosures shall comply with the requirements of these Specifications and shall be NEMA Type 1.

C. **Outdoor Locations**: In outdoor locations, raceway shall be rigid galvanized steel conduit; entrances shall be threaded; and fittings shall have gasketed covers. Fittings and conduit shall be drained. Threaded fastening hardware shall be stainless steel. Mounting brackets shall be galvanized. Attachments or welded assemblies shall be galvanized after fabrication. Instruments and control cabinets, panels, switchboards and motor control centers shall be "Weatherproof NEMA Type 3R." Enclosures shall be mounted 1/4-inch from walls to provide an air space unless specifically shown otherwise.

D. **Damp Location**: Locations which are indoors and 2 feet below grade elevation or which are indicated as damp locations on the Drawings shall have electrical installations which conform to the requirements for outdoor locations; except, that the air space from walls may be less than 1/4-inch and enclosures shall be NEMA Type 2. "Damp locations" shall include pipe galleries, tunnels, and basements. Rooms housing liquid handling equipment are also classified as damp locations regardless of grade elevation.

E. **Splash Locations**: Areas indicated as "splash-proof" locations shall have electrical installations as described for "outdoor locations"; except, that NEMA Type 4 enclosures shall be provided for instruments and controls, panels, switchboards, and motor control centers.

1.10 FIELD TESTING

A. **Testing:** Products shall be field-tested for compliance with the indicated requirements.

B. **Witnesses:** The OWNER and the CONSTRUCTION MANAGER (at the option of either) reserves the right to witness field tests.

1.11 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. **Delivery of Materials**: Products shall be delivered in original, unbroken packages, containers, or bundles bearing the name of the manufacturer.

B. **Storage:** Products shall be carefully stored in a manner that will prevent damage and in an area that is protected from the elements. Products shall not be damaged, marred, or splattered with water, foam, plaster, or paint. Moving parts shall be kept clean and dry.

C. **Replacement**: Damaged materials or equipment, including face plates of panels and switchboard sections, shall be replaced or refinished by the manufacturer at no expense to the OWNER.

1.12 REGULATORY REQUIREMENTS

A. In addition to other indicated regulatory requirements, the WORK of this Section shall comply with the requirements of SSPWC Subsection 209-1.

1.13 UTILITY REQUIREMENTS

A. The WORK of this Section includes compliance with the requirements of San Diego Gas and Electric Company and payment of related charges.

PART 2 -- PRODUCTS

2.1 GENERAL

A. **Listing:** Electrical equipment and materials shall be listed for the intended purpose by an independent testing laboratory including Underwriters Laboratories (UL) or an independent testing laboratory shall be acceptable to the inspection authority having jurisdiction.

B. **Unlisted Products:** When a product is not available with a testing laboratory listing for the intended purpose, special testing (if any) required by the authority having jurisdiction shall be included in the original contract price.

C. **Project/Site Conditions:** Unless otherwise indicated, equipment and materials shall be sized and rated for the ambient conditions in San Diego but not less than an ambient temperature of 40 degrees C at sea level without exceeding the manufacturer's stated tolerances.

D. **Product Qualifications**: Equipment and materials shall be new and shall bear the UL label, where UL requirements apply. Equipment and materials shall be the products of reputable manufacturers specializing in the products indicated in this Section. Similar items in the project shall be products of the same manufacturer. Equipment and materials shall be of industrial grade and standard of construction and shall be of sturdy design and manufacture; and shall be capable of reliable, trouble-free service.

2.2 RACEWAY, FITTINGS AND SUPPORTS

A. **Raceway**: Raceway shall comply with the following:

1. **Rigid Steel Conduit:** Raceway shall be rigid steel conduit complying with ANSI C80.1 unless otherwise indicated. Rigid steel conduit shall be full weight, mild steel, hot-dip galvanized and bichromate coated inside and outside after galvanizing.

2. **Intermediate Metal Conduit**: Intermediate metal conduit shall comply with UL 1242 and FEDSPEC WW-C-581E and shall have smooth finished surfaces. Conduit shall be galvanized. Minimum size shall be 3/4 inch.

3. **Fittings:** Locknuts shall be extra heavy electrogalvanized steel for sizes through 2 inches. Locknuts larger than 2 inches shall be electrogalvanized malleable iron. Bushings shall be electrogalvanized malleable iron with insulating collar. Grounding bushings shall be locking type and shall include a feed-through compression lug for securing the ground cables. Unions shall be electrogalvanized ferrous alloy type. Threadless fittings are not acceptable. Gaskets shall be made of neoprene.

   Expansion fittings in embedded runs shall be watertight and shall be provided with an internal bonding jumper. The expansion material shall be neoprene and shall allow for 3/4-inch movement in any direction.

4. **Plastic Coated Rigid Steel Conduit and Fittings:** Plastic coated conduit shall be rigid steel conduit with PVC jacket and shall conform to Federal Specification WW-C-581E, ANSI C80.1, and to Underwriter's Laboratories specifications. The zinc surfaces of the conduit shall remain intact and undisturbed on both the inside and the outside of the conduit through the preparation and application processing. A PVC coating shall be bonded to the galvanized outer surface of the conduit. The bond between the PVC coating and the conduit surface shall be greater than the tensile strength of the plastic. The thickness of the PVC coating shall be a minimum of 40 mils. A PVC jacketed coupling shall be provided with each length of conduit. A PVC sleeve equal to the OD of the conduit shall extend 1-1/2 inches from each end of coupling.

   Fittings used with plastic coated conduit shall be similarly coated to the same thickness as the conduit and shall be provided with type 304 stainless steel hardware. Conduit and fittings shall be manufactured by the same company. Minimum size shall be 3/4 inch.

5. **Electrical Metallic Tubing:** Electrical metallic tubing shall be electrogalvanized complying with ANSI C80.3. Fittings shall be compression type. Minimum size shall be 3/4 inch. Electrical metallic tubing shall be galvanized inside and out with an enamel coating inside and a chromate coating outside.

6. **Flexible Metal Conduit:** Flexible metal conduit shall be formed from spirally wound galvanized steel strip with successive convolutions securely interlocked. Minimum size shall be 1/2 inch. Fittings shall be compression type. Flexible metal conduit shall be provided with ground wire.

7. **Liquidtight Flexible Steel Conduit:** Liquidtight flexible steel conduit shall be formed from spirally wound galvanized steel strip with successive convolutions securely interlocked and jacketed with liquidtight plastic cover. Minimum size shall be 1/2 inch. Fittings for liquidtight conduit shall have cadmium-plated malleable iron body and gland nut with cast-in lug, brass grounding ferrule threaded to engage conduit spiral and O-ring seals around the conduit, box connection and insulated throat. Forty-five and 90-degree fittings shall be used where applicable.

8. **Rigid Nonmetallic Conduit:** Rigid nonmetallic conduit shall be NEMA TC2, type EPC-40-PVC, or EPC-80-PVC high impact, polyvinylchloride (PVC). Fittings used with PVC conduit shall be PVC solvent weld type. Nonmetallic conduits shall be UL listed for applications indicated. Minimum size shall be 1 inch.

9. **Wireways:** Wireways and auxiliary gutters shall be JIC EMP-1 sectional flanged oiltight type with hinged covers and shall be 8 inches by 8 inches in cross section unless otherwise indicated.

B. **Boxes and Fittings:** Boxes and fittings shall comply with the following:

1. **Sheet Metal Boxes:** Boxes and fittings installed in areas where electrical metallic tubing is indicated shall be standard UL approved electro-galvanized sheet steel.

2. **Cast Ferrous Alloy Boxes:** Boxes shall be hot-dip galvanized cast ferrous alloy unless otherwise indicated. Integrally cast threaded hubs or bosses shall be provided for conduit entrances and shall provide for full 5-thread contact on tightening. Drilling and threading shall be done before galvanizing. A full body neoprene gasket shall be included with the cover. Type 304 stainless steel screws shall be provided for covers. Where two or more devices are located together, outlet and device boxes shall be gang type. Cover plates shall be hot-dip galvanized cast ferrous alloy unless the particular device requires a cover that is not manufactured in this material.

3. **Floor Boxes:** Floor boxes shall be hot-dip galvanized cast boxes with an NEMA 4 rating. Boxes shall include a recessed ring neoprene gasket, hot-dip galvanized steel checker cover plates and type 304 stainless steel machine screws of not less than 1/4 inch diameter. The cover screws shall be flat head type or recessed socket head screws designed to be flush with cover plate.

4. **Welded Sheet Steel Boxes:** Large boxes shall be fabricated from welded steel and shall be hot-dip galvanized after fabrication. Before finish is applied, a grounding pad drilled for two bolted grounding lugs or a grounding stud shall be welded to the inside of the box. Hardware shall be 304 stainless steel. Boxes shall, as a minimum, meet NEMA 12 and JIC EMP-1 requirements.

5. **Hubs:** Threaded hubs for connection of conduit to junction, device or terminal boxes shall be made of cast ferrous alloy, electroplated with zinc and shall have insulated liner and insulating bushings. The hubs shall utilize a neoprene O-ring and shall ensure a watertight connection.

C. **Raceway Supports**: Raceway supports shall comply with the following:

1. **Conduit Supports:** Hot-dip galvanized framing channel shall be used to support groups of conduit. Individual conduit supports shall be one-hole galvanized malleable iron pipe straps used with galvanized clamp backs and nesting backs where required. Conduit supports for PVC coated rigid steel and PVC conduit systems shall be one-hole PVC coated clamps or PVC conduit wall hangers.

2. **Ceiling Hangers:** Ceiling hangers shall be adjustable galvanized carbon steel rod hangers. Straps or hangers of plumber's perforated tape are not acceptable. Unless otherwise indicated hanger rods shall be 1/2-inch full-threaded rods and shall meet ASTM A193. Hanger rods in corrosive areas and those exposed to weather or moisture shall be stainless steel.

3. **Structural Attachments (Racks):** Structural attachments shall be constructed from hot-dip galvanized framing channel as specified. Field cuts shall be treated with zinc enriched paint.

2.3 CONCRETE PADS, UNDERGROUND DUCTS, MANHOLES AND PULL-BOXES

A. **General:** The WORK of this Section includes concrete pads, manholes, pull-boxes and concrete required for encasement, installation, or construction and shall be 2500-psi concrete conforming to the requirements of Section 03300 and the following:

1. Consolidation of encasement concrete around duct banks shall be by hand puddling, and no mechanical vibration will be permitted.

2. A workability admixture consisting of a hydroxylated carboxylic acid type in liquid form shall be used in encasement concrete, admixtures containing calcium chloride shall not be used.

3. Concrete for encasement of conduit or duct banks shall contain an integral red-oxide coloring pigment in the proportion of 8 pounds per cubic yard of concrete.

B. **Concrete Pads:** Concrete housekeeping pads shall be provided for floor-standing electrical equipment. Housekeeping pads shall be 3 inches above surrounding finished floor or grade and shall be 2 inches larger in both dimensions than the supported equipment unless otherwise indicated.

C. **Concrete-Encased Ducts:** Where an underground distribution system is indicated, it shall be constructed of multiple runs of single bore thin-wall non-metallic ducts, concrete encased, with steel reinforcing bars, with underground manholes and pullboxes.

D. **Manholes and Pull-Boxes**: Manholes and pullboxes shall comply with the following:

1. Manholes and pull-boxes shall be of precast concrete. Concrete construction shall be designed for traffic loading. Covers shall be traffic type, except as otherwise indicated. "P" covers shall be identified as "High Voltage Electric." "S" covers shall be identified as "Secondary Electric" and "C" covers as "Signal." Manholes and pullboxes shall be equipped with pulling-in irons opposite and below each ductway entrance. Manholes shall have concrete covers with 30-inch diameter lids. Covers and lids shall be bolted to cast-in-place steel frames with corrosion resistant hardware. Frames shall be factory-primed; covers shall be galvanized and shall have lifting handles.

2. Manholes and pullboxes shall have cable supports so that each cable is supported at 3-foot intervals within the manhole or pullbox. Cable supports shall be fastened with galvanized bolts and shall be fabricated of fiberglass or galvanized steel.

3. Duct entrances shall be grouted smooth. Ducts for primary and secondary cables shall be terminated with flush-end bells. Sections of prefabricated manholes and pullboxes shall be assembled with waterproof mastic. Each manhole or pullbox shall be set on a 6-inch bed of gravel as recommended by the manufacturer.

2.4 CONDUCTORS, WIRE AND CABLE

A. **General**: The type, size and number of conductors shall comply with the indicated requirements. Number and types of communication, paging, and security cables shall be as required for the particular equipment provided.

Conductors, including ground conductors, shall be copper. Insulation shall bear the manufacturer's trademark, type, voltage rating, and conductor size.

B. **Color Coding:** Color coding shall comply with the following:

1. **Control Conductors:** Control conductors color coding shall be manufacturer's standard.

2. **Power Conductors**: Single-conductor power conductors shall have the following colors for 600V or less:

	120/208V
Phase A	Black
Phase B	Red
Phase C	Blue
Ground	Green
Neutral	White

Color coding tape shall be used where colored insulation is not available. Branch circuit switch shall be yellow. Insulated ground wire shall be green, and neutral shall be gray. Color coding and phasing shall be consistent throughout the site, but bars at panelboards, switchboards, and motor control centers shall be connected Phase A-B-C, top to bottom, or left to right, facing connecting lugs.

General purpose ac control conductors shall be pink. General purpose dc control conductors shall be blue.

Cables sized No. 4 AWG and larger may be black with colored 3/4-inch vinyl plastic tape applied in 3-inch lengths around the cable at each end. The cables shall be tagged at terminations and in pull boxes, handholes and manholes.

C. **Lighting and Receptacle Branch Circuit Conductors:** Lighting conductors shall be stranded except for No. 12 AWG which shall be solid.

1. Conductors shall comply with the following characteristics:

Voltage:	600 volts.
Conductor:	Bare annealed copper; stranded in accordance with ASTM B8.
Insulation:	THWN/THHN, 90 degree C dry, 75 degree C wet, polyvinylchloride (PVC) per UL 83.
Jacket:	Nylon.
Flame resistance:	UL 83.

D. **Power and Control Conductors and Cable, 600 Volts:** Conductors and cable shall comply with the following:

1. **Single Conductors:** Single conductor cable shall be stranded and shall be installed in conduits for power and control circuits.

Conductors shall comply with the following characteristics:

Voltage:	600 volts.
Conductor:	Coated, Class B, stranded, annealed copper per ASTM B8.

Insulation:	XHHW, 90 degrees C dry, 75 degrees C wet, composite of ethylene propylene rubber (EPR) and chlorosulfonated polyethylene (CSPE) per ICEA UL 44 and NEMA WC-7.
Jacket:	Chlorosulfonated polyethylene (CSPE).
Flame resistance:	IEEE 383.

E. **Signal Cables:** Signal cables shall comply with the following:

1. **General:** Signal cable shall be provided for instrument signal transmission, alarm, communication and any circuit operating at less than 100 volts. Cables shall be color coded black and white for pairs or black, white and red for triads. Circuit shielding shall be provided in addition to cable shielding.

2. **Single Circuit:** Cable shall consist of one pair or triad, No. 16 AWG conductors with 15 mils of 90 degree C polyvinylchloride (PVC) insulation, 4 mils nylon conduit or jacket, twisted on a 2-inch lay, and covered with a 100 percent 1.35 mil aluminum-Mylar tape shield with No. 18 AWG 7-strand tinned copper drain wire and a 45 mil PVC jacket overall. Cable shall be UL listed, Type TC, rated 600 volts.

3. **Multiple Circuit:** Cable shall consist of four or more pairs or triads which are made up of No. 18 AWG conductors with 15 mils of 90 degree C PVC insulation, 4 mils nylon jacket, twisted on a staggered lay 1-1/2 to 2-1/2 inches, and covered with a 100 percent 1.35 mil aluminum-Mylar tape shield with No. 22 AWG 7-strand tinned copper drain wire. Overall cable shield shall be 2.35 mil aluminum-Mylar tape with a No. 20 AWG 7-strand tinned copper drain wire. Cable shall be UL listed, Type TC, 600 volts.

4. **Thermocouple Extension:** Extension cable shall be provided for the type of thermocouple circuit indicated. Conductors shall be 16 AWG, solid alloy, with 15 mils of 90 degree C flame-retardant polyvinylchloride insulation, twisted and covered with 100 percent 2.35 mil aluminum polyester tape and a 20 AWG, 7-strand, tinned-copper drain wire and a 35 mil, flame-retardant PVC jacket overall. Cable shall be listed for cable tray installation.

F. **Portable Cord:** Portable cord shall be UL listed, Type SO for sizes No. 10 AWG and smaller. Cords with conductors larger than No. 10 AWG shall be UL listed, Type G. Cords shall contain an equipment grounding conductor.

1. Cables shall comply with the following:

Conductors:	Flexible rope stranded per ASTM B189 and B33. Conductors shall be coated except ground conductors may be uncoated.
Insulation:	Insulation shall be ethylenepropylene (EPR) as per ICEA S-68-516 and rated for continuous operation at 90 degrees C.
Jacket:	Heavy-duty neoprene as per ICEA S-68-516.

G. **Splicing and Terminating Materials:** Splicing and terminating materials shall comply with the following:

1. 600 Volt Conductor and Cable Connectors: Connectors shall be compression type of correct size and UL listed for the specific application. Connectors shall be tin-plated high conductivity copper. Connectors for wire sizes No. 10 AWG and smaller shall be nylon

self-insulated, ring tongue or locking-spade terminals. Connectors for wire sizes No. 8 AWG and larger shall be one-hole lugs up to size No. 3/0 AWG, and two-hole or four-hole lugs for size No. 4/0 and larger. Mechanical clamp, dimple, screw-type connectors are not acceptable.

In-line splices and taps shall be used only where indicated, or shown on the shop drawings. When used, they shall be of the same construction as other connectors. Splices shall be compression type, made with a compression tool die designed for the purpose. Splice shall be covered with a heat-shrinkable sleeve or boot.

2. Portable Cable Fittings: Portable cable fittings for terminating the cable shall provide a watertight seal between the cord and the terminator and between the terminator and mounting hub. The cable terminator shall include neoprene liner which grips the cord jacket when the back nut on the fitting is tightened.

2.4 WIRING DEVICES

A. **General:** Wiring devices shall be UL approved for the current and voltage indicated and shall comply with NEMA WD-1. Devices shall contain provisions for back wiring and side wiring with captively held binding screws.

Devices shall be brown, except those located in finished areas shall be ivory.

Special purpose devices shall be the color indicated.

Receptacles and switches shall conform to Federal Specifications W-C-596E and W-S-896E, respectively, and the indicated standards.

B. **Receptacles and Plugs:** Receptacles and plugs shall comply with the following:

1. **General:** Receptacles shall be grounding type.

2. **120V Receptacles:** Receptacles indicated for indoor use in clean areas shall be duplex 20 amp, NEMA 5-20R, and shall accept NEMA 5-15P and 5-20P plug caps.

Receptacle indicated for use outdoors or in process or corrosive areas shall be duplex, 20 ampere, NEMA 5-20R, and shall accept NEMA 5-15P and 5-20P plug caps. Receptacle and plug caps shall be corrosion resistant, marine duty with yellow polycarbonate weatherproof lift covers.

3. **Ground Fault Interrupter Receptacles:** Receptacles shall be NEMA 5-20R configured and shall mount in a standard outlet box. Units shall trip at 5 milliamperes of ground current and shall comply with NEMA WD-1-1.10 and UL 943. GFI receptacles shall be capable of individual as well as "downstream" operation.

4. **240V Receptacles:** 240-volt duplex receptacles shall be 2-pole, 3-wire, grounding type, 240-volt, ac, 20-amperes, NEMA Configuration 6-20R.

Single 30-ampere receptacles shall be 2-pole, 3-wire, grounding type, 125-volt, ac, 30-amperes, NEMA Configuration 5-30R.

5. **Plug Caps:** Male plug caps for 120 volt and 240 volt receptacles shall be of the cord grip armored type with heavy phenolic housing, of the same manufacture as the receptacle. Plug caps shall be rated 15 amps. One plug cap shall be provided for every four receptacles (minimum 2 plug caps).

6. **Three Phase Receptacles and Plugs:** Receptacles shall be suitable for 480 volt, 3-phase, 4-wire service, with ampere ratings as indicated. Receptacles and plugs shall be designed so that the grounding pole is permanently connected to the housing. The grounding pole shall make contact before the line poles are engaged when the plug is connected to the receptacle housing. The plug sleeve shall also make contact with the receptacle housing before the line and load poles make contact. Receptacles shall include cast back box, angle adapter, gaskets, and a gasketed screw-type, weathertight cap with chain fastener. Each receptacle shall be provided with one plug.

C. **Switches:** Switches shall comply with the following:

1. **General Purpose (Indoor, Clean Areas):** General purpose switches shall be quiet AC type, specification grade, and shall comply with rated capacities as required. Switches shall match receptacles in color.

2. **Switches For Outdoor and Corrosive Areas:** Switches shall be heavy-duty industrial type 20-ampere presswitch type with weatherproof/corrosion resistant neoprene plate. CONTRACTOR shall provide abuse-resistant nylon handles, and switches with corrosion-resistant steel nickel plate bridge.

D. **Device Plates:** Device plates shall be provided with switches. In noncorrosive indoor areas, receptacle device plates shall be made of sheet steel, zinc electroplated with chrome finish.

Device plates in corrosive or outdoor areas shall be corrosion-resistant/marine-duty type.

Device plates shall include engraved laminated phenolic nameplates with 1/8-inch white characters on black background.

Nameplates for switches shall identify panel and circuit number and area served.

