SAN DIEGO COUNTY REGIONAL AIRPORT AUTHORITY

April 26, 2017

Mr Morris Dye
City of San Diego
Development Services Department
1222 First Avenue
San Diego, California 92101

Re: Airport Land Use Commission Consistency Determination – Community Plan Amendment to construct a research & development building at 9775 Towne Centre Drive; APN 343-121-14

Dear Mr Dye:

As the Airport Land Use Commission (ALUC) for San Diego County, the San Diego County Regional Airport Authority acknowledges receipt of an application for a determination of consistency for the project described above. This project is located within the Airport Influence Area (AIA) for the Marine Corps Air Station (MCAS) Miramar Airport Land Use Compatibility Plan (ALUCP).

ALUC staff has reviewed your application and accompanying materials and has determined that it meets our requirements for completeness. In accordance with ALUC Policies and applicable provisions of the State Aeronautics Act (Cal. Pub. Util. Code §21670-21679.5), ALUC staff has determined that the proposed project is **consistent** with the MCAS Miramar ALUCP based upon the facts and findings summarized below:

(1) The proposed project involves a community plan amendment to construct a research & development building.

(2) The proposed project is located within the 60-65 dB CNEL noise contour. The ALUCP identifies research & development uses located within the 60-65 dB CNEL noise contour as compatible with airport uses.

(3) The proposed project is in compliance with the ALUCP airspace protection surfaces because the project sponsor has certified that notice of construction is not required to the Federal Aviation Administration (FAA) because the project is located within an urbanized area, is substantially shielded by existing structures or natural terrain, and cannot reasonably have an adverse effect on air navigation.

(4) The proposed project is located within Accident Potential Zone (APZ) II. The ALUCP identifies research & development uses located within APZ II as conditionally compatible with airport uses, provided that the project complies with an intensity of 50 people per

acre, which the ALUCP represents as a floor area ratio (FAR) of 0.34. The project proposes an FAR of 0.31.

(5) The proposed project is located within the overflight notification area, but does not involve any new residential use subject to overflight notification requirements.

(6) Therefore, the proposed project is consistent with the adopted MCAS Miramar ALUCP.

(7) This determination of consistency is not a "project" as defined by the California Environmental Quality Act (CEQA), Cal. Pub. Res. Code §21065.

Please contact Ed Gowens at (619) 400-2244 if you have any questions regarding this letter.

Yours truly,

Angela Jamison

Angela Jamison
Manager, Airport Planning

cc: Amy Gonzalez, SDCRAA General Counsel
Tony Sordello, Caltrans Division of Aeronautics
Keri Robinson, Caltrans, District 11
Juan Lias, MCAS Miramar Community Plans & Liaison Office

Biological Resource Report for the 9775 Towne Centre Drive Project, San Diego, California

Prepared for
BMR-Apex LP
17190 Bernardo Center Drive
San Diego, CA 92128
Contact: Mr. Federico Mina

Prepared by
RECON Environmental, Inc.
1927 Fifth Avenue
San Diego, CA 92101
P 619.308.9333

RECON Number 8521
January 9, 2018

Beth Procsal, Associate Biologist

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1.0 Summary

RECON Environmental, Inc. conducted a general biological survey of the approximately 5.59-acre 9775 Towne Centre Drive project site, which is part of a larger 12.27-acre property. The project site is located in the city of San Diego, east of Interstate 5 (I-5), west of Interstate 805 (I-805), north of Towne Center Drive, and located adjacent to an urban canyon within the University Community Plan area (Figure 1). The project site is found on the U.S. Geological Survey (USGS) 7.5-minute topographical map series, La Jolla and Del Mar quadrangles (Figure 2; USGS 1996, 1994) and City of San Diego, Engineering and Development, City 800' scale map, Number 258-1701 (Figure 3). The project site is composed of scientific research office buildings, parking lots, and a northeast-facing slope consisting of native vegetation (Figure 4). City of San Diego Multi-Habitat Planning Area (MHPA) overlaps with the project site (Figure 5). Approximately 1.04 acre of MHPA will be corrected out of the MHPA to align with the project development limits of disturbance and approximately 0.26 acre of land would be added to the MHPA at the northeastern end of the project site to align with the existing open space easement and property line.

The project site is part of a previous 234-acre 16-lot project, formally known as Eastgate Technology Park, and was graded in conjunction with the Tentative Subdivision Map (02-293-0) as part of the approved Eastgate Technology Park Environmental Impact Report (EIR; EQD No. 81-12-31, City of San Diego 1982). An open space easement was recorded by Westerra Pacific Associates in 1989 on the remaining undisturbed acreage, a portion of which includes the project parcel.

The project would demolish the existing scientific research office building and construct a 4-story scientific research office building with below-grade parking. The project requires a Community Plan Amendment, Site Development Permit, and Planned Development Permit to amend Planned Industrial Development Permit (PID) 90-0892.

The project would include 0.12 acre of impacts to coastal sage scrub and 5.16 acres of impacts to disturbed land within the project site. Mitigation for impacts to sensitive biological resources on the project site was previously addressed in the Eastgate Technology Park EIR (EQD No. 81-12-31) and no upland mitigation is required. Indirect impacts as a result of MHPA adjacency, including indirect impacts to coastal California gnatcatcher, would be avoided through project compliance with the City of San Diego's Multiple Species Conservation Plan Subarea Plan – Land Use Adjacency Guidelines.

Project Location

FIGURE 1
Regional Location

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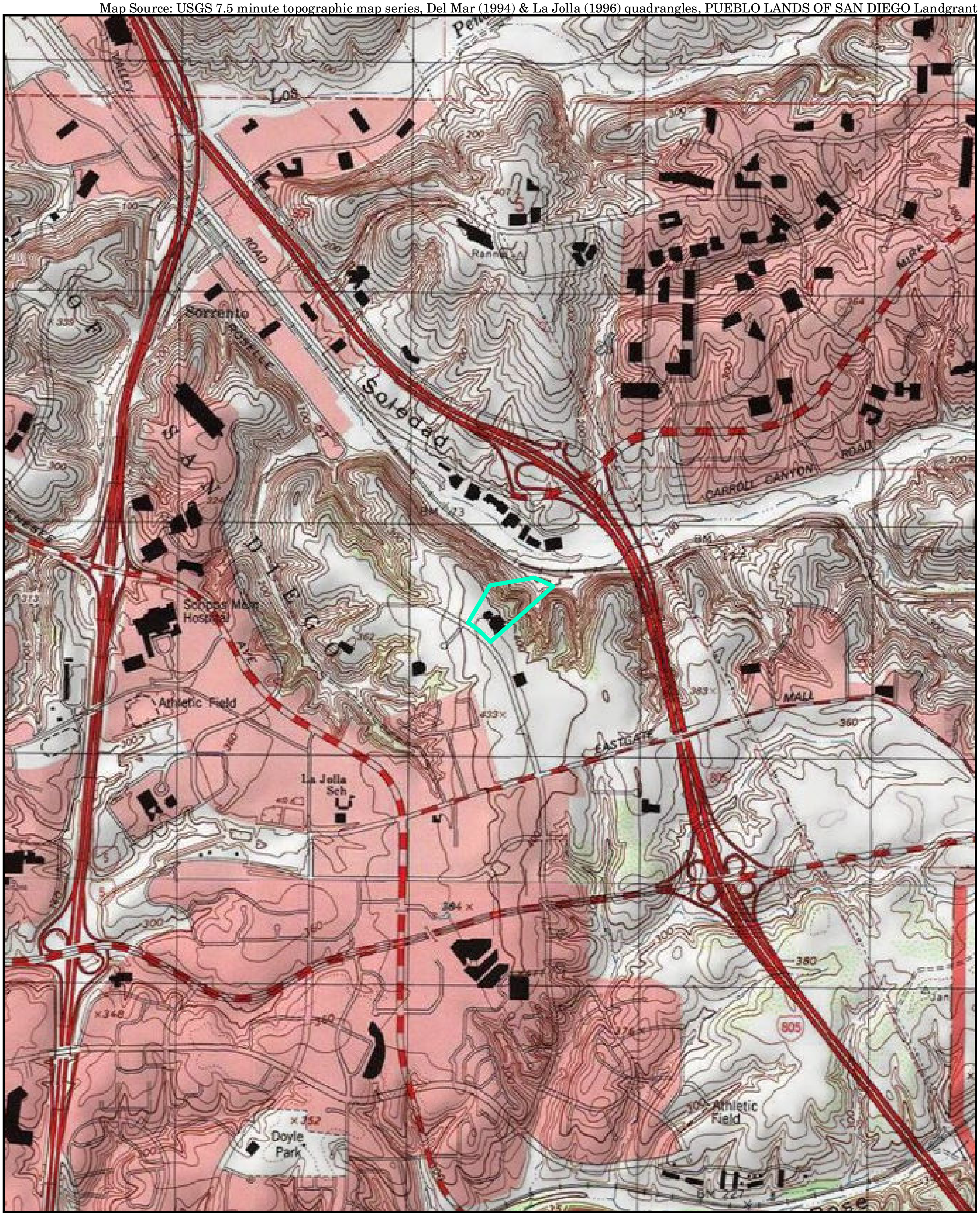
Map Source: USGS 7.5 minute topographic map series, Del Mar (1994) & La Jolla (1996) quadrangles, PUEBLO LANDS OF SAN DIEGO Landgrant



Property Boundary

FIGURE 2
Project Location on USGS Map

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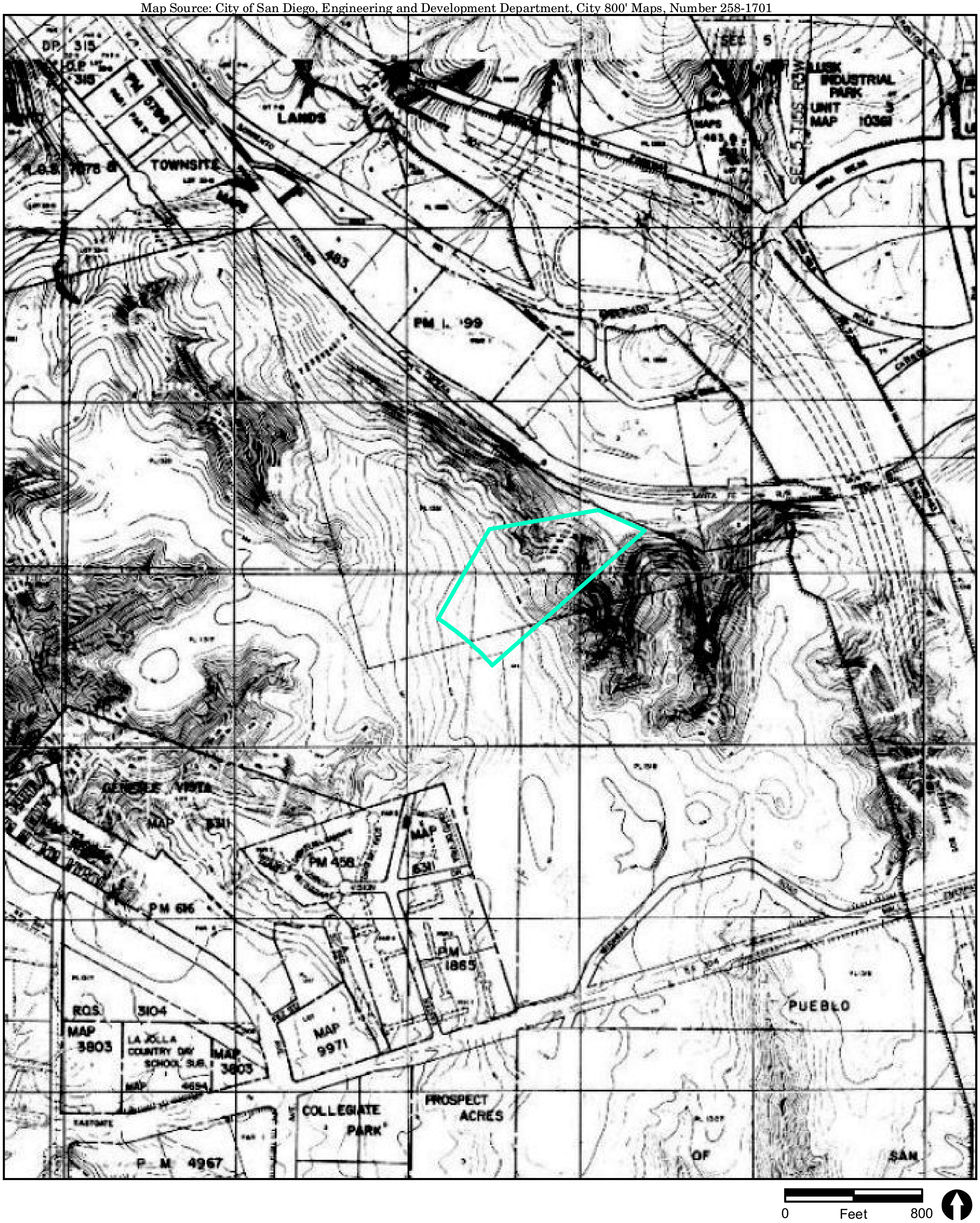
Map Source: City of San Diego, Engineering and Development Department, City 800' Maps, Number 258-1701



Property Boundary

FIGURE 3
Project Location on City 800' Map

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Image Source: NearMaps (flown Jan 2017)

FIGURE 4

Project Location on Aerial Photograph

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Image Source: NearMaps (flown Nov 2017)

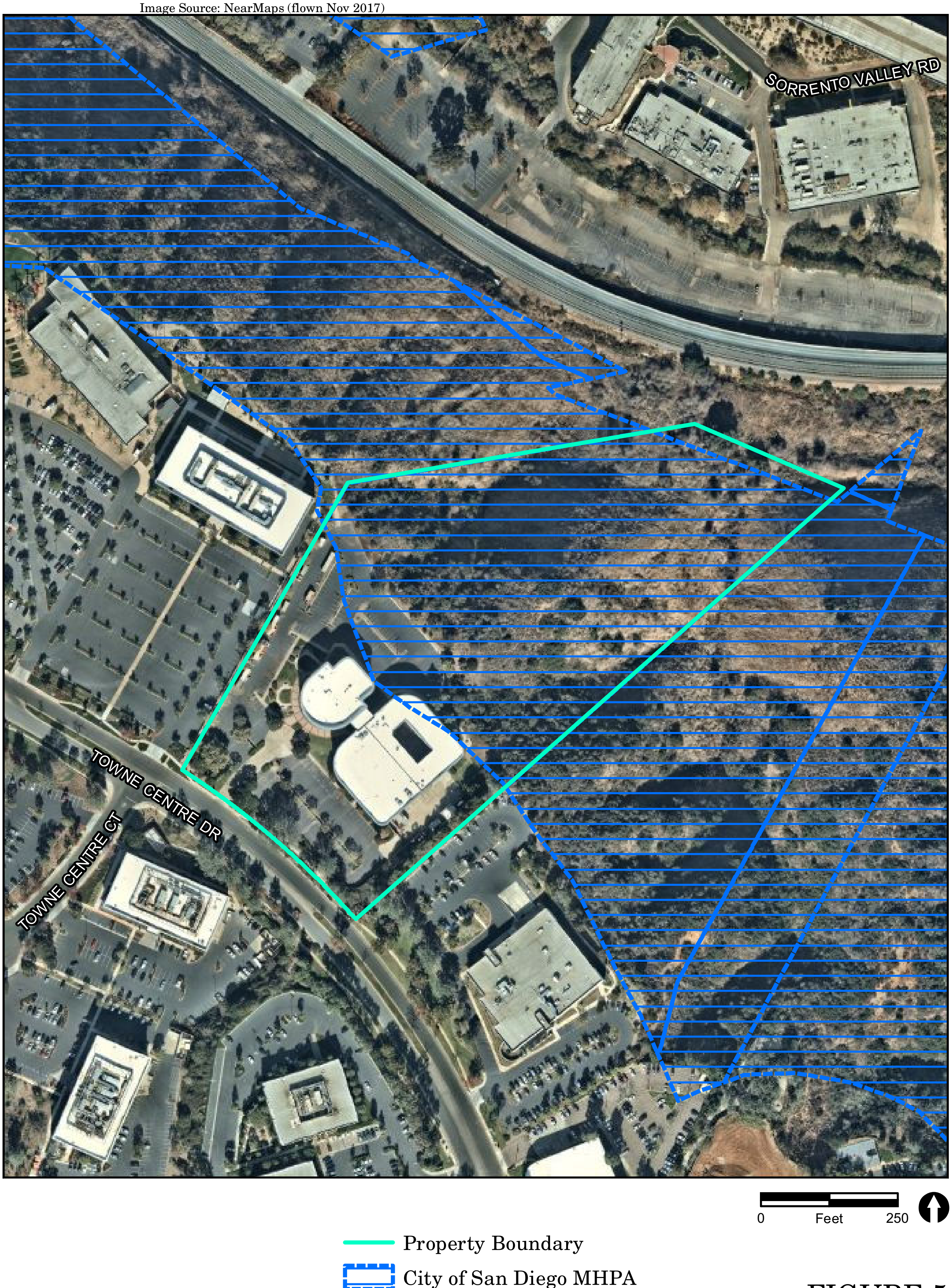

FIGURE 5

Project in Relation to
MSCP Preserve Area

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This report provides all the necessary biological data and background information required for environmental analysis according to guidelines set forth in the City of San Diego's Multiple Species Conservation Program (MSCP) Subarea Plan (1997) and the City of San Diego Biology Guidelines (2012).

2.0 Methods and Survey Limitations

A site visit was conducted on January 13, 2017, by RECON Environmental, Inc. (RECON) biologist Beth Procsal. The survey was conducted between 6:45 a.m. and 7:30 a.m. The air temperature was 60 degrees Fahrenheit, and wind speed ranged from 0 to 2 miles per hour. Cloud cover during the survey was 100 percent. Vegetation communities were mapped on a 1-inch-equals-60-feet aerial photograph of the survey area.

Wildlife and plant species observed during the survey were noted. Wildlife species were observed directly or detected from calls, tracks, scat, nests, or other sign. Because the survey was performed during the day, nocturnal animals were identified by sign. All plant species observed within the survey area were also noted, and plants that could not be identified in the field were identified later using taxonomic keys. One limitation to the survey methods was identified during the survey. The northeastern portion of the site was not accessible due to steep slopes with dense vegetation. This portion of the site was indirectly surveyed with the aid of binoculars.

Floral nomenclature for common plants follows the Jepson Online Herbarium (University of California 2017), for ornamental plants Brenzel (2001), and for sensitive plants California Native Plant Society (CNPS; 2017). Vegetation community classifications follow Oberbauer et. al (2008), which is based on Holland's 1986 Preliminary Descriptions of the Terrestrial Natural Communities of California. Zoological nomenclature for birds is in accordance with the American Ornithologists' Union Checklist (2016) and Unitt (2004); for mammals with Baker et al. (2003); and for reptiles with Crother (2008). Determination of the potential occurrence for listed, sensitive, or noteworthy species is based upon known ranges and habitat preferences for the species (Jennings and Hayes 1994; Unitt 2004; CNPS 2017; Reiser 2001), and species occurrence records from the California Natural Diversity Database (CNDDB; State of California 2017a).

3.0 Survey Results/Existing Conditions

3.1 Prior Entitlement

The project site is part of a previous 234-acre 16-lot project, formally known as Eastgate Technology Park, and was graded in conjunction with the Tentative Subdivision Map (02-293-0) as part of the approved Eastgate Technology Park Environmental Impact Report (EIR; EQD No. 81-12-31, City of San Diego 1982). The Eastgate Technology Park approved approximately 133 acres for development with Light Industrial and Scientific Research uses, with 18.12 acres of streets and landscaped walkways. The balance of the Eastgate Technology Park project area was placed within an open space easement that was recorded by Westerra Pacific Associates in 1989. Based on a review of the 1982 EIR, significant biological resources impacts were identified to variegated dudleya (*Dudleya variegata*), short-leaved dudleya (*Dudleya brevifolia*), raptor foraging habitat, and vernal pools. These impacts were mitigated thorough participation in the Vernal Pool Preservation Program and preservation of 21 percent of the site in an open space easement. Impacts to variegated dudleya and short-leaved dudleya were considered significant and unavoidable.

The project parcel contains a portion of the original open space easement granted as part of the Eastgate Technology Park. Of the 12.27-acre property, 6.68 acres are within the existing covenant of easement dedicated as part of the Eastgate Technology Park. Although the remaining area of the property was entitled for development as part of the prior approval, a portion was left undisturbed. The current proposal is entirely within the previously authorized development area.

3.2 Topography and Soils

Elevations within the project site range from 380 feet above mean sea level (MSL) to 400 feet above MSL. Two soil types, Altamont clay with 30 to 50 percent slopes and Chesterton fine sandy loam with 5 to 9 percent slopes, as mapped by the U.S. Department of Agriculture (USDA; 1973), occur within the project site. The majority of the site, where the existing developments are located, is generally flat.