Nameplates for receptacles shall identify circuit and voltage if other than 120 volts, single phase.

2.5 LIGHTING AND POWER DISTRIBUTION PANELBOARDS

A. **General:** Panelboards shall be flush, surface or motor control center mounted as indicated. Panelboards shall be dead front factory assembled. Panelboards shall comply with NEMA PB-1 and UL circuit breakers shall be group mounted. Panelboards used for service equipment shall be UL labeled for such use.

Ground fault circuit breakers shall be provided for circuits which supply convenience outlets located outdoors or within lavatory and wash down areas indoors.

Trim and cabinets of surface-mounted panels in general purpose areas shall be phosphate treated, primed and finished with baked enamel, panels of flush mounted panels shall be finished to match surrounding wall color. Surface mounted cabinets and trim in wet and damp areas shall be galvanized. Panelboards in corrosive areas shall be encased in fiberglass enclosures.

The number of circuit breakers and the ampere ratings for lighting panelboard shall be in accordance with panel schedules indicated. The panelboard circuit breakers shall be group mounted and shall be Type NQOB with 3- or 2-pole main breakers as required and branch circuit breakers with 10,000 AIC, minimum or as indicated.

Panelboards shall comply with the following:

1. **Arrangement and Construction:** The front of the panel shall have concealed trim clamps and hinges. The locks shall be flush with cylinder tumbler-type with spring loaded door pulls. The fronts shall not be removable with doors in the locked position. Panelboard locks shall be keyed alike.

   Gutter space shall be provided on all sides of the breaker assembly to connect and arrange incoming wiring.

   A directory holder with clear plastic plate and metal frame shall be mounted on the inside of the door.

2. **Bus:** Bus shall be tin-plated copper and shall have current ratings indicated on the panelboard schedules and shall be sized in accordance with UL 67. Ratings shall be determined by temperature rise test. Minimum bus size shall be 100 amperes. Panel fault withstand rating shall be equal to the interrupting rating of the smallest circuit breaker in the panel.

   Panelboards shall include a separate ground bus.

   Neutral bar shall be full-sized and shall have one terminal screw for each branch circuit; main bus bar shall be full-sized for entire length.

   The neutral bus of instrument power panels shall be mounted on insulated stand-offs.

   Spaces shown shall have cross connections for the maximum sized device that can be fitted.

3. **Circuit Breakers**: Circuit breakers for power panelboard shall be molded-case type designed for the current ratings and pole configurations indicated on the panelboard schedule. Circuit breakers rated 120/208 volt and 120/240 volt alternating current shall have a minimum interrupting current rating of 18,000 amperes (symmetrical) at 240V AC or as indicated on the panelboard schedule.

   Circuit breakers shall be bolt-on type and shall be listed in accordance with UL 489 for the service indicated.

4. **Finish:** Panelboard cabinet shall be fabricated from hot-dip galvanized steel in accordance with UL 50. Panelboard fronts shall have a gray, baked enamel finish.

B. **Lighting Panelboards**: Except as otherwise indicated, lighting panelboards shall be rated for 120/208-volt 3-phase operation or 120/240-volt for single phase operation. Cabinets for building panels shall be 20-inch wide minimum, with 4-inch minimum side gutters and 5-inch minimum top and bottom gutters. Panelboard trim shall be the same size as cabinet on surface-mounted panels and 3/4-inch larger all around than cabinet of flush-mounted panels.

C. **Power Panelboards:** Power panelboards shall be rated for 600 volts, 3-phase operation. Cabinets for power panelboards shall comply with the following: with 225-amp mains, 30 inches wide; with 400-amp, 38 inches wide; with 1200-amp mains, 42 inches wide. Minimum bottom and top gutters shall be 8-inch, minimum side gutter shall be 5-inch.

2.6 DISCONNECT SWITCHES

A. Disconnect switches shall be externally operated with quick-make/quick-break mechanisms. The handle shall be interlocked with the switch cover by means of a defeatable interlock device. The switch shall be lockable in the "off" position. Switches shall have nameplates with manufacturer, rating, and catalog number. Heavy-duty switches shall have arc suppressors, pin hinges, and shall be horsepower rated at 600-volts. Heavy-duty switches shall be provided for all motor circuits above 3 horsepower. In smaller motor circuits switches shall be general duty. Switch enclosure shall be NEMA 4X.

2.7 ELECTRICAL IDENTIFICATION

A. **Nameplates:** Nameplates shall be fabricated from white-center, black-face laminated plastic engraving stock. Nameplates shall be fastened securely, using fasteners of brass, cadmium plated steel, or stainless steel, screwed into inserts or tapped holes, as required. Engraved characters shall be block style of adequate size to be read easily at a distance of 6 feet with no characters smaller than 1/8-inch high.

B. **Conductor and Equipment Identification**: Conductor and equipment identification devices shall be either imprinted plastic-coated cloth marking devices or shall be heat-shrink plastic tubing, imprinted split-sleeve markers cemented in place.

C. **Identification Tape (Buried)**: Identification tape for protection of buried installation shall be a 6-inch wide green polyethylene tape imprinted "CAUTION - ELECTRIC UTILITIES BELOW".

2.8 TIME CLOCKS

A. Time clocks shall be commercial electric sealed synchronous motor type, 12-inch round dial with white face and black arabic numerals, and shall be suitable with one minute sub-divisions, a red sweep second hand, black hour and minute hands, a manual reset knob, and a recessed back box with three-pole receptacle.

2.9 CABINETS AND ENCLOSURES

A. **General:** The WORK of this Section includes the following requirements for control cabinets of lighting panelboards,.

B. **Wiring:** Wiring of terminal cabinets and control cabinets shall be accomplished with stranded copper conductor rated for 600-volts and UL listed as Type MTW. Wires for annunciator and indication circuits shall be No. 16 AWG. Other wiring shall be No. 14 AWG. Color coding shall comply with the indicated requirements. Incoming wires to terminal or relay cabinets shall be terminated on a master set of terminal blocks. All wiring from the master terminals to internal components shall be factory-installed and shall be contained in plastic raceways with removable covers. Wiring to door-mounted devices shall be extra flexible and anchored to doors using wire anchors cemented in place. Exposed terminals of door-mounted devices shall be guarded to prevent accidental personnel contact with energized terminals.

C. **Engraving:** Nameplates shall comply with the indicated requirements.

2.10 MANUFACTURERS

A. Products of the type or model number indicated shall be manufactured by one of the below listed manufacturers (or equal):

1. **Sealing Compound:**
   Chico A
2. **Watertight Seals:**
   O.Z. Gedney Co., Type CSMC
   Thunderline Corp.
   Link Seal
3. **Lighting and Receptacle Branch Circuit Conductors:**
   Okoseal-N, Series 116-67-XXXX
4. **Single Power and Control Conductors and Cable, 600V:**
   Okonite-Okolon, Series 112-11-XXXX
   Anaconda
   Durasheath EP
5. **Single Circuit Signal Cable:**
   Okoseal-N Type P-OS
6. **Multiple Circuit Signal Cable:**
   Okoseal-N Type SP-OS
7. **Thermocouple Extension:**
   Okonite P-OS, Type PLTC
8. **Portable Cords:**
   Okocord
9. **Compression Tool Die For Splicing:**
   Thomas and Betts Corp.
10. **Heat Shrinkable Moisture Seal Caps:**
    Raychem Corp. "Thermofit"
11. **120V Receptacles (Indoor, Clean Areas):**
    Hubbell IG-5362
    Arrow-Hart 6766
    G.E. 4107-1 (Brown)
12. **120V Receptacles (Outdoor, Process or Corrosive Areas):**
    Hubbell 53CM62/53CM21
    General Electric GE5262-C
13. **240V Duplex Receptacles (Gray):**
    Hubbell 5462
    General Electric G.E. 4188-9

14. **240V Single Receptacles (Black):**
    Hubbell 9308
    General Electric G.E. 4138-3
15. **Three Phase Receptacles (60 amps):**
    Crouse-Hinds Catalog No. AREA 6424
    Hubbell Hubbellock
16. **Three Phase Receptacles (30 amps):**
    Crouse-Hinds Catalogue No. AREA 3423
    Bryant Cat. 7223FR
    Russell Stoll No. JRFA6344
17. **Toggle Switches:**

	Hubbell	**Bryant**	**Hubbell**	**Bryant**
Single Pole	1221 (brown)	4901 (brown)	1221I (ivory)	4901I (ivory)
Three Way	1223	4903	1223I	4903I
Double Pole	1222	4902	1222I	4902I
Momentary	1556	4821	1556I	4821I

18. **Electrical Identification:**
    Nameplates
        Formica Type ES-1
    Imprinted Plastic Coated Cloth
        Brady
        Thomas & Betts
19. **Device Plates:**
    Crouse-Hinds
    Appleton
20. **Plug Strips:**
    Plugmold
21. **Manholes and Pullboxes:**
    Brooks
    Quikset
22. **Flexible Conduit:**
    American Brass
    Anaconda
    Electroflex
23. **Compression Connectors:**
    Burndt "Hi Lug"
    Thomas & Betts "Shure Stake"
24. **Spring Connectors (Wire Nuts):**
    3M "Scotch Lok"
    Ideal "Wing Nuts"

25. **Insulating Tape:**
    Scotch No. 33
    Plymouth "Slip knot"
26. **High Temperature Insulating Tape (Polyvinyl):**
    Plymouth
    3M
27. **Pre-Insulated Fork Tongue Lugs:**
    Thomas & Betts RC Series
    Burndy
28. **Epoxy Resin Splicing Kits**:
    3M Scotchcoat 82 Series
    Burndy "Hy Seal"
29. **Stress Cone Material For Make-up Of Medium Voltage Shielded Cable:**
    G & W
    3M
    duPont
30. **Stainless Steel Covers:**
    Sierra S-line
    Hubbell
31. **Products For Cast Boxes:**
    Switches at outdoor locations
        Crouse-Hinds DS 128
        Mackworth Rees Style 3845
        Joy Flexitite
    Switches at damp locations
        Mackworth Rees Style 3496
        Joy Flexitite
    Switches at dry locations
        Crouse-Hinds DS 32G
        Pyle National SCT-10k
    Receptacles at outdoor locations
        Crouse-Hinds
        Hubbell
    Receptacles at damp or dry locations
        Crouse-Hinds DS 23G
        Pyle National N-1
    Receptacles at corrosive locations
        Crouse-Hinds "Ark Gard"
        Appleton DTQ
        Hubbell 52CM21 or 5221

32. **Cast Boxes Required for Pull or Junction Boxes:**
    Floor boxes with checker plate covers
        O-Z Type "YR",
    Surface boxes
        O-Z type "YH"
33. **Floor Type Outlet Boxes:**
    Hubbell Catalog B-2530 with S-2530 cover plate
    Steel City (Russell & Stoll) Catalog 78AL and 889
34. **Power Outlet Boxes:**
    Hubbell Cat. No. SC-3098
    Steel City Cat. No SFH40RG
35. **Telephone Outlet Boxes:**
    Hubbell Cat. No. SS-309-T
    Steel City Cat. No SFL10
36. **Insulated Bushings:**
    O-Z Type A and B
    Thomas & Betts
    Steel City
    Appleton
    Efcor
    Gedney
37. **Insulated Grounding Bushings:**
    O-Z Type BL
    Thomas & Betts
    Steel City
    Efcor
    Gedney
38. **Erickson Couplings:**
    Appleton Type EC
    Thomas & Betts
    Steel City
    Efcor
    Gedney
39. **Liquid-tight Fittings:**
    Appleton Type ST
    Thomas & Betts
    Crouse-Hinds
    Efcor
    Gedney

40. **Hubs:**

    Appleton Type HUB

    Thomas & Betts

    Myers Scrutite

    Efcor

41. **Sealing Fittings:**

    Appleton Type EYS

    O-Z Type FSK

42. **Expansion Couplings:**

    O-Z Type D

    Crouse-Hinds Type

43. **Pressure Switches:**

    Mercoid

    Square D

    Barksdale

44. **High Level Flood Switches:**

    Autocon Vigitrol Class 7501

    Square D

45. **Induction Relay (Series 1 Control)**

    C.F. Warrick

    B.W. Controller

46. **Probe Switches:**

    Series 3W or 3R by B.W. Controller

    C.F. Warrick

47. **Level Switches:**

    Mercoid Control

    Ashcroft

48. **Clocks:**

    Simplex Time Recorder Co. Type 78-45

    Edwards Co. Cat. 1882B

PART 3 -- EXECUTION

3.1 GENERAL

A. **Field Control of Location and Arrangement**: The Drawings diagrammatically indicate the location and arrangement of outlets, conduit runs, equipment, and other items. Exact locations shall be determined in the field based on the physical size and arrangement of equipment, finished elevations, and obstructions. Locations shown on the Drawings shall be

adhered to as closely as possible. Omissions or conflicts on Drawings or between Drawings and Specifications shall be brought to the attention of the CONSTRUCTION MANAGER for clarification before proceeding with the WORK.

B. **Installation:** The CONTRACTOR shall make all necessary provisions throughout the site to receive the work as construction progresses and shall furnish and install adequate backing, supports, inserts, and anchor bolts for the hanging and support of all electrical fixtures, conduit, panelboard, and switches, and shall furnish and install sleeves through walls, floors, or foundations where electrical lines are required to penetrate.

Conduit and equipment shall be installed in such a manner as to avoid all obstructions and to preserve head room and keep openings and passageways clear. Fixtures, switches, convenience outlets, and similar items shall be located within finished rooms, as shown. Where the Drawings do not indicate exact locations, locations of concealed conductors shall be as indicated on the shop drawings.

C. **Workmanship:** Materials and equipment shall be installed in accordance with printed recommendations of the manufacturer. The installation shall be accomplished by workmen skilled in this type of work and installation shall be coordinated in the field with other trades so that interferences are avoided.

D. **Tests:** The WORK of this Section includes tests required by the authority having jurisdiction. Tests shall be performed in the presence of the CONSTRUCTION MANAGER. The WORK includes testing equipment, replacement parts and labor necessary to repair damage resulting from damaged equipment or from testing and correction of faulty installation. The following tests shall be performed:

Insulation resistance tests.

Operational testing of equipment.

E. **Field Quality Control**: Conduit shall be provided with a number tag at each end and in each manhole and pullbox. Trays shall be identified by stencils at intervals not exceeding 50 feet, at intersections, and at each end.

3.2 RACEWAY, FITTINGS AND SUPPORTS

A. **General**: Except as otherwise indicated, conduit installed in direct contact with earth and in concrete slabs on grade shall be corrosion-protected.

Conduit shall be left exposed until inspected by the CONSTRUCTION MANAGER.

Raceways shall be installed as indicated. Raceway systems shall be electrically and mechanically complete before conductors are installed. Bends and offsets shall be smooth and symmetrical, and shall be accomplished with tools designed for the purpose intended. Factory elbows shall be used for all 3/4-inch conduits. Bends in larger sizes of metallic conduit shall be accomplished by field bending or by the use of factory elbows.

Conduit may be cast integral with horizontal and vertical concrete slabs, providing one-inch clearance is maintained between conduit surface and concrete surface. If said clearance cannot be maintained, the conduit shall be installed exposed below elevated slabs; provided, that in the case of slabs on grade, conduit shall be installed below the slab and shall be encased with a minimum cover of 3 inches of concrete.

Non-metallic conduit may be cast integral with horizontal slabs with placement criteria as stated in the previous paragraph. Non-metallic conduit may be run beneath structures or slabs on grade, without concrete encasement. In these instances conduit shall be placed at least 12 inches below the bottom of the structure or slab. Non-metallic conduit may be buried 24 inches minimum below grade, with a 3-inch concrete cover, in open areas or where otherwise not protected by concrete slab or structures. Top of concrete cover shall be colored red. Non-metallic conduit shall be permitted only in concealed locations as described above. The use of direct burial thinwall duct will be permitted only as indicated for underground ducts.

Where a run of concealed PVC conduit becomes exposed, a transition to rigid steel conduit is required. Such transition shall be accomplished by means of a factory elbow or a minimum 3-foot length of rigid steel conduit, either terminating at the exposed concrete surface with a flush coupling. Piercing of concrete walls by non-metallic runs shall be accomplished by means of a short steel nipple terminating with flush couplings.

Flexible conduit may be used in lengths required for the connection of recessed lighting fixtures; otherwise the maximum length of flexible conduit shall be 18 inches.

1. **Application:** Galvanized rigid steel shall be installed in the locations indicated:

Embedded or encased in non-hazardous areas	Schedule 40 PVC
Exposed in corrosive areas	Plastic coated, rigid steel
Direct buried lighting and receptacle raceways in non-hazardous areas	Schedule 80 PVC
Hazardous and corrosive areas within stud walls, above suspended ceilings, and within elevator machine rooms	Plastic coated, rigid metallic tubing
Final raceway connections to equipment	Liquidtight, flexible metallic

2. **Conduit Runs Between Boxes:** The number of directional changes of the conduit shall be limited to total not more than 270 degrees in any run between pull boxes. Conduit runs shall be limited to 400 feet, less 100 feet or fraction thereof, for every 90 degrees of change in direction. Bends and offsets shall be avoided where possible but, where necessary, shall be made without flattening or kinking, or shall be factory preformed bends. Turns shall be made with cast metal fittings or conduit bends. Welding, brazing or otherwise heating of conduit is not acceptable.

3. **Junction and Pull Boxes:** Cast junction or pull boxes shall be installed where required for pulling cable and as necessary to meet the indicated requirements. Pull boxes used for multiple conduit runs shall not combine circuits of different motor control centers, switchboards, or switchgear.

4. **Conduit Terminations:** The WORK of this Section includes conductors required to interconnect incoming annunciator, control and instrumentation except as otherwise indicated.

   Two- and 3-conductor shielded cables installed in conduit runs which exceed 2,000 feet may be spliced in pullboxes. These cable runs shall have only one splice per conductor.

   Control conductors shall be spliced or terminated only at the locations indicated and only on terminal strips or terminal lugs of vendor furnished equipment. 120/208-volt branch circuit conductors may be spliced in suitable fittings at locations required.

   Solid conductors shall be terminated at equipment terminal screws such that conductor is tightly wound around screw and does not protrude beyond screw head. Stranded conductors shall be terminated directly on equipment box lugs such that all conductor strands are confined within lug. Use forked-tongue lugs where equipment box lugs have not been provided.

   PVC conduit entering fiberglass boxes or cabinets shall be secured by threaded bushings on the interior of the box and shall be terminated with a threaded male terminal adapter having a neoprene O-ring. Joints shall be made with standard PVC couplings.

   Conduit entering field equipment enclosures shall enter the bottom or side of the box. Where conduit comes from above, it shall be run down beside the enclosure and a tee conduit and drip leg installed.

5. **Matching Existing Facilities:** When new conduit is added to areas which are already painted, the conduit and its supports shall be painted to match the existing facilities. Where new conduit is used to replace existing conduit, the existing conduit and supports shall be removed, resulting blemishes shall be patched and repainted to match original conditions. Similarly, if existing conduits are to be reused and rerouted, resulting blemishes shall be corrected in the same manner.

6. **Conduit Support:** Exposed rigid steel or plastic coated conduit shall be run on supports spaced not more than 10 feet apart and shall be constructed with runs parallel or perpendicular to walls, structural members, or intersections of vertical planes and ceiling. Exposed PVC conduit shall be run on supports spaced not more than 3 feet apart for conduits up to 1 inch, 5 feet apart for conduits 1 1/4 inches to 2 inches and 6 feet apart for conduits 2 1/2 inches and larger. No conduit shall approach closer than 6 inches to any object operating above 30 degrees C. PVC conduit shall not be provided where it will be damaged by heat.

   Conduit rack and tray supports shall be secured to concrete walls and ceilings by means of cast-in-place anchors. Individual conduit supports shall use cast-in-place anchors, die-cast, rustproof alloy or expansion shields. Wooden plugs, plastic inserts or gunpowder-driven inserts are not acceptable.

7. **Conduit Penetrations:** Unless otherwise indicated, conduit routed perpendicular through floors, walls or other concrete structures shall pass through cast-in-place openings wherever possible. In cases where cast-in-place openings are not possible, appropriate size holes shall be bored through the concrete to accommodate the conduit passage. The size and location of the holes shall not impair the structure's integrity. After completion, grout or calk around conduit and finish to match existing surroundings. Unless otherwise protected, conduits that rise vertically through the floor shall be protected by a 3 1/2-inch high concrete pad with a sloping top.

Conduits entering manholes and handholes shall be horizontal. Conduits shall not enter through the concrete bottom of handholes and manholes.

Wherever conduits penetrate outdoor concrete walls or ceilings below grade, watertight seal shall be installed.

8. **Conduit Separation:** Signal conduits shall be separated from AC power or control conduits. The separation shall be a minimum of 12 inches for metallic conduits and 24 inches for nonmetallic conduits.

9. **Conduit Seals For Hazardous or Corrosive Areas:** Conduit passing from a hazardous or corrosive area into a nonhazardous or noncorrosive area shall be provided with a sealing fitting which shall be located at the boundary in accordance with NEC.

   Seal fittings for conduit systems in hazardous atmosphere locations shall be hot-dip galvanized cast ferrous alloy. Sealing compound shall be hard type and shall be UL listed for explosionproof sealing fittings. Sealing compound shall be nonhardening type for corrosive areas. Sealing compound shall not be poured in place until electrical installation has been otherwise accepted.

10. **Plastic Coated Conduit:** Plastic coated conduit shall be made up tight with strap wrenches. Conduit threads shall be covered by a plastic overlap which shall be coated and sealed in accordance with manufacturer's recommendations. Pipe wrenches and channel locks shall not be used for tightening plastic coated conduits. Damaged areas shall be patched, using manufacturer's recommended material. The area to be patched shall be built up to the full thickness of the coating. Painted fittings are not acceptable.

11. **Liquidtight Flexible Conduit:** The length of flexible liquidtight conduit shall not exceed 15 times the trade diameter of the conduit. The length of liquidtight conduit shall not exceed 36 inches.

12. **Conduit Fittings:** Fittings shall comply with the same requirements as the raceway with which they will be used. Fittings having a volume less than 100 cubic inches for use with rigid steel conduit, shall be cast or malleable non-ferrous metal. Fittings larger than one inch shall be "mogul size." Fittings shall be of the gland ring compression type. Covers of fittings, unless in "dry" locations, shall include gaskets. Surface-mounted cast fittings, housing wiring devices in outdoor and damp locations, shall have mounting lugs.

    Erickson couplings shall be used at all points of union between ends of rigid steel conduits which cannot be coupled. Running threads and threadless couplings shall not be used. Couplings shall be 3-piece type.

    Transition fittings to mate steel to PVC conduit, and PVC access fitting, shall be as furnished or recommended by the manufacturer of the PVC conduit.

3.3 UNDERGROUND DUCTS, MANHOLES AND PULL-BOXES

A. **Underground Ducts**: Where an underground distribution system is indicated, installation shall comply with the following:

1. Ducts shall be laid on a grade line of at least 4 inches per 100 feet, sloping towards pullboxes or manholes. Duct shall be installed and pullbox and manhole depths adjusted so that the top of the concrete envelope is a minimum of 24 inches below

grade. Changes in direction of the duct envelope by more than 10 degrees horizontally or vertically shall be accomplished using bends with a minimum radius 24 times the duct diameter. Couplings shall be staggered at least 6 inches vertically. Bottom of trench shall be of select backfill or sand. Horizontal and vertical duct separation shall be maintained by plastic spacers set every 5 feet. The duct array shall be anchored every 4 feet to prevent movement during placement of the concrete envelope. Each bore of the completed duct bank shall be cleaned by drawing through it a standard flexible mandrel one foot long and 1/4-inch smaller than the nominal size of the duct through which the mandrel will be drawn. After passing of the mandrel, a wire brush and swab shall be drawn through. A raceway, in the duct envelope, which does not require conductors, shall have a 1/8-inch polypropylene pull cord installed throughout the entire length of the raceway.

2. Duct bank markers shall be installed every 200 feet along run of duct bank, at changes in horizontal direction of duct bank, and at ends of duct bank. Concrete markers, 6 by 6 inches square and one foot long, shall be set flush with grade. The letter "D" and arrow set in the concrete shall be facing in the direction of the duct alignment

B. **Manholes and Pull-Boxes**: Manholes and handholes shall be set plumb to limit the depth of standing water to a maximum of 2 inches. Manhole covers, unless otherwise indicated, shall be set at grade. Sections of pre-fabricated manholes and pullboxes shall be assembled with waterproof mastic and shall be set on a 6-inch bed of gravel as recommended by the manufacturer.

3.4 CONDUCTORS, WIRE AND CABLE

A. **General:** Pulling wire and cable into conduit shall be completed without damaging or putting undue stress on the cable insulation. Soapstone, talc or UL listed pulling compounds are acceptable lubricants for pulling wire and cable. Grease is not acceptable. Raceway construction shall be complete, cleaned, and protected from the weather before cable is installed.

Whenever a cable leaves a raceway, a cable support shall be provided.

When flat bus bar connections are made with unplated bar, the contact areas shall be "scratch-brushed" before connection. Bolts shall be torqued to the bus manufacturer's recommendations.

B. **600 Volt Conductor and Cable:** Conductors in panels and electrical equipment, No. 6 AWG and smaller, shall be bundled and laced at intervals not greater than 6 inches, spread into trees and connected to their respective terminals. Lacing shall be made up with plastic cable ties. Lacing is not necessary in plastic panel wiring duct. Conductors crossing hinges shall be bundled into groups not exceeding 12 and shall be so arranged that they will be protected from chafing when the hinged member is moved.

Slack shall be provided in junction and pull boxes, handholes and manholes. Slack shall be sufficient to allow cables or conductors to be routed along the walls of the box. Amount of slack shall be equal to largest dimension of the box. Where plastic panel wiring duct is installed for wire runs, lacing is not required. Plastic panel wiring duct shall not be used in manholes and handholes.

Stranded conductors shall be terminated. Conductors shall be terminated directly on the terminal block. Compression lugs and connectors shall be installed using manufacturer's recommended tools.

Lighting and receptacle circuits may be in the same conduit in accordance with derating requirements of the NEC. However, lighting and receptacle circuits shall not be installed in conduits with power or control conductors.

Solid wire shall not be lugged nor shall electrical spring connectors be used on any except for solid wires in lighting and receptacle circuits. Lugs and connectors shall be installed with a compression tool.

Conductor and cable markers shall be provided at splice points.

C. **Signal Cable:** Circuits shall be installed as individually shielded twisted pairs or triads. In no case shall a circuit be made up using conductors from different pairs or triads. Triads shall be used wherever 3-wire circuits are required. Terminal blocks shall be provided at instrument cable junctions, and circuits shall be identified at such junctions unless otherwise indicated. Signal circuits shall be installed without splices between instruments, terminal boxes, or panels.

Shields are not acceptable as a signal path, except for circuits operating at radio frequencies and utilizing coaxial cables.

Common ground return conductors for two or more circuits are not acceptable.

Unless otherwise indicated, shields shall be bonded to the signal ground bus at the control panel and isolated from ground and other shields at other locations. Terminals shall be installed for running signal leads and shield drain wires through junction boxes.

Spare circuits and the shield drain wire shall be terminated on terminal blocks at both ends of the cable run and be electrically continuous through terminal boxes. Shield drain wires for spare circuits shall not be grounded at either end of the cable run.

Terminal boxes shall be installed at instrument cable splices. If cable is buried or in raceway below grade at splice, an instrument stand shall be provided as specified with terminal box mounted approximately 3 feet above grade.

Cable for paging, telephone, and security systems shall be installed and terminated in compliance with the manufacturer's recommendations.

3.5 WIRING DEVICES

A. **General**: Boxes shall be independently supported by galvanized brackets, expansion bolts, toggle bolts, or machine or wood screws as appropriate. Wooden plugs inserted in masonry or concrete shall not be used as a base to secure boxes, nor shall welding or brazing be used for attachment.

Unless otherwise indicated, receptacles and switches installed in sheet steel boxes shall be flush mounted and shall be located 18 inches above the floor unless otherwise indicated.

Switch boxes and receptacles installed in cast device boxes shall be mounted 48 inches above the floor.

B. **Application of Boxes and Covers**: Boxes and covers shall be installed as follows:

1. Outlet, switch, and junction boxes for flush-mounting in general purpose locations shall be sheet metal.

2. Outlet, switch, and junction boxes where surface mounted in exposed locations shall be cast alloy ferrous boxes with mounting lugs, zinc or cadmium plating, and enamel finish. Surface mounted boxes in concealed locations may be welded sheet steel boxes.

3. Outlet, control station, and junction boxes, including covers, for installation in corrosive locations shall be fiberglass-reinforced polyester and shall include mounting lugs.

4. Sheet metal boxes for flush-mounting in concrete shall include with cast, malleable box covers and gaskets. Covers for pressed steel boxes shall be one-piece pressed steel, cadmium plated, except that boxes for installation in plastered areas shall be stainless steel over plaster rings.

5. Outlet boxes shall be used as junction boxes wherever possible. Where separate pullboxes are indicated, they shall include screw covers. Outdoors boxes shall be galvanized and shall be provided with gasketed covers and threaded hubs. Indoor boxes shall be painted.

3.6 LIGHTING AND POWER DISTRIBUTION PANELBOARDS

A. **General:** The circuit description as indicated on the record drawings or panelboard schedule shall be typed on the circuit directory.

B. **Testing:** Panelboards shall be tested for proper operation and function.

3.7 CABINETS AND ENCLOSURES

A. The installation of cabinets and enclosures shall comply with the following:

1. **Cabinets:** Cabinets shall be set plumb at an elevation such that the maximum circuit breaker height shall be less than 5 ft 6 inches. Top edge of trim of adjacent panels shall be at the same height. Panels which are indicated as flush mounted shall be set so cabinet is flush and serves as a "ground" for plaster application.

2. **Connections:** Factory bus and wire connections shall be made at shipping splits, and all field wiring and grounding connections shall be made after the assemblies are anchored.

3. **Finishes:** Enclosures smaller in volume than 500 cubic inches shall be finished in accordance with the manufacturer's standard procedures. Finish color shall be No. 61 complying with ANSI Z55.1.

3.8 EQUIPMENT ANCHORING

A. Freestanding or wall-hung equipment shall be anchored in place by methods that will meet seismic requirement in the area where project is located. Wall-mounted panels that weigh more than 500 pounds or which are within 18 inches of the floor shall be provided with fabricated steel support pedestal(s). Pedestals shall be of welded steel angle sections. If the supported equipment is a panel or cabinet and enclosed with removable side plates, it shall

match supported equipment in physical appearance and dimensions. Transformers hung from 4-inch stud walls and weighing more than 300 pounds, shall have auxiliary floor supports.

B. Anchoring methods and leveling shall comply with the printed recommendations of the equipment manufacturers.

3.9 CONDUCTOR AND EQUIPMENT IDENTIFICATION

A. The completed electrical installation shall include adequate identification to facilitate proper control of circuits and equipment and to reduce maintenance effort.

B. Control and instrumentation wire and cable shall be assigned a unique identification number. Numbers shall be assigned to conductors having common terminals. Identification numbers shall appear within 3 inches of conductor terminals. "Control" shall be defined as any conductor used for alarm, annunciator, or signal purposes or any connect switch or relay contacts or any relay coils.

1. Multiconductor cable shall be assigned a number which shall be attached to the cable at intermediate pull boxes and at stub-up locations beneath free-standing equipment. It is expected that the cable number will form a part of the individual wire number. All individual control conductors and instrumentation cable shall be identified at pull points as described above.

2. The instrumentation cable numbers shall incorporate the loop numbers shown.

C. Spare conductors shall be terminated on terminal screws and shall be identified with a unique number as well as with destination.

D. Nameplates shall be provided for panelboards, panels, starters, switches, and pushbutton stations. In addition to the name plates indicated, control devices shall be equipped with standard collar-type legend plates, as required.

E. Terminal strips shall be identified by imprinted, varnished, marker strips attached under the terminal strip.

F. Three-phase receptacles shall be consistent with respect to phase connection of receptacle terminals. Errors in phasing shall be corrected at the bus, not at the receptacle.

G. Toggle switches which control loads out of sight of switch, and all multi-switch locations of more than 2 switches, shall have suitable inscribed finish plates.

H. Empty conduits shall be tagged at both ends to indicate the destination at the far end. Where it is not possible to tag the conduit, destination shall be identified by marking an adjacent surface.

I. Identification tape shall be installed directly above buried raceway. Tape shall be installed 8 inches below grade and parallel with raceway. Identification tape shall be installed for buried raceway not under buildings or equipment pads except identification tape is not required for protection of street lighting raceway.

** END OF SECTION **

SECTION 16170 - GROUNDING SYSTEM

PART 1 -- GENERAL

1.1 WORK OF THIS SECTION

A. The WORK of this Section includes providing grounding for electrical systems, exposed nonenergized metal surfaces of equipment and metal structures.

1.2 RELATED SECTIONS

A. The WORK of the following Sections applies to the WORK of this Section. Other Sections of the specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.

1. Section 03300 Cast-In-Place Concrete

2. Section 05500 Miscellaneous Metalwork

3. Section 16050 Basic Electrical Materials and Methods

1.3 CODES

A. The WORK of this Section shall comply with the current editions, with revisions, of the following codes and City of San Diego Supplements:

1. National Electrical Code

1.4 SPECIFICATIONS AND STANDARDS

A. Except as otherwise indicated, the current editions of the following apply to the WORK of this Section:

IEEE 81	Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System, Guide for
UL 467	Standard for Grounding and Bonding Equipment

1.5 SHOP DRAWINGS AND SAMPLES

A. The following shall be submitted:

1. Shop drawings showing details of grounding system.

2. Product data for grounding electrodes and connections.

1.6 OWNER'S MANUAL

A. The following shall be included in the OWNER'S MANUAL:

1. Manufacturer's instructions including instructions for storage, handing, protection, examination, preparation and installation of exothermic welded connectors.

2. Test reports indicating overall resistance to ground and resistance of each electrode.

1.7 PROJECT RECORD DRAWINGS

A. The following shall be included in the PROJECT RECORD DRAWINGS:

1. Accurate record of actual locations of grounding electrodes.

1.8 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. **Delivery of Materials:** Products shall be delivered in original, unbroken packages, containers, or bundles bearing the name of the manufacturer.

B. **Storage:** Products shall be carefully stored in a manner that will prevent damage and in an area that is protected from the elements.

PART 2 -- PRODUCTS

2.1 GENERAL

A. The WORK of this Section includes the following:

1. Products listed and classified by Underwriters Laboratories, Inc as suitable for purpose specified and shown.

2. Except as otherwise indicated, grounding products and systems shall comply with the NEC.

2.2 ROD ELECTRODE

A. Rod electrodes shall be 3/4 inch copper-clad steel unless otherwise shown on the drawings, sectional type, joined by threaded copper alloy couplings. Length of rods forming an individual ground array shall be equal in length and shall be of the length required to obtain a minimum ground resistance of 5 ohms. Top of ground rod shall be fitted with a coupling and steel driving stud. Rods shall be of sufficient length to ensure contact with ground water and shall be not less than 10 feet.

2.3 CABLE

A. Ground cable shall be annealed bare copper, concentric stranded wire. If cable sizes are not indicated, the minimum sizes shall be as follows:

1. Lighting panels 2 AWG

2. Exposed metal 2 AWG

2.4 MECHANICAL CONNECTORS

A. Compression connectors shall comply with the following:

1. **Material:** Cast Copper

2.5 GROUNDING WELL COMPONENTS

A. Grounding well components shall comply with the following:

1. **Well Pipe:** 8 inch diameter by 24 inch long concrete pipe with belled end.

2. **Well Cover:** Cast iron with legend "GROUND" embossed on cover.

2.6 MANUFACTURERS

A. Products indicated shall be manufactured by one of the following (or equal):

1. **Rods and Fittings:**

Copperweld

Blackburn

Weaver

2. **Compression Connectors:**

Thomas and Bett

PART 3 – EXECUTION

3.1 GENERAL

A. Embedded and buried ground connections shall be made by compression connectors utilizing diamond or hexagon dies and a hand compression tool for wire sizes 2 AWG and smaller and a hydraulic pump and compression head for wire sizes 2/0 AWG and larger. Compression connections shall be prepared in accordance with the manufacturer's instructions. Exposed ground connections to equipment shall be made by bolted clamps unless otherwise indicated. Solder shall not be used in any part of the ground circuits.

B. Embedded ground cables and fittings shall be securely attached to concrete reinforcing steel with tie wires and prevented from displacement during concrete placement. As each part of the grounding system which is laid below finished grade is completed, the CONSTRUCTION MANAGER shall be notified 2 hours prior to backfilling.

C. Grounding conductors which are extended beyond concrete surfaces for equipment connection shall be extended a sufficient length to reach the final connection point without splicing. Minimum extension shall be 3 feet. Grounding conductors which project from a concrete surface shall be located as close as possible to a corner of the equipment pad, protected by conduit, or terminated in a flush grounding plate. Exposed grounding conductors shall be supported by noncorrosive metallic hardware at 4-foot intervals maximum Grounding conductors for future equipment shall be terminated using a two-hole copper flush mounted grounding plate.

D. Grounding conductor shall not be used as a system neutral.

E. Lightning arresters shall be directly connected to the ground system using copper conductors.

3.3 EQUIPMENT AND ENCLOSURE GROUND

A. Electrical and distribution equipment and metal equipment platforms which support any electrical equipment shall be bonded to the nearest ground bus or to the nearest switchgear ground bus. This grounding requirement is in addition to the indicated raceway grounding.

B. Connection to ground electrodes and ground conductors shall be exothermic welded where concealed and shall be bolted pressure type where exposed. Bolted connectors shall be assembled wrench-tight.

C. Insulated grounding bushings shall be employed for all grounding connections to steel conduits in switchboards, in motor control centers, in pullboxes, and elsewhere where conduits do not terminate at a hub or a sheet metal enclosure.

D. Where insulated bushings are required, they shall be installed in addition to double lock-nuts.

E. Shielded power cable shall have its shield grounded at each termination in a manner recommended by the cable manufacturer. Shielded instrumentation cable shall be grounded at one end only; this shall be at the Motor Control Board or otherwise at the "receiving" end of the signal carried by the cable except as otherwise indicated. Termination of each shield drain wire shall be on its own terminal screw. All of these terminal screws in one rack shall be connected with No. 16 solid tinned bare copper wire jumper; connection to ground shall be accomplished with a No. 12 green insulated conductor to the main ground bus.

F. Nonelectrical equipment with metallic enclosures shall be connected to the grounding system.

3.4 ISOLATED GROUNDING

A. Where the manufacturer of equipment supplied from 120 volt instrument power panels requires an isolated ground, an additional isolated ground conductor from the equipment through the instrument power panel for connection to a single point ground bus in the automatic transfer switch enclosure shall be provided. The isolated ground conductor shall have green insulation with a yellow stripe and shall be run in the same raceway as the power and neutral conductors.

B. The neutral conductor from the ultra-isolation transformers shall be grounded only at the single point ground bus in the automatic transfer switch.

3.5 EXAMINATION

A. The WORK of this Section includes verification that final backfill and compaction has been completed before driving rod electrodes.

3.6 INSTALLATION

A. Rod electrodes and additional rod electrodes as required to achieve specified resistance to ground shall be installed at locations indicated.

B. Grounding well pipes with cover shall be installed at each rod location with well pipe top flush with finished grade.

C. Number 4 AWG bare copper wire shall be installed in foundation footing.

D. Grounding electrode conductor shall be installed and connected to reinforcing steel in foundation footing.

E Metal siding not attached to grounded structure shall be bonded together and to ground.

F. Reinforcing steel and metal accessories shall be bonded to structures.

G. Transient suppression plates shall be installed where indicated.

H. Ground grid shall be installed under access floors where indicated. Grid shall be constructed of 2 AWG bare copper wire installed on 24 inch centers both ways. Each access floor pedestal shall be bonded to grid.

I. Metallic raceway, pipe, duct and other metal object entering space under access floors shall be bonded together using 2 AWG bare copper conductor.

J. Isolated grounding conductors shall be installed for circuits supplying personal computers.

K. Where equipment grounding conductors are indicated, separate insulated conductors shall be installed within each feeder and branch circuit raceway. Ends shall be terminated on suitable lug, bus, or bushing.

3.7 FIELD QUALITY CONTROL

A. Grounding and bonding system conductors and connections shall be inspected for tightness and proper installation.

3.8 GROUNDING SYSTEM TESTS

A. Suitable test instruments shall be used to measure resistance to ground of system. Testing shall be performed in accordance with test instrument manufacturer's recommendations using the fall-of-potential method.

B. The grounding test shall comply with IEEE Standard 81. A plot of ground resistance readings for each isolated ground rod or ground mat shall be submitted on 8-1/2 x 11 inch size graph paper. The current reference rod shall be driven at least 100 feet from the ground rod or grid under test. The measurements shall be made at 10-foot intervals beginning 25 feet from the test electrode and ending 75 feet from it, in direct line between the ground rod or center of grid and the current reference electrode.

C. A grounding system that shows greater than 2 ohm resistance for the flat portion of the plotted data shall be considered inadequately grounded. Additional parallel connected ground rods and/or deeper driven rods shall be provided until the ground resistance measurements complies with the indicated requirements. Use of salts, water or compounds to attain the specified ground resistance is not acceptable.

** END OF SECTION **

SECTION 16400 - LOW VOLTAGE ELECTRICAL SERVICE AND DISTRIBUTION

PART 1 -- GENERAL

1.1 WORK OF THIS SECTION

A. The WORK of this Section includes providing all electrical service sections, distribution switchboards, special control panels, control and terminal cabinets, control devices, circuit breakers, and all appurtenant work, complete and operable.

1.2 RELATED SECTIONS

A. The WORK of the following Sections applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.

1. Section 16030 Electrical Tests

2. Section 16050 Basic Electrical Materials and Methods

1.3 CODES

A. The WORK of this Section shall comply with the current editions of the following codes as adopted by the City of San Diego Municipal Code:

1. National Electrical Code (NEC) NFPA 70

1.4 SPECIFICATIONS AND STANDARDS

A. Except as otherwise indicated, the current editions of the following apply to the WORK of this Section:

ANSI/IEEE C37.20	Switchgear Assemblies, including Metal-Enclosed Bus
ANSI/NEMA ICS-2	Devices, Controllers, and Assemblies for Industrial Control
NEMA PB2	Dead Front Distribution Switchboard

1.5 SHOP DRAWINGS AND SAMPLES

A. The following shall be submitted:

1. Shop drawings of the service section and switchboards. After review of shop drawings of the service section by the CONSTRUCTION MANAGER, said drawings shall also be submitted to the utility company for approval prior to fabrication.