Altamont clay, 30 to 50 percent slopes, is steep and is 20 to 32 inches deep over shale. Runoff is rapid and the erosion hazard is high. The available water-holding capacity is 3.5 to 5 inches. Included in the mapping are small areas of Linne clay loam and areas where the soils are only 10 inches deep over shale. This soil type is mainly used for rangeland (USDA 1973). Altamont clay soil generally occurs on the undeveloped portion along the northeastern boundary of the project site.

Chesterton fine sandy loam, with 5 to 9 percent slopes, eroded, is strongly sloping and has lost part of its original surface layer through sheet erosion. Runoff is slow to medium, and the erosion hazard moderate. Included in mapping are small areas of Huerhuero soils and Carlsbad soils. The Chesterton fine sandy loam soil type is chiefly used for tomatoes, flowers, and range (USDA 1973) and occurs on the majority of the property, currently covered with development.

3.3 Vegetation Communities and Land Cover Types

The vegetation communities and land cover types observed within the entire property include coastal sage scrub, non-native grassland, and disturbed land (Figure 6). Table 1 shows the vegetation communities and land cover types that occur on the project site inside and outside of the MHPA. The plant species observed during the survey are listed in Attachment 1.

Under the City of San Diego Biology Guidelines, the environmentally sensitive lands (ESL) regulations define sensitive biological resources into four tiers of sensitivity. Upland vegetation communities that are classified as Tier I (rare uplands), Tier II (uncommon uplands), or Tier III (common uplands) are considered sensitive by the City. Tier IV (other uplands) vegetation communities are not considered sensitive (City of San Diego 2012).

Table 1
Vegetation Communities and Land Cover Types
(acres)

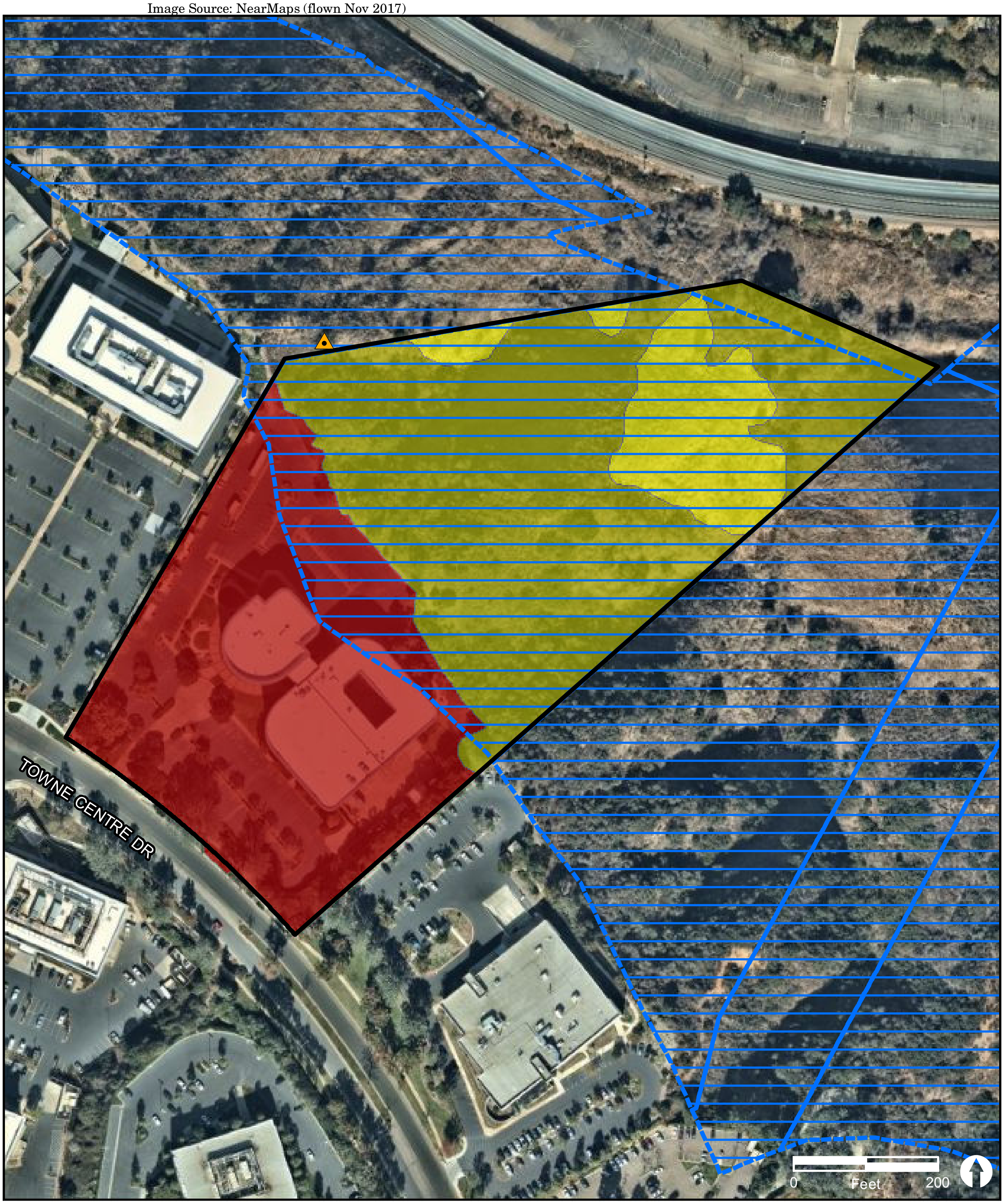
Vegetation and Land Cover Types	ESL Tier	Project Site Inside MHPA	Project Site Outside MHPA	Open Space Easement Inside MHPA	Open Space Easement Outside MHPA	Total Property
Coastal sage scrub	II	0.40	0.04	5.37	0.00	5.78
Non-native grassland	III-B	0.00	0.00	1.31	0.00	1.31
Disturbed land	IV	0.94	4.21	0.00	0.00	5.02
TOTAL	**-**	**1.34**	**4.25**	**6.68**	**0.00**	**12.27**

Coastal sage scrub, a Tier II habitat under the City of San Diego's Biology Guidelines, predominantly occurs in the northern portion of the project site on a northeast-facing slope (Photograph 1). This vegetation community is dominated by coyote brush (*Baccharis pilularis*), black sage (*Salvia mellifera*), lemonadeberry (*Rhus integrifolia*), and California sagebrush (*Artemisia californica*). The vegetation is fairly open at the top of the slope, adjacent to the parking lot, and the density of the vegetation increases further down the slope. Coastal sage scrub occupies 0.44 acre of the project site and 5.37 acres within the existing open space easement.

Non-native grassland, a Tier IIIB habitat under the City of San Diego's Biology Guidelines occurs within the open space easement and is dominated by ripgut grass (*Bromus diandrus*). This vegetation community occupies 1.31 acres of the existing open space easement.

Disturbed land, a Tier IV habitat under the City of San Diego's Biology Guidelines, which occupies 5.02 acres of the project site, consists of the current commercial buildings, parking lots, and ornamental plantings (Photographs 2 and 3). The ornamental vegetation is dominated by ground cover including slender myoporum (*Myoporum parvifolium*), hedges including Wheeler's dwarf (*Pittosporum tobira*), and various ornamental trees. Torrey pines (*Pinus torreyana* ssp. *torreyana*) have been planted within this land cover type and is found along the edge of the existing parking lot of the project site.

Image Source: NearMaps (flown Nov 2017)



Property Boundary

City of San Diego MHPA

Sensitive Species Observation

Coastal California Gnatcatcher

Vegetation Community and Land Cover

Coastal Sage Scrub

Non-native Grassland

Disturbed Land

RECON

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FIGURE 6

Existing Biological Resources

PHOTOGRAPH 1
Coastal Sage Scrub, Looking North, Photo Date: March 13, 2017

PHOTOGRAPH 2
Disturbed Land in the Foreground with Coastal Sage Scrub in the Background, Looking East, Photo Date: March 13, 2017

RECON

PHOTOGRAPH 3
Disturbed Land, Looking Southwest, Photo Date: March 13, 2017

3.4 Wildlife

Wildlife species observed on-site include those adapted to coastal sage scrub, and urban and developed areas, and include northern mockingbird (*Mimus polyglottos polyglottos*), wrentit (*Chamaea fasciata henshawi*), Bewick's wren (*Thryomanes bewickii*), California [=western] scrub-jay (*Aphelocoma californica*), house wren (*Troglodytes aedon parkmanii*), lesser goldfinch (*Spinus* [=*Carduelis*] *psaltria hesperophilus*), and California towhee (*Melozone* [=*Pipilo*] *crissalis*).

3.5 Multiple Species Conservation Program

3.5.1 Multi-Habitat Planning Area Boundary Line Correction

The original MHPA boundary for the site was established as part of the City's regional MSCP mapping efforts, which became effective in March 1997. When this boundary is displayed over the subject property, it can be seen that the MHPA line crosses areas previously graded and approved for development. MHPA boundary line corrections are allowed under the City's MSCP to rectify minor mapping inaccuracies at the project level and can be processed with the project's discretionary review. MHPA corrections typically involve removing existing, pre-MSCP development from the mapped MHPA.

A MHPA boundary line correction would typically be considered by the City when it can be shown that there is a discrepancy between the adopted MHPA boundary and other mapping information that results in inclusion of existing developed areas in the MHPA due to the regional scale of the MHPA mapping. For a MHPA correction to be supported by City staff, it must be clearly demonstrated that: (1) the proposed area to be corrected out of the MHPA was legally permitted for grading; OR (2) no habitat, including wetlands, would be removed; (3) no buffer area (e.g., wetland buffer, wildlife corridor) would be impacted; and (4) removing the area from the MHPA would not avert the applicant from having to otherwise comply with the City's MSCP Land Use Adjacency Guidelines.

3.5.2 MHPA Boundary Line Correction Analysis

Approximately 7.73 acres of MHPA are mapped on the property (Figure 7). Of the 7.73 acres of mapped MHPA, approximately 1.04 acres will be corrected out of the MHPA as part of the project. The proposed MHPA boundary line correction would move the MHPA boundary line northeast to align with the development limits of disturbance (Figure 8). Additionally, 0.26 acre of land within the northeastern end of the existing open space easement will also be added to the MHPA (see Figure 8).

Image Source: USGS (flown May 1994)

FIGURE 7

RECON

MHPA Overlay on 1994 Aerial Photograph

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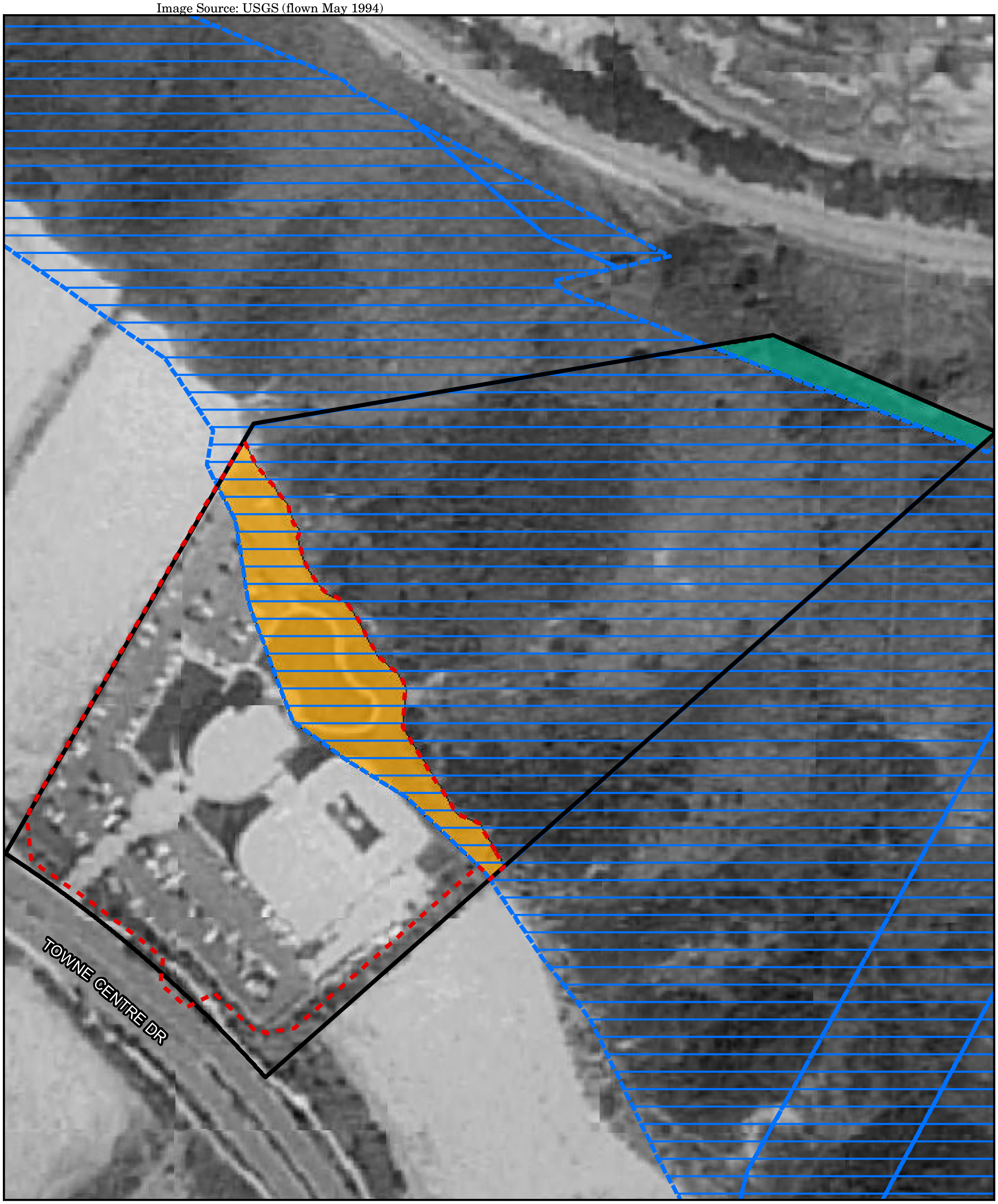
Image Source: USGS (flown May 1994)



Property Boundary
Limits of Disturbance
City of San Diego MHPA
Proposed MHPA Correction-Deletion
Proposed MHPA Correction-Addition

RECON

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FIGURE 8

Proposed MHPA Correction

Figure 7 shows a portion of the Eastgate Technology Park project (City of San Diego 1982), where the 9775 Towne Centre Drive project will occur, overlaid onto a 1994 aerial. This shows that grading was approved before the adoption of the City's MSCP in March 1997. The Tentative Subdivision Map (02-293-0) provided for the Eastgate Technology Park project was approved in 1982, and Map 10830 recorded January 23, 1984. In 1989, a subsequent Parcel Map was approved that created the current parcel boundaries. The Eastgate Technology Park EIR (EQD No. 81-12-31) evaluated potential biological resource impacts associated with development of the technology park and implemented biological resources mitigation that included dedication of the open space easement that currently exists on the project parcel. The remainder of the parcel was identified as development area in the prior environmental document. Based on these prior development approvals, the

property possessed legally vested development rights prior to the establishment of the MSCP, and the appropriate MHPA correction should align with the existing easement boundaries.

The MHPA correction would move the boundary of the MHPA to align with the development limits of disturbance. This correction would result in 0.1 acre of coastal sage scrub and 0.94 acre of disturbed lands being removed from the MHPA (see Figure 7). The 0.1 acre of coastal sage scrub within this area was previously approved for development per the 1982 EIR (City of San Diego 1982) and subsequent recorded maps. Therefore, no additional habitat over what was previously authorized for development would be removed from the MHPA. Table 2 summaries the vegetation communities on-site once the boundary line correction is approved.

Table 2
MHPA Boundary Line Correction Summary
(acres)

Vegetation and Land Cover Types	ESL Tier	Existing within Project Site Outside of the MHPA	Existing within Project Site Inside the MHPA
Coastal sage scrub	II	0.44	0.00
Disturbed land	IV	5.15	0.00
Non-native grassland	IIIB	-	-
TOTAL	**-**	**5.59**	**0.00**

No MHPA buffer areas would be affected and the correction would not relieve the applicant from compliance with the MHPA Land Use Adjacency Guidelines. The following section discusses in detail how the project would comply with the MSCP Land Use Adjacency Guidelines.

3.5.3 MSCP Subarea Plan – Land Use Adjacency Guidelines

1. The following City of San Diego's Land Use Adjacency Guidelines will be incorporated as project conditions of approval, which will preclude indirect impacts to the MHPA as a result of the project.

   A. **Drainage** – All new and proposed parking lots and developed areas in and adjacent to the preserve must not drain directly into the MHPA. All developed and paved areas must prevent the release of toxins, chemicals, petroleum products, exotic plant materials and other elements that might degrade or harm the natural environment or ecosystem processes within the MHPA. This can be accomplished using a variety of methods including natural detention basins, grass swales, or mechanical trapping devices. These systems should be maintained approximately once a year, or as often as needed, to ensure proper functioning. Maintenance should include dredging out sediments if needed, removing exotic plant materials, and adding chemical-neutralizing compounds (e.g., clay compounds) when necessary and appropriate.

   - The project hardscape will drain away from the MHPA line and into bio-retention basins where it is treated before being released into the existing storm drain system.

   B. **Toxics** – Land uses, such as recreation and agriculture, which use chemicals or generate by-products such as manure that are potentially toxic or impactive to wildlife, sensitive species, habitat, or water quality, need to incorporate measures to reduce impacts caused by the application and/or drainage of such materials into the MHPA. Such measures should include drainage/detention basins, swales, or holding areas with non-invasive grasses or wetland-type native vegetation to filter out the toxic materials. Regular maintenance should be provided. Where applicable, this requirement should be incorporated into leases on publicly owned property as leases come up for renewal.

   - The project hardscape will drain away from the MHPA line and into bio-retention basins where it is treated before being released into the existing storm drain system. Project construction limits are denoted on the plans and will be outside of the MHPA line.

   C. **Lighting** – Lighting of all developed areas adjacent to the MHPA should be directed away from the MHPA. Where necessary, development should provide adequate shielding with non-invasive plant materials (preferably native), berming, and/or other methods to protect the MHPA and sensitive species from night lighting.

   - The project will incorporate pole-mounted lights with shoebox-style fixtures in the parking lot. Where necessary (when adjacent to the MHPA), these fixtures could be equipped with a “House Side Shield” to prevent light from bleeding out behind the fixture.

D. **Barriers** – New development adjacent to the MHPA may be required to provide barriers (e.g., non-invasive vegetation, rocks/boulders, fences, walls, and/or signage) along the MHPA boundaries to direct public access to appropriate locations and reduce domestic animal predation.

- A retaining wall is proposed to follow the project site boundary from the northeastern corner to approximately half way along the eastern boundary. A barrier fence or another acceptable fence would be installed along the eastern boundary, adjacent to the MHPA. The fencing adjacent to the MHPA will be 3 to 5 feet tall and will have openings to allow movement of small mammals. The final design specifications of the fence will be included as a project condition of approval. The location of this fence is shown on the Landscape Plan.

E. **Invasives** – No invasive non-native plant species shall be introduced into areas adjacent to the MHPA.

- The plant palette for this project as detailed on the project landscape plans do not include any invasive species or prohibited plant species listed in the City of San Diego Landscape Standards Manual (City of San Diego 2009). Therefore, no invasive or prohibited plant species would be introduced into the MHPA.

F. **Brush Management** – New residential development located adjacent to and topographically above the MHPA (e.g., along canyon edges) must be set back from slope edges to incorporate Zone 1 brush management areas on the development pad and outside of the MHPA. Zones 2 and 3 will be combined into one zone (Zone 2) and may be located in the MHPA upon granting of an easement to the City (or other acceptable agency) except where narrow wildlife corridors require it to be located outside of the MHPA. Zone 2 will be increased by 30 feet, except in areas with a low fire hazard severity rating where no Zone 2 would be required. Brush management zones will not be greater in size that is currently required by the City’s regulations. The amount of woody vegetation clearing shall not exceed 50 percent of the vegetation existing when the initial clearing is done. Vegetation clearing shall be done consistent with City standards and shall avoid/minimize impacts to covered species to the maximum extent possible. For all new development, regardless of the ownership, the brush management in the Zone 2 area will be the responsibility of a homeowners association or other private party.

- Brush management planting and extents will be completed in compliance with the Landscape Regulations Section 142.0412 as part of the City of Municipal Code. Brush management zone 1 is located completely within the development footprint. Brush management zone 2 will extend into the MHPA by 70 feet.

G. **Noise** – Uses in or adjacent to the MHPA should be designed to minimize noise impacts. Berms or walls should be constructed adjacent to commercial areas, recreational areas, and any other use that may introduce noises that could impact or interfere with wildlife utilization of the MHPA. Excessively noisy uses or activities adjacent to breeding areas must incorporate noise reduction measures and be curtailed during the breeding season of sensitive species. Adequate noise reduction measures should also be incorporated for the remainder of the year. Due to the site's location adjacent to or within the MHPA where the Qualified Biologist has identified potential nesting habitat for listed avian species, construction noise that exceeds the maximum levels allowed shall be avoided during the breeding seasons for the coastal California gnatcatcher (March 1 – August 15).