2. Design test reports conducted for similar assemblies at the factory.

1.6 OWNER'S MANUAL

A. The following shall be included in the OWNER'S MANUAL:

1. Operating procedures.

2. Maintenance procedures.

3. Manufacturer's parts list, illustrations, assemblies and diagrams.

PART 2 -- PRODUCTS

2.1 GENERAL

A. **Materials:** All materials and equipment furnished under this Specification shall be new and shall bear the Underwriters' Laboratories label where such service is regularly available.

B. **Equipment:** All equipment for the same purpose shall be of the same make.

C. **Standard Products:** Materials and equipment shall be catalogue products of companies regularly engaged in the manufacture of such items, shall be the latest standard design that conforms to the specification requirements, and shall essentially duplicate material and equipment that has been in satisfactory use for several years.

2.2 SWITCHBOARDS

A. Indoor construction shall be of the universal frame type using die-formed welded and bolted members. Enclosing panels shall be 14-gauge steel and shall be bolted in place. In addition, indoor construction shall conform to the following:

1. Switchboard shall be totally enclosed, NEMA 1, gasketed.

2. Bus bar shall be copper fully insulated. Copper shall be silver plated at joints. Bus bars shall be braced for short circuit currents of 65,000 amperes minimum, or as indicated. A full length copper ground bus bar shall be provided at the bottom of the switchboard enclosure.

2.3 OVERCURRENT PROTECTIVE DEVICES

A. Circuit breakers having a frame size of 150-amperes or less shall be molded-case type with thermal magnetic non-interchangeable, trip-free, sealed trip units. Breaker contact material shall be a non-weldable silver alloy. Breakers shall have arc-extinguishing chutes. Ground fault tripping, where required, shall be as indicated below.

B. Circuit breakers with a frame size of 225 amperes to 600 amperes shall be molded case with interchangeable thermal and adjustable magnetic trip elements. Ground fault protection shall be provided by means of a core balance transformer encircling all feeder leads. The transformer shall energize a surface-mounted, solid-state relay, adjustable from 10-20 percent of phase current with an adjustable time delay of zero to 36 cycles. Ground fault protection shall include a test panel containing indication and test tripping circuits.

2.4 MANUFACTURERS

A. Products of the type indicated shall be manufactured by the following (or equal):

a. Westinghouse

b. General Electric

c. Square D

PART 3 -- EXECUTION

3.1 INSTALLATION - GENERAL

A. All electrical equipment materials shall be installed securely in place. Equipment shall be mounted parallel and perpendicular to the walls, floors, and ceilings.

B. All anchors and fasteners shall be types designed for the intended purpose and shall be capable of adequately, safely, and permanently securing the material in place. Screws shall be used on wood surfaces, masonry anchors in concrete or brick, toggle bolts on hollow walls, machine screws, bolts, or welded studs on steel. Nails shall be used only for temporary attachment or support.

C. Omissions or conflicts on Drawings or between Drawings and Specifications shall be brought to the attention of the CONSTRUCTION MANAGER for clarification before proceeding with the work.

D. The CONTRACTOR shall make all necessary provisions throughout the site to receive all equipment as construction progresses and shall provide adequate backing, supports, inserts, and anchor bolts for the hanging and support of all electrical cabinets, enclosures, conduit, panelboards, and switches, and shall provide sleeves through walls, floors, or foundations where electrical lines are required to penetrate.

E. Floor standing equipment shall be leveled with shims as required to maintain horizontal surfaces within 1/32-inch per horizontal foot; after leveling, equipment shall be anchored, then grouted so that no space is existing between concrete and equipment support beams.

3.2 TESTING

A. All WORK shall be tested per Section 16030.

** END OF SECTION **

SECTION 16500 - LIGHTING

PART 1 -- GENERAL

1.1 WORK OF THIS SECTION

A. The WORK of this Section includes providing lighting fixtures, accessories, and controls required for a complete and operable lighting system.

1.2 RELATED SECTIONS

A. The WORK of the following Sections applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.

Section 16050 Basic Electrical Materials and Methods

1.3 STANDARD SPECIFICATIONS

A. Except as otherwise indicated in this Section of the Specifications, the CONTRACTOR shall comply with the current edition of the Standard Specifications for Public Works Construction (SSPWC), "GREENBOOK".

1.4 CODES

A. The WORK of this Section shall comply with the current editions of the following codes as adopted by the City of San Diego Municipal Code:

National Electrical Code (NEC), NFPA 70

Uniform Building Code (UBC)

1.5 SPECIFICATIONS AND STANDARDS

A. Except as otherwise indicated, the current editions of the following apply to the WORK of this Section:

UL	Underwriters Laboratories
CBM	Certified Ballast Manufacturer's Association

1.6 SHOP DRAWINGS AND SAMPLES

A. The following shall be submitted:

1. List of all fixture types with manufacturer's name and full catalog number.

2. Catalog information for each fixture, accessory, and control device. Each equipment submittal shall clearly describe make, materials, and dimensions. Catalog information shall clearly show manufacturer's name and full catalog number. Additional information is required for the following items:

a. Fixtures: Material description shall include diffuser, hardware, gasketing, reflector and chassis, and finish.

b. Ballasts: Type of ballast, power factor, starting characteristics, temperature and sound rating, input watts and lamp watts.

c. Lighting Poles: Anchoring details, fixture attachment hardware, handholes, and pole mounted accessories or controls.

d. Photo-electric cell units: Switching capacity, lighting level adjustment method, and enclosure.

e. Polar plots on 8-1/2 x 11 inch paper providing candlepower vs. angle and foot-lamberts of brightness vs. angle for longitudinal and traverse axis.

d. Table of utilization factors for calculation of illumination levels by the zonal cavity method.

1.7 OWNER'S MANUAL

A. The following shall be included in the OWNER'S MANUAL in compliance with the current edition of the GREENBOOK:

1. Manufacturer's installation instructions.

2. Manufacturer's maintenance procedures, including dismantling procedures and parts list.

PART 2 -- PRODUCTS

2.1 GENERAL

A. Lighting materials including lighting fixtures, accessories, hardware, and controls shall conform with the detailed requirements indicated on the lighting fixture schedule. Lighting fixtures shall be provided where indicated. Raceway and wire, for other than street lighting, shall be in accordance with Section 16050. Materials for street lighting applications shall be in accordance with SSPWC section 209.

2.2 FIXTURES

A. **General:** Fixtures shall be pre-wired with leads 18 AWG minimum, for Connection to external lighting circuit.

B. **Exterior Fixtures:** Pole-mounted fixtures, in combination with their mounting pole and bracket, shall be designed to withstand 100 MPH winds without damage. Exterior fixtures shall have corrosion-resistant hardware and either hinged door or lens retainer. Fixtures specified with integral photo-electric control shall be of the fixture manufacturer's standard design.

C. **Interior Fixtures:** Interior fluorescent fixtures without diffusers shall be furnished with end plates. Where required, diffusers shall be of high molecular strength acrylic. Minimum thickness of acrylic shall be 0.125 inches, except for those on 4 foot square fixtures which shall be a minimum of 0.187 inches thick.

2.3 LAMPS

A. **Color:** Unless otherwise indicated, fluorescent lamps shall be warm white. Incandescent lamps shall be frosted inside. High-pressure sodium lamps shall be "color corrected."

B. **Other:** Incandescent lamps shall be rated 130V AC. Unless otherwise indicated, lamp shape shall be standard A or PS. Unless otherwise indicated, high-pressure discharge lamps shall be suitable for operation in any burning position.

C. Type: Path and security lighting shall be per San Diego County Code of Regulatory Ordinances section 51.

2.4 PHOTO-ELECTRIC CELL UNITS

A. Photo-electric cell units shall consist of a cadmium sulfide cell housed in a plug receptacle assembly. The plug receptacle assembly shall be three-prong polarized locking type. Assembly shall be weatherproof, suitable for outdoor mounting and shall be rated for 1800 VA capacity at 120V. Unless otherwise indicated, photo-electric cells shall be provided with time-delay features.

2.6 LIGHTING POLES

A. **General:** Lighting poles shall be provided with pole cap and all necessary fixture mounting hardware. Contractor to submit structural calculations for poles.

2.7 LIGHTING JUNCTION BOXES

A. Junction boxes for the distribution of outdoor lighting circuits shall be precast concrete, set flush with the ground. Size shall be approximately 10.5 x 17.25 x 12 inches deep. Junction boxes for street lighting shall be in accordance with SSPWC section 307. Junction box cover, for other than street lighting, shall be cast iron with cast inscription: "LIGHTING".

2.8 LIGHTING CONTROL RELAYS

A. Unless otherwise indicated, relays for lighting control shall be mechanically held, based-mounted, and single-purpose units.

B. Unless otherwise indicated, coil voltage rating shall be 120 volts AC with double break contacts rated 20 amps continuous to 600 volts AC. Contacts shall be marked for ballast lighting (HID), tungsten, and general purpose loads.

2.9 EMERGENCY LIGHTING POWER SUPPLY (NOT USED)

2.10 SPARE LAMPS

A. Spares shall be provided for all lamp types except medium base incandescent lamps rated less than 300 watts. The number of spares shall be equal to 5 percent of each rating type, with a minimum of one standard manufacturer's package.

2.11 MANUFACTURERS

A. Products of the type indicated shall be of the following manufacturer (or equal):

1. **Lamps:**

General Electric

North American Philips (Norelco)

Sylvania

Venture Lighting International

2. **Exterior Security and Pathway Lighting Fixtures and Poles:**

Visionaire Lighting or approved equal

PART 3 -- EXECUTION

3.1 INSTALLATION

A. **General:** Raceways and lighting circuits shall be provided from the fixtures, switches, and fixture outlets to the power panelboard in accordance with the NEC. Raceways and wire shall be provided in accordance with Section 16050. Fixtures shall be aligned and directed to illuminate an area as indicated. A concealed latch and hinge mechanism shall be provided to permit access to the lamps and ballasts and for removal and replacement of the diffuser without removing the fixture from ceiling panels. Fixtures recessed in concrete shall have protective coating of bituminous paint.

B. **Fixtures:** Internally wired conductors of fixtures having a temperature rating exceeding 75 degrees C shall be spliced to circuit conductors in a separately mounted junction box. Fixture shall be connected to junction box using flexible conduit with a temperature rating equal to that of the fixture.

C. **Photo-Electric Cell Units:** Photoelectric cells shall be oriented toward the north.

3.2 CLEANUP

A. Labels and marks, except the UL label, shall be removed from exposed parts of the fixtures. Fixtures shall be cleaned when the project is ready for acceptance.

B. All burned-out, broken, and otherwise disabled lamps shall be replaced when the project is ready for acceptance.

** END OF SECTION **

City of San Diego

CITY CONTACT: Damian Singleton, Contract Specialist, Email: Dsingleton@sandiego.gov
Phone No. (619) 533-3482, Fax No. (619) 533-3633

ADDENDUM "A"

FOR

SILVER WING NEIGHBORHOOD PARK LIGHTING

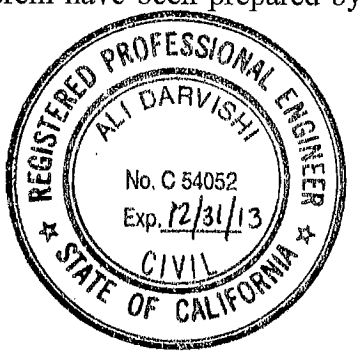
BID NO.:	**L-14-5818-DBB-1**
SAP NO. (WBS/IO/CC):	**S-11051**
CLIENT DEPARTMENT:	**1714**
COUNCIL DISTRICT:	**8**
PROJECT TYPE:	**GB**

BID DUE DATE:

1:30 PM
SEPTEMBER 12, 2013
CITY OF SAN DIEGO
PUBLIC WORKS CONTRACTING GROUP
1010 SECOND AVENUE, SUITE 1400, MS 614C
SAN DIEGO, CA 92101

ENGINEER OF WORK

The engineering Specifications and Special Provisions contained herein have been prepared by or under the direction of the following Registered Engineer:



For City Engineer

8/27/13
Date

Seal:

A. CHANGES TO CONTRACT DOCUMENTS

The following changes to the Contract Documents are hereby made effective as though originally issued with the bid package. Bidders are reminded that all previous requirements to this solicitation remain in full force and effect.

THE SUBMITTAL DATE FOR THIS PROJECT HAS BEEN **EXTENDED AS STATED ON THE COVER PAGE.**

B. BIDDER's QUESTIONS

Questions pertaining to Scope or Specifications

Q1. All sections of concrete vary in size with some of the existing cement panel sections being over 15'. Do we have to replace full panels of concrete in all areas where demoed?

A1. If the Contractor proposes to demolish concrete panels to support their electrical work, then concrete panels may be saw cut at the City's discretion. During construction, the Contractor shall submit proposed concrete demolition plans to support their electrical duct bank work. If during construction, the City determines the Contractor's proposed panel saw cuts are not appropriate, then the Contractor shall replace the full panel, as a no cost change.

Q2. Do all replaced sections of concrete have to be doweled and epoxied? If so, what is the minimum size of rebar?

A2. Replaced sections of the concrete shall be dowelled in accordance with the San Diego Regional Standard Drawing "G-10 Concrete Joint Detail".

Q3. There is no clearance to install a new panel by code in the electrical room located at the comfort station. Should we assume that the new panel location is to be installed outside on the rear side of the comfort station?

If so, should the panel be NEMA 3R or 4R? If so, can we eliminate the NEMA 4R junction box on the plans?

A3. If the Contractor is unable to install the new panel against the wall based on existing conditions and the size of the proposed panel, then a NEMA 4R enclosure on the outside of the building as a no cost change is acceptable.A separate NEMA 4R junction box shall be required as shown on the Plans.

Q4. On pg E-4 #2 (the bottom depiction) There is no diameter of the concrete foundation/base for the light poles. What is the specified diameter for this projects light pole foundations/bases?

A4. Support Structure Wind Load Strength: Poles and other support structures, brackets, arms, bases, anchorages and foundations shall be determined based on a

wind speed of 100 MPH, Exposure Category C and an Importance Factor of 1.0. Luminaire, visor, and cross-arm shall withstand 150 mph winds and maintain luminaire aiming alignment.

Structural Design: The stress analysis and safety factor of the poles shall conform to AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals.

Soil Conditions: A geotechnical report is not provided by the City. The Contractor shall determine at their own expense whether or not they need a geotechnical report for proper design and installation of the light poles. The foundation design shall be based on soils that meet or exceed those of a Class 5 material as defined by 2007 CBC, Table 1804.2.

It shall be the Contractor's responsibility to notify the City if any soil conditions exist other than those on which the foundation design is based, or if the soil cannot be readily excavated. The City may a Field Order for differing site conditions based on the following:

- Providing engineered foundation embedment design by a registered engineer in the State of California.
- Additional materials required to achieve alternate foundation.
- Excavation and removal of materials other than normal soils, such as rock, caliche, etc.
- Foundation Drawings: Project specific foundation drawings stamped by a registered engineer. The foundation drawings shall list the moment, shear (horizontal) force, and axial (vertical) force at ground level for each pole.

Q5 Does the city really want that overkill, waste of money duct bank as shown on the plans for conduit in a park?

A5. Install ducts banks per sheet E-3, keyed note 2, and detail 3/E-4. Only this detail applies under the parking lot as shown on the Plans.

Tony Heinrichs, Director
Public Works Department

Dated: *September 4, 2013*
San Diego, California

TH/NB/DS/egz

City of San Diego

CONTRACTOR'S NAME: CURTO CONSTRUCTION COMPANY
ADDRESS: 5502 CONNECTICUT AVENUE LA MESA CA 91942-1116
TELEPHONE NO.: 619 961 3156 FAX NO.: N/A
CITY CONTACT: Damian Singleton, CONTRACT SPECIALIST, Email: Dsingleton@sandiego.gov
Phone No.: (619) 533-3482, Fax No.; (619) 533-3633
L.C.Ritter/NB/egz

CONTRACT DOCUMENTS

FOR

SILVER WING NEIGHBORHOOD PARK LIGHTING

VOLUME 2 OF 2

BID NO.:	L-14-5818-DBB-1
SAP NO. (WBS/IO/CC):	S-11051
CLIENT DEPARTMENT:	1714
COUNCIL DISTRICT:	8
PROJECT TYPE:	GB

THIS CONTRACT IS SUBJECT TO THE FOLLOWING:

- THE CITY'S SUBCONTRACTING PARTICIPATION REQUIREMENTS FOR SLBE PROGRAM.
- COMPETITION RESTRICTED TO: SLBE-ELBE ☐ or ELBE ☒ FIRMS ONLY.

THIS BIDDING DOCUMENT TO BE SUBMITTED IN ITS ENTIRETY
REFER TO VOLUME 1 COVER PAGE FOR TIME, DATE, AND LOCATION

TABLE OF CONTENTS

Volume 2 - Bidding Documents

The following forms must be completed in their entirety and submitted with the Bid. Include the form(s) even if the information does not apply. Where the information does not apply write in N/A. Failure to include any of the forms may cause the Bid to be deemed **non-responsive.** If you are uncertain or have any questions about any required information, contact the City no later than 14 days prior to Bid due date.

PROPOSAL

Bidder's General Information

To the City of San Diego:

Pursuant to "Notice Inviting 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 Curton Const Co

(2) Signature (Given and surname) of proprietor [signature]

(3) Place of Business (Street & Number) 5502 Connecticut Ave

(4) City and State La Mesa Ca Zip Code 91942

(5) Telephone No. 619 961 3156 Facsimile No. N/A

IF A PARTNERSHIP, SIGN HERE:

(1) Name under which business is conducted _____

(2) Name of each member of partnership [indicate character of each partner, general or special (limited):

_____

_____

(3) Signature (Note: Signature must be made by a general partner)

_____

Full Name and Character of partner

_____

_____

(4) Place of Business (Street & Number) _____

(5) City and State _____ Zip Code _____

(6) Telephone No. _____ Facsimile No. _____

IF A CORPORATION, SIGN HERE:

(1) Name under which business is conducted _____

(2) Signature, with official title of officer authorized to sign for the corporation:

_____
(Signature)

_____
(Printed Name)

_____
(Title of Officer)

(Impress Corporate Seal Here)

(3) Incorporated under the laws of the State of _____

(4) Place of Business (Street & Number) _____

(5) City and State _____ Zip Code _____

(6) Telephone No. _____ Facsimile No. _____

THE FOLLOWING SECTIONS MUST BE FILLED IN BY ALL PROPOSERS:

In accordance with the "**Notice Inviting 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, C-10

LICENSE NO. 370276 EXPIRES 3/31, 2015

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): [redacted]

E-Mail Address: 331 ccc @ gmail.com

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 OWNER

SUBSCRIBED AND SWORN TO BEFORE ME, THIS _____ DAY OF _____, 2_____.

Notary Public in and for the County of _____, State of _____

see attached for CALIF. jurat

(NOTARIAL SEAL)

NON-COLLUSION AFFIDAVIT TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID UNDER 23 USC 112 AND PCC 7106

State of California)
) ss.
County of SAN DIEGO)

PETER CURTO, being first duly sworn, deposes and says that he or she is OWNER 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: _____

Title: OWNER

Subscribed and sworn to before me this _____ day of _____, 2_____

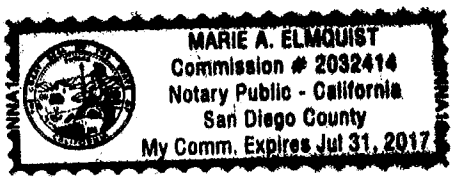
See attached for CALIF. jurat
Notary Public

(SEAL)

State of California
County of San Diego

Subscribed and sworn to (or affirmed) before me on this 4 day of September, 2013, by Peter Curto, proved to me on the basis of satisfactory evidence to be the person(s) who appeared before me.

(Seal)



Signature Marie A. Elmquist

State of California
County of San Diego

Subscribed and sworn to (or affirmed) before me on this 4 day of September, 2013, by Peter Curto, proved to me on the basis of satisfactory evidence to be the person(s) who appeared before me.

(Seal)

MARIE A. ELMQUIST
Commission # 2032414
Notary Public - California
San Diego County
My Comm. Expires Jul 31, 2017

Signature Marie A. Elmquist

State of California
County of San Diego

Subscribed and sworn to (or affirmed) before me on this 4 day of September, 2013, by Peter Curto, proved to me on the basis of satisfactory evidence to be the person(s) who appeared before me.

(Seal)

MARIE A. ELMQUIST
Commission # 2032414
Notary Public - California
San Diego County
My Comm. Expires Jul 31, 2017

Signature Marie A. Elmquist

State of California
County of San Diego

Subscribed and sworn to (or affirmed) before me on this 4 day of September, 2013, by Peter Curto, proved to me on the basis of satisfactory evidence to be the person(s) who appeared before me.

(Seal)

MARIE A. ELMQUIST
Commission # 2032414
Notary Public - California
San Diego County
My Comm. Expires Jul 31, 2017

Signature Marie A. Elmquist

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 10 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 10 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:

DATE OF CLAIM	LOCATION	DESCRIPTION OF CLAIM	LITIGATION (Y/N)	STATUS	RESOLUTION/REMEDIAL ACTION TAKEN

Contractor Name: CURTO CONST CO

Certified By PETER CURTO Title OWNER

Name

Signature Date 9/5/2013

USE ADDITIONAL FORMS AS NECESSARY

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: CURTO CONST CO	Contact Name: PETER CURTO
Company Address: 5502 CONNECTICOT AVE	Contact Phone: 619 961 3156
LA MESA, CA 91942	Contact Email: 331 CCC@GMAIL.COM

CONTRACT INFORMATION

Contract Title: SILVER WING PARK LIGHTING	Start Date: 12/1/2013
Contract Number (if no number, state location): S-11051	End Date: 4/1/2014

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.

PETER CURTO / OWNER — Name/Title of Signatory

Signature

FOR OFFICIAL CITY USE ONLY

Receipt Date: EBO Analyst: ☐ Approved ☐ Not Approved – Reason:

(Rev 02/15/2011)

PROPOSAL (BID)

The Bidder agrees to the construction of **SILVER WING NEIGHBORHOOD PARK LIGHTING**, 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	Quantity	Unit	Payment Reference	NAICS	Description	Unit Price	Extension
BASE BID							
1.	1	LS	2-4.1	524126	Bonds (Payment and Performance)		$ 6,000.00
2.	1	LS	9-3.1	238210	Installation of Security Lighting		$ 167,850.00
3.	1	LS	701-13.9.5	237990	Construction BMP's		$ 3,000.00
4.	1	AL	7-5.3	238210	Permits-Type I Allowance		$3,000.00
5.	1	AL	9-3.5	238210	Field Orders-Type II Allowance		$10,000.00
						ESTIMATED TOTAL BASE BID	$ 189,850.00

TOTAL BID PRICE FOR BID (Items 1 through 5 inclusive) amount written in words:

ONE HUNDRED EIGHTY NINE THOUSAND EIGHT HUNDRED FIFTY AND 00/100 DOLLARS

The Bid shall contain an acknowledgment of receipt of all addenda, the numbers of which shall be filled in on the Bid form. If an addendum or addenda has been issued by the City and not noted as being received by the Bidder, this proposal shall be rejected as being **non-responsive**. The following addenda have been received and are acknowledged in this bid: ~~NONE~~ "A"

The names of all persons interested in the foregoing proposal as principals are as follows:

PETER CURTO

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.

Bidder: PETER CURTO

Title: OWNER

Business Address: 5502 Connecticut Ave La Mesa CA 91942

Place of Business: Same

Place of Residence: Same

Signature:

NOTES:

A. The City shall determine the low Bid based on the Base Bid alone.

B. 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 bid proposal.

C. Failure to initial all corrections made in the bidding documents shall cause the Bid to be rejected as **non-responsive** and ineligible for further consideration.

D. Blank spaces must be filled in, using figures. Bidder's failure to submit a price for any Bid item that requires the Bidder to submit a price shall render the Bid **non-responsive** and shall be cause for its rejection.

E. 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.

F. 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.

G. 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.

H. Bids 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.

LIST OF SUBCONTRACTORS

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 Bidder 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 Contractor's total Bid. The Bidder shall also list below the portion of the work which will be done by each subcontractor under this Contract. The Contractor 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 Bidder'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 Bidders' own forces. The Bidder shall list all SLBE, ELBE, DBE, DVBE, MBE, WBE, OBE, SDB, WoSB, HUBZone, and SDVOSB Subcontractors that Bidders 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 SDVOSB①	WHERE CERTIFIED ②	CHECK IF JOINT VENTURE PARTNERSHIP
Name: NONE Address: City: State: Zip: Phone:						
Name: Address: City: State: Zip: Phone:						
Name: Address: City: State: Zip: Phone:						

① As appropriate, Bidder 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, Bidder 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 Bidder will not receive any subcontracting participation percentages if the Bidder fails to submit the required proof of certification.

NAMED EQUIPMENT/MATERIAL SUPPLIER LIST

The Bidder seeking the recognition of equipment, materials, or supplies obtained from Suppliers towards achieving any mandatory, voluntary, or both subcontracting participation percentages shall list the Supplier(s) on 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 Bidder will be credited up to 60% of the amount to be paid to the Suppliers for such materials and supplies unless vendor manufactures or substantially alters materials and supplies in which case 100% will be credited. The Bidder is to 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 Percentage, 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 SDVOSB①	WHERE CERTIFIED ②
Name: NONE Address: City: State: Zip: Phone:						
Name: Address: City: State: Zip: Phone:						
Name: Address: City: State: Zip: Phone:						

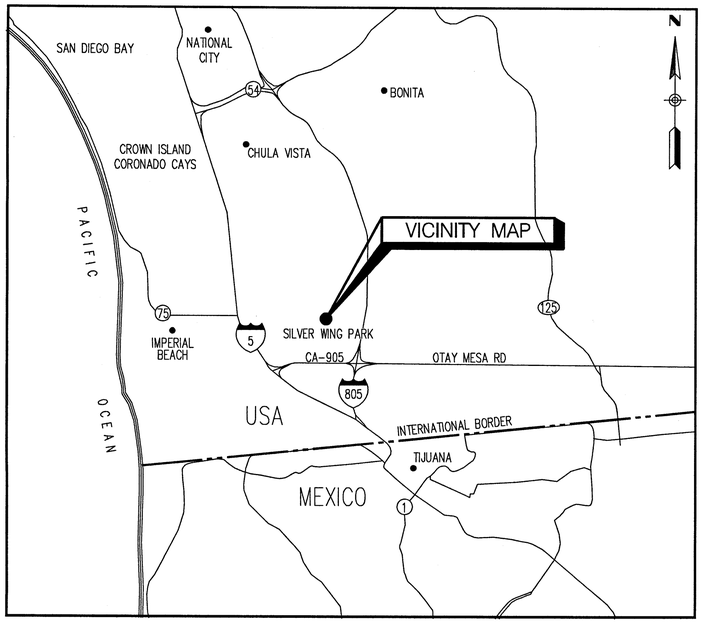
① As appropriate, Bidder shall identify Vendor/Supplier as one of the following and shall include a valid proof of certification (except for OBE, SLBE and ELBE):

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, Bidder 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 Bidder will not receive any subcontracting participation percentages if the Bidder fails to submit the required proof of certification.

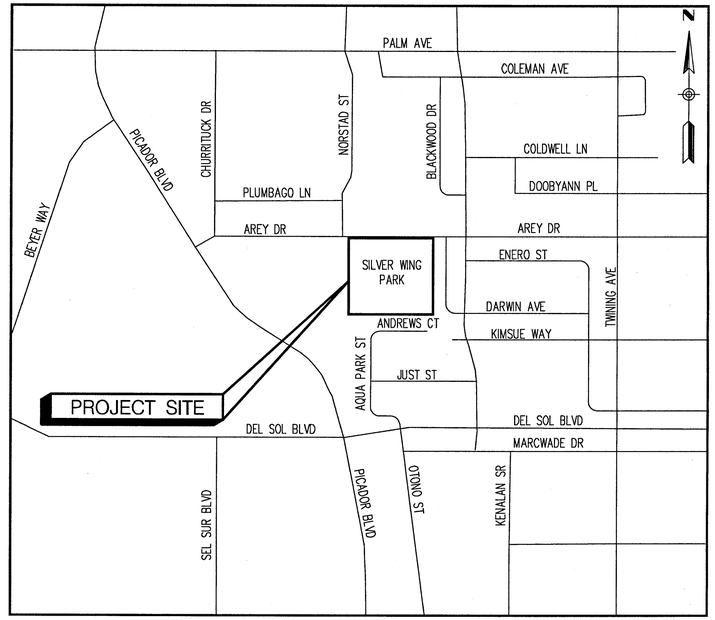


VICINITY MAP
NOT TO SCALE

CITY OF SAN DIEGO

PLANS FOR THE CONSTRUCTION OF

SILVER WING PARK SECURITY LIGHTING



LOCATION MAP
NOT TO SCALE

* I HEREBY DECLARE THAT I AM THE ENGINEER OF WORK FOR THIS PROJECT, THAT I HAVE EXERCISED RESPONSIBLE CHARGE OVER THE DESIGN OF THE PROJECT AS DEFINED IN SECTION 6703 OF THE BUSINESS AND PROFESSIONS CODE, AND THAT THE DESIGN IS CONSISTENT WITH CURRENT STANDARDS. I UNDERSTAND THAT THE CHECK OF PROJECT DRAWINGS AND SPECIFICATIONS BY THE CITY OF SAN DIEGO IS CONFINED TO A REVIEW ONLY AND DOES NOT RELIEVE ME, AS ENGINEER OF WORK, OF MY RESPONSIBILITIES FOR PROJECT DESIGN.

Eric R. Lovering — 05/03/2013
(ENGINEER'S NAME) — DATE

BASIS OF DESIGN

2010 CALIFORNIA BUILDING CODE
2010 CALIFORNIA ELECTRICAL CODE
2010 CALIFORNIA PLUMBING CODE

CONSTRUCTION CHANGE / ADDENDUM			
CHANGE	DATE	AFFECTED OR ADDED SHEET NUMBERS	APPROVAL NO.

WARNING
0 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

CITY OF SAN DIEGO
PUBLIC WORKS PROJECT

TEMPORARY BMP CONSTRUCTION SITE STORM WATER PRIORITY: HIGH ____ MEDIUM ____ LOW_X_

CONSULTANT

LEE & RO, Inc.
San Diego, California

SPEC. NO. 5818

REGISTERED PROFESSIONAL ENGINEER — ERIC R. LOVERING — No.E18727 — ELECTRICAL — STATE OF CALIFORNIA

G-1

SILVER WING PARK
SECURITY LIGHTING

COVER SHEET

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING AND CAPITAL PROJECTS DEPARTMENT
SHEET 01 OF 10 SHEETS

APPROVED: Samir M. FOR CITY ENGINEER — 5/9/13 DATE

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	LRI			

CONTRACTOR _____ DATE STARTED _____
INSPECTOR _____ DATE COMPLETED _____

WBS S-11051
SUBMITTED BY: SAMIR MAHMALJI, PROJECT OFFICER II
CLARK RITTER, PROJECT MANAGER
150-1749 CCS27 COORDINATE
6310407, 1790444 CCS83 COORDINATE
36661-01-D

SILVER WING PARK SECURITY LIGHTING

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DRAWING INDEX

CITY OF SAN DIEGO DRAWING NO.	SHEET NO.	DESCRIPTION
		GENERAL
36661-01-D	G-1	COVER SHEET
36661-02-D	G-2	DRAWING INDEX AND PROJECT DATA
36661-03-D	G-3	STANDARDS, LEGENDS, GENERAL NOTES, & ABBREVIATIONS
		DEMOLITION
36661-04-D	D-1	ELECTRICAL DEMOLITION PLAN
		ELECTRICAL
36661-05-D	E-1	ELECTRICAL LEGENDS, SYMBOLS & ABBREVIATIONS
36661-06-D	E-2	PATHWAY PHOTOMETRIC PLAN
36661-07-D	E-3	ELECTRICAL SITE PLAN
36661-08-D	E-4	ELECTRICAL DETAILS
36661-09-D	E-5	SINGLE LINE DIAGRAM & PANEL SCHEDULE
36661-10-D	E-6	TITLE 24

PROJECT DIRECTORY

LEE & RO, INC.
10640 SCRIPPS RANCH BLVD., SUITE 150
SAN DIEGO, CA 92131
PH: (858) 558-4411

AGUIRRE & ASSOCIATES
8265 COMMERCIAL STREET, SUITE 1
LA MESA, CA 91942
PH: (619) 464-6978

PROJECT DATA

PROJECT NAME: SILVER WING PARK - SECURITY LIGHTING UPGRADES

PROJECT ADDRESS: SILVER WING PARK
3735 AREY DRIVE
SAN DIEGO, CA 92154

ZONE: GRID TITLE 6; AR-1-1
OWNER: CITY OF SAN DIEGO

ASSESSOR'S PARCEL NUMBER: 630-330-09 AND 630-330-13

LEGAL DESCRIPTION: A PORTION OF WEST HALF OF THE EAST HALF OF QUARTER OF SECTION 26, TOWNSHIP 18 SOUTH, RANGE 2 WEST, SAN BERNARDINO MERIDIAN, IN THE CITY OF SAN DIEGO

SCOPE OF WORK

THE WORK IN THIS CONTRACT COMPRISES THE FOLLOWING:

1. PROVIDE SECURITY LIGHTING AROUND PARK PATHWAYS.

INDEX OF DISCIPLINES

G	GENERAL
C	CIVIL
D	DEMOLITION
S	STRUCTURAL
M	MECHANICAL
E	ELECTRICAL
I	INSTRUMENTATION

UNDERGROUND UTILITIES

THE CONTRACTOR SHALL, AT LEAST THREE (3) WORKING DAYS PRIOR TO THE START OF WORK, NOTIFY THE FOLLOWING UTILITIES AND REQUEST THAT THEIR UNDERGROUND FACILITIES BE MARKED OUT. THIS REQUEST SHALL BE MADE BY THE CONTRACTOR PRIOR TO ALL TRENCHING OPERATIONS, REGARDLESS OF WHETHER THE PLANS SHOW UNDERGROUND TELEPHONE OR GAS AND ELECTRIC DUCTS, CABLES OR PIPELINES.

UNDERGROUND SERVICE ALERT	1-800-227-2600, 1-800-422-4133
SAN DIEGO GAS & ELECTRIC	1-800-227-2600, 811
AT&T	1-800-227-2600, 811
COSD NEIGHBORHOOD CODE COMPLIANCE DIVISION	1-619-236-5500
UNDERGROUND WATER/SEWER MARKOUT	1-619-527-3477
CITY IRRIGATION SYSTEMS AND WIRING	1-619-235-1179
STREET DIVISION/STREET LIGHTS	1-619-527-7500
WIRELESS COMMUNICATIONS	1-619-236-6081
SAN DIEGO FIRE DEPARTMENT	911
POLICE DEPARTMENT DISPATCH	911
ENVIRONMENTAL SERVICES	1-858-492-5055

CONTRACTOR'S RESPONSIBILITIES

1. PURSUANT TO SECTION 4216 OF THE GOVERNMENT CODE, AT LEAST 2 WORKING DAYS PRIOR TO COMMENCING ANY EXCAVATION, THE CONTRACTOR SHALL CONTACT THE REGIONAL NOTIFICATION CENTER (UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA) AND OBTAIN AN INQUIRY IDENTIFICATION NUMBER.
2. THE CONTRACTOR SHALL NOTIFY SDG&E AT LEAST 10 WORKING DAYS PRIOR TO EXCAVATING WITHIN 10' OF SDG&E UNDERGROUND HIGH VOLTAGE TRANSMISSION POWER LINES. (I.e., 69 KV & HIGHER)

GENERAL LEGEND

- CENTERLINE
- 123 — CONTOUR LINE, PROPOSED FINISHED GRADE
- 123.20 — SPOT ELEVATION
- (123.20) — SPOT ELEVATION
- PROPOSED REDUCER, PROPOSED PIPE
- EXISTING REDUCER
  NOTE: EXISTING REDUCER TO BE SHOWN ONLY WHEN CONNECTING TO A PROPOSED PIPE.
- PVMT — PAVEMENT
- GRADE — GRADE
- CURB LINE
- PROPERTY LINE ALONG STREET OR ALLEY R/W
- MH — EXISTING MANHOLE - PLAN
- 227 — MAJOR CONTOUR
- MINOR CONTOUR
- CONTROL POINT
- TREE
- RCV® — RECLAIMED WATER VALVE
- WM□ — WATER METER
- SIGN ▷ — SIGN
- E PB ▪ — ELECTRICAL PULLBOX
- ICV ⧈ — IRRIGATION CONTROL VALVE
- LT — LIGHT STANDARD
- CHAINLINK FENCE
- NEW LIGHT POST

MATERIAL SYMBOLS

- CONCRETE
- CHECKERED PLATE
- GRASS
- GRATING
- EARTH

SILVER WING PARK SECURITY LIGHTING

G-2

SILVER WING PARK
SECURITY LIGHTING

DRAWING INDEX AND PROJECT DATA

CONSTRUCTION CHANGE / ADDENDUM

CHANGE	DATE	AFFECTED OR ADDED SHEET NUMBERS	APPROVAL NO.

WARNING
0 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

CITY OF SAN DIEGO
PUBLIC WORKS PROJECT

TEMPORARY BMP CONSTRUCTION SITE STORM WATER PRIORITY: HIGH ____ MEDIUM ____ LOW__X__

CONSULTANT

LEE & RO, Inc.
San Diego, California

SPEC. NO. 5818

REGISTERED PROFESSIONAL ENGINEER — VANESSA M. WILKES — No. C73111 — Exp. 12/31/14 — CIVIL — STATE OF CALIFORNIA

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING AND CAPITAL PROJECTS DEPARTMENT
SHEET 02 OF 10 SHEETS

APPROVED Samir M 5/9/13
FOR CITY ENGINEER DATE

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	LRI			

CONTRACTOR _____ DATE STARTED _____
INSPECTOR _____ DATE COMPLETED _____

WBS S-11051
SUBMITTED BY: SAMIR MAHMALJI, PROJECT OFFICER II
CLARK RITTER, PROJECT MANAGER
150-1749, CC827 COORDINATE
6310407, 1790444, CC383 COORDINATE
36661-02-D

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GENERAL NOTES

1. APPROVAL OF THESE PLANS BY THE CITY ENGINEER DOES NOT AUTHORIZE ANY WORK TO BE PERFORMED UNTIL •A PERMIT/•A NOTICE TO PROCEED HAS BEEN ISSUED.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SURVEY MONUMENTS AND/OR VERTICAL CONTROL BENCHMARKS WHICH ARE DISTURBED OR DESTROYED BY CONSTRUCTION. A LAND SURVEYOR MUST FIELD LOCATE, REFERENCE, AND/OR PRESERVE ALL HISTORICAL OR CONTROLLING MONUMENTS PRIOR TO ANY EARTHWORK. IF DESTROYED, A LAND SURVEYOR SHALL REPLACE SUCH MONUMENTS WITH APPROPRIATE MONUMENTS. A CORNER RECORD OR RECORD OF SURVEY, AS APPROPRIATE, SHALL BE FILED AS REQUIRED BY THE PROFESSIONAL LAND SURVEYORS ACT, SECTION 8771OF THE BUSINESS AND PROFESSIONS CODE OF THE STATE OF CALIFORNIA. IF ANY VERTICAL CONTROL IS TO BE DISTURBED OR DESTROYED, THE CITY OF SAN DIEGO FIELD SURVEY SECTION MUST BE NOTIFIED, IN WRITING, AT LEAST 3 DAYS PRIOR TO THE CONSTRUCTION. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE COST OF REPLACING ANY VERTICAL CONTROL BENCHMARKS DESTROYED BY THE CONSTRUCTION.
3. IMPORTANT NOTICE: SECTION 4216 OF THE GOVERNMENT CODE REQUIRES A DIG ALERT IDENTIFICATION NUMBER BE ISSUED BEFORE A "PERMIT TO EXCAVATE" WILL BE VALID. FOR YOUR DIG ALERT I.D. NUMBER, CALL UNDERGROUND SERVICE ALERT, TOLL FREE 1-800-422-4133, THREE DAYS BEFORE YOU DIG.
4. CONTRACTOR SHALL IMPLEMENT AN EROSION AND SEDIMENT CONTROL PROGRAM DURING THE PROJECT GRADING AND/OR CONSTRUCTION ACTIVITIES. THE PROGRAM SHALL MEET ALL APPLICABLE REQUIREMENTS OF THE STATE WATER RESOURCES CONTROL BOARD AND THE CITY OF SAN DIEGO MUNICIPAL CODE AND STORM WATER STANDARDS MANUAL.
5. NOT USED.
6. ALL EXISTING AND/OR PROPOSED PUBLIC UTILITY SYSTEM AND SERVICE FACILITIES SHALL BE INSTALLED UNDERGROUND IN ACCORDANCE WITH SECTION 144.0240 OF THE MUNICIPAL CODE.
7. PRIOR TO ANY DISTURBANCE TO THE SITE, EXCLUDING UTILITY MARK-OUTS AND SURVEYING, THE CONTRACTOR SHALL MAKE ARRANGEMENTS FOR A PRE-CONSTRUCTION MEETING WITH THE CITY OF SAN DIEGO FIELD ENGINEERING DIVISION (858) 627-3200.
8. DEVIATIONS FROM THESE SIGNED PLANS WILL NOT BE ALLOWED UNLESS A CONSTRUCTION CHANGE IS APPROVED BY THE CITY ENGINEER OR THE CHANGE IS REQUIRED BY THE CITY INSPECTOR.
9. AS-BUILT DRAWINGS MUST BE SUBMITTED TO THE RESIDENT ENGINEER PRIOR TO ACCEPTANCE OF THIS PROJECT BY THE CITY OF SAN DIEGO.
10. THE AREA WHICH IS DEFINED AS A NON GRADING AREA AND WHICH IS NOT TO BE DISTURBED SHALL BE STAKED PRIOR TO START OF THE WORK. THE PERMIT APPLICANT AND ALL OF THEIR REPRESENTATIVES OR CONTRACTORS SHALL COMPLY WITH THE REQUIREMENTS FOR PROTECTION OF THIS AREA AS REQUIRED BY ANY APPLICABLE AGENCY. ISSUANCE OF THE CITY'S GRADING PERMIT SHALL NOT RELIEVE THE APPLICANT OR ANY OF THEIR REPRESENTATIVES OR CONTRACTORS FROM COMPLYING WITH ANY STATE OR FEDERAL REQUIREMENTS BY AGENCIES INCLUDING, BUT NOT LIMITED TO, CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, CALIFORNIA DEPARTMENT OF FISH AND GAME. COMPLIANCE MAY INCLUDE OBTAINING PERMITS, OTHER AUTHORIZATIONS, OR COMPLIANCE WITH MANDATES BY ANY APPLICABLE STATE OR FEDERAL AGENCY.