Prior to the issuance of any grading permit (for public utility projects: prior to the preconstruction meeting), the City Manager (or appointed designee) shall verify that the MHPA boundaries and the following project requirements regarding the coastal California gnatcatcher are shown on the construction plans:

No clearing, grubbing, grading, or other construction activities shall occur between March 1 and August 15, the breeding season of the coastal California gnatcatcher, until the following requirements have been met to the satisfaction of the City Manager:

A. A qualified biologist (possessing a valid endangered species act section 10(a)(1)(a) recovery permit) shall survey those habitat areas within the MHPA that would be subject to construction noise levels exceeding 60 decibels [db(a)] hourly average for the presence of the coastal California gnatcatcher. Surveys for the coastal California gnatcatcher shall be conducted pursuant to the protocol survey guidelines established by the USFWS within the breeding season prior to the commencement of any construction. If gnatcatchers are present, then the following conditions must be met:

   I. Between March 1 and August 15, no clearing, grubbing, or grading of occupied gnatcatcher habitat shall be permitted; areas restricted from such activities shall be staked or fenced under the supervision of a qualified biologist; and

   II. Between March 1 and August 15, no construction activities shall occur within any portion of the site where construction activities would result in noise levels exceeding 60 db(a) hourly average at the edge of occupied gnatcatcher habitat. An analysis showing that noise generated by construction activities would not exceed 60 db(a) hourly average at the edge of occupied habitat must be completed by a qualified acoustician (possessing current noise engineer license or registration with monitoring noise level experience with listed animal species) and approved by the City Manager at least two weeks prior to the commencement of construction activities. Prior to the commencement of construction activities during the breeding season, areas restricted from such activities shall be staked or fenced under the supervision of a qualified biologist; or

III. At least two weeks prior to the commencement of construction activities, under the direction of a qualified acoustician, noise attenuation measures (e.g., berms, walls) shall be implemented to ensure that noise levels resulting from construction activities will not exceed 60 dB(A) hourly average at the edge of habitat occupied by the coastal California gnatcatcher. Concurrent with the commencement of construction activities and the construction of necessary noise attenuation facilities, noise monitoring* shall be conducted at the edge of the occupied habitat area to ensure that noise levels do not exceed 60 dB(A) hourly average. If the noise attenuation techniques implemented are determined to be inadequate by the qualified acoustician or biologist, then the associated construction activities shall cease until such time that adequate noise attenuation is achieved or until the end of the breeding season (August 16).

*Construction noise monitoring shall continue to be monitored at least twice weekly on varying days, or more frequently depending on the construction activity, to verify that noise levels at the edge of occupied habitat are maintained below 60 dB (A) hourly average or to the ambient noise level if it already exceeds 60 dB (A) hourly average. If not, other measures shall be implemented in consultation with the biologist and the City Manager, as necessary, to reduce noise levels to below 60 dB(A) hourly average or to the ambient noise level if it already exceeds 60 dB(A) hourly average. Such measures may include, but are not limited to, limitations on the placement of construction equipment and the simultaneous use of equipment.

B. If coastal California gnatcatchers are not detected during the protocol survey, the qualified biologist shall submit substantial evidence to the city manager and applicable resource agencies, which demonstrates whether or not mitigation measures such as noise walls are necessary between March 1 and August 15 as follows:

I. If this evidence indicates the potential is high for coastal California gnatcatcher to be present based on historical records or site conditions, then condition A.III shall be adhered to as specified above.

II. If this evidence concludes that no impacts to this species are anticipated, no mitigation measures would be necessary.

H. **Grading/Land Development** – Manufactured slopes associated with site development shall be included within the development footprint for projects within or adjacent to the MHPA.

- Construction limits are shown on the plans are outside the MHPA limits.

4.0 Sensitive Biological Resources

4.1 Sensitivity Criteria/Regulatory Setting

For purposes of this report, species will be considered sensitive if they are (1) covered species under the City of San Diego's MSCP Subarea Plan; (2) listed by state or federal agencies as threatened or endangered or are proposed for listing (State of California 2017b, 2017c, 2017d, 2017e); (3) on California Rare Plant Rank 1B (considered endangered throughout its range) or California Rare Plant Rank 2 (considered endangered in California but more common elsewhere) of the California Native Plant Society (CNPS) Inventory of Rare and Endangered Vascular Plants of California (2017); or (4) designated by the City of San Diego as a narrow endemic species (City of San Diego 2012). Noteworthy plant species are considered to be those that are on California Rare Plant Rank 3 (more information about the plant's distribution and rarity needed) and California Rare Plant Rank 4 (plants of limited distribution) of the CNPS Inventory (2017). Sensitive vegetation communities are those identified by the City of San Diego (2012). The project is expected to comply with all the following state, federal, and local regulations.

State Regulations: Under Section 3503 of the California Fish and Game Code, it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Section 3503.5 of the California Fish and Game Code prohibits take, possession, or destruction of any birds in the orders Falconiformes (raptors) or Strigiformes (owls), or of their nests and eggs (State of California 1991).

Federal Regulations: Migratory Bird Treaty Act (MBTA) was established to provide protection to the breeding activities of migratory birds throughout the U.S. The MBTA protects migratory birds and their breeding activities from take and harassment. The project is designed to comply with MBTA, which precludes direct impacts to nesting birds and raptors.

City of San Diego Regulations: As stated in the City of San Diego 2012 Biology Guidelines, a project site is considered to contain sensitive biological resources if:

- The site has been identified as part of the MHPA by the City's MSCP Subarea Plan.

- The site supports or could support (e.g. in different seasons/rainfall conditions, etc.) Tier I, II, or III-A & -B vegetation communities (such as grassland, chaparral, coastal sage scrub, etc.). The California Environmental Quality Act (CEQA) determination of significant impacts may be based on what was on the site (e.g. if illegal grading or vegetation removal occurred, etc.), as appropriate.

- The site contains, or comes within 100 feet of a natural or manufactured drainage (determine whether it is vegetated with wetland vegetation). The site occurs within the 100-year flood plain established by the Federal Emergency Management Agency (FEMA) or the Flood Plain (FP)/ Flood Way (FW) zones.

- The site does not support a vegetation community identified in Tables 2a, 2b or 3 (Tier I, II, IIIA or IIIB) of the Biology Guidelines; however, wildlife species listed as threatened or endangered or other protected species may use the site (e.g., California least terns on dredge spoil, wildlife using agricultural land as a wildlife corridor, etc.).

MHPA lands are those that have been included within the City's MSCP Subarea Plan for habitat conservation. These lands have been determined to provide the necessary habitat quality, quantity, and connectivity to sustain the unique biodiversity of the San Diego region. MHPA lands are considered by the City of San Diego to be a sensitive biological resource.

4.2 Sensitive Vegetation Communities

Coastal sage scrub (Tier II) and non-native grassland are considered a sensitive habitats under the City of San Diego's MSCP (City of San Diego 1997). These sensitive vegetation communities are shown on Figure 6.

4.3 Sensitive Plants

Two sensitive plant species were observed on the project site. One of these species, Nuttall's scrub oak (*Quercus dumosa*), a CNPS rare plant ranking of 1B.1, was scattered throughout the coastal sage scrub. Although Torrey pines, a MSCP covered species with CNPS rare plant ranking of 1B.2, are present within the project site, these trees are not naturally occurring and are not considered sensitive. The Torrey pines within the existing parking lots were planted, and by examining historic aerials, it was obvious that these trees were part of the existing project's landscaping. Sensitive plant species known to occur within one mile of the project area based on a California Natural Diversity Database review are presented and their potential for their occurrence on the site evaluated in Attachment 2.

4.4 Sensitive Wildlife Species

No sensitive wildlife species were observed on-site during the general survey; however, coastal California gnatcatcher (*Polioptila californica californica*), was detected immediately adjacent to the project site within the MHPA. Five sensitive wildlife species have a moderate to high potential to occur/nest on-site within the native habitats in the MHPA, adjacent of the project site. These species include Belding's orange-throated whiptail (*Aspidoscelis hyperythra beldingi*), a California Department of Fish and Wildlife (CDFW) species of special concern and an MSCP covered species; coastal whiptail (*Aspidoscelis tigris stejnegeri*), a CDFW species of special concern; coastal California gnatcatcher, a federally listed as threatened species, a CDFW species of special concern, and an MSCP covered species; southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), a CDFW watch list species and an MSCP covered species; and San Diego desert woodrat (*Neotoma lepida intermedia*), a CDFW species of special concern. All sensitive wildlife species known to occur in the project vicinity (within one mile of the project site) that are federally listed threatened or endangered, or that have potential to occur based on species range are evaluated in Attachment 3.

4.5 Wildlife Movement Corridor

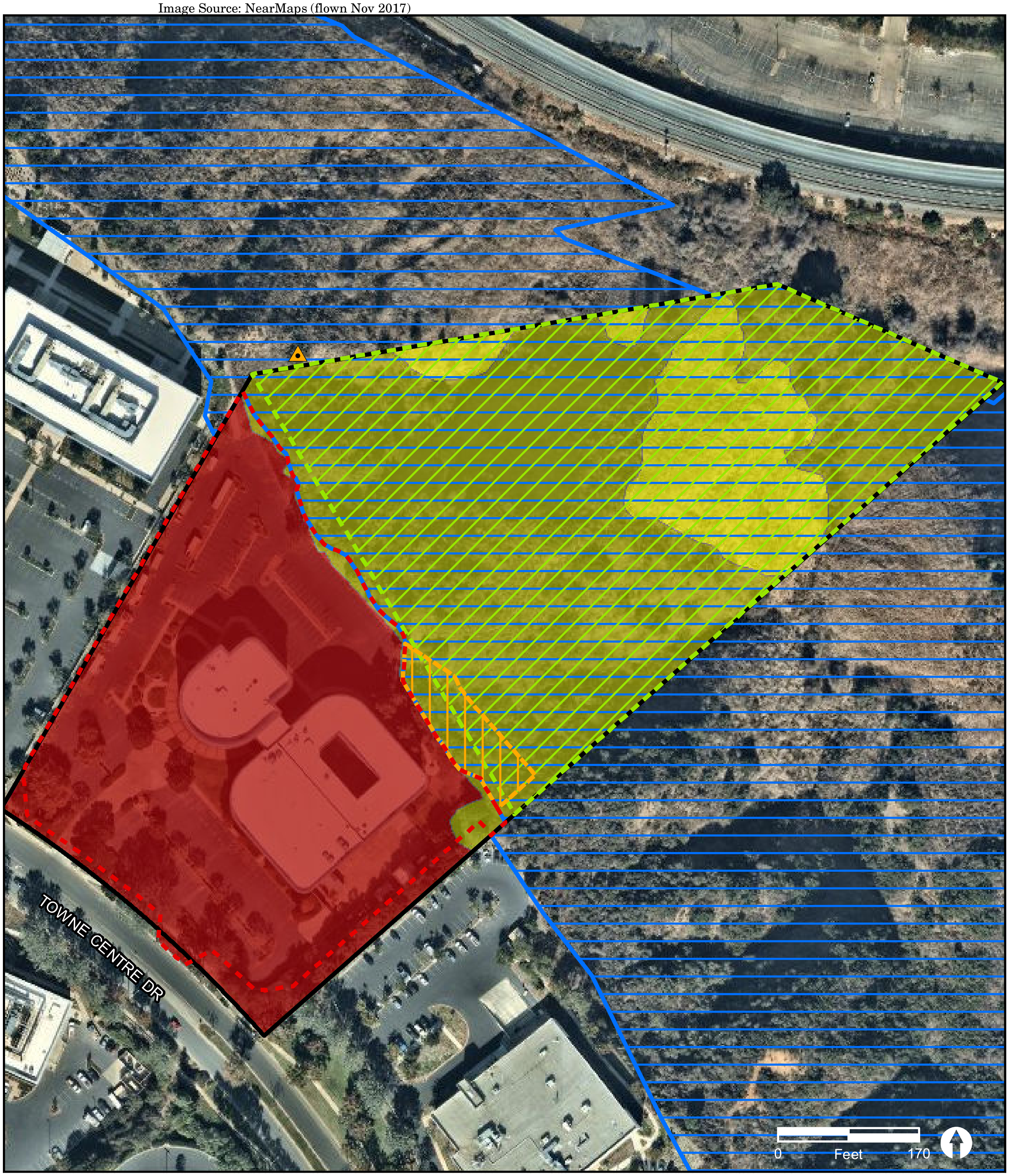
Wildlife movement corridors are defined as areas that connect suitable wildlife habitat areas in a region otherwise fragmented by rugged terrain, changes in vegetation, or human disturbance. Natural features such as canyon drainages, ridgelines, or areas with vegetation cover provide corridors for wildlife travel. Wildlife movement corridors are important, because they provide access to mates, food, and water; allow the dispersal of individuals away from high population density areas; and facilitate the exchange of genetic traits between populations (Beier and Loe 1992). Wildlife movement corridors are considered sensitive by resource and conservation agencies.

The northeastern portion of the project site is located adjacent to an urban canyon system bounded by industrial development, roads, and fencing which ultimately restrict its use by wildlife. Furthermore, the canyon is not designated as a MSCP regional wildlife corridor as it does not provide a throughway for wildlife species by connecting with major areas of off-site habitat. Therefore, the project site would not be considered a significant wildlife movement corridor.

5.0 Project Impacts

5.1 Sensitive Habitats

Project site grading, construction, and landscaping will impact 5.28 acres including 0.12 acre of coastal sage scrub in the eastern corner of the project site, which is considered an ESL Tier II sensitive habitat, and 5.16 acres of disturbed land (Figure 9, Table 3). No direct impacts will occur to the existing open space easement. An additional 0.29 acre of Tier II



Property Boundary
Limits of Disturbance + BMZ 1
BMZ 2
Existing Open Space Easement
City of San Diego MHPA - Corrected

Sensitive Species Observation
Coastal California Gnatcatcher

Vegetation Community and Land Cover
Coastal Sage Scrub
Non-native Grassland
Disturbed Land

FIGURE 9
Impacts to Biological Resources (Assuming the Approval of the Boundary Line Correction)

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habitat comprised of coastal sage scrub would be affected due to the implementation of Brush Management Zone 2 (BMZ 2). BMZ 2 impacts are considered impact neutral pursuant to the City's Land Development Code (City of San Diego 2015) and Biology Guidelines (City of San Diego 2012) and do not require mitigation.

Table 3
Impacts to Vegetation Communities and Land Cover Types Assuming the Boundary Line Correction (acres)

Vegetation and Land Cover Types	ESL Tier	Existing within Project Site	Project Impacts Inside the MHPA	Project Impacts Outside the MHPA[1]	Recorded in Existing Open Space Easement, 1989	On-Site Preservation within Covenant of Easement
Coastal sage scrub	II	0.44	0.00	0.12	5.37	0.30
Disturbed land	IV	5.15	0.00	5.16	-	0.00
Non-native grassland	IIIB	-	-	-	1.31	-
TOTAL	**-**	**5.59**	**0.00**	**5.28**	**6.68**	**0.30**

[1] Acreage does not include 0.29 acre of Zone 2 brush management within coastal sage scrub. These are considered impact neutral and do not contribute towards mitigation.

Impacts to sensitive vegetation communities (i.e., coastal sage scrub) were addressed in the Eastgate Technology Park EIR (EQD No. 81 12 31; City of San Diego 1982). Mitigation measures outlined in the EIR were previously implemented when the entire site was graded. Therefore, there are no new impacts to the existing coastal sage scrub outside what was originally authorized for development, and no new mitigation is required.

5.2 Sensitive Plant Species

The project will directly impact approximately six Nuttall's scrub oak individuals. Although this species is considered rare by CNPS, it is not covered by the MSCP nor does it have federal or state status. Therefore, impacts to this species are not expected to reduce the regional population to a less than self-sustaining level, and impacts would be less than significant. No state listed, federally listed, or MSCP covered species would be impacted by the proposed project.

5.3 General and Sensitive Wildlife Species

Five sensitive wildlife species have moderate potential to occur in the coastal sage scrub on-site. The loss of vegetation associated with the proposed project is so small that these impacts are not expected to reduce the wildlife populations below self-sustaining levels and are considered less than significant. Furthermore, compliance with the MSCP Subarea Plan Land Use Adjacency Guidelines (see Section 3.5.3) would ensure there would be no subsequent impacts to the adjacent native habitats. Habitat-based mitigation for project-related sensitive species impacts would not be required as described in Section 5.1. Area

Specific Management Directives (ASMDs) provided as conditions of coverage for MSCP covered species facilitate further protection for these species.

The ASMDs for Belding's orange-throated whiptail must address edge effects. Edge effects may include (but are not limited to) trampling, dumping, vehicular traffic, competition with invasive species, parasitism by cowbirds, predation by domestic animals, noise, collecting, recreational activities, and other human intrusion (City of San Diego 1997). All of the development footprint would be located outside of the corrected MHPA, but would be located immediately adjacent to the MHPA. However, the area adjacent to the MHPA is limited to the eastern side of the project site and is located immediately next to a downhill slope, which will discourage unauthorized human entry into the MHPA. Additionally a barrier fence would be installed. Therefore, edge effects would be limited.

The ASMDs for coastal California gnatcatcher and southern California rufous-crowned sparrow also require fire protection measures to reduce the potential for habitat degradation due to unplanned fire, and management measures to maintain or improve habitat quality including vegetation structure. Fire protection and management measures would be implemented through compliance with brush management regulations. The project would incorporate a Brush Management Zone 1 (BMZ 1) that ranges from 30 to 79 feet wide from the edge of the building to the nearest native or naturalized vegetation. Within BMZ 1 there would be no structures, landscaping would be low growing with the exception of trees, and all plants would be low fuel and fire resistive. Brush Management Zone 2 (BMZ 2) is only required where BMZ 1 does not extend to 79 feet. The BMZ 2 would be approximately 65 feet wide, and vegetation (including coastal sage scrub) would be thinned within this area as a management measure to control fuel sources and reduce fire risk (50 percent of the plants over 24 inches in height would be cut and cleared to a height of 6 inches). Any new plant material would be native, low fuel, and fire resistive within BMZ 2. Per brush management regulations, no clearing of occupied habitat within the City's MHPA and within the County's Biological Resource Core Areas may occur between March 1 and August 15. These fire management and protection measures would avoid indirect impacts to coastal California gnatcatcher and southern California rufous-crowned sparrow.

Coastal whiptail and San Diego desert woodrat are considered a CDFW species of special concern but are not covered by the MSCP. No ASMDs have been developed for these species. However, it is anticipated that indirect impacts to coastal whiptail and San Diego desert woodrat would be avoided through the implementation of ASMDs for coastal California gnatcatcher, which also reside in coastal sage scrub.

5.4 Indirect Impacts

The project site is located adjacent to the MHPA and thus will be required to comply with MHPA Land Use Adjacency Guidelines as a condition of project approval in order to avoid potential indirect impacts to MHPA lands and adjacent sensitive habitats and species. Compliance with Land Use Adjacency Guidelines would ensure drainage and lighting is directed away from the MHPA and appropriate barriers are installed to prevent entry into the MHPA. Due to the presence of occupied coastal California gnatcatcher habitat adjacent to the proposed area of disturbance, noise during construction could have an adverse effect on the breeding activities of this species. Land Use Adjacency Guidelines for noise would be required as a project condition of approval as detailed in Section 3.5.3. With implementation of the Land Use Adjacency Guidelines, adverse indirect impacts to the adjacent MHPA and to occupied coastal California gnatcatcher habitat would be avoided.

6.0 Mitigation

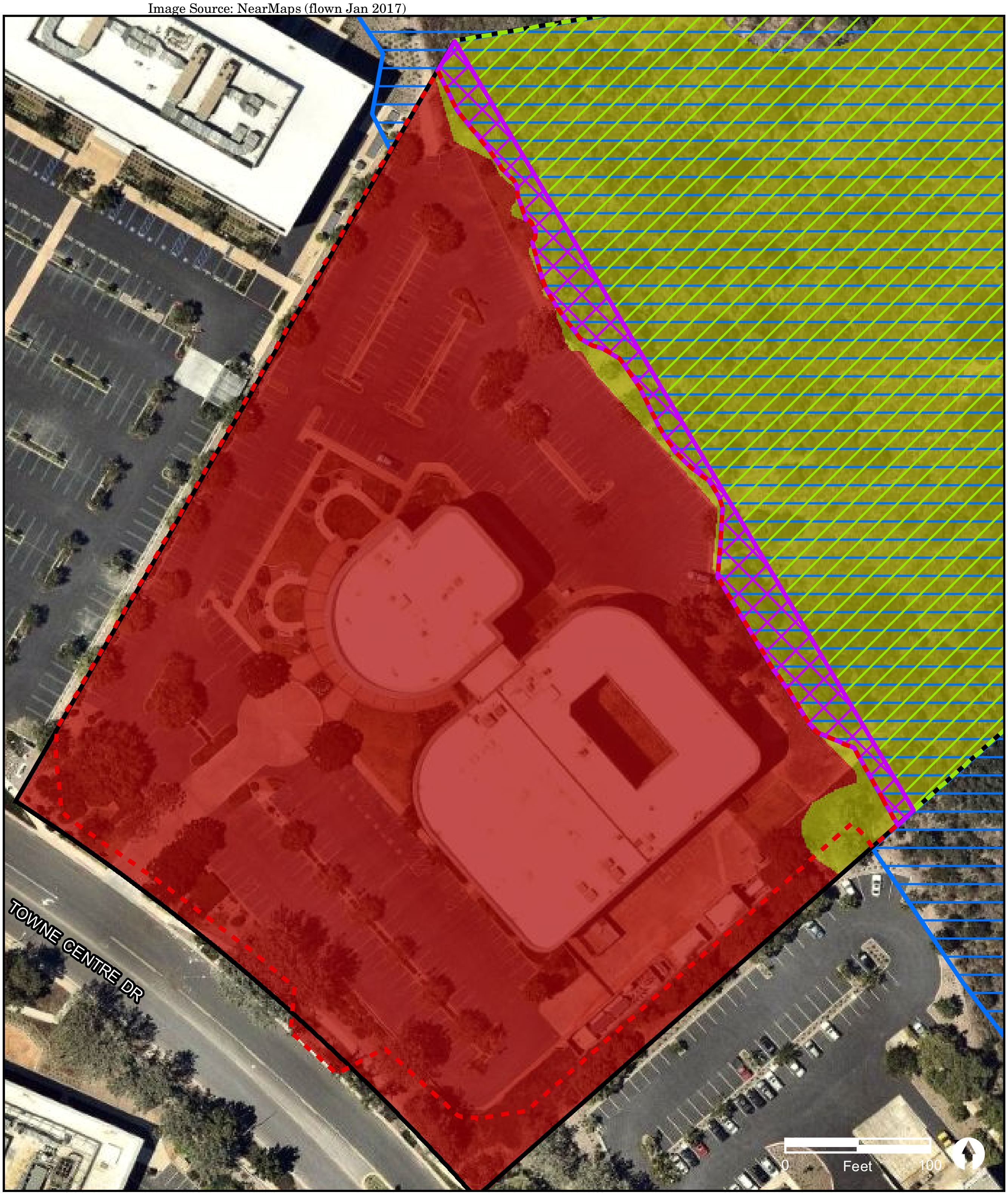
Mitigation is required for project impacts that are considered significant under CEQA (City of San Diego 2011). All impacts to sensitive biological resources shall be avoided to the maximum extent feasible, and minimized prior to proposing mitigation whenever possible. Mitigation is intended to reduce the impacts to below a level of significance. As discussed herein, all biological resource impacts would be less than significant and mitigation is not required.

Although the project would result in 0.12 acre of impact to coastal sage scrub, development of this area was evaluated and mitigated for as part of the 1989 Eastgate Technology Park EIR. The area of disturbance is located within the previously identified impact footprint, which was mitigated by dedication of an open space easement recorded by Westerra Pacific Associates in 1989. The existing open space easement is maintained in perpetuity, and allows no structures or development (City of San Diego 1982).

Between the development footprint and the original open space easement, the remaining 0.30 acre of coastal sage scrub habitat within the project site would remain in the MHPA and be conserved in a covenant of easement per the MSCP Implementing Agreement Section 143.0152 of the City of San Diego Land Development Code (see Table 2; Figure 10). Thus, all portions of the corrected MHPA boundary, outside of the proposed development area and not within an existing covenant of easement, would be conserved within a proposed covenant of easement as represented on Figure 10.

Thus, no significant impacts would occur and no mitigation is required. Compliance with the MHPA Adjacency requirements and dedication of a covenant of easement between the development footprint and the original open space easement would ensure that significant impacts are avoided.

Image Source: NearMaps (flown Jan 2017)



Property Boundary

Limits of Disturbance + BMZ 1

Open Space Easement Recorded by Westerra Pacific Associates in 1989

Proposed Covenant of Easement for MHPA Land

City of San Diego MHPA - Corrected

Vegetation Community and Land Cover

Coastal Sage Scrub

Disturbed Land

RECON

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FIGURE 10
Proposed Covenant of Easement within the Property Boundary

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ATTACHMENTS

ATTACHMENT 1

Plant Species Observed

Attachment 1 Plant Species Observed			
Scientific Name	Common Name	Habitat	Origin
GYMNOSPERMS			
PINACEAE	**PINE FAMILY**		
Pinus torreyana Parry ex Carrière ssp. *torreyana*	Torrey pine	DIST	I
POACEAE (GRAMINEAE)	**GRASS FAMILY**		
Bromus diandrus Roth	ripgut grass	DIST	I
Bromus madritensis L. ssp. *rubens* (L.) Husn.	red brome	DIST, CSS	I
Cortaderia selloana (Schult. & Schult. f.) Asch. & Graebn.	pampas grass	DIST, CSS	I
Ehrharta calycina Sm.	perennial veldt grass	DIST	I
ANGIOSPERMS: DICOTS			
ANACARDIACEAE	**SUMAC OR CASHEW FAMILY**		
Malosma laurina Nutt. ex Abrams	laurel sumac	CSS	N
Rhus integrifolia (Nutt.) Benth. & Hook. f. ex Rothr.	lemonade berry	CSS	N
Schinus terebinthifolius Raddi	Brazilian pepper tree	DIST	I
Toxicodendron diversilobum (Torr. & A. Gray) Greene	western poison oak	CSS	N
ASTERACEAE	**SUNFLOWER FAMILY**		
Artemisia californica Less.	California sagebrush	CSS	N
Baccharis pilularis DC.	chaparral broom, coyote brush	CSS	N
Encelia californica Nutt.	California encelia	CSS	N
Erigeron [=*Conyza*] *canadensis* L.	horseweed	DIST	N
Helminthotheca [=*Picris*] *echioides* (L.) Holub	bristly ox-tongue	DIST	I
Isocoma menziesii (Hook. & Arn.) G.L. Nesom	coastal goldenbush	CSS	N
Pseudognaphalium [=*Gnaphalium*] *californicum* (DC.) Anderb.	California everlasting, green everlasting	CSS	N
Sonchus oleraceus L.	common sow thistle	DIST, CSS	I
BORAGINACEAE	**BORAGE FAMILY**		
Cryptantha sp.	cryptantha	CSS	N
Eucrypta chrysanthemifolia (Benth.) Greene	eucrypta	CSS	N
CUCURBITACEAE	**GOURD FAMILY**		
Marah macrocarpa (Greene) Greene	wild cucumber	CSS	N
FABACEAE (LEGUMINOSAE)	**LEGUME FAMILY**		
Melilotus indicus (L.) All.	sourclover	CSS	I

Attachment 1 Plant Species Observed			
Scientific Name	Common Name	Habitat	Origin
Fagaceae	**Oak Family**		
Quercus dumosa Nutt.	Nuttall's scrub oak	CSS, DIST	N
Geraniaceae	**Geranium Family**		
Geranium sp.	geranium	DIST	I
Lamiaceae	**Mint Family**		
Salvia mellifera Greene	black sage	CSS	N
Montiaceae	**Montia Family**		
Claytonia perfoliata Donn ex Willd.	miner's lettuce	CSS	N
Nyctaginaceae	**Four O'clock Family**		
Mirabilis laevis [=*Mirabilis californica*] (Benth.) Curran var. *crassifolia* (Choisy) Spellenb.	wishbone bush	CSS	N
Oxalidaceae	**Oxalis Family**		
Oxalis pes-caprae L.	Bermuda buttercup	DIST	I
Pittosporaceae	**Pittosporum Family**		
Pittosporum tobira	'Wheeler's dwarf'	DIST	I
Rosaceae	**Rose Family**		
Adenostoma fasciculatum Hook. & Arn.	chamise, greasewood	CSS	N
Heteromeles arbutifolia (Lindl.) M. Roem.	toyon, Christmas berry	CSS	N
Scrophulariaceae	**Figwort Family**		
Myoporum parvifolium R. Br.	slender myoporum	DIST, CSS	I
Solanaceae	**Nightshade Family**		
Solanum nigrum L.	black nightshade	CSS	I
Verbenaceae	**Vervain Family**		
Lantana camara L.	lantana	DIST	I

HABITATS
CSS = Coastal sage scrub
DIST = Disturbed land

ORIGIN
N = Native to locality
I = Introduced species from outside locality

ATTACHMENT 2

Sensitive Plant Species
Observed or with the Potential for Occurrence

Attachment 2
Sensitive Plant Species
Observed or with the Potential for Occurrence

Species' *Scientific Name* Common Name	State/Federal Status	CNPS Rank	City of San Diego	Habitat/ Preference/Requirements/ Blooming Period	Observed?	Basis for Determination of Occurrence Potential
GYMNOSPERMS						
PINACEAE **PINE FAMILY**						
Pinus torreyana ssp. *torreyana* Torrey pine (native pop.)	–/–	1B.2	MSCP	Evergreen tree; closed-cone coniferous forest, chaparral; sandstone; elevation 250–525 feet. San Diego County endemic. There are approximately 7,000 native trees, most in Torrey Pines State Reserve, others on private property. This species is widely planted as an ornamental in the region.	Yes	Torrey Pines were observed within the disturbed lands within the project site. Planted individuals occurring within the parking lot around the existing development are not considered sensitive.
ANGIOSPERMS: DICOTS						
CHENOPODIACEAE **GOOSEFOOT FAMILY**						
Aphanisma blitoides aphanisma	–/–	1B.2	NE, MSCP	Annual herb; coastal bluff scrub, coastal sage scrub; sandy soils; blooms March–June; elevation less than 1,000 feet.	No	This species was not observed within the project site and is not expected to occur due to the lack of sandy soils.
APIACEAE **CARROT FAMILY**						
Eryngium aristulatum var. *parishii* San Diego button-celery	CE/FE	1B.1	NE, MSCP	Biennial/perennial herb; vernal pools, mesic areas of coastal sage scrub and grasslands, blooms April–June; elevation less than 2,000 feet. Known from San Diego and Riverside counties. Additional populations occur in Baja California, Mexico.	No	This species was not observed within the project site and is not expected to occur due to the lack of vernal pool habitat or mesic areas of coastal sage scrub/grasslands.

Attachment 2 Sensitive Plant Species Observed or with the Potential for Occurrence						
Species' *Scientific Name* Common Name	State/Federal Status	CNPS Rank	City of San Diego	Habitat/ Preference/Requirements/ Blooming Period	Observed?	Basis for Determination of Occurrence Potential
ASTERACEAE SUNFLOWER FAMILY						
Ambrosia pumila San Diego ambrosia	–/FE	1B.1	NE, MSCP	Perennial herb (rhizomatous); chaparral, coastal sage scrub, valley and foothill grasslands, creek beds, vernal pools, often in disturbed areas; blooms May–September; elevation less than 1,400 feet. Many occurrences extirpated in San Diego County.	No	This perennial species was not observed and would have been apparent at the time of the survey, if present. Therefore, it is not expected to occur within the project site.
Artemisia palmeri San Diego sagewort	–/–	4.2	–	Perennial deciduous shrub; coastal sage scrub, chaparral, riparian, mesic, sandy areas; blooms May–September; elevation less than 3,000 feet.	No	This perennial species was not observed and would have been apparent at the time of the survey, if present. Therefore, it is not expected to occur within the project site. San Diego sagewort has been known to occur within a one-mile buffer of the project site (State of California 2017c).
Baccharis vanessae Encinitas baccharis [=Encinitas coyote brush]	CE/FT	1B.1	NE, MSCP	Perennial deciduous shrub; chaparral; maritime; sandstone; blooms August–November; elevation less than 2,500 feet. San Diego County endemic. Known from fewer than 20 occurrences. Extirpated from Encinitas area.	No	This species is not expected to occur as it is out of its known range.
Deinandra [=*Hemizonia*] *conjugens* Otay tarplant	CE/FT	1B.1	NE, MSCP	Annual herb; clayey soils of coastal scrub openings, valley and foothill grassland; blooms April–June, elevation less than 1,000 feet.	No	This species is not expected to occur as it is out of its known range.

Attachment 2 Sensitive Plant Species Observed or with the Potential for Occurrence						
Species' *Scientific Name* Common Name	State/Federal Status	CNPS Rank	City of San Diego	Habitat/ Preference/Requirements/ Blooming Period	Observed?	Basis for Determination of Occurrence Potential
BORAGINACEAE	**BORAGE FAMILY**					
Harpagonella palmeri Palmer's grapplinghook	–/–	4.2	–	Annual herb; chaparral, coastal sage scrub, valley and foothill grasslands; clay soils; blooms March–May; elevation less than 3,200 feet. Inconspicuous and easily overlooked.	No	This annual species was not observed and would have been apparent at the time of the survey, if present. Therefore, it is not expected to occur within the project site. Palmer's grapplinghook has been known to occur within a one-mile buffer of the project site (State of California 2017c).
CACTACEAE	**CACTUS FAMILY**					
Cylindropuntia californica var. *californica* [=*Opuntia parryi* var. *serpentina*] snake cholla	–/–	1B.1	NE, MSCP	Perennial stem succulent; chaparral, coastal sage scrub; blooms April–May; elevation 100–500 feet.	No	This perennial species was not observed and would have been apparent at the time of the survey, if present. Therefore, it is not expected to occur within the project site.

Attachment 2 Sensitive Plant Species Observed or with the Potential for Occurrence						
Species' *Scientific Name* Common Name	State/Federal Status	CNPS Rank	City of San Diego	Habitat/ Preference/Requirements/ Blooming Period	Observed?	Basis for Determination of Occurrence Potential
Ferocactus viridescens San Diego barrel cactus	–/–	2B.1	MSCP	Perennial stem succulent; chaparral, coastal sage scrub, valley and foothill grasslands, vernal pools; blooms May–June; elevation less than 1,500 feet.	No	This perennial species was not observed and would have been apparent at the time of the survey, if present. Therefore, it is not expected to occur within the project site. San Diego barrel cactus has been known to occur within a one-mile buffer of the project site (State of California 2017c).
CRASSULACEAE **STONECROP FAMILY**						
Dudleya brevifolia [=*D. blochmaniae* ssp. *brevifolia*] short-leaved dudleya [short-leaved live-forever]	CE/–	1B.1	NE, MSCP	Perennial herb; southern maritime chaparral, coastal sage scrub on Torrey sandstone; blooms in April; elevation less than 1,000 feet. San Diego County endemic. Known from fewer than five occurrences in the Del Mar and La Jolla areas.	No	This perennial species was not observed and would have been apparent at the time of the survey, if present. Therefore, it is not expected to occur within the project site. San Diego barrel cactus has been known to occur within a one-mile buffer of the project site (State of California 2017b).
Dudleya variegata variegated dudleya	–/–	1B.2	NE, MSCP	Perennial herb; openings in chaparral, coastal sage scrub, grasslands, vernal pools; blooms May–June; elevation less than 1,900 feet.	No	This perennial species was not observed and would have been apparent at the time of the survey, if present. Therefore, it is not expected to occur within the project site.

Attachment 2 Sensitive Plant Species Observed or with the Potential for Occurrence						
Species' *Scientific Name* Common Name	State/Federal Status	CNPS Rank	City of San Diego	Habitat/ Preference/Requirements/ Blooming Period	Observed?	Basis for Determination of Occurrence Potential
Astragalus tener var. *titi* coastal dunes milkvetch	CE/FE	1B.1	NE, MSCP	Annual herb; coastal bluff scrub, coastal dunes, sandy soils, mesic coastal prairie; blooms March–May; elevation less than 200 feet. California endemic. Known from fewer than 10 occurrences in San Diego (presumed extirpated), Los Angeles (presumed extirpated), and Monterey counties.	No	This species was not observed within the project site and is not expected to occur due to the lack of sandy soils.
FAGACEAE **OAK FAMILY**						
Quercus dumosa Nuttall's scrub oak	–/–	1B.1	–	Perennial evergreen shrub; closed-cone coniferous forest, coastal chaparral, coastal sage scrub; sandy and clay loam soils; blooms February–March; elevation less than 1,300 feet.	Yes	This species was observed within the coastal sage scrub and the disturbed lands. Nuttall's scrub oak has been known to occur within a one-mile buffer of the project site (State of California 2017c).
LAMIACEAE **MINT FAMILY**						
Acanthomintha ilicifolia San Diego thornmint	CE/FT	1B.1	NE, MSCP	Annual herb; chaparral, coastal sage scrub, and grasslands; friable or broken clay soils; blooms April–June; elevation less than 3,200 feet.	No	This species was not observed within the project site and is not expected to occur due to the lack of friable or broken clay soils.
Pogogyne abramsii San Diego mesa mint	CE/FE	1B.1	NE, MSCP	Annual herb; vernal pools; blooms April–July; elevation 300–700 feet. San Diego County endemic.	No	This species was not observed within the project site and is not expected to occur due to the lack of vernal pool habitat.

Attachment 2 Sensitive Plant Species Observed or with the Potential for Occurrence						
Species' *Scientific Name* Common Name	State/Federal Status	CNPS Rank	City of San Diego	Habitat/ Preference/Requirements/ Blooming Period	Observed?	Basis for Determination of Occurrence Potential
Pogogyne nudiuscula Otay mesa mint	CE/FE	1B.1	NE, MSCP	Annual herb; vernal pools; blooms May–July; elevation 300–820 feet. In California, known from approximately 10 occurrences in Otay Mesa in San Diego County. Additional populations occur in Baja California, Mexico.	No	This species was not observed within the project site and is not expected to occur due to the lack of vernal pool habitat.
POLEMONIACEAE **PHLOX FAMILY**						
Navarretia fossalis spreading navarretia [=prostrate navarretia]	–/FT	1B.1	NE, MSCP	Annual herb; vernal pools, marshes and swamps, chenopod scrub; blooms April–June; elevation 100–4,300 feet.	No	This species was not observed within the project site and is not expected to occur due to the lack of vernal pool habitat.
RHAMNACEAE **BUCKTHORN FAMILY**						
Adolphia californica California adolphia	–/–	2B.1	–	Perennial deciduous shrub; Diegan coastal sage scrub and chaparral; clay soils; blooms December–May; elevation 100–2,500 feet.	No	This perennial species was not observed and would have been apparent at the time of the survey, if present. Therefore, it is not expected to occur within the project site. California adolphia has been known to occur within a one-mile buffer of the project site (State of California 2017c).

Attachment 2 Sensitive Plant Species Observed or with the Potential for Occurrence						
Species' *Scientific Name* Common Name	State/Federal Status	CNPS Rank	City of San Diego	Habitat/ Preference/Requirements/ Blooming Period	Observed?	Basis for Determination of Occurrence Potential
Ceanothus verrucosus wart-stemmed ceanothus	–/–	2B.2	MSCP	Perennial evergreen shrub; chaparral; blooms December–April; elevation less than 1,300 feet.	No	This perennial species was not observed and would have been apparent at the time of the survey, if present. Therefore, it is not expected to occur within the project site. Wart-stemmed ceanothus has been known to occur within a one-mile buffer of the project site (State of California 2017c).
ANGIOSPERMS: MONOCOTS						
AGAVACEAE **AGAVE FAMILY**						
Agave shawii var. *shawii* Shaw's agave	–/–	2B.1	NE, MSCP	Perennial leaf succulent; coastal bluff scrub, coastal sage scrub, maritime succulent scrub; blooms September–May; elevation less than 400 feet.	No	This species is not expected to occur as it is out of its known range.
POACEAE **GRASS FAMILY**						
Orcuttia californica California Orcutt grass	CE/FE	1B.1	NE, MSCP	Annual herb; vernal pools; blooms April–August; elevation 50–2,200 feet.	No	This species was not observed within the project site and is not expected to occur due to the lack of vernal pool habitat.