GRADING NOTES

1. GRADING AS SHOWN ON THESE PLANS SHALL BE IN CONFORMANCE WITH CURRENT STANDARD SPECIFICATIONS AND CHAPTER 14, ARTICLE 2, DIVISION 1, OF THE SAN DIEGO MUNICIPAL CODE.
2. GRADED, DISTURBED, OR ERODED AREAS THAT WILL NOT BE PERMANENTLY PAVED, COVERED BY STRUCTURE, OR PLANTED FOR A PERIOD OVER 90 DAYS SHALL BE TEMPORARILY RE-VEGETATED WITH A NON-IRRIGATED HYDROSEED MIX, GROUND COVER, OR EQUIVALENT MATERIAL.

REFERENCE DRAWINGS

1. SILVER WING PARK IMPROVEMENT PROJECT, 15692-D
2. SILVER WING PARK ADA IMPROVEMENT PROJECT, 35482-D
3. SILVER WING PARK RECREATION CENTER PROJECT, CA-SDG8108A

BENCHMARK

CITY OF SAN DIEGO BRASS DISK "SORRENTO-2"
ELEV. 357.68'

WORK TYPE DESIGNATIONS

OR (D) - DEMOLITION

OR (E) - EXISTING

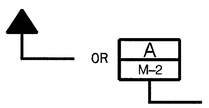
OR (N) - NEW WORK

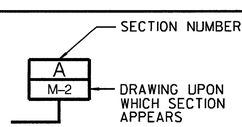
ABBREVIATIONS

ABAND	ABANDON
AC	ASPHALT CONCRETE
AD	AREA DRAIN
ASSY	ASSEMBLY
BFG	BELOW FINISHED GRADE
BTWN	BETWEEN
C, ℄	CENTERLINE
CB	CATCH BASIN
CO	CLEAN OUT
CONC	CONCRETE
COND	CONDUIT
(D)	DEMOLISH
DF	DRINKING FOUNTAIN
DG	DECOMPOSED GRANITE
DIA	DIAMETER
EL, ELEV	ELEVATION
ELEC	ELECTRICAL
(E), EX, EXIST	EXISTING
EV	ELECTRICAL VAULT
FD	FLOOR DRAIN
FF	FILTER FEED, FINISHED FLOOR
FG	FINISHED GRADE
FH	FIRE HYDRANT
FL	FLOW LINE
FP	FLAG POLE
FPW	FIRE PROTECTION WATER
FS	FINISHED SURFACE
GS	GROUND SHOT
GV	GATE VALVE
HP	HIGH PRESSURE
IE	INVERT ELEVATION
LWL	LOW WATER LEVEL
(N)	NEW
NG	NATURAL GAS
POC	POINT OF CONNECTION
PROP	PROPOSED
PW	POTABLE WATER
RT	RIGHT
S	SURVEY LINE
SD	STORM DRAIN
SDG&E	SAN DIEGO GAS AND ELECTRIC
SDMH	STORM DRAIN MANHOLE
SDR	SUMP DRAIN
SDRMH	SUMP DRAIN MANHOLE
SLV	STREET LIGHT VAULT
SMH	SEWER MANHOLE
SST	STAINLESS STEEL
STR	STRUCTURAL
SVT	SANITARY VENT
SWR	SEWER
TC	TOP OF CURB
TEL	TELEPHONE
TG	TOP OF GRATE
TP	TOP OF PIPE
UMH	UTILITY MANHOLE
UNK	UNKNOWN
UV	UTILITY VAULT

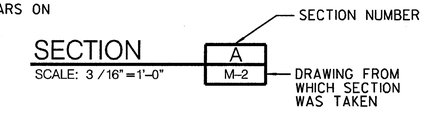
SECTION AND DETAIL IDENTIFICATION

SECTION CUT ON DRAWING G-1:

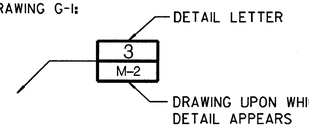




SECTION AS APPEARS ON DRAWING G-2:



PROJECT SPECIFIC DETAIL CALLED OUT ON DRAWING G-1:



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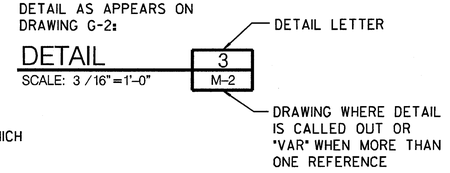
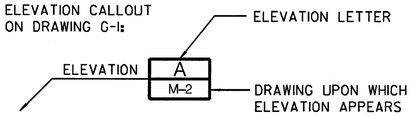
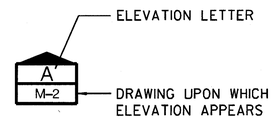


ELEVATION CALLOUT ON DRAWING G-1:





TRAFFIC CONTROL GENERAL NOTES

1. COMPLY WITH STANDARD SPECIFICATION FOR PUBLIC WORKS CONSTRUCTION, 2009 EDITION, SECTION 7-10.1 THRU 7-10.4.
2. PLANS SHALL BE SUBMITTED TO THE CITY FOR REVIEW AND APPROVAL A MINIMUM OF 10 WORKING DAYS PRIOR TO THE START OF WORK.
3. IT IS THE RESPONSIBILITY OF THE CONTRACTOR PERFORMING WORK ON CITY PROPERTY TO INSTALL AND MAINTAIN THE TRAFFIC CONTROL DEVICES TO INSURE THE SAFE MOVEMENT OF TRAFFIC AND PEDESTRIANS THROUGH OR AROUND THE WORK AREA AND PROVIDE MAXIMUM PROTECTION AND SAFETY TO CONSTRUCTION WORKERS.
4. THE CONTRACTOR SHALL HAVE ALL SIGNS, DELINEATORS, BARRICADES, ETC. PROPERLY PLACED PRIOR TO COMMENCING CONSTRUCTION.
5. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN TEMPORARY SHORING, BRACING, BARRICADES AND PROTECTIVE MEASURES, ETC., REQUIRED TO SAFELY PROTECT THE ENTIRE CONSTRUCTION SITE PERIPHERY, CONSTRUCTION PERSONNEL, CITY STAFF, AND THE PUBLIC. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ALL OF THE ABOVE 24 HOURS PER DAY DURING THE PERIOD OF CONSTRUCTION.

SILVER WING PARK SECURITY LIGHTING

G-3

SILVER WING PARK
SECURITY LIGHTING

STANDARDS, LEGENDS, GENERAL NOTES, & ABBREVIATIONS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING AND CAPITAL PROJECTS DEPARTMENT
SHEET 03 OF 10 SHEETS

WBS S-11051

APPROVED Samir M FOR CITY ENGINEER — DATE 5/9/13

SUBMITTED BY SAMIR MAHMALJI, PROJECT OFFICER II

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	LRI			

CLARK RITTER, PROJECT MANAGER

150-1749 CCS27 COORDINATE

6310407, 1790444 CCS83 COORDINATE

CONTRACTOR _____ DATE STARTED _____
INSPECTOR _____ DATE COMPLETED _____

36661-03-D

TEMPORARY BMP CONSTRUCTION SITE STORM WATER PRIORITY: HIGH ____ MEDIUM ____ LOW _X_

SPEC. NO. 5818

CONSULTANT

LEE & RO, Inc.
San Diego, California

REGISTERED PROFESSIONAL ENGINEER — VANESSA M. WILLIAMS — No. C73111 — Exp. 12/31/14 — CIVIL — STATE OF CALIFORNIA

CONSTRUCTION CHANGE / ADDENDUM

CHANGE	DATE	AFFECTED OR ADDED SHEET NUMBERS	APPROVAL NO.

WARNING

0 1

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

CITY OF SAN DIEGO
PUBLIC WORKS PROJECT

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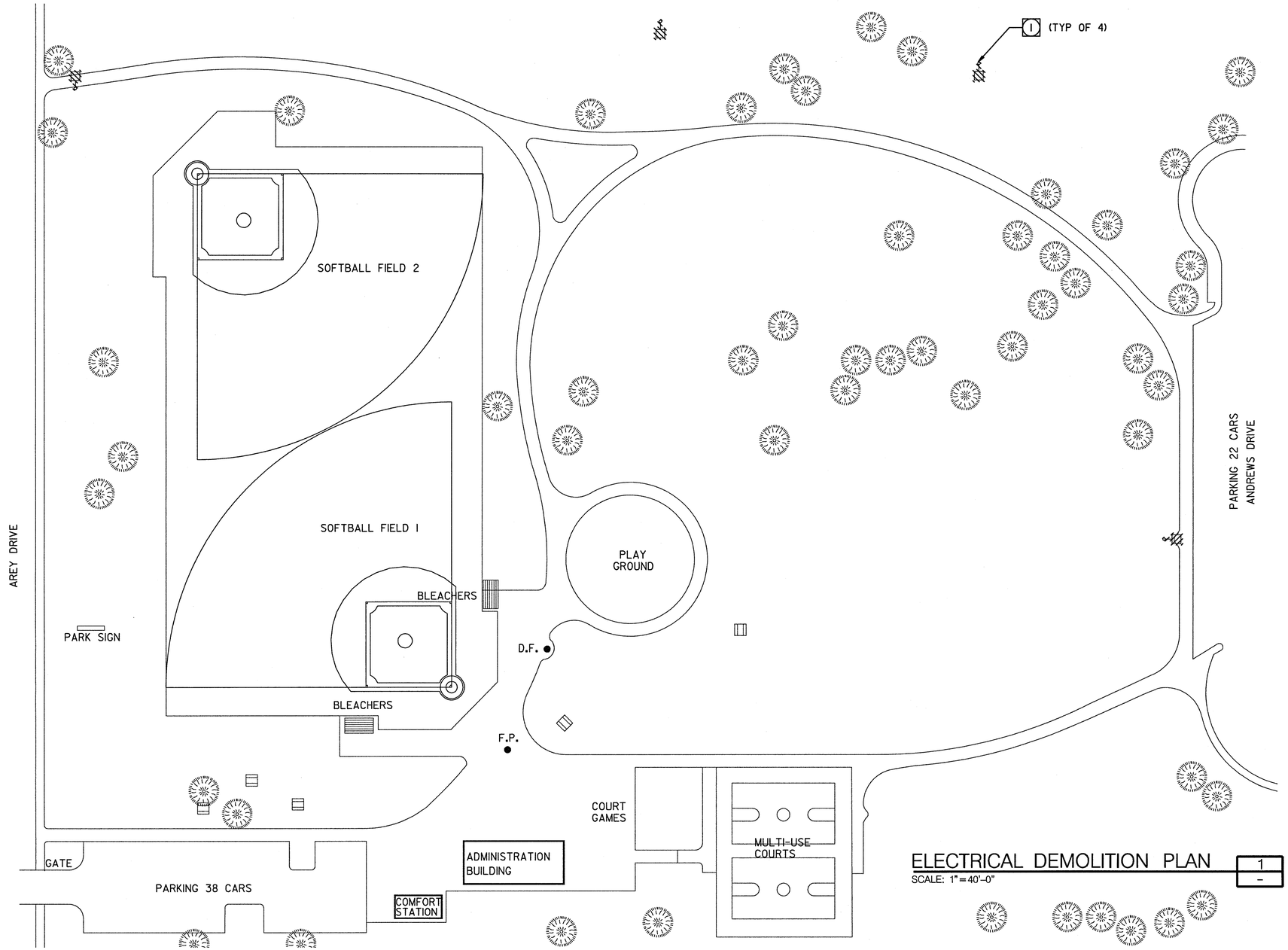

ELECTRICAL DEMOLITION PLAN

SCALE: 1"=40'-0"

1
–

N

0 40 80 120

SCALE 1"=40'

DEMOLITION NOTES:

1. PROTECT EXISTING TREES AND OTHER VEGETATION IN PLACE, AGAINST CUTTING, BREAKING, OR SKINNING OF ROOTS; SKINNING BRUISING OF BARK; SMOTHERING OF TREES BY STOCKPILING CONSTRUCTION MATERIALS OR EXCAVATED MATERIALS WITHIN DRIP LINE. PROVIDE TEMPORARY GUARDS TO PROTECT TREES AND VEGETATION TO REMAIN. IF TREE FAILS AND CITY FINDS CONTRACTOR DID NOT TAKE THE NECESSARY PRECAUTIONS, TREE SHALL BE REPLACED IN KIND AND SIZE PER APPROVAL (MIN. SIZE 60" BOX).
2. COORDINATE WITH UTILITY COMPANIES AND AGENCIES AS REQUIRED. CONTRACTOR SHALL MAKE EXPLORATORY EXCAVATIONS AND LOCATE EXISTING UNDERGROUND FACILITIES SUFFICIENTLY AHEAD OF CONSTRUCTION TO PERMIT REVISIONS TO PLANS IF REVISIONS ARE NECESSARY DUE TO ACTUAL LOCATION OF EXISTING FACILITIES. WHERE UTILITY CUTTING, CAPPING, OR PLUGGING IS REQUIRED, PERFORM SUCH WORK IN ACCORDANCE WITH REQUIREMENTS OF THE UTILITY COMPANY OR GOVERNMENTAL AGENCY HAVING JURISDICTION.
3. BEFORE EXCAVATION, VERIFY THE LOCATION OF UNDERGROUND UTILITIES AT LEAST TWO WORKING DAYS PRIOR TO EXCAVATION.

NOTE:

(1) DEMOLISH AND DISPOSE OF OFFSITE EXISTING POLE AND FIXTURE HEAD. PULL CONDUCTORS BACK TO NEAREST HANDHOLE AND TERMINATE WITH WATERPROOF END CAP.

(2) CONTRACTOR SHALL PROTECT ALL EXISTING WATER AND RECLAIMED WATER CONDUITS, VALVES, AND METERS IN PLACE.

LEGEND:

EXISTING LIGHT POLE/FIXTURE

DEMOLISH

SILVER WING PARK SECURITY LIGHTING

D-1

SILVER WING PARK
SECURITY LIGHTING

ELECTRICAL DEMOLITION PLAN

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING AND CAPITAL PROJECTS DEPARTMENT
SHEET 040F 10 SHEETS

WBS S-11051

APPROVED: Samir M 5/9/13
FOR CITY ENGINEER DATE

SUBMITTED BY: SAMIR MAHMALJI, PROJECT OFFICER II

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	LRI			

CLARK RITTER, PROJECT MANAGER

150-1749 CCS27 COORDINATE

6310407, 1790444 CCS83 COORDINATE

36661-04-D

CONTRACTOR _____ DATE STARTED _____
INSPECTOR _____ DATE COMPLETED _____

TEMPORARY BMP CONSTRUCTION SITE STORM WATER PRIORITY: HIGH ____ MEDIUM ____ LOW _X_

SPEC. NO. 581B

CONSULTANT

LEE & RO, Inc.
San Diego, California

REGISTERED PROFESSIONAL ENGINEER
ERIC R. LOVERING
No. E18727
ELECTRICAL
STATE OF CALIFORNIA

CONSTRUCTION CHANGE / ADDENDUM			
CHANGE	DATE	AFFECTED OR ADDED SHEET NUMBERS	APPROVAL NO.

WARNING
0 1
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CITY OF SAN DIEGO
PUBLIC WORKS PROJECT

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ELECTRICAL DIAGRAM LEGEND

- DRAWOUT TYPE CIRCUIT BREAKER 3-POLE UNLESS OTHERWISE NOTED
- MOLDED CASE CIRCUIT BREAKER 3-POLE UNLESS OTHERWISE NOTED
- 60A — DISCONNECT SWITCH, 60A 3-POLE UNLESS OTHERWISE NOTED
- 60AF — FUSE, 60A
- GROUND CONNECTION
- CURRENT TRANSFORMER
- POWER TRANSFORMER, DELTA CONNECTED PRIMARY AND SOLIDLY GROUNDED STAR CONNECT SECONDARY
- 1 OR 1 — MAGNETIC MOTOR STARTER FVNR, 3 POLE, UON NUMBER DENOTES NEMA SIZE
- 5 — INDUCTION MOTOR, 3 PHASE NUMBER DENOTES HP
- R — INDICATING LIGHT, PUSH TO TEST TYPE LENS COLOR CODE: A=AMBER, R=RED, W=WHITE, G=GREEN
- R — INDICATES CONTROL RELAY OR MOTOR STARTER COIL
  - T OR TD = TIME DELAY RELAY
  - R OR CR = CONTROL RELAY
  - MS = MAGNETIC MOTOR STARTER
  - C = MAGNETIC CONTACTOR

- NORMALLY OPEN VACUUM OR PRESSURE SWITCH, CLOSE ON RISING PRESSURE
- NORMALLY CLOSED VACUUM OR PRESSURE SWITCH, OPEN ON RISING PRESSURE
- NORMALLY OPEN TEMPERATURE ACTUATED SWITCH, CLOSE ON RISING TEMPERATURE
- NORMALLY CLOSED TEMPERATURE ACTUATED SWITCH, OPEN ON RISING TEMPERATURE
- NORMALLY CLOSED LIMIT SWITCH
- NORMALLY OPEN FLOW SWITCH CLOSE ON FLOW INCREASE
- NORMALLY CLOSED FLOW SWITCH OPEN ON FLOW INCREASE
- NORMALLY OPEN PUSH BUTTON, MOMENTARY CLOSE
- NORMALLY CLOSED PUSHBUTTON, MOMENTARY OPEN
- LOS — NORMALLY CLOSED PUSH BUTTON SINGLE CIRCUIT, LOCK-OUT-STOP (LOCATED AT MOTOR UNLESS OTHERWISE NOTED)
- NORMALLY OPEN TIMED CONTACT - CONTACT ACTION, IN DIRECTION OF ARROW, RETARDED ON ENERGIZATION
- NORMALLY CLOSED TIMED CONTACT - CONTACT ACTION, IN DIRECTION OF ARROW, RETARDED ON ENERGIZATION
- NORMALLY OPEN TIMED CONTACT- UPON INITIAL ENERGIZATION, CONTACT CHANGES STATE, CONTACT ACTION, IN DIRECTION OF ARROW, RETARDED ON DE-ENERGIZATION
- NORMALLY CLOSED TIMED CONTACT- UPON INITIAL ENERGIZATION, CONTACT CHANGES STATE, CONTACT ACTION, IN DIRECTION OF ARROW, RETARDED ON DE-ENERGIZATION

- ON OFF / XO OX — TWO-POSITION SELECTOR SWITCH, H=HAND, M=MANUAL, R=REMOTE, L=LOCAL, A=AUTOMATIC, O=OFF OR OPEN, C=CLOSE, X'S AND O'S INDICATE SEQUENCE OF OPERATION
- H O A / XOO OXO OOX — THREE-POSITION SELECTOR SWITCH (SAME AS ABOVE)
- SINGLE POLE TOGGLE SWITCH
- GROUND CONNECTION
- OL — NORMALLY CLOSED, AUXILIARY OVERLOAD RELAY CONTACT
- OL — NORMALLY OPEN, AUXILIARY OVERLOAD RELAY CONTACT
- MANUAL MOTOR STARTER WITH THERMAL OVERLOAD RELAY
- FUSE
- ETM — ELAPSED TIME METER
- SPACE HEATER (LOCATED AT MOTOR, UNO)
- RES — RESISTOR (FIXED)
- POTENTIOMETER TYPE RESISTOR (CONTINUOUSLY ADJUSTABLE)
- R — PUSH-TO-TEST INDICATING LIGHT R=RED, A=AMBER, Y=YELLOW, W=WHITE, G=GREEN
- TERMINALS IN ELECTRICAL CONTROL EQUIPMENT
- CONTACT OR DEVICE REMOTE FROM ELECTRICAL CONTROL EQUIPMENT
- SOFTWARE LINK

ABBREVIATIONS

A	AMPERE (AMPS), ANALOG
AC	ALTERNATING CURRENT/ AIR CONDITIONING
AF	AMPS-FRAME
AIC	AVAILABLE INTERRUPTING CURRENT
AM	AMP METER
AS	AMP SWITCH
AT	AMPS-TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AWG	AMERICAN WIRE GAUGE
BKR	BREAKER
BPS	BOOSTER PUMP STATION
BSC	BARE STRANDED COPPER
C	CONDUIT
CB	CIRCUIT BREAKER
CID	CURRENT INDICATING TRANSMITTER
CKT	CIRCUIT
CO	CONDUIT ONLY
CP	CONTROL PANEL
CPT	CURRENT POTENTIAL TRANSFORMER
CR	CONTROL RELAY
CT	CURRENT TRANSFORMER
CU	COPPER
DC	DISCONNECT
DCS	DISTRIBUTIVE CONTROL SYSTEM
EB	ENCLOSED BREAKER
ETM	ELAPSED TIME METER
(E),EXST	EXISTING
E.G.	EQUIPMENT GROUND
FBK	FEEDER BREAKER
FLA	FILL LOAD AMPS
FVNR	FULL VOLTAGE NON-REVERSING
G,GND	GROUND
GFI	GROUND FAULT INTERRUPTER
GIW	GROUND FAULT INTERRUPTER, WEATHER PROOF
HH	HAND HOLE
HID	HIGH INTENSITY DISCHARGE (LAMP)
HMI	HUMAN MACHINE INTERFACE
HPS	HIGH PRESSURE SODIUM (LAMP)
HTR	HEATER
HZ	HERTZ
I/O	INPUT/OUTPUT
J	JUNCTION BOX
K	KIRK KEY INTERLOCK
KCM	THOUSAND CIRCULAR MILS (OR MCM)
KV	KILOVOLT
KVA	KILOVOLT AMPERES
L	LINE
LCP	LOCAL CONTROL PANEL
LOS	LOCK-OUT STOP PUSH BUTTON
LTG	LIGHTING
MA	MILLIAMPERE
MBK	MAIN BREAKER
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTION
MH	MANHOLE
MIC	MANUFACTURER'S INTERCONNECTING CABLE
MOV	MOTOR OPERATED VALVE
MS	MAGNETIC STARTER
MTS	MANUAL TRANSFER SWITCH
(N)	NEW
N	NEUTRAL
NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
NC	NORMALLY CLOSED
NF	NON-FUSED
NL	NIGHT LIGHT
NO	NORMALLY OPEN
N/P	NAMEPLATE
OC	OPEN/CLOSE (STATUS)
P	POLE
PB	PULL BOX
PC	PHOTO CELL
PH,	PHASE
PNL	PANEL
PM	POWER MONITOR
RECEPT	RECEPTACLE
RTD	RESISTANCE TEMPERATURE DEVICE
RVAT	REDUCED VOLTAGE AUTO XFMR STARTER
S	STAINLESS STEEL
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
TB	TERMINAL BLOCK
TD	TIME DELAY
TDI	TIME DELAY IMMIGRATION
TEMP	TEMPERATURE
TOU	TIME OF USE
TSP	TWISTED SHIELDED PAIR
TST	TWISTED SHIELDED TRIAD
TT	THERMOSTAT
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
UG	UNDERGROUND
UON	UNLESS OTHERWISE NOTED
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLT
VA	VOLTAMPERES
VAC	VOLTS AC
VDC	VOLTS DC
VFD	VARIABLE FREQUENCY DRIVE
VS	VOLTAGE SWITCH
W	WATTS, WIRE
WP	WEATHERPROOF
XFMR	TRANSFORMER