Attachment 2
Sensitive Plant Species
Observed or with the Potential for Occurrence

FEDERAL CANDIDATES AND LISTED PLANTS

FE	=	Federally listed endangered
FT	=	Federally listed threatened
FC	=	Federal candidate for listing as endangered or threatened

STATE LISTED PLANTS

CE	=	State listed endangered
CR	=	State listed rare
CT	=	State listed threatened

CALIFORNIA NATIVE PLANT SOCIETY (CNPS): CALIFORNIA RARE PLANT RANKS (CRPR)

1A	=	Species presumed extinct.
1B	=	Species rare, threatened, or endangered in California and elsewhere. These species are eligible for state listing.
2A	=	Plants presumed extirpated in California, but more common elsewhere.
2B	=	Species rare, threatened, or endangered in California but more common elsewhere. These species are eligible for state listing.
3	=	Species for which more information is needed. Distribution, endangerment, and/or taxonomic information is needed.
4	=	A watch list of species of limited distribution. These species need to be monitored for changes in the status of their populations.
.1	=	Species seriously threatened in California (over 80% of occurrences threatened; high degree and immediacy of threat).
.2	=	Species fairly threatened in California (20-80% occurrences threatened; moderate degree and immediacy of threat).
.3	=	Species not very threatened in California (<20% of occurrences threatened; low degree and immediacy of threat or no current threats known).
CBR	=	Considered but rejected

CITY OF SAN DIEGO

NE	=	Narrow endemic
MSCP	=	Multiple Species Conservation Program covered species

ATTACHMENT 3

Sensitive Wildlife Species Occurring or with the Potential for Occurrence

Attachment 3 Sensitive Wildlife Species Occurring or with the Potential for Occurrence					
Species' Common Name/ Scientific Name	Listing Status	Habitat Preference/ Requirements	Detected On-Site?	Potential to Occur On-Site?	Basis for Determination of Occurrence Potential
INVERTEBRATES (Nomenclature from Eriksen and Belk 1999)					
BRANCHINECTIDAE FAIRY SHRIMP					
San Diego fairy shrimp *Branchinecta sandiegonensis*	FE, MSCP, *	Vernal pools.	No	None	This species was not observed and not expected to occur on-site due to the lack of vernal pool habitat.
REPTILES (Nomenclature from Crother 2008)					
TEIIDAE WHIPTAIL LIZARDS					
Belding's orange-throated whiptail *Aspidoscelis hyperythra beldingi*	CSC, MSCP	Chaparral, coastal sage scrub with coarse sandy soils and scattered brush.	No	Moderate	This species was not observed and has a moderate potential to occur on-site due to the presence of coastal sage scrub habitat.
Coastal whiptail *Aspidoscelis tigris stejnegeri*	CSC	Coastal sage scrub, chaparral, woodlands, and streamsides where plants are sparsely distributed.	No	Moderate	This species was not observed and has a moderate potential to occur on-site due to the presence of coastal sage scrub habitat.
BIRDS (Nomenclature from American Ornithologists' Union 2016 and Unitt 2004)					
RALLIDAE RAILS, GALLINULES, & COOTS					
California black rail *Laterallus jamaicensis*	CT, CFP	Tidal marshes, grassy marshes. Resident populations extirpated.	No	None	This species was not observed and not expected to occur on-site due to the lack of marsh habitat.
SYLVIIDAE GNATCATCHERS					
Coastal California gnatcatcher *Polioptila californica californica*	FT, CSC, MSCP	Coastal sage scrub, maritime succulent scrub. Resident.	No	High	This species was not observed and has a high potential to occur on-site due to the presence of coastal sage scrub habitat.

Attachment 3 Sensitive Wildlife Species Occurring or with the Potential for Occurrence					
Species' Common Name/ Scientific Name	Listing Status	Habitat Preference/ Requirements	Detected On-Site?	Potential to Occur On-Site?	Basis for Determination of Occurrence Potential
EMBERIZIDAE **EMBERIZIDS**					
Southern California rufous-crowned sparrow *Aimophila ruficeps canescens*	WL, MSCP	Coastal sage scrub, chaparral, grassland. Resident.	No	Moderate	This species was not observed and has a moderate potential to occur on-site due to the presence of coastal sage scrub habitat.
MAMMALS (Nomenclature from Baker 2003)					
MURIDAE **OLD WORLD MICE & RATS (I)**					
San Diego desert woodrat *Neotoma lepida intermedia*	CSC	Coastal sage scrub and chaparral.	No	Moderate	This species was not observed and has a moderate potential to occur on-site due to the presence of coastal sage scrub habitat.

(I) = Introduced species

STATUS CODES

Listed/Proposed

FE = Listed as endangered by the federal government
FT = Listed as threatened by the federal government
CT = Listed as threatened by the state of California

Other

CFP = California fully protected species
CSC = California Department of Fish and Wildlife species of special concern
WL = California Department of Fish and Wildlife watch list species
MSCP = City and County of San Diego Multiple Species Conservation Program covered species
* = Taxa listed with an asterisk fall into one or more of the following categories:

- Taxa considered endangered or rare under Section 15380(d) of CEQA guidelines
- Taxa that are biologically rare, very restricted in distribution, or declining throughout their range
- Population(s) in California that may be peripheral to the major portion of a taxon's range but which are threatened with extirpation within California
- Taxa closely associated with a habitat that is declining in California at an alarming rate (e.g., wetlands, riparian, old growth forests, desert aquatic systems, native grasslands)

latitude 33
PLANNING & ENGINEERING

File: 1517.00

August 9, 2017

City of San Diego-Development Services Department
1222 First Avenue
San Diego, CA 92101

SUBJECT: Climate Action Plan Checklist
PTS 527644 - 9775 Towne Centre Drive

To Whom It May Concern,

The Climate Action Plan (CAP) Checklist, (Exhibit A) and associated Conceptual Site Plan (Exhibit B), has been filled out for the proposed 9775 Towne Centre Drive project by Latitude 33 Planning and Engineering and Perkins+Will, Inc. to the best of our abilities using the newly updated City CAP Checklist form, which was revised June 2017.

The project is part of the continued build-out of the 218.5 gross acres within the Eastgate Technology Park in the University Community Plan Area. It proposes demolition of a 103,800 square foot existing Scientific Research office building and construction of a 165,000 square foot Scientific Research building with associated parking within the 12.108-acre Lot 6A (APN 434-120-14) of the Eastgate Technology Park that is subject to Planned Industrial Development Permit No. 90-0892 ("PID"). The PID contemplates 100,000 square feet of Scientific Research development for the project site. The trips associated with the additional 65,000 square feet of development (less 8,500 square feet of non-trip generating accessory space) will be transferred from other sites subject to the PID, as permitted by the terms of the PID; earned through a Transportation Demand Management Program, or transferred from other Scientific Research designated sites outside of the PID, but within the Community Plan and on the same dead-end street as the project. Transfers from outside the PID area will be accomplished by a Community Plan Amendment. The CAP Consistency Checklist for Steps 1 and 2 were filled out and consistency with applicable policies has been noted. Step 3 is not applicable to this project because the project is not changing the land use or zoning designations.

Step 1: Land Use Consistency

1. The proposed project is consistent with the General Plan and Community Plan land use and zoning designations because the project proposes a continued Scientific Research and Development use within the IP-1-1 Zone (industrial) and is consistent with its regulations. The Project is within the Industrial – Scientific Research and Development land use in the University Community Plan. The Project is processing a Community Plan Amendment, but is not proposing to change the site's land use designation. The Project will amend the Community Plan by providing a footnote to codify an increase in square footage and Average Daily Trips to the site through a transfer process from nearby properties and/or a Transportation Demand Management Plan that are also within the University Community

Plan area and zoned Scientific Research and Development. Accordingly, the transfer will not result in a net increase in traffic for the Community Plan area. The proposed transfer of intensity is therefore consistent with growth projections used in the development of the Climate Action Plan, as further demonstrated by the fact that the project is consistent with SANDAG Series 12 growth projections used to determine CAP projections which were based on the current Community Plan buildout intensity land uses.

Step 2: CAP Strategies Consistency. The project is consistent with all CAP strategies applicable to non-residential projects outside the transit priority area, as described below. A conceptual site plan is attached to illustrate approximately how various CAP strategies can feasibly be implemented. In accordance with enforceable permit conditions, the final design of the project will depict the ultimate location and implementation of measures that conform to CAP Step 2 strategies. Substantial conformance is demonstrated through final plans that conform to the performance standards described in CAP Step 2 regardless of the method ultimately selected.

Strategy 1: Energy and Water Efficient Buildings

1. *Cool/Green Roofs:* The Project proposes roofing materials with a high solar reflection index equal or greater than the values specified in the voluntary measures under California Green Building Standards Code and Attachment A, Table 1 of the CAP checklist. In consultation with our project engineers and architects, we have verified that cool and green roof products are available in the commercial marketplace, site space is available, and that it is technically feasible to implement this strategy.

2. *Plumbing fixtures and fittings:* The Project proposes low-flow fixtures and appliances that meet the provisions of, and do not exceed, the maximum flow rate specified in the California Green Building Standards Code and comply with Tier 1 Voluntary Measures, achieving a thirty percent water savings over the CALGreen baseline, and Attachment A, Tables 2 and 3 of the CAP checklist. In consultation with our project engineers and architects, we have verified that low-flow fixtures and appliances are available in the commercial marketplace, site space is available, and that it is technically feasible to implement this strategy.

Strategy 3: Bicycling, Walking, Transit & Land Use

3. *Electric Vehicle Charging:* Compliant with 2016 CALGreen Code, the project proposes designated parking for the future installation of electric supply equipment to provide electric vehicle charging stations for at least six percent of the provided parking spaces, which is at least six percent of 495 provided spaces (at least 30 spaces). The CAP checklist asks whether fifty percent of the designated required spaces (at least 15 of 30) will have necessary electric vehicle supply equipment installed to provide active electric vehicle charging stations ready for use. Consistent with the CAP checklist, at least fifty percent of the designated spaces (at least 15 of 30) will have necessary electric vehicle supply equipment installed to provide active electric vehicle charging stations ready for use. In consultation with our project engineers and architects, we have verified that the electric vehicle conduit and charging stations are available in the commercial marketplace, site space is available, and that it is technically feasible to implement this strategy.

4. *Bicycle Parking Spaces:* The Project proposes to provide more than the 20 short-term and 20 long-term bicycle parking spaces required in the City's Municipal Code. The project will provide at least 21 of each type of bike space. In consultation with our project engineers and architects, we have verified that short-term and long-term bike racks are available in the commercial marketplace, site space is available, and that it is technically feasible to implement this strategy.

5. *Shower facilities:* The Project proposes changing/shower facilities in accordance with the voluntary measures under the California Green Building Standards Code, more than is required by the City's Municipal Code. The applicant is a developer of scientific research buildings supporting lab and office space for tenant occupants, who typically occupy an average 350 square feet per person. Accordingly, the tenant yield of the 156,500 square feet of non-accessory use space is 450 persons. Accordingly, the CAP strategy performance standards require and the applicant will install at least 3 shower stalls plus 10 two tier lockers. In consultation with our project engineers and architects, we have verified that on-site shower and locker equipment are available in the commercial marketplace, site space is available, and that it is technically feasible to implement this strategy.

6. *Designated Parking Spaces:* The Project is an employment use but is not within a Transit Priority Area. This checklist item is not applicable by the CAP Checklist. Nevertheless, San Diego Municipal Code section 142.0530(d)(1)(A) and (B) separately requires at least <u>8 percent of the 495 provided parking spaces (at least 40 spaces)</u> for carpool vehicles (vehicles containing two or more persons) and zero emissions vehicles (any vehicles certified to zero-emissions standards) within the overall minimum parking spaces required. San Diego Municipal Code section 142.0530(d)(4) separately provides that designated parking spaces can also be used by low-emitting and fuel-efficient vehicles, were it is determined that the designated parking spaces are otherwise underutilized. In consultation with our project engineers and architects, we have verified that site space is available for designated parking spaces convenient to employee entrances and that it is technically feasible to implement this strategy.

7. *Transportation Demand Management Program:* The Project proposes a Transportation Demand Management (TDM) program that would be applicable to existing and future tenants. The project proposes a Parking cash out program via a transit/bike incentive, commitment to SANDAG's iCommute program, on-site Bikesharing, a Telework program, Transit subsidies, and access to services within a quarter mile. For greater detail, please see the Transportation Demand Management Program within the Traffic Impact Analysis.

<u>Step 3: Project CAP Conformance Evaluation</u>

1. *Step 3: Project CAP Conformance Evaluation* is not applicable because the proposed Project is not changing the land use or zoning designations.

Exhibit A

CAP Checklist

CLIMATE ACTION PLAN CONSISTENCY CHECKLIST INTRODUCTION

In December 2015, the City adopted a Climate Action Plan (CAP) that outlines the actions that City will undertake to achieve its proportional share of State greenhouse gas (GHG) emission reductions. The purpose of the Climate Action Plan Consistency Checklist (Checklist) is to, in conjunction with the CAP, provide a streamlined review process for proposed new development projects that are subject to discretionary review and trigger environmental review pursuant to the California Environmental Quality Act (CEQA).[1]

Analysis of GHG emissions and potential climate change impacts from new development is required under CEQA. The CAP is a plan for the reduction of GHG emissions in accordance with CEQA Guidelines Section 15183.5. Pursuant to CEQA Guidelines Sections 15064(h)(3), 15130(d), and 15183(b), a project's incremental contribution to a cumulative GHG emissions effect may be determined not to be cumulatively considerable if it complies with the requirements of the CAP.

This Checklist is part of the CAP and contains measures that are required to be implemented on a project-by-project basis to ensure that the specified emissions targets identified in the CAP are achieved. Implementation of these measures would ensure that new development is consistent with the CAP's assumptions for relevant CAP strategies toward achieving the identified GHG reduction targets. Projects that are consistent with the CAP as determined through the use of this Checklist may rely on the CAP for the cumulative impacts analysis of GHG emissions. Projects that are not consistent with the CAP must prepare a comprehensive project-specific analysis of GHG emissions, including quantification of existing and projected GHG emissions and incorporation of the measures in this Checklist to the extent feasible. Cumulative GHG impacts would be significant for any project that is not consistent with the CAP.

The Checklist may be updated to incorporate new GHG reduction techniques or to comply with later amendments to the CAP or local, State, or federal law.

[1] Certain projects seeking ministerial approval may be required to complete the Checklist. For example, projects in a Community Plan Implementation Overlay Zone may be required to use the Checklist to qualify for ministerial level review. See Supplemental Development Regulations in the project's community plan to determine applicability.

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CAP CONSISTENCY CHECKLIST SUBMITTAL APPLICATION

- The Checklist is required only for projects subject to CEQA review.[2]
- If required, the Checklist must be included in the project submittal package. Application submittal procedures can be found in Chapter 11: Land Development Procedures of the City's Municipal Code.
- The requirements in the Checklist will be included in the project's conditions of approval.
- The applicant must provide an explanation of how the proposed project will implement the requirements described herein to the satisfaction of the Planning Department.

Application Information

Contact Information

Project No./Name: PTS 527644 / 9775 TOWNE CENTRE DRIVE

Property Address: 9775 Towne Centre Drive, San Diego, CA. 92121

Applicant Name/Co.: Randi Coopersmith, Latitude 33 Planning & Engineering

Contact Phone: (858) 875-1703 Contact Email: randi.coopersmith@latitude33.com

Was a consultant retained to complete this checklist? ■ Yes ☐ No If Yes, complete the following

Consultant Name: Ryan Bussard Contact Phone: (206) 381-6010

Company Name: Perkins+Will, Inc. Contact Email: ryan.bussard@perkinswill.com

Project Information

1. What is the size of the project (acres)? 12.108 acres
2. Identify all applicable proposed land uses:
   - ☐ Residential (indicate # of single-family units):
   - ☐ Residential (indicate # of multi-family units):
   - ☐ Commercial (total square footage):
   - ■ Industrial (total square footage): Scientific Research and Development - 156,500 SF
   - ■ Other (describe): Accessory Space - 8,500 SF
3. Is the project or a portion of the project located in a Transit Priority Area? ☐ Yes ☐ No
4. Provide a brief description of the project proposed:

The project is a 4-story 156,500 Scientific Research and Development space with an additional 8,500 square feet of accessory space for a total of 165,000 GFA, with a 2 story below-grade parking structure. It will include surface parking stalls, an entry courtyard, landscape zones and amenity areas.

[2] Certain projects seeking ministerial approval may be required to complete the Checklist. For example, projects in a Community Plan Implementation Overlay Zone may be required to use the Checklist to qualify for ministerial level review. See Supplemental Development Regulations in the project's community plan to determine applicability.

CAP CONSISTENCY CHECKLIST QUESTIONS

Step 1: Land Use Consistency

The first step in determining CAP consistency for discretionary development projects is to assess the project's consistency with the growth projections used in the development of the CAP. This section allows the City to determine a project's consistency with the land use assumptions used in the CAP.

Step 1: Land Use Consistency		
Checklist Item (Check the appropriate box and provide explanation and supporting documentation for your answer)	Yes	No
A. Is the proposed project consistent with the existing General Plan and Community Plan land use and zoning designations?;[3] OR, Please see CAP Explanation Letter. B. If the proposed project is not consistent with the existing land use plan and zoning designations, and includes a land use plan and/or zoning designation amendment, would the proposed amendment result in an increased density within a Transit Priority Area (TPA)[4] and implement CAP Strategy 3 actions, as determined in Step 3 to the satisfaction of the Development Services Department?; OR, C. If the proposed project is not consistent with the existing land use plan and zoning designations, does the project include a land use plan and/or zoning designation amendment that would result in an equivalent or less GHG-intensive project when compared to the existing designations?	☑	☐

If "***Yes***," proceed to Step 2 of the Checklist. For question B above, complete Step 3. For question C above, provide estimated project emissions under both existing and proposed designation(s) for comparison. Compare the maximum buildout of the existing designation and the maximum buildout of the proposed designation.

If "***No***," in accordance with the City's Significance Determination Thresholds, the project's GHG impact is significant. The project must nonetheless incorporate each of the measures identified in Step 2 to mitigate cumulative GHG emissions impacts unless the decision maker finds that a measure is infeasible in accordance with CEQA Guidelines Section 15091. Proceed and complete Step 2 of the Checklist.

[3] This question may also be answered in the affirmative if the project is consistent with SANDAG Series 12 growth projections, which were used to determine the CAP projections, as determined by the Planning Department.

[4] This category applies to all projects that answered in the affirmative to question 3 on the previous page: Is the project or a portion of the project located in a transit priority area.

Step 2: CAP Strategies Consistency

The second step of the CAP consistency review is to review and evaluate a project's consistency with the applicable strategies and actions of the CAP. Step 2 only applies to development projects that involve permits that would require a certificate of occupancy from the Building Official or projects comprised of one and two family dwellings or townhouses as defined in the California Residential Code and their accessory structures.[5] All other development projects that would not require a certificate of occupancy from the Building Official shall implement Best Management Practices for construction activities as set forth in the Greenbook (for public projects).

Step 2: CAP Strategies Consistency			
Checklist Item (Check the appropriate box and provide explanation for your answer)	Yes	No	N/A
Strategy 1: Energy & Water Efficient Buildings			
1. *Cool/Green Roofs*. • Would the project include roofing materials with a minimum 3-year aged solar reflection and thermal emittance or solar reflection index equal to or greater than the values specified in the voluntary measures under California Green Building Standards Code (Attachment A)?; OR • Would the project roof construction have a thermal mass over the roof membrane, including areas of vegetated (green) roofs, weighing at least 25 pounds per square foot as specified in the voluntary measures under California Green Building Standards Code?; OR • Would the project include a combination of the above two options? Check "N/A" only if the project does not include a roof component.	☑	☐	☐

[5] Actions that are not subject to Step 2 would include, for example: 1) discretionary map actions that do not propose specific development, 2) permits allowing wireless communication facilities, 3) special events permits, 4) use permits or other permits that do not result in the expansion or enlargement of a building (e.g., decks, garages, etc.), and 5) non-building infrastructure projects such as roads and pipelines. Because such actions would not result in new occupancy buildings from which GHG emissions reductions could be achieved, the items contained in Step 2 would not be applicable.

2. *Plumbing fixtures and fittings* With respect to plumbing fixtures or fittings provided as part of the project, would those low-flow fixtures/appliances be consistent with each of the following: Residential buildings: • Kitchen faucets: maximum flow rate not to exceed 1.5 gallons per minute at 60 psi; • Standard dishwashers: 4.25 gallons per cycle; • Compact dishwashers: 3.5 gallons per cycle; and • Clothes washers: water factor of 6 gallons per cubic feet of drum capacity? Nonresidential buildings: • Plumbing fixtures and fittings that do not exceed the maximum flow rate specified in Table A5.303.2.3.1 (voluntary measures) of the California Green Building Standards Code (See Attachment A); and • Appliances and fixtures for commercial applications that meet the provisions of Section A5.303.3 (voluntary measures) of the California Green Building Standards Code (See Attachment A)? Check "N/A" only if the project does not include any plumbing fixtures or fittings.	☑	☐	☐

Strategy 3: Bicycling, Walking, Transit & Land Use			
3. *Electric Vehicle Charging* • Multiple-family projects of 17 dwelling units or less: Would 3% of the total parking spaces required, or a minimum of one space, whichever is greater, be provided with a listed cabinet, box or enclosure connected to a conduit linking the parking spaces with the electrical service, in a manner approved by the building and safety official, to allow for the future installation of electric vehicle supply equipment to provide electric vehicle charging stations at such time as it is needed for use by residents? • Multiple-family projects of more than 17 dwelling units: Of the total required listed cabinets, boxes or enclosures, would 50% have the necessary electric vehicle supply equipment installed to provide active electric vehicle charging stations ready for use by residents? • Non-residential projects: Of the total required listed cabinets, boxes or enclosures, would 50% have the necessary electric vehicle supply equipment installed to provide active electric vehicle charging stations ready for use? Check "N/A" only if the project is a single-family project or would not require the provision of listed cabinets, boxes, or enclosures connected to a conduit linking the parking spaces with electrical service, e.g., projects requiring fewer than 10 parking spaces.	☑	☐	☐

Strategy 3: Bicycling, Walking, Transit & Land Use (Complete this section if project includes non-residential or mixed uses)			
4. *Bicycle Parking Spaces* Would the project provide more short- and long-term bicycle parking spaces than required in the City's Municipal Code (Chapter 14, Article 2, Division 5)?[6] Check "N/A" only if the project is a residential project.	☑	☐	☐

[6] Non-portable bicycle corrals within 600 feet of project frontage can be counted towards the project's bicycle parking requirements.