ELECTRICAL PLAN LEGEND

- POLE MOUNTED LIGHTING FIXTURE WITH CONCRETE PULLBOX AT BASE OF POLE
- SURFACE OR PENDENT MOUNTED FIXTURE
- PENDENT OR CEILING MOUNTED FLUORESCENT FIXTURE
- 1' X 4' LIGHT FIXTURE
- 1' X 4' EMERGENCY LIGHT FIXTURE
- WALL MOUNTED OCCUPANCY SENSOR
- EMERGENCY FIXTURE WITH BATTERY PACK
- WALL MOUNTED FIXTURE
- STANCHION MOUNTED FIXTURE
- EXIT SIGN

- EXPLOSION PROOF CONDUIT SEAL
- S — SINGLE POLE TOGGLE TYPE LIGHTING SWITCH
- GROUNDED TYPE DUPLEX RECEPTACLE
- M M — MOTOR
- LOCAL CONTROL STATION (LCS)
- EXPOSED ELECTRICAL CONDUIT
- CONDUIT IN SLAB OR UNDERGROUND
- P — A-1.3 — HOMERUN TO PANEL A CIRCUIT 1& 3
- G — GROUND WIRE, SIZE AS NOTED

- HASH MARKS DENOTE QUANTITY OF CONDUCTORS, #12AWG UON
- ELECTRICAL CONDUIT RUN-UP
- ELECTRICAL CONDUIT RUN-DOWN
- WATER TIGHT FLEXIBLE CONDUIT
- PANEL BOARD
- D X 2/40 8' — FIXTURE TYPE; FIXTURE QUANTITY; NUMBER OF LAMPS/LAMP WATTAGE PER FIXTURE; MOUNTING HEIGHT
- J — JUNCTION BOX
- GROUND ROD AND WELL, 3/4"ø X 10'-0" LENGTH COPPERCLAD STEEL
- OR — FIELD POLE/FIXTURES

- DISCONNECT SWITCH 3P
- FIELD MOUNTED INSTRUMENT
- SPEAKER/HORN
- GENERATOR RECEPTACLE
- PC — PHOTOCELL
- TELEPHONE OUTLET
- VARIABLE FREQUENCY DRIVE
- P102 — CONDUIT NUMBER (P=POWER, C=CONTROL, I=INSTRUMENTATION)
- (**) — QUANTITY (IE CONDUIT & CONDUCTORS)

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CITY OF SAN DIEGO
PUBLIC WORKS PROJECT

CONSULTANT

LEE & RO, Inc.
San Diego, California

TEMPORARY BMP CONSTRUCTION SITE STORM WATER PRIORITY: HIGH ____ MEDIUM ____ LOW__X__

SPEC. NO. 5818

REGISTERED PROFESSIONAL ENGINEER — ERIC R. LOVERING — No.E18727 — ELECTRICAL — STATE OF CALIFORNIA

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING AND CAPITAL PROJECTS DEPARTMENT
SHEET 05 OF 10 SHEETS

WBS S-11051

APPROVED: Samir M. FOR CITY ENGINEER — 5/9/13 DATE

SUBMITTED BY: SAMIR MAHMALJI, PROJECT OFFICER II

CLARK RITTER, PROJECT MANAGER

150-1749, CCS27 COORDINATE

6310407, 1790444, CCS83 COORDINATE

36661-05-D

DESCRIPTION	BY	APPROVED	DATE	FILMED
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CONTRACTOR _____ DATE STARTED _____
INSPECTOR _____ DATE COMPLETED _____

E-1

SILVER WING PARK SECURITY LIGHTING

ELECTRICAL LEGENDS, SYMBOLS & ABBREVIATIONS

SILVER WING PARK SECURITY LIGHTING

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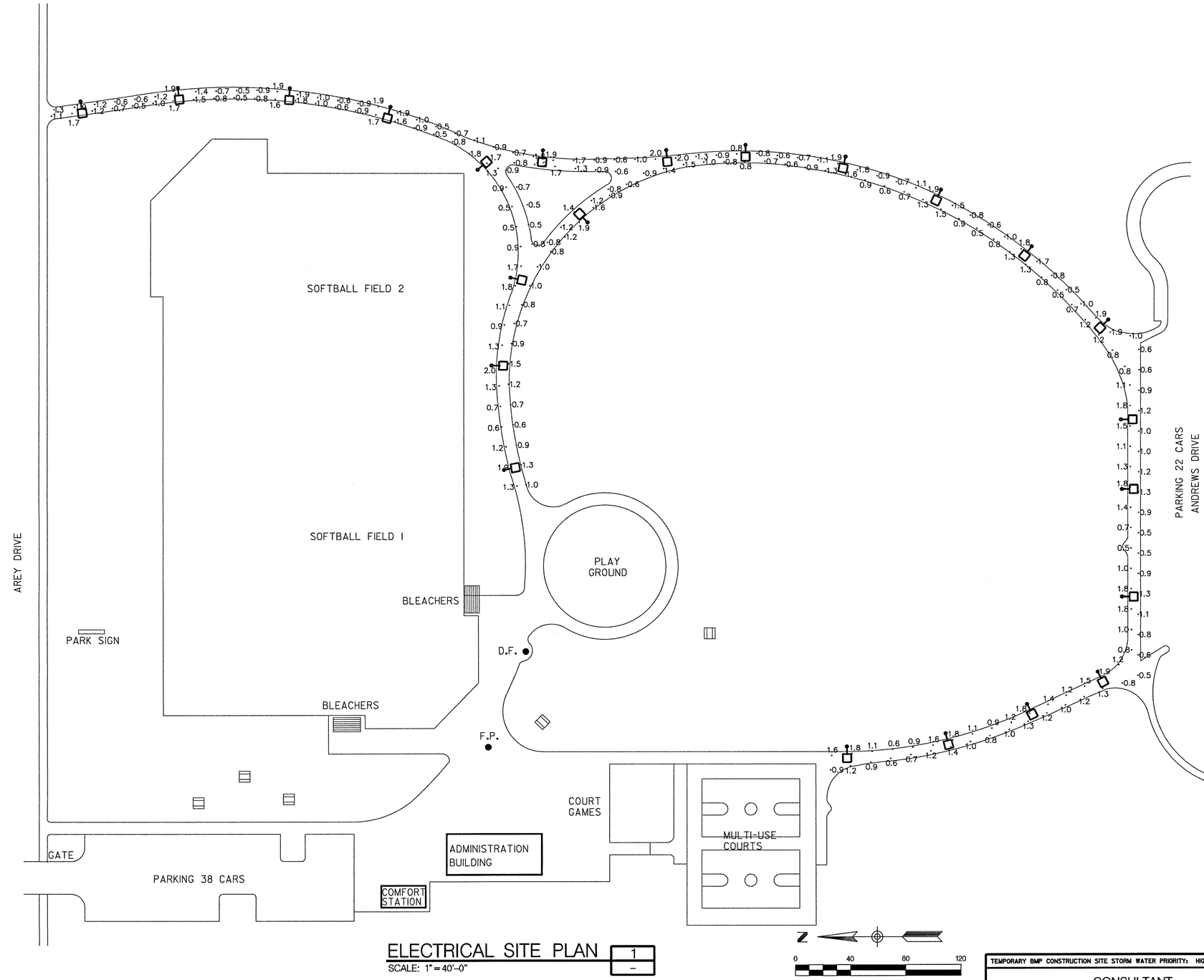

ELECTRICAL SITE PLAN 1
SCALE: 1" = 40'-0"

LUMINAIRE SCHEDULE						
SYMBOL	CAT. NO.	DESCRIPTION	LAMP	LUMENS	LLF	VA
	LUMINAIRE: VISIONAIRE T3-90x2-L-2-B0A-BZ-DF208, (OR EQUAL)	SUN-3,TYPE III,90X2, LPS,208VAC, BOLT-ON-ARM,BRONZE, W/ FUSING 30" H CONCRETE BASE 29"L. X 20"W. X 9"H" POLE MOUNTED LUMINAIRE SPECULAR REFLECTOR FLAT TEMPERED GLASS LENS	2X90LPS	7800	0.75	220
	POLE: RNTS,5R,11,22',12BC, 136,SI,BZ	NON-TAPERED, STEEL,5"D,22',12"BASE, 1"X36"ANCHOR, BOLT-ON-ARM,BRONZE, 11 GAUGE				

STATISTICS					
DESCRIPTION	AVG	MAX	MIN	MAX/MIN	AVG/MIN
WALKWAY	1.1 FC	2.0 FC	0.5 FC	4.0 :1	2.2 :1

NOTE:

1. VALUES ON PLAN ARE IN FOOT CANDLES.

SILVER WING PARK SECURITY LIGHTING

E-2

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CITY OF SAN DIEGO
PUBLIC WORKS PROJECT

TEMPORARY BMP CONSTRUCTION SITE STORM WATER PRIORITY: HIGH ____ MEDIUM ____ LOW_X_

CONSULTANT

LEE & RO, Inc.
San Diego, California

SPEC. NO. 5818

REGISTERED PROFESSIONAL ENGINEER ERIC R. LOVERING No.E18721 ELECTRICAL STATE OF CALIFORNIA
Exp. 06/30/15

SILVER WING PARK
SECURITY LIGHTING

PHOTOMETRIC PLAN

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING AND CAPITAL PROJECTS DEPARTMENT
SHEET 06 OF 10 SHEETS

APPROVED: Samir M FOR CITY ENGINEER — DATE 5/9/13

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CLARK RITTER, PROJECT MANAGER
150-1749, CCS27 COORDINATE
6310407, 1790444, CCS83 COORDINATE
36661-06-D

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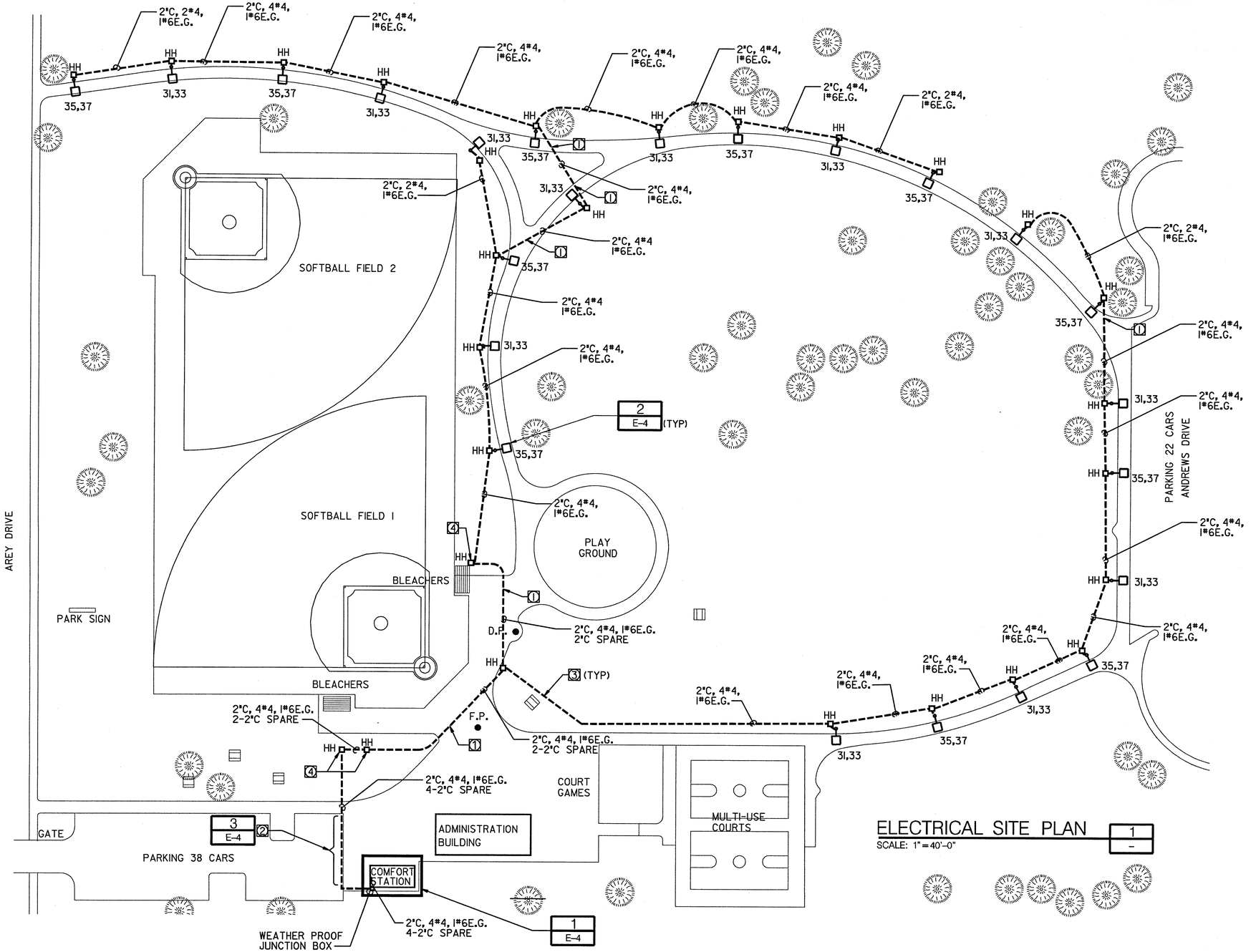

ELECTRICAL SITE PLAN 1

SCALE: 1"=40'-0"

0 40 80 120

SCALE 1"=40'

LEGEND:

(CIRCUIT 1, CIRCUIT 2)

KEY NOTE:

1. REPAIR (E) A/C PAVING PER SECTION 02575 - PAVEMENT REHABILITATION, OF THE TECHNICAL SPECIFICATIONS.
2. REINFORCED CONCRETE DUCT BANK SHALL BE INSTALLED BENEATH DRIVEWAY PER DETAIL 3/E-4; EMBEDDED BARE COPPER GROUND WIRE IS NOT REQUIRED PER STANDARD DETAIL.
3. INSTALL DIRECT BURIED DUCT BANK PER CITY STANDARD DETAIL SDW-126. CONDUIT SPACING SHALL BE 1-1/2" CLEAR. COVER SHALL BE AT LEAST 30 INCHES.
4. HAND HOLES SHALL BE PROVIDED PER THIS CONTRACT, FOR FUTURE USE.
5. CONTRACTOR MUST COORDINATE WITH RESIDENT ENGINEER FOR SHUTOFF OF IRRIGATION AT LEAST ONE WEEK PRIOR TO ANY EQUIPMENT, MACHINERY OR VEHICLES ON TURF FOR LIGHTING INSTALLATION. TURF MUST BE DRY AND 4'X 8' SHEETS OF PLYWOOD MUST BE PLACED UNDER VEHICLES AND EQUIPMENT TO PREVENT DAMAGE TO EXISTING TURF. EQUIPMENT SHALL NOT BE STORED NOR DEMOLITION MATERIALS STOCKPILED WITHIN TREE CANOPY OR TREE AREA.
6. CONTRACTOR SHALL HAVE LICENSED ARBORIST EVALUATE, PRUNE AND TRIM EXISTING TREES PRIOR TO NEW LIGHTING POLE AND DUCT BANK INSTALLATION. SEE SECTION 308-6.1 OF WHITEBOOK/ GREENBOOK. PRIOR TO COMMENCEMENT OF WORK, CONTRACTOR'S LICENSED ARBORIST SHALL COORDINATE ALL TREE WORK WITH PARK AND RECREATION DEPARTMENT ARBORIST, MICHAEL MARIKA (619-235-1179) AND RESIDENT ENGINEER.
7. IF DAMAGE IS CAUSED TO EXISTING IRRIGATION ADJACENT TO CONCRETE WALKWAYS, CONTRACTOR SHALL REPAIR/REPLACE IN KIND, TYPICAL.
8. CONTRACTOR SHALL REPAIR DAMAGE TO EXISTING TURF AND RESOD AS REQUIRED.

NOTES:

1. INSTALL PATHWAY LIGHTS PER DRAWING SCALE. LIGHTS TO BE A MAXIMUM OF 3 FT FROM THE PATHWAY.
2. HAND HOLE SHALL HAVE LOCKABLE COVERS.
3. CONTRACTOR TO USE WATERPROOF SPLICES IN ALL HANDHOLES.

SILVER WING PARK SECURITY LIGHTING

E-3

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CITY OF SAN DIEGO
PUBLIC WORKS PROJECT

TEMPORARY BMP CONSTRUCTION SITE STORM WATER PRIORITY: HIGH ____ MEDIUM ____ LOW_X_

SPEC. NO. 5818

CONSULTANT

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San Diego, California

REGISTERED PROFESSIONAL ENGINEER ERIC R. LOVERING No.E18727 ELECTRICAL STATE OF CALIFORNIA

SILVER WING PARK SECURITY LIGHTING

ELECTRICAL SITE PLAN

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING AND CAPITAL PROJECTS DEPARTMENT
SHEET 07 OF 10 SHEETS

APPROVED: Samir M 5/9/13
FOR CITY ENGINEER DATE

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CLARK RITTER, PROJECT MANAGER

150-1749 CCS27 COORDINATE

6310407, 1790444 CCS83 COORDINATE

36661-07-D

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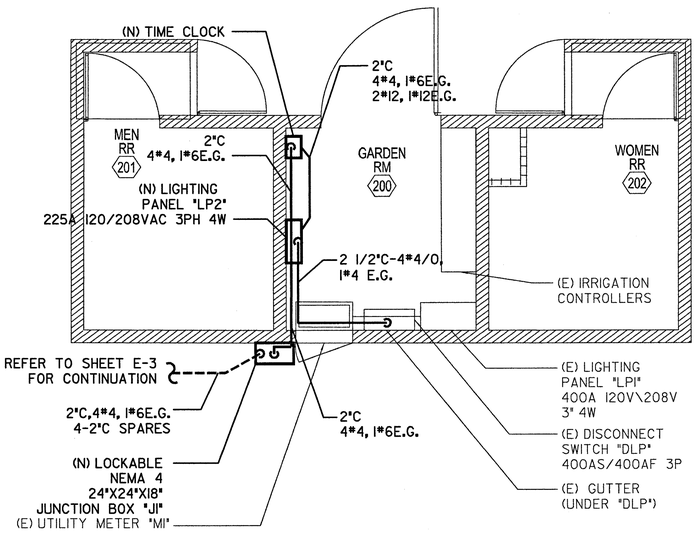
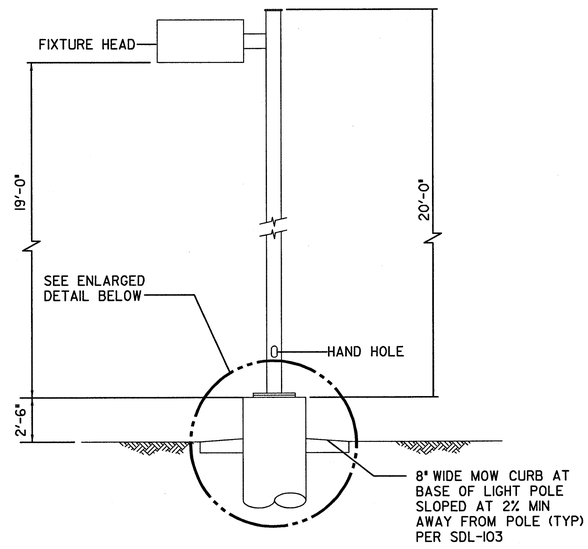