5. *Shower facilities*

If the project includes nonresidential development that would accommodate over 10 tenant occupants (employees), would the project include changing/shower facilities in accordance with the voluntary measures under the California Green Building Standards Code as shown in the table below?

Number of Tenant Occupants (Employees)	Shower/Changing Facilities Required	Two-Tier (12" X 15" X 72") Personal Effects Lockers Required
0-10	0	0
11-50	1 shower stall	2
51-100	1 shower stall	3
101-200	1 shower stall	4
Over 200	1 shower stall plus 1 additional shower stall for each 200 additional tenant-occupants	1 two-tier locker plus 1 two-tier locker for each 50 additional tenant-occupants

☑ ☐ ☐

Check "N/A" only if the project is a residential project, or if it does not include nonresidential development that would accommodate over 10 tenant occupants (employees).

6. *Designated Parking Spaces*

If the project includes a nonresidential use in a TPA, would the project provide designated parking for a combination of low-emitting, fuel-efficient, and carpool/vanpool vehicles in accordance with the following table?

Number of Required Parking Spaces	Number of Designated Parking Spaces
0-9	0
10-25	2
26-50	4
51-75	6
76-100	9
101-150	11
151-200	18
201 and over	At least 10% of total

This measure does not cover electric vehicles. See Question 4 for electric vehicle parking requirements.

Note: Vehicles bearing Clean Air Vehicle stickers from expired HOV lane programs may be considered eligible for designated parking spaces. The required designated parking spaces are to be provided within the overall minimum parking requirement, not in addition to it.

Check "N/A" only if the project is a residential project, or if it does not include nonresidential use in a TPA.

☐ ☐ ☐

7. *Transportation Demand Management Program*

If the project would accommodate over 50 tenant-occupants (employees), would it include a transportation demand management program that would be applicable to existing tenants and future tenants that includes:

At least one of the following components:

- Parking cash out program
- Parking management plan that includes charging employees market-rate for single-occupancy vehicle parking and providing reserved, discounted, or free spaces for registered carpools or vanpools
- Unbundled parking whereby parking spaces would be leased or sold separately from the rental or purchase fees for the development for the life of the development

And at least three of the following components:

- Commitment to maintaining an employer network in the SANDAG iCommute program and promoting its RideMatcher service to tenants/employees
- On-site carsharing vehicle(s) or bikesharing
- Flexible or alternative work hours
- Telework program
- Transit, carpool, and vanpool subsidies
- Pre-tax deduction for transit or vanpool fares and bicycle commute costs
- Access to services that reduce the need to drive, such as cafes, commercial stores, banks, post offices, restaurants, gyms, or childcare, either onsite or within 1,320 feet (1/4 mile) of the structure/use?

Check "N/A" only if the project is a residential project or if it would not accommodate over 50 tenant-occupants (employees).

☑ ☐ ☐

Step 3: Project CAP Conformance Evaluation (if applicable)

The third step of the CAP consistency review only applies if Step 1 is answered in the affirmative under option B. The purpose of this step is to determine whether a project that is located in a TPA but that includes a land use plan and/or zoning designation amendment is nevertheless consistent with the assumptions in the CAP because it would implement CAP Strategy 3 actions. In general, a project that would result in a reduction in density inside a TPA would not be consistent with Strategy 3.The following questions must each be answered in the affirmative and fully explained.

1. **Would the proposed project implement the General Plan's City of Villages strategy in an identified Transit Priority Area (TPA) that will result in an increase in the capacity for transit-supportive residential and/or employment densities?**

   Considerations for this question:
   - Does the proposed land use and zoning designation associated with the project provide capacity for transit-supportive residential densities within the TPA?
   - Is the project site suitable to accommodate mixed-use village development, as defined in the General Plan, within the TPA?
   - Does the land use and zoning associated with the project increase the capacity for transit-supportive employment intensities within the TPA?

2. **Would the proposed project implement the General Plan's Mobility Element in Transit Priority Areas to increase the use of transit?**

   Considerations for this question:
   - Does the proposed project support/incorporate identified transit routes and stops/stations?
   - Does the project include transit priority measures?

3. **Would the proposed project implement pedestrian improvements in Transit Priority Areas to increase walking opportunities?**

   Considerations for this question:
   - Does the proposed project circulation system provide multiple and direct pedestrian connections and accessibility to local activity centers (such as transit stations, schools, shopping centers, and libraries)?
   - Does the proposed project urban design include features for walkability to promote a transit supportive environment?

4. **Would the proposed project implement the City of San Diego's Bicycle Master Plan to increase bicycling opportunities?**

   Considerations for this question:
   - Does the proposed project circulation system include bicycle improvements consistent with the Bicycle Master Plan?
   - Does the overall project circulation system provide a balanced, multimodal, "complete streets" approach to accommodate mobility needs of all users?

5. **Would the proposed project incorporate implementation mechanisms that support Transit Oriented Development?**

   Considerations for this question:
   - Does the proposed project include new or expanded urban public spaces such as plazas, pocket parks, or urban greens in the TPA?
   - Does the land use and zoning associated with the proposed project increase the potential for jobs within the TPA?
   - Do the zoning/implementing regulations associated with the proposed project support the efficient use of parking through mechanisms such as: shared parking, parking districts, unbundled parking, reduced parking, paid or time-limited parking, etc.?

6. **Would the proposed project implement the Urban Forest Management Plan to increase urban tree canopy coverage?**

   Considerations for this question:
   - Does the proposed project provide at least three different species for the primary, secondary and accent trees in order to accommodate varying parkway widths?
   - Does the proposed project include policies or strategies for preserving existing trees?
   - Does the proposed project incorporate tree planting that will contribute to the City's 20% urban canopy tree coverage goal?

CLIMATE ACTION PLAN CONSISTENCY CHECKLIST
ATTACHMENT A

This attachment provides performance standards for applicable Climate Action Pan (CAP) Consistency Checklist measures.

Table 1 **Roof Design Values for Question 1: Cool/Green Roofs supporting Strategy 1: Energy & Water Efficient Buildings of the Climate Action Plan**

Land Use Type	Roof Slope	Minimum 3-Year Aged Solar Reflectance	Thermal Emittance	Solar Reflective Index
Low-Rise Residential	≤ 2:12	0.55	0.75	64
	> 2:12	0.20	0.75	16
High-Rise Residential Buildings, Hotels and Motels	≤ 2:12	0.55	0.75	64
	> 2:12	0.20	0.75	16
Non-Residential	≤ 2:12	0.55	0.75	64
	> 2:12	0.20	0.75	16

Source: Adapted from the California Green Building Standards Code (CALGreen) Tier 1 residential and non-residential voluntary measures shown in Tables A4.106.5.1 and A5.106.11.2.2, respectively. Roof installation and verification shall occur in accordance with the CALGreen Code.

CALGreen does not include recommended values for low-rise residential buildings with roof slopes of ≤ 2:12 for San Diego's climate zones (7 and 10). Therefore, the values for climate zone 15 that covers Imperial County are adapted here.

Solar Reflectance Index (SRI) equal to or greater than the values specified in this table may be used as an alternative to compliance with the aged solar reflectance values and thermal emittance.

Table 2 **Fixture Flow Rates for Non-Residential Buildings related to Question 2: Plumbing Fixtures and Fittings supporting Strategy 1: Energy & Water Efficient Buildings of the Climate Action Plan**

Fixture Type	Maximum Flow Rate
Showerheads	1.8 gpm @ 80 psi
Lavatory Faucets	0.35 gpm @60 psi
Kitchen Faucets	1.6 gpm @ 60 psi
Wash Fountains	1.6 [rim space(in.)/20 gpm @ 60 psi]
Metering Faucets	0.18 gallons/cycle
Metering Faucets for Wash Fountains	0.18 [rim space(in.)/20 gpm @ 60 psi]
Gravity Tank-type Water Closets	1.12 gallons/flush
Flushometer Tank Water Closets	1.12 gallons/flush
Flushometer Valve Water Closets	1.12 gallons/flush
Electromechanical Hydraulic Water Closets	1.12 gallons/flush
Urinals	0.5 gallons/flush

Source: Adapted from the California Green Building Standards Code (CALGreen) Tier 1 non-residential voluntary measures shown in Tables A5.303.2.3.1 and A5.106.11.2.2, respectively. See the California Plumbing Code for definitions of each fixture type.

Where complying faucets are unavailable, aerators rated at 0.35 gpm or other means may be used to achieve reduction.

Acronyms:
gpm = gallons per minute
psi = pounds per square inch (unit of pressure)
in. = inch

Table 3	Standards for Appliances and Fixtures for Commercial Application related to Question 2: Plumbing Fixtures and Fittings supporting Strategy 1: Energy & Water Efficient Buildings of the Climate Action Plan	
Appliance/Fixture Type	**Standard**	
Clothes Washers	Maximum Water Factor (WF) that will reduce the use of water by 10 percent below the California Energy Commissions' WF standards for commercial clothes washers located in Title 20 of the *California Code of Regulations*.	
Conveyor-type Dishwashers	0.70 maximum gallons per rack (2.6 L) (High-Temperature)	0.62 maximum gallons per rack (4.4 L) (Chemical)
Door-type Dishwashers	0.95 maximum gallons per rack (3.6 L) (High-Temperature)	1.16 maximum gallons per rack (2.6 L) (Chemical)
Undercounter-type Dishwashers	0.90 maximum gallons per rack (3.4 L) (High-Temperature)	0.98 maximum gallons per rack (3.7 L) (Chemical)
Combination Ovens	Consume no more than 10 gallons per hour (38 L/h) in the full operational mode.	
Commercial Pre-rinse Spray Valves (manufactured on or after January 1, 2006)	Function at equal to or less than 1.6 gallons per minute (0.10 L/s) at 60 psi (414 kPa) and • Be capable of cleaning 60 plates in an average time of not more than 30 seconds per plate. • Be equipped with an integral automatic shutoff. • Operate at static pressure of at least 30 psi (207 kPa) when designed for a flow rate of 1.3 gallons per minute (0.08 L/s) or less.	

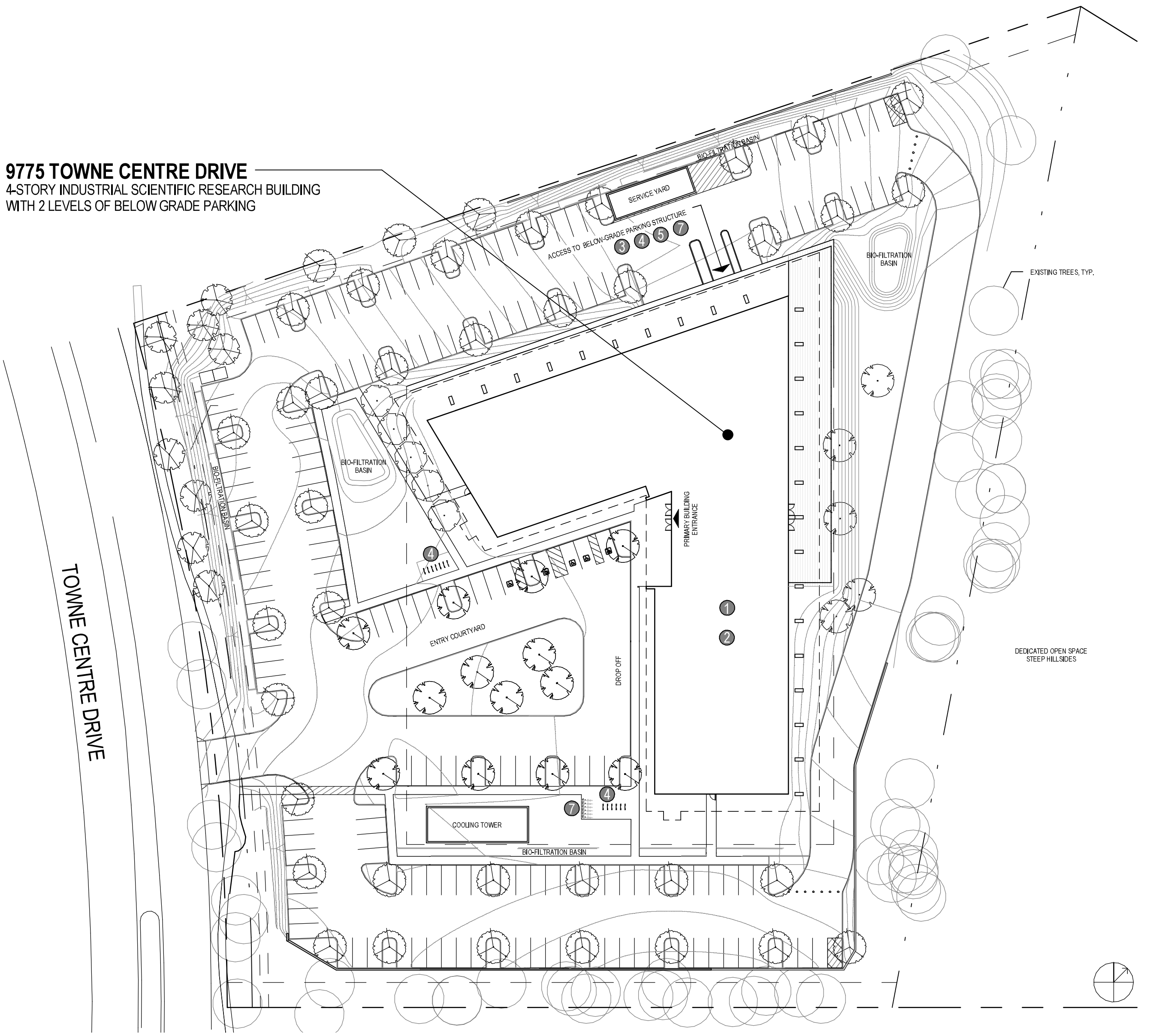
Source: Adapted from the California Green Building Standards Code (CALGreen) Tier 1 non-residential voluntary measures shown in Section A5.303.3. See the California Plumbing Code for definitions of each appliance/fixture type.

Acronyms:
L = liter
L/h = liters per hour
L/s = liters per second
psi = pounds per square inch (unit of pressure)
kPa = kilopascal (unit of pressure)

Exhibit B

Conceptual CAP Implementation Site Plan

[See page that follows]



SITE PLAN

1" = 100'-0"

NON-RESIDENTIAL CLIMATE ACTION PLAN (CAP) MEASURES

1. ROOFING MATERIALS WITH REQUIRED SOLAR REFLECTION INDEX
2. LOW-FLOW FIXTURES AND APPLIANCES
3. ELECTRIC VEHICLE CHARGING STATIONS
4. ADDITIONAL SHORT AND LONG TERM BICYCLE PARKING
5. ADDITIONAL SHOWER FACILITIES
7. TRANSPORTATION DEMAND MANAGEMENT PROGRAMS APPLICABLE TO EXISTING AND FUTURE TENANTS

2017

DRAINAGE STUDY

9775 TOWNE CENTRE DRIVE

AUGUST 2017

PREPARED BY: latitude 33 PLANNING & ENGINEERING

PREPARED FOR: BMR-APEX

JOB NUMBER:1517.0

DRAINAGE STUDY FOR

9775 TOWNE CENTRE DRIVE

CITY OF SAN DIEGO, CALIFORNIA

PTS No. 527644

January 2017
Revised: August 2017

Prepared for:
BMR-APEX LP
17190 BERNARDO CENTER DRIVE
SAN DIEGO, CA 92128

Prepared by:
LATITUDE 33 PLANNING AND ENGINEERING
9968 Hibert Street, 2nd Floor
San Diego, California 92131
(858) 751-0633

____

Giovanni Posillico, PE | RCE 66332 Prepared by: AB

TABLE OF CONTENTS

I. PROJECT DESCRIPTION

The project site is located within the City of San Diego, State of California, at 9775 Towne Centre Drive, San Diego CA 92121. See figure 1 below for a vicinity map.

FIGURE 1 – VICINITY MAP

The total project site is 5.58 acres, of which approximately 4.75 acres is disturbed. The total drainage area is 6.28 acres including portions of the site to the south. The site is bounded to the north and south by existing commercial developments.

The project includes the demolition of the existing onsite building and surface improvements and the construction of a new building and surface improvements. Refer to the proposed site plan included in Appendix C.

This report has been prepared in support of Latitude 33's preliminary design for the 9775 Towne Centre Drive Project. This report provides hydrologic and hydraulic analyses of the proposed condition 100-year flow rates as well as drainage facility sizing.

FIGURE 2 – EXISTING AERIAL

II. EXISTING DRAINAGE CONDITION

In its existing condition, the site is divided into seven drainage basins, including three main discharge points. All site runoff eventually enters the existing storm drain system or is discharged to the canyon to the east. The basins are described as below:

BASIN E.1

This basin is comprised of concrete sidewalk, landscaping and asphalt roadway, primarily sheet flows and gutter flows to the north-west. Drainage from basin E.1 discharges at POC 1, which continues to drain along Towne Centre Drive.

BASIN E.2

This basin is comprised of an existing building, concrete sidewalk, landscape and asphalt parking lot, which primarily sheet flows and gutter flows to the north-west towards the edge of the parking lot. Drainage from basin E.2 flows into an inlet at the west end of the parking lot, which joins with basin E.1 at POC 1.

BASIN E.3, E.4, E.5, E.6

These basins contain the existing building, concrete sidewalk and asphalt parking lot to the west, east and south of the building. Basins E.3, E.4, E.5 and E.6 each sheet flow to their own respective inlets, which join together to discharge at POC 2.

BASIN E.7

This basin contains the existing open space slopes to the east of the building and some minor surface improvement areas to the east of the building. It includes some minor concrete sidewalk and mainly landscape areas, draining towards the east to the open space, shown as POC 3.

III. DEVELOPED DRAINAGE CONDITION

In post construction conditions, the site will be divided into seven drainage basins. Please refer to the Proposed Hydrology exhibit included in Appendix C for POC locations.

BASIN P.1

This basin is comprised of concrete sidewalk, landscape and a portion of asphalt roadway, primarily sheet flowing and gutter flowing to the north-west. Drainage from basin E.1 discharges at POC 1, which continues to drain along Towne Centre Drive.

BASIN P.2. P.3, P.4, P.5, P.6

Drainage from Basin P.2 mainly sheet flows through the parking lot northwest of the building to a low point on the north side of the parking lot. Basin P.2 is ultimately pumped up to POC 2. Basin P.3 will contain some runoff from the proposed building and also some sheet flow from the west side of the proposed building, collected in a bioretention basin. Basin P.4 will consist of parking lot sheet flow from the southwest side of the building. Basin P.5 will consist of a portion of the proposed building runoff, a portion of existing slope runoff, and the parking lot to the southeast of the proposed building. Basin P.6 will contain a portion of the proposed building, landscape area runoff and the proposed grasscrete fire access road, collected in a bioretention basin. Basins P.2, P.3, P.4, P.5 and P.6 all ultimately discharge at POC 2.

BASIN P.7

This basin contains the undisturbed open space to the east of the building and sheet flows easterly towards the open space, shown as POC 3.

IV. HYDROLOGIC METHODOLOGY

The proposed development was analyzed in conformance with the City of San Diego Drainage Design Manual, dated April 1984. In the hydrology study, all basins analyzed are less than one square mile. The Rational Method module within the Autodesk Storm and Sanitary Analysis (SSA) software was utilized to calculate storm runoff for a 100-year frequency storm. The criteria used for this analysis are described as follows:

- For existing and proposed conditions, runoff coefficients of 0.45 and 0.90 were assumed for landscape and paved areas respectively. For areas containing both open space and commercial/retail area, a composite C value was determined using the equation provided on table 2 of the Drainage Design Manual.

- Initial travel time values were computed using the Overland Time of Flow Nomograph, as shown on Page 86 in the City of San Diego Drainage Design Manual.

- “Gutter and Roadway Discharge - Velocity Chart” and Manning’s Equation were used to determine the flow velocity for concentrated flows in curb and gutters, drainage channels and conduits. Travel times were then determined by dividing the flow distance by the velocity of flow.

- Final times of concentration values for each basin were calculated by adding the initial and final travel times, with a minimum time of 5 minutes.

- The rainfall intensity was obtained from the “Intensity-Duration-Frequency Curves” from the City of San Diego Drainage Manual, included in Appendix A.

- Drainage Area: The existing condition drainage basins were delineated from the base topographic map as shown on the Existing Hydrology Exhibit provided in Appendix B. The proposed condition drainage basins were delineated using the proposed grading plan as show on the Proposed Hydrology Exhibit provided in Appendix C.

The existing and proposed condition rational method results are included in Appendix A and summarized in Table 1 and Table 2 respectively.