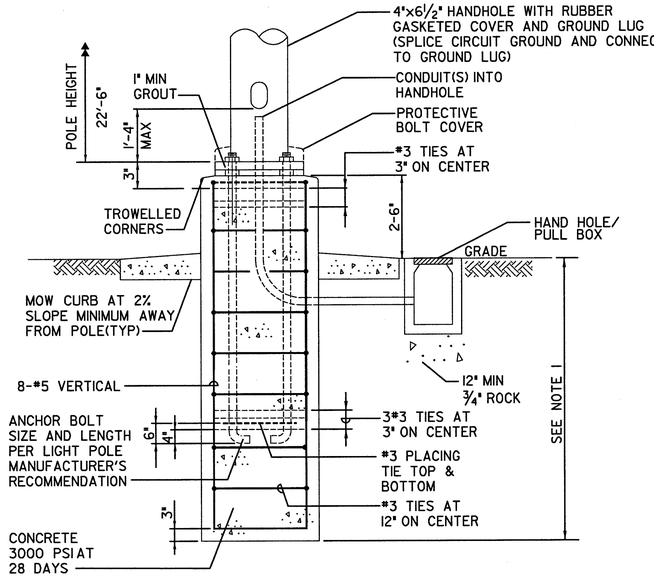
COMFORT STATION

SCALE: NTS

1 / E-4



NEW LIGHT POLE INSTALLATION DETAIL

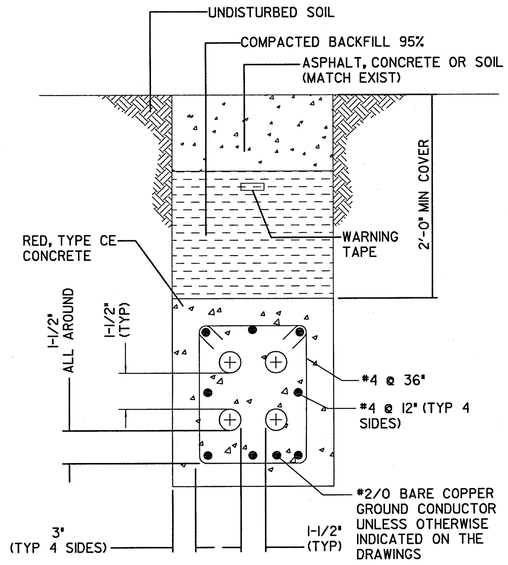


ENLARGED DETAIL

OUTDOOR POLE (TYP)

SCALE: NTS

2 / E-4



DUCT BANK (TYP)

SCALE: NTS

3 / E-4

SILVER WING PARK SECURITY LIGHTING

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PUBLIC WORKS PROJECT

TEMPORARY BMP CONSTRUCTION SITE STORM WATER PRIORITY: HIGH ____ MEDIUM ____ LOW__X__

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LEE & RO, Inc.
San Diego, California

REGISTERED PROFESSIONAL ENGINEER ERIC R. LOVERING No.E18727 ELECTRICAL STATE OF CALIFORNIA

E-4

SILVER WING PARK
SECURITY LIGHTING

ELECTRICAL DETAILS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING AND CAPITAL PROJECTS DEPARTMENT
SHEET 08 OF 10 SHEETS

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150-1749, CCS27 COORDINATE
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36661-08-D

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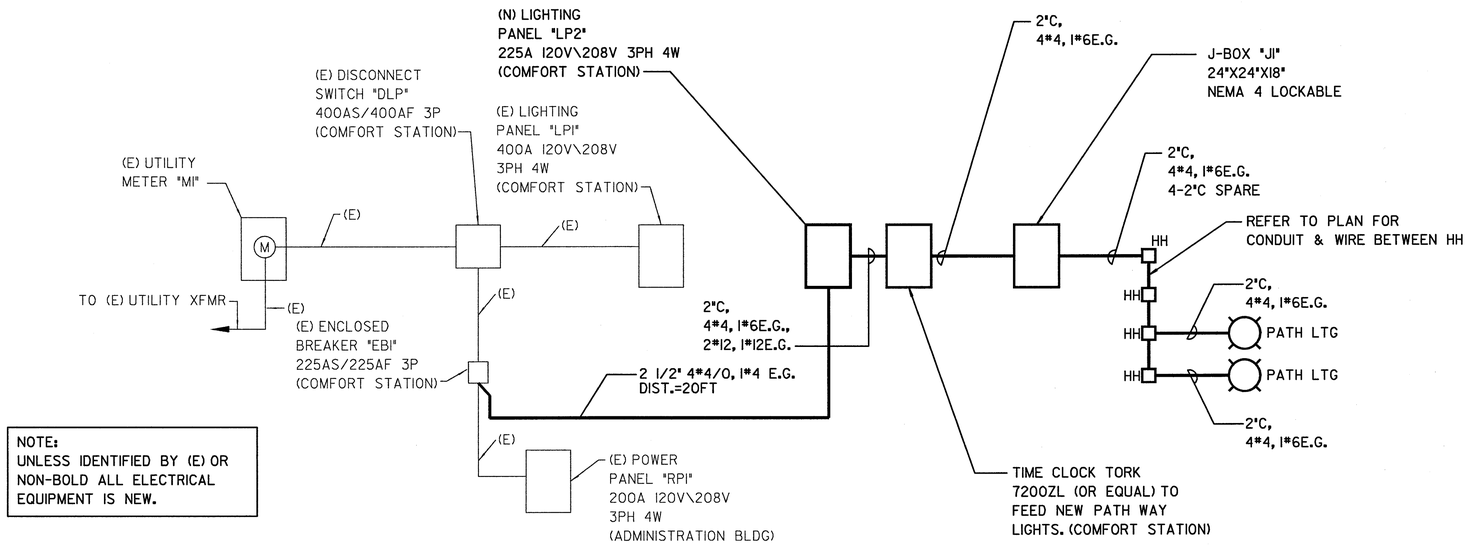

NOTE:
UNLESS IDENTIFIED BY (E) OR NON-BOLD ALL ELECTRICAL EQUIPMENT IS NEW.

SINGLE LINE DIAGRAM
NO SCALE

PANEL "LP2"

MOUNTING	SURFACE	DOUBLE LUG	NO	VOLTS	120/208	MAIN	225/3P
NEMA 3R	NO	200% NEUTRAL	NO	PHASE	3	BUS	225 AMP
FEED THRU	NO	I/G BUS	NO	WIRE	4	A.I.C.	42K

NOTES	LOCATION	A	B	C	LTG	CONV	KIT	RECP	BKR	CIRC	CIRC	BKR	RECP	KIT	CONV	LTG	A	B	C	LOCATION	NOTES
	SPACE									1	2									SPACE	
	SPACE									3	4									SPACE	
	SPACE									5	6									SPACE	
	SPACE									7	8									SPACE	
	SPACE									9	10									SPACE	
	SPACE									11	12									SPACE	
	SPACE									13	14									SPACE	
	SPACE									15	16									SPACE	
	SPACE									17	18									SPACE	
	SPACE									19	20									SPACE	
	SPACE									21	22									SPACE	
	SPACE									23	24									SPACE	
	SPACE									25	26									SPACE	
	SPACE									27	28									SPACE	
	SPACE									29	30									SPACE	
	PATH LIGHTING	1320			12				30/2	31	32	20/1						100		TIME CLOCK	
	-		1320						-	33	34	20/1								SPARE	
	PATH LIGHTING			1210	11				30/2	35	36	20/1								TVSS	
	-	1210							-	37	38	20/3								-	
	SPARE								20/1	39	40	-								-	
	SPARE								20/1	41	42	-									

A = 2530 W/LCL A = 3162 | B = 1320 W/LCL B = 1650 | C = 1320 W/LCL C = 1650

TOTAL VA = 5170 | W/LCL = 6462 | AVE W/LCL AMPS = 10 | TOTAL LCL = 5170 X .25 = 1292
HIGH PHASE VA = 2530 | W/LCL = 3162 | HIGH PH W/LCL AMPS = | HIGH PHASE LCL = 2530 X .25 = 611

PANEL SCHEDULE
NO SCALE

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SILVER WING PARK SECURITY LIGHTING

E-5

SILVER WING PARK
SECURITY LIGHTING
SINGLE LINE DIAGRAM & PANEL SCHEDULE

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING AND CAPITAL PROJECTS DEPARTMENT
SHEET 09 OF 10 SHEETS

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36661-09-D

CONTRACTOR _____ DATE STARTED _____
INSPECTOR _____ DATE COMPLETED _____

n:\proj\84007\design\phase 1\PHASE 1 – E-05.dgn
5/3/2013 4:12:29 PM Daniel Park

Certificate of Compliance (Page 1 of 4) OLTG-1C

Project Name: Silver Wing Park	Date: 05/18/2012
Project Address: 3737 Arey Drive, San Diego, California 92154	Total Hardscape Illuminated Area:

General Information

Phase of Construction: ☒ New Construction ☐ Addition ☐ Alteration

Documentation Author's Declaration Statement

- I certify that this Certificate of Compliance documentation is accurate and complete.

Name: James Drummond PE	Signature: [signature]
Company: LEE & RO INC.	Date: 05/18/2012
Address: 1199 S. Fullerton Rd.	If Applicable CEA # CEPE #
City/State/Zip: Industry, CA 91748	Phone: (626)912-3391

Principal Lighting Designer's Declaration Statement

- I am eligible under Division 3 of the California Business and Professions Code to accept responsibility for the lighting design.
- This Certificate of Compliance identifies the lighting features and performance specifications required for compliance with Title 24, Pages 1 and 6 of the California Code of Regulations.
- The design features represented on this Certificate of Compliance are consistent with the information provided to document this design on the other applicable compliance forms, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.

Name: James Drummond PE	Signature: [signature]
Company: LEE & RO INC.	Phone: (626)912-3391
Address: 1199 S. Fullerton Rd.	License #: E-19043
City/State/Zip: Industry, CA 91748	Date: 05/18/2012

Principal Lighting Designer's Declaration

☐ I certify that this Certificate of Compliance documentation is accurate and complete, and accounts for all outdoor lighting power, including building mounted, pole mounted, as well as all other outdoor lighting designed for the site, and that Additional Lighting Power Allowances for Specific Applications or Additional Lighting Power Allowances for Ordinance Requirements have not been counted more than one time for the same area, in accordance with Section 147 of the Standards.

Outdoor Lighting Mandatory Measures
Indicate location on building plans of Mandatory Measures Note Block: ____________

LIGHTING COMPLIANCE FORMS & WORKSHEETS (check box if worksheet is included)

For detailed instructions on the use of this and all Energy Efficiency Standards compliance forms, please refer to the Nonresidential Manual published by the California Energy Commission.

☒	OLTG-1C	Certificate of Compliance. All 4 pages required on plans for all submittals.
☒	OLTG-2C	(Page 1 of 3) Lighting Wattage Allowances for General Hardscape, Sales Frontage, or Ornamental Lighting. Optional on plans.
☒	OLTG-2C	(Page 2 of 3) Lighting Wattage Allowances for Per Application or Per Area. Optional on plans.
☐	OLTG-2C	(Page 3 of 3) Additional Lighting Power Allowance for Ordinance Requirements. Optional on plans.

Certificate of Compliance (Page 2 of 4) OLTG-1C

COMPLIANCE FIXTURE / LIGHTING CONTROL SCHEDULE and FIELD INSPECTION CHECKLIST

Project Name: Silver Wing Park — Date: 05/18/2012

INSTALLATION CERTIFICATE, OLTG-1-INST (Retain a copy and verify form is completed and signed.) Field Inspection ☐

CERTIFICATE OF ACCEPTANCE, OLTG-2A (Retain a copy and verify form is completed and signed.) Field Inspection ☐

Luminaire Schedule			Installed Watts							
A	B	C	D	E	F		G	H	I	
					How wattage was determined				Field Inspector[2]	
Name Or Item Tag	Luminaire Description[1] See footnote below (i.e.: 1 lamp pole-top shoe-box 400 watt metal halide)	Cutoff Designation	Watts per Luminaire	Special Features	Default from NA-8	According to §130 (d or e)	Number of Luminaires	Installed Watts (D x G)	Pass	Fail
SUN-3	2 LAMP 90W LOW PRESSURE SODIUM	FULL	250	☐	☐	☒	23	5750	☐	☐
				☐	☐	☐			☐	☐
				☐	☐	☐			☐	☐
				☐	☐	☐			☐	☐
				☐	☐	☐			☐	☐
				☐	☐	☐			☐	☐
				☐	☐	☐			☐	☐
	Enter total into OLTG-1C; Page 4 of 4; Row H; Total Installed Watts:							5750		

1. Type of luminaire (i.e.: post top, wall pack, surface, shoe box); for non-incandescent luminaires, indicate nominal lamp wattage and lamp type (i.e.: fluorescent, incandescent, HID); ballast type (i.e.: electronic or magnetic); number of lamps and number of ballasts per luminaire. For incandescent luminaires, the luminaire wattage listed in column D shall be the maximum relamping rated wattage on a permanent factory-installed label on the luminaire, NOT the wattage of the lamp (bulb) used, in accordance with Section 130(d or e).
2. If Fail then describe on Page 2 of the Inspection Checklist Form and take appropriate action to correct. Verify building plans if necessary.

EXEMPT LUMINAIRES — Field Inspection ☐

Name or Symbol	Description of exempt luminaires in accordance with §147

MANDATORY CONTROLS — Field Inspection ☐

#	Description	Location	#	Description	Location

SPECIAL FEATURES INSPECTION CHECKLIST (See Page 2 of 4 of OLTG-1C)

The local enforcement agency should pay special attention to the items specified in this checklist. These items require special written justification and documentation, and special verification. The local enforcement agency determines the adequacy of the justification, and may reject a building or design that otherwise complies based on the adequacy of the special justification and documentation submitted.

Field Inspector Notes or Discrepancies:

Certificate of Compliance (Page 3 of 4) OLTG-1C

Project Name: Silver Wing Park — Date: 05/18/2012

A. OUTDOOR LIGHTING ZONE

OUTDOOR LIGHTING ZONE: ☐ OLZ 1 ☐ OLZ 2 ☒ OLZ 3 ☐ OLZ 4

Is the Outdoor Lighting Zone: ☒ Default in accordance with §10-114, or ☐ Amended by JHA

Complete the information below if the default Outdoor Lighting Zone has been amended by the local jurisdiction having authority (JHA):

- ☐ The site is a government designated park, recreation area, wildlife preserve, or portion thereof, and has been designated as LZ2 or LZ3, in accordance with Table 10-114-A, because the site is contained within such a zone.
- ☐ The local jurisdiction having authority has officially adopted a change to the State Default Lighting Zone and has notified the Energy Commission by providing the materials required in §10-114(d) to the Executive Director.
- ☐ The adopted change is posted on the Energy Commission website.

B. ADDITIONAL LIGHTING POWER ALLOWANCE FOR ORDINANCE REQUIREMENTS

Are additional lighting power allowances for ordinance in Table 147-C used? ☐ Yes ☒ No

Complete the information below if additional lighting power allowances for ordinance requirements are used:

- ☐ The local jurisdiction having authority has officially adopted specific outdoor light levels, which are expressed as average or minimum footcandle levels, by following a public process that allowed for formal public notification, review, and comment about the proposed change.
- ☐ The local jurisdiction having authority which adopted specific outdoor light levels and has notified the Commission by providing the following materials required §10-114(f) to the Executive Director.

C. ACCEPTANCE FORMS

Required Acceptance Tests

Designer:

*This form is to be used by the designer and attached to the plans. Listed below is the acceptance test for the Lighting system, **OLTG-2A**. The designer is required to check the acceptance tests and list all control devices serving the building or space shall be certified as meeting the Acceptance Requirements for Code Compliance. If all the lighting system or control of a certain type requires a test, list the different lighting and the number of systems. The NA7 Section in the Appendix of the Nonresidential Reference Appendices Manual describes the test. Since this form will be part of the plans, completion of this section will allow the responsible party to budget for the scope of work appropriately. **Forms can be grouped by type of Luminaire controlled.***

Enforcement Agency:

***Systems Acceptance.** Before Occupancy Permit is granted for a newly constructed building or space or when ever new lighting system with controls is installed in the building or space shall be certified as meeting the Acceptance Requirements.*
*The **OLTG-2A** form is not considered a complete form and is not to be accepted by the enforcement agency unless the boxes are checked and/or filled and signed. In addition, a Certificate of Acceptance forms shall be submitted to the enforcement agency that certifies plans, specifications, installation certificates, and operating and maintenance information meet the requirements of §10-103(b) of Title 24 Part 6. The field inspector must receive the properly filled out and signed forms before the building can receive final occupancy. A copy of the **OLTG-2A** for each different lighting luminaire control(s) must be provided to the owner of the building for their records.*

	Luminaires Controlled			Certificate of Acceptance OLTG-2A
Equipment Requiring Testing	Description	Number of Like Controls	Location	Outdoor Lighting Acceptance Tests
OP		1		
ATS		2		

*1. Insert: **OMS** for Outdoor Motion Sensor; **OLSC** for Outdoor Lighting Shutoff Controls; **OP** for Outdoor Photocontrol; **ATS** for Astronomical Time Switch; and **STS** for Standard (non-astronomical) Time Switch acceptance.*

CERTIFICATE OF COMPLIANCE (Page 4 of 4) OLTG-1C

Project Name: Silver Wing Park — Date: 05/18/2012

ALLOWED AND INSTALLED OUTDOOR LIGHTING POWER

		Lighting Wattage Power Allowance
A	Lighting power allowance for general hardscape (from OLTG-2C Page 1 of 3)	6198
B	Specific application lighting wattage allowance per unit length (from OLTG-2C Page 1 of 3)	
C	Specific application wattage allowance for ornamental lighting (from OLTG-2C Page 1 of 3)	
D	Specific application wattage allowance per application (from OLTG-2C Page 2 of 3)	
E	Specific application lighting wattage allowance per area (from OLTG-2C Page 2 of 3)	
F	Additional lighting power allowance for ordinance requirements (from OLTG-2C Page 3 of 3)	
G	Total Allowed Wattage = Sum of rows A through F:	6198
H	Total Installed Watts (from Luminaire Schedule, from OLTG-1C (Page 2 of 4)	6198
Provided that the lighting wattage power allowances listed in rows A through F are identical to the lighting wattage power allowances taken from OLTG-2C Pages 1 through 3, complies if Installed Wattage in row H is less than or equal to the Total Installed Wattage in row G	☒ Yes	☐ No

OUTDOOR LIGHTING WORKSHEET (Page 1 of 3) OLTG-2C

Project Name: Silver Wing Park — Date: 05/18/2012

A. LIGHTING POWER ALLOWANCE FOR GENERAL HARDSCAPE

AREA WATTAGE ALLOWANCE (AWA)			LINEAR WATTAGE ALLOWANCE (LWA)			INITIAL WATTAGE ALLOWANCE	TOTAL GENERAL HARDSCAPE LIGHTING ALLOWANCE
A	B	C	D	E	F	G	H
ILLUMINATED HARDSCAPE AREA	AWA PER SQUARE FOOT	AWA (A X B)	PERIMETER LENGTH OF GENERAL HARDSCAPE	LWA PER LINEAR FOOT	LWA (D X E)	IWA (WATTS)	C + F + G
25,000	0.092	2300	3400	0.92	3128	770	6198
Enter total into OLTG-1C; Page 4 of 4; Row A; Lighting Power Allowance for General Hardscape:							6198

☐ Yes: AWA, LWA, and IWA from Table 147-A was used as appropriate for the Outdoor Lighting Zone

B. SPECIFIC APPLICATION LIGHTING WATTAGE ALLOWANCE PER UNIT LENGTH (Available only for sales frontage)

DETERMINE WATTAGE ALLOWANCE				LUMINAIRE TYPE		DESIGN WATTS			
A	B	C	D	E	F	G	H	I	J
Specific Lighting Application	Linear Feet of Frontage	Sales Frontage allowance for OLZ (watts per lf)	Wattage Allowance (B x C)	Name or Symbol	Luminaire Type	Luminaire Quantity	Watts per Luminaire	Design Watts (G x H)	Allowed Watts Minimum of D or I
Enter total into OLTG-1C; Page 4 of 4; Row B; Specific Application Lighting Wattage Allowance Per Unit Length									

C. SPECIFIC APPLICATION WATTAGE ALLOWANCE FOR ORNAMENTAL LIGHTING

DETERMINE WATTAGE ALLOWANCE				LUMINAIRE TYPE		DESIGN WATTS			
A	B	C	D	E	F	G	H	I	J
Specific Lighting Application	Square feet of Hardscape	Ornamental Lighting Allowance for OLZ (watts per ft²)	Wattage Allowance (B x C)	Name or Symbol	Luminaire Type	Luminaire Quantity	Watts per Luminaire	Design Watts (G x H)	Allowed Watts Minimum of D or I
Enter total into OLTG-1C; Page 4 of 4; Row C; Specific Application Wattage Allowance for Ornamental Lighting									

SILVER WING PARK SECURITY LIGHTING

E-6

CONSTRUCTION CHANGE / ADDENDUM			
CHANGE	DATE	AFFECTED OR ADDED SHEET NUMBERS	APPROVAL NO.

WARNING

0 ——— 1

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

CITY OF SAN DIEGO
PUBLIC WORKS PROJECT

TEMPORARY BMP CONSTRUCTION SITE STORM WATER PRIORITY: HIGH ____ MEDIUM ____ LOW _X_

SPEC. NO. 5818

CONSULTANT

LEE & RO, Inc.
San Diego, California

REGISTERED PROFESSIONAL ENGINEER — ERIC R. LOVERING — No. E18727 — Exp. 06/30/13 — ELECTRICAL — STATE OF CALIFORNIA

SILVER WING PARK
SECURITY LIGHTING

TITLE 24

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING AND CAPITAL PROJECTS DEPARTMENT
SHEET 10 OF 10 SHEETS

WBS S-11051

APPROVED: [signature] 5/9/13
FOR CITY ENGINEER — DATE

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	LRI			

CONTRACTOR ______ DATE STARTED ______
INSPECTOR ______ DATE COMPLETED ______

SUBMITTED BY: SAMIR MAHMALJI — PROJECT OFFICER II

CLARK RITTER — PROJECT MANAGER

150-1749 — CCS27 COORDINATE

6310407, 1790444 — CCS83 COORDINATE

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