Table 1 - Summary of Existing Condition Flows

Drainage Basin	Drainage Area (AC)	100-year Peak Flow (CFS)
POC 1		
E.1	1.02	3.23
E.2	1.49	5.47
Total	**2.51**	**8.70**
POC 2		
E.3	0.13	0.41
E.4	0.73	2.87
E.5	1.22	3.98
E.6	0.82	2.63
Total	**2.90**	**9.58***
POC 3		
E.7	0.87	1.80
Total	**0.87**	**1.80**
OVERALL	**6.28**	**20.08***

***Value accounts for flood routing and is not a summation of the peak flows from the tributary areas.**

Table 2 - Summary of Developed Condition Flows

Drainage Basin	Drainage Area (AC)	100-year Peak Flow (CFS)
POC 1		
P.1	1.04	2.46
Total	**1.04**	**2.46**
POC 2		
P.2	1.13	3.27
P.3	0.75	2.18
P.4	0.68	2.68
P.5	1.08	3.78
P.6	1.20	1.38
Total	**4.84**	**10.62***
POC 3		
P.7	0.41	0.66
Total	**0.41**	**0.66**
OVERALL	**6.28**	**13.74***

*** Value accounts for flood routing and is not a summation of the peak flows from the tributary areas.**

V. CONCLUSION

The hydrologic and hydraulic analysis confirms the proposed development and associated storm drain system effectively conveys the 100-year storm event in open channel flow with no instances of pressure flow. In the existing condition, the project site releases a peak flow of 20.08 CFS of runoff. In the proposed condition, the site releases a peak flow 13.74 CFS of runoff, resulting in a 6.74 CFS decrease in peak flow. Additionally, the site does not require permitting associated with Sections 401 or 404 of the Federal Clean Water Act due to the lack of wetlands, streams, or other protected water bodies.

APPENDIX A: REFERENCES

TABLE 2

RUNOFF COEFFICIENTS (RATIONAL METHOD)

DEVELOPED AREAS (URBAN)

Land Use	Coefficient, C Soil Type (1)
Residential:	D
Single Family	.55
Multi-Units	.70
Mobile Homes	.65
Rural (lots greater than 1/2 acre)	.45
Commercial (2) 80% Impervious	.85
Industrial (2) 90% Impervious	.95

NOTES:

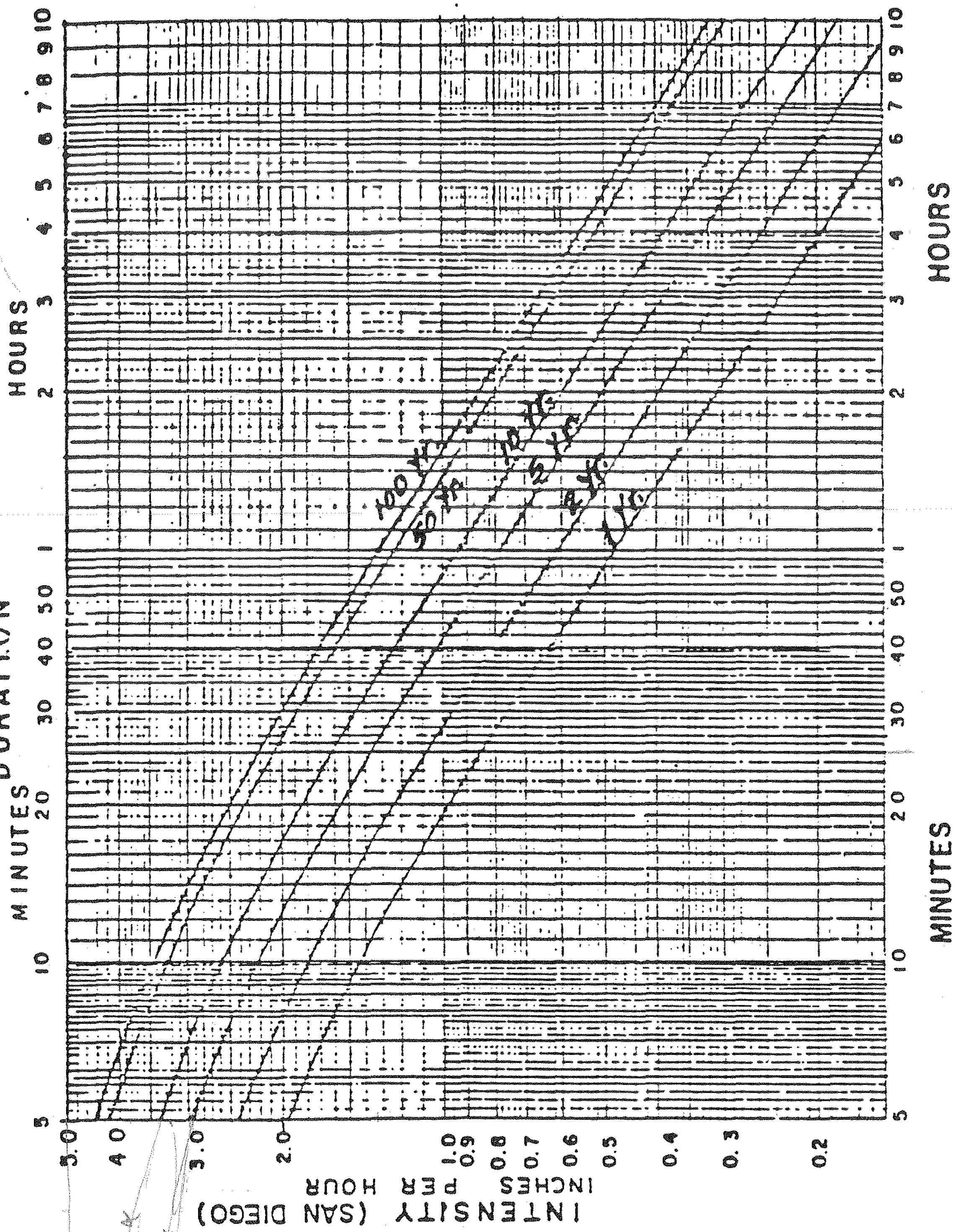
(1) Type D soil to be used for all areas.

(2) Where actual conditions deviate significantly from the tabulated imperviousness values of 80% or 90%, the values given for coefficient C, may be revised by multiplying 80% or 90% by the ratio of actual imperviousness to the tabulated imperviousness. However, in no case shall the final coefficient be less than 0.50. For example: Consider commercial property on D soil.

Actual imperviousness = 50%

Tabulated imperviousness = 80%

$$\text{Revised C} = \frac{50}{80} \times 0.85 = 0.53$$



ELEV.	FACTOR
0–1500	1.00
1500–3000	1.25
3000–4000	1.42
4000–5000	1.60
5000–6000	1.70
DESERT	1.25

To obtain correct intensity, multiply intensity on chart by factor for design elevation.

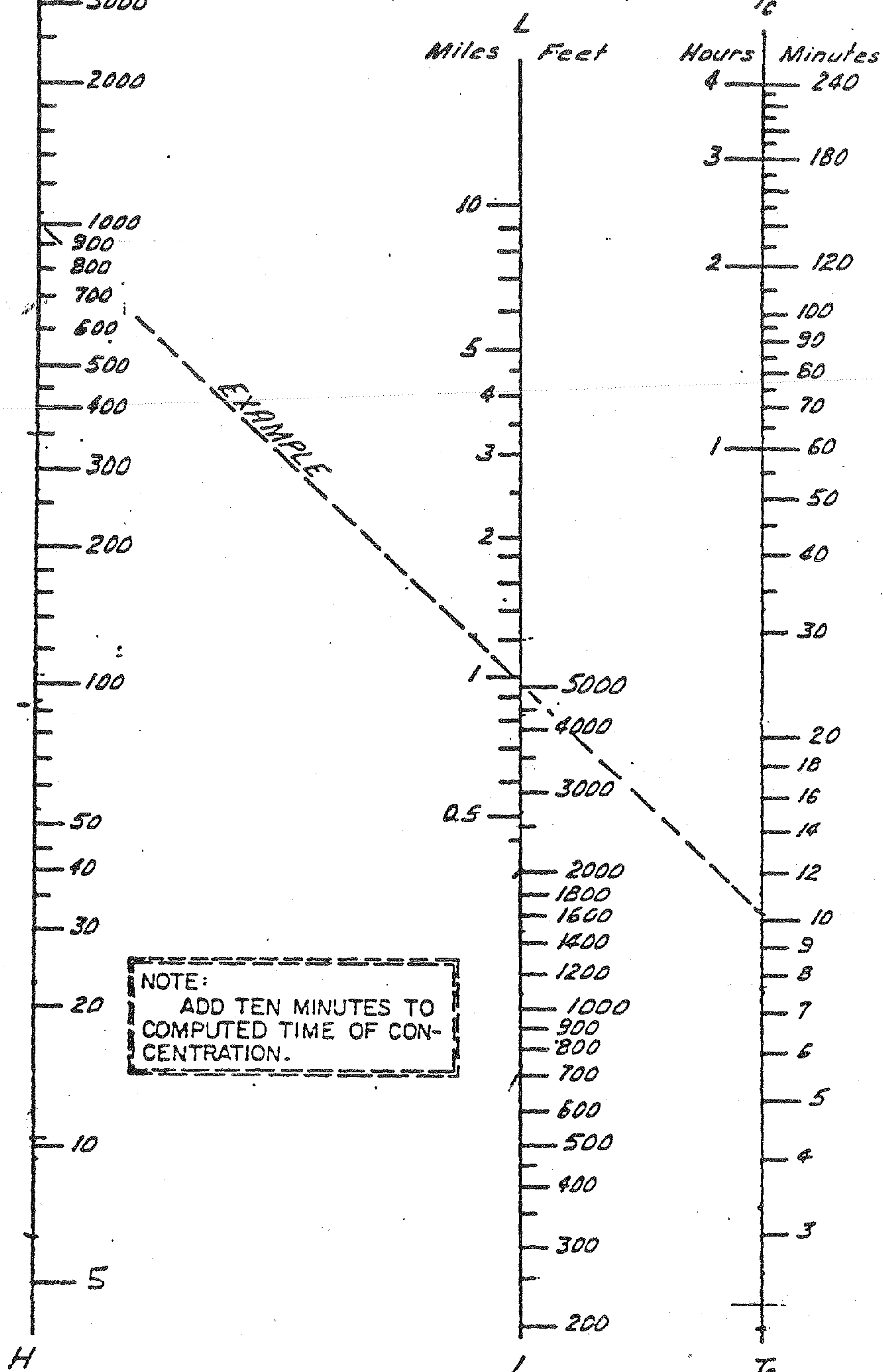
RAINFALL INTENSITY - DURATION - FREQUENC CURVES for COUNTY OF SAN DIEGO

APPENDIX I-

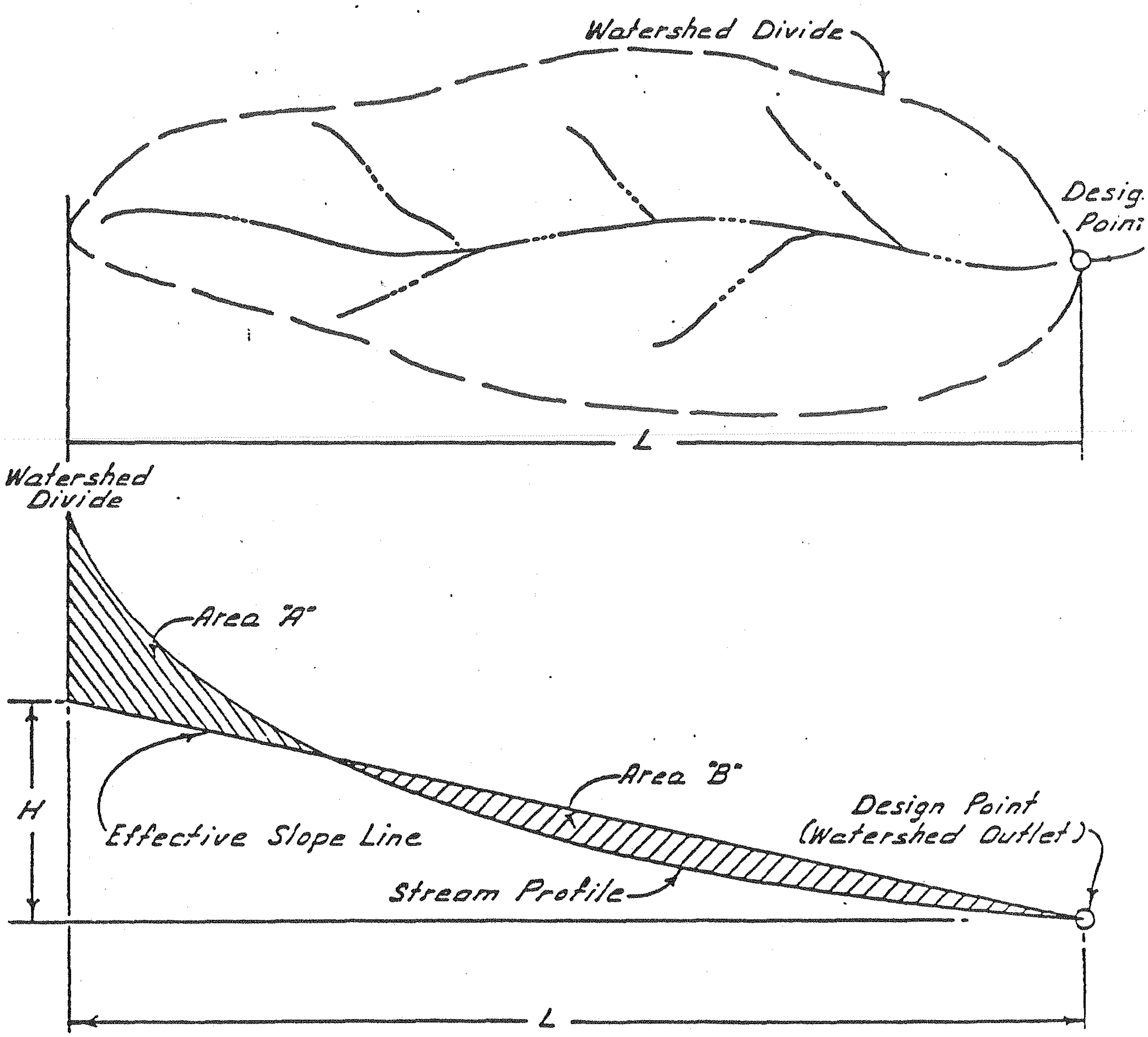
EQUATION

$$T_c = \left(\frac{11.9L^3}{H}\right)^{.385}$$

T_c = Time of concentration (in hours)
L = Length of watershed (in miles)
H = Difference in elevation along effective slope line (See Appendix X-B) (in feet)



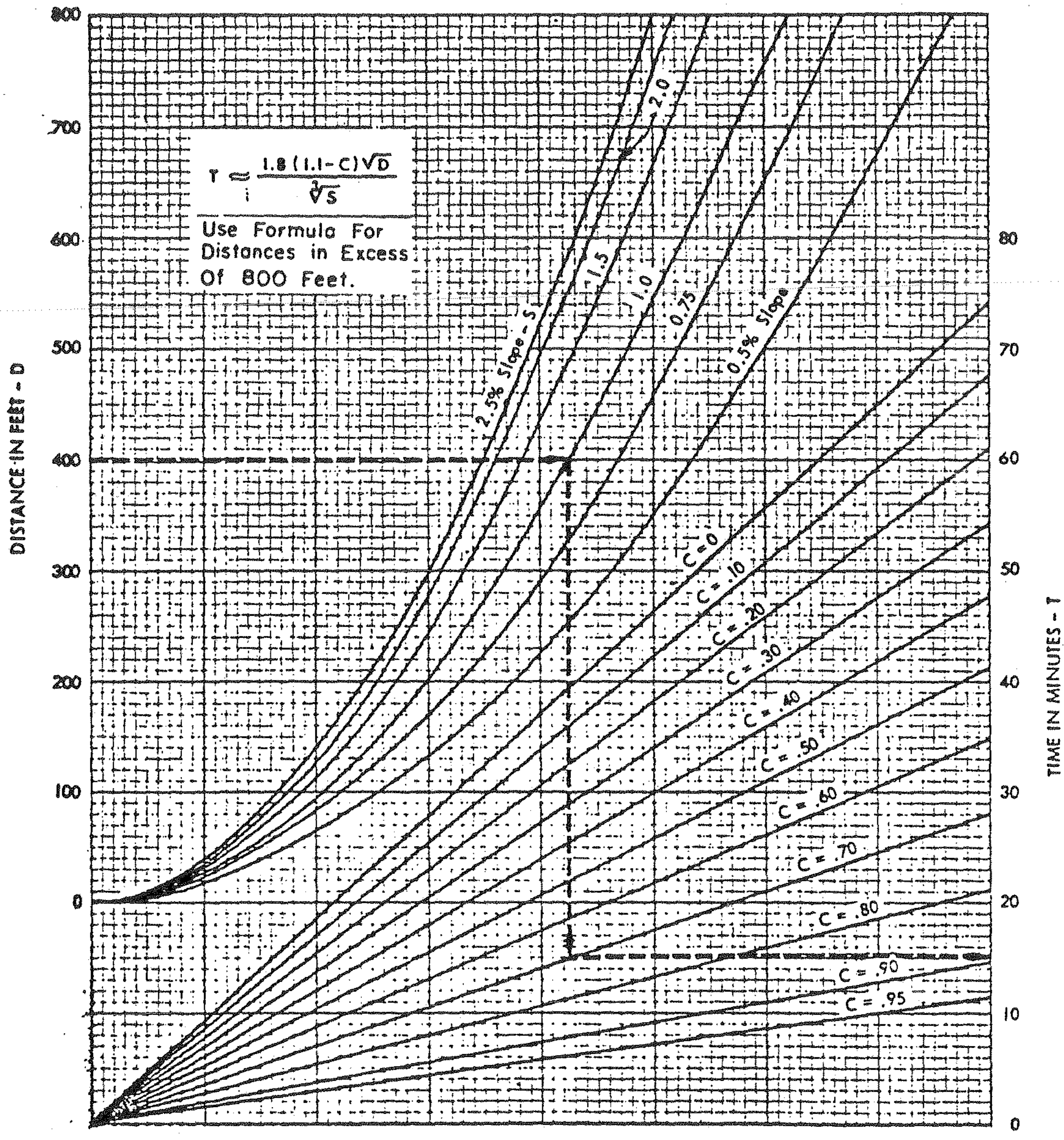
SAN DIEGO COUNTY DEPARTMENT OF SPECIAL DISTRICT SERVICES DESIGN MANUAL	NOMOGRAPH FOR DETERMINATION OF TIME OF CONCENTRATION (Tc) FOR NATURAL WATERSHEDS	
APPROVED [illegible]	DATE	APPENDIX



Area "A" = Area "B"

SAN DIEGO COUNTY DEPARTMENT OF SPECIAL DISTRICT SERVICES DESIGN MANUAL	COMPUTATION OF EFFECTIVE SLOPE FOR NATURAL WATERSHEDS
APPROVED [illegible]	DATE [illegible] — APPENDIX

URBAN AREAS OVERLAND TIME OF FLOW CURVES



Surface Flow Time Curves

EXAMPLE:

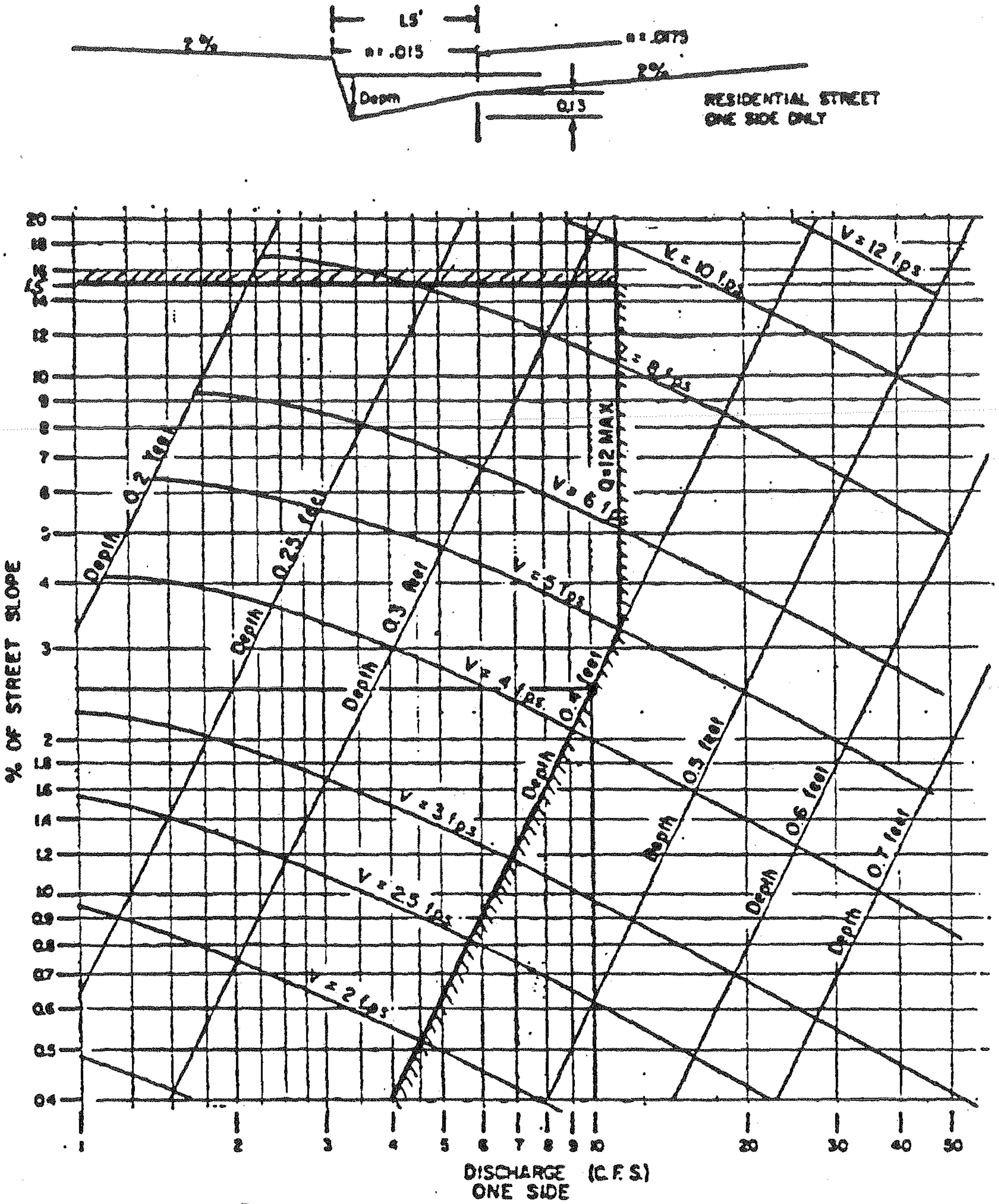
GIVEN: LENGTH OF FLOW = 400 FT.

SLOPE = 1.0 %

COEFFICIENT OF RUNOFF C = .70

READ: OVERLAND FLOWTIME = 15 MINUTES

CHART 1-104.12

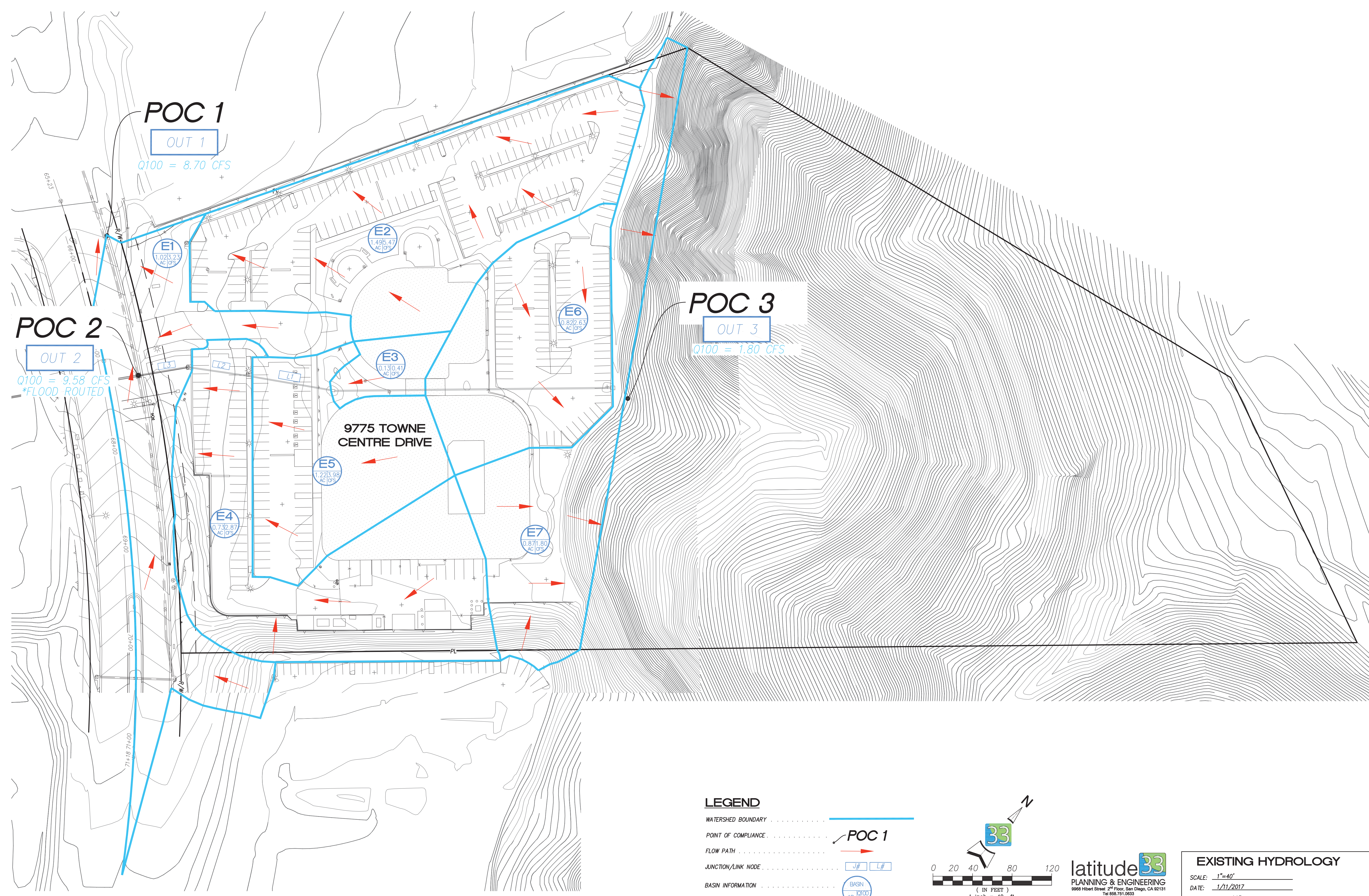


EXAMPLE:

Given: Q = 10 S = 2.5 %
Chart gives: Depth = 0.4, Velocity = 4.4 f.p.s.

REV.		CITY OF SAN DIEGO - DESIGN GUIDE	SHT. NO.
		GUTTER AND ROADWAY DISCHARGE - VELOCITY CHART	

APPENDIX B: EXISTING HYDROLOGIC CALCULATIONS



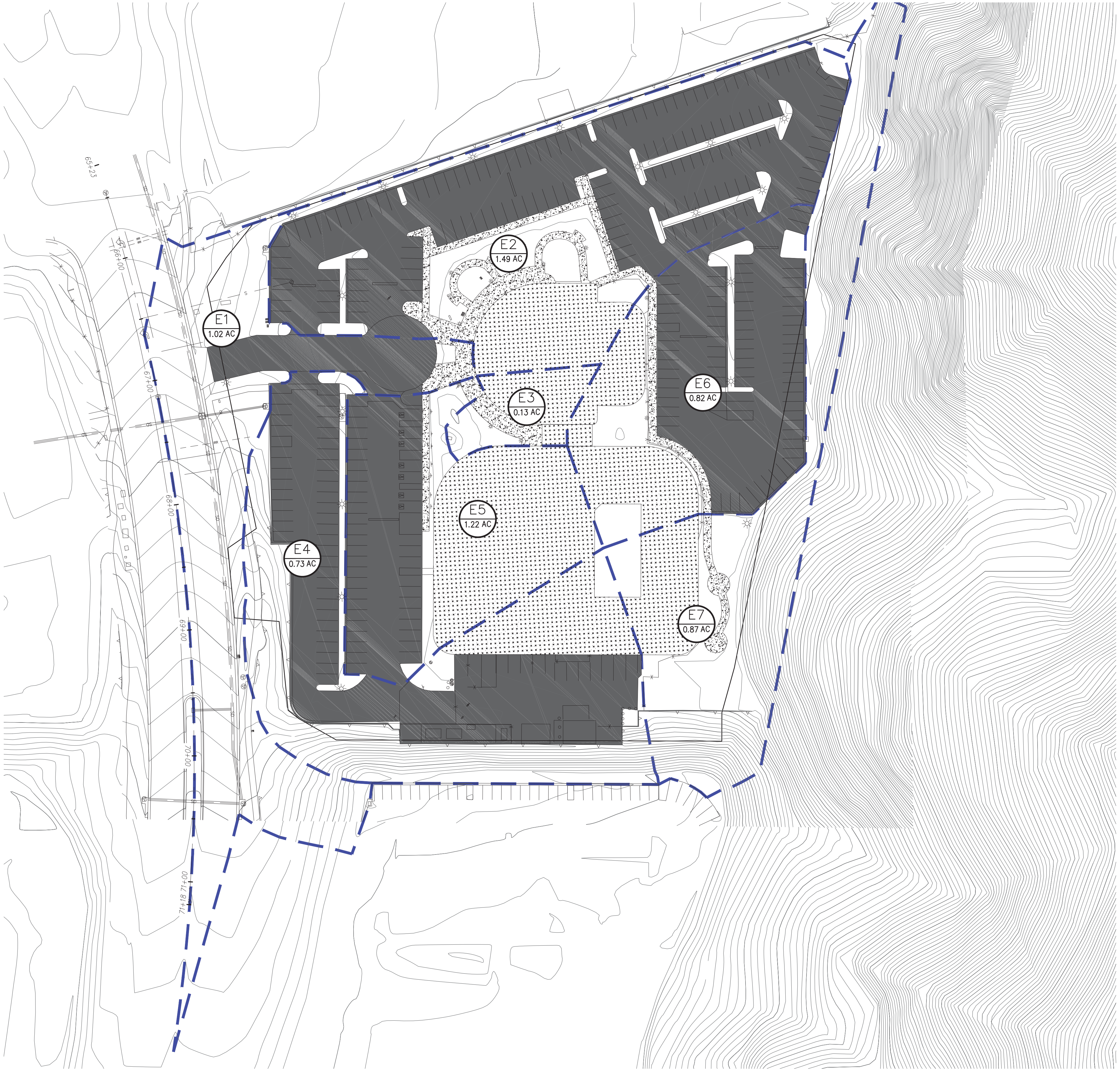
latitude 33
PLANNING & ENGINEERING
9968 Hibert Street 2nd Floor, San Diego, CA 92131
Tel 858.751.0633

EXISTING HYDROLOGY

SCALE: 1"=40'

DATE: 1/11/2017

PREPARED BY: AAB



LEGEND

- BUILDING
- ASPHALT
- CONCRETE
- LANDSCAPE
- DMA AREA (1 / 1.0 AC)
- DMA BOUNDARY

EXISTING DMA TABLE

DMA NO.	TOTAL AREA	WEIGHTED C	HARDSCAPE (AC)	LANDSCAPE (AC)
1	1.02 AC	0.72	0.61	0.41
2	1.49 AC	0.84	1.28	0.21
3	0.13 AC	0.73	0.08	0.05
4	0.73 AC	0.90	0.73	0.00
5	1.22 AC	0.76	0.84	0.38
6	0.82 AC	0.75	0.55	0.27
7	0.87 AC	0.59	0.27	0.60

N

0 15 30 60 90
(IN FEET)
1 inch = 30 ft.

latitude 33
PLANNING & ENGINEERING
9968 Hibert Street 2nd Floor, San Diego, CA 92131
Tel 858.751.0633

PROPOSED DMA MAP

9775 TOWNE CENTRE DRIVE
ATTACHMENT 1A

Project Description

File Name	EX SSA Model.SPF
Description	H:\1500\1517.00 - BioMed Realty - 9775 Towne Centre Drive\Engineering\Reports\Drainage\SSA\EX Parcels.dwg

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	Rational
Time of Concentration (TOC) Method	SCS TR-55
Link Routing Method	Hydrodynamic
Enable Overflow Ponding at Nodes	YES
Skip Steady State Analysis Time Periods	YES

Analysis Options

Start Analysis On	Jan 12, 2017	00:00:00
End Analysis On	Jan 13, 2017	00:00:00
Start Reporting On	Jan 12, 2017	00:00:00
Antecedent Dry Days	0	days
Runoff (Dry Weather) Time Step	0 01:00:00	days hh:mm:ss
Runoff (Wet Weather) Time Step	0 00:05:00	days hh:mm:ss
Reporting Time Step	0 00:05:00	days hh:mm:ss
Routing Time Step	30	seconds

Number of Elements

	Qty
Rain Gages	0
Subbasins	7
Nodes	6
Junctions	3
Outfalls	3
Flow Diversions	0
Inlets	0
Storage Nodes	0
Links	3
Channels	0
Pipes	3
Pumps	0
Orifices	0
Weirs	0
Outlets	0
Pollutants	0
Land Uses	0

Rainfall Details

Return Period	100 year(s)

Subbasin Summary

SN	Subbasin ID	Area (ac)	Weighted Runoff Coefficient	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	{Site 1}._E1	1.02	0.7200	0.37	0.26	0.27	3.23	0 00:05:00
2	{Site 1}._E2	1.49	0.8400	0.37	0.31	0.46	5.47	0 00:05:00
3	{Site 1}._E3	0.13	0.7300	0.37	0.27	0.03	0.41	0 00:05:00
4	{Site 1}._E4	0.73	0.9000	0.37	0.33	0.24	2.87	0 00:05:00
5	{Site 1}._E5	1.22	0.7600	0.40	0.31	0.38	3.98	0 00:05:44
6	{Site 1}._E6	0.82	0.7500	0.39	0.30	0.24	2.63	0 00:05:34
7	{Site 1}._E7	0.87	0.5900	0.58	0.34	0.30	1.80	0 00:09:51

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft²)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	Jun-02	Junction	380.10	381.00	0.00	0.00	0.00	0.41	380.29	0.00	1.31	0 00:00	0.00	0.00
2	Jun-03	Junction	378.40	385.90	0.00	0.00	0.00	3.25	378.92	0.00	6.98	0 00:00	0.00	0.00
3	Jun-04	Junction	376.80	383.50	0.00	0.00	0.00	6.98	377.54	0.00	5.96	0 00:00	0.00	0.00
4	OUT_1	Outfall	0.00					8.70	0.00					
5	OUT_2	Outfall	373.00					9.58	373.66					
6	OUT_3	Outfall	0.00					1.80	0.00					

Subbasin Hydrology

Subbasin : {Site 1}._E1

Input Data

Area (ac) 1.02
Weighted Runoff Coefficient 0.7200

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
hardscape	0.61	-	0.90
landscape	0.41	-	0.45
Composite Area & Weighted Runoff Coeff.	1.02		0.72

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

Where :

Tc = Time of Concentration (hr)
n = Manning's roughness
Lf = Flow Length (ft)
P = 2 yr, 24 hr Rainfall (inches)
Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (Sf^0.5) (unpaved surface)
V = 20.3282 * (Sf^0.5) (paved surface)
V = 15.0 * (Sf^0.5) (grassed waterway surface)
V = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
V = 9.0 * (Sf^0.5) (cultivated straight rows surface)
V = 7.0 * (Sf^0.5) (short grass pasture surface)
V = 5.0 * (Sf^0.5) (woodland surface)
V = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)

Channel Flow Equation :

V = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
R = Aq / Wp
Tc = (Lf / V) / (3600 sec/hr)

Where :

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
R = Hydraulic Radius (ft)
Aq = Flow Area (ft^2)
Wp = Wetted Perimeter (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)
n = Manning's roughness

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.013	0.00	0.00
Flow Length (ft) :	195	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.75	0.00	0.00
Velocity (ft/sec) :	1.02	0.00	0.00
Computed Flow Time (min) :	3.20	0.00	0.00

Channel Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.013	0.00	0.00
Flow Length (ft) :	460	0.00	0.00
Channel Slope (%) :	2	0.00	0.00
Cross Section Area (ft²) :	.2	0.00	0.00
Wetted Perimeter (ft) :	1.5	0.00	0.00
Velocity (ft/sec) :	4.23	0.00	0.00
Computed Flow Time (min) :	1.81	0.00	0.00

Total TOC (min) 5.01

Subbasin Runoff Results

Total Rainfall (in) 0.37
Total Runoff (in) 0.26
Peak Runoff (cfs) 3.23
Rainfall Intensity 4.379
Weighted Runoff Coefficient 0.7200
Time of Concentration (days hh:mm:ss) 0 00:05:01

Subbasin : {Site 1}._E2

Input Data

Area (ac) 1.49
Weighted Runoff Coefficient 0.8400

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
hardscape	1.28	-	0.90
landscape	0.21	-	0.45
Composite Area & Weighted Runoff Coeff.	1.49		0.84

Time of Concentration

Channel Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.013	0.00	0.00
Flow Length (ft) :	476	0.00	0.00
Channel Slope (%) :	1	0.00	0.00
Cross Section Area (ft²) :	.2	0.00	0.00
Wetted Perimeter (ft) :	1.5	0.00	0.00
Velocity (ft/sec) :	2.99	0.00	0.00
Computed Flow Time (min) :	2.65	0.00	0.00

Total TOC (min) 2.65

Subbasin Runoff Results

Total Rainfall (in) 0.37
Total Runoff (in) 0.31
Peak Runoff (cfs) 5.47
Rainfall Intensity 4.380
Weighted Runoff Coefficient 0.8400
Time of Concentration (days hh:mm:ss) 0 00:02:39

Subbasin : {Site 1}._E3

Input Data

Area (ac) 0.13
Weighted Runoff Coefficient 0.7300

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
hardscape	0.08	-	0.90
landscape	0.05	-	0.45
Composite Area & Weighted Runoff Coeff.	0.13		0.73

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.013	0.00	0.00
Flow Length (ft) :	133	0.00	0.00
Slope (%) :	1	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.75	0.00	0.00
Velocity (ft/sec) :	0.71	0.00	0.00
Computed Flow Time (min) :	3.10	0.00	0.00

Total TOC (min) 3.10

Subbasin Runoff Results

Total Rainfall (in) 0.37
Total Runoff (in) 0.27
Peak Runoff (cfs) 0.41
Rainfall Intensity 4.380
Weighted Runoff Coefficient 0.7300
Time of Concentration (days hh:mm:ss) 0 00:03:06

Subbasin : {Site 1}._E4

Input Data

Area (ac) 0.73
Weighted Runoff Coefficient 0.9000

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
hardscape	0.73	-	0.90
Composite Area & Weighted Runoff Coeff.	0.73		0.90

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.013	0.00	0.00
Flow Length (ft) :	206	0.00	0.00
Slope (%) :	1	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.75	0.00	0.00
Velocity (ft/sec) :	0.78	0.00	0.00
Computed Flow Time (min) :	4.41	0.00	0.00

Channel Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.013	0.00	0.00
Flow Length (ft) :	70	0.00	0.00
Channel Slope (%) :	1	0.00	0.00
Cross Section Area (ft²) :	.2	0.00	0.00
Wetted Perimeter (ft) :	1.5	0.00	0.00
Velocity (ft/sec) :	2.99	0.00	0.00
Computed Flow Time (min) :	0.39	0.00	0.00

Total TOC (min) 4.80

Subbasin Runoff Results

Total Rainfall (in) 0.37
Total Runoff (in) 0.33
Peak Runoff (cfs) 2.87
Rainfall Intensity 4.380
Weighted Runoff Coefficient 0.9000
Time of Concentration (days hh:mm:ss) 0 00:04:48

Subbasin : {Site 1}._E5

Input Data

Area (ac) 1.22
Weighted Runoff Coefficient 0.7600

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
hardscape	0.84	-	0.90
landscape	0.38	-	0.45
Composite Area & Weighted Runoff Coeff.	1.22		0.76

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.013	0.00	0.00
Flow Length (ft) :	150	0.00	0.00
Slope (%) :	1	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.75	0.00	0.00
Velocity (ft/sec) :	0.73	0.00	0.00
Computed Flow Time (min) :	3.42	0.00	0.00

Channel Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.013	0.00	0.00
Flow Length (ft) :	417	0.00	0.00
Channel Slope (%) :	1	0.00	0.00
Cross Section Area (ft^2) :	.2	0.00	0.00
Wetted Perimeter (ft) :	1.5	0.00	0.00
Velocity (ft/sec) :	2.99	0.00	0.00
Computed Flow Time (min) :	2.32	0.00	0.00

Total TOC (min) 5.74

Subbasin Runoff Results

Total Rainfall (in) 0.40
Total Runoff (in) 0.31
Peak Runoff (cfs) 3.98
Rainfall Intensity 4.281
Weighted Runoff Coefficient 0.7600
Time of Concentration (days hh:mm:ss) 0 00:05:44

Subbasin : {Site 1}._E6

Input Data

Area (ac) 0.82
Weighted Runoff Coefficient 0.7500

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
hardscape	0.55	-	0.90
landscape	0.27	-	0.45
Composite Area & Weighted Runoff Coeff.	0.82		0.75

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.013	0.00	0.00
Flow Length (ft) :	315	0.00	0.00
Slope (%) :	1.3	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.75	0.00	0.00
Velocity (ft/sec) :	0.94	0.00	0.00
Computed Flow Time (min) :	5.57	0.00	0.00

Total TOC (min) 5.57

Subbasin Runoff Results

Total Rainfall (in) 0.39
Total Runoff (in) 0.30
Peak Runoff (cfs) 2.63
Rainfall Intensity 4.303
Weighted Runoff Coefficient 0.7500
Time of Concentration (days hh:mm:ss) 0 00:05:34

Subbasin : {Site 1}._E7

Input Data

Area (ac) 0.87
Weighted Runoff Coefficient 0.5900

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
hardscape	0.27	-	0.90
landscape	0.60	-	0.45
Composite Area & Weighted Runoff Coeff.	0.87		0.59

Time of Concentration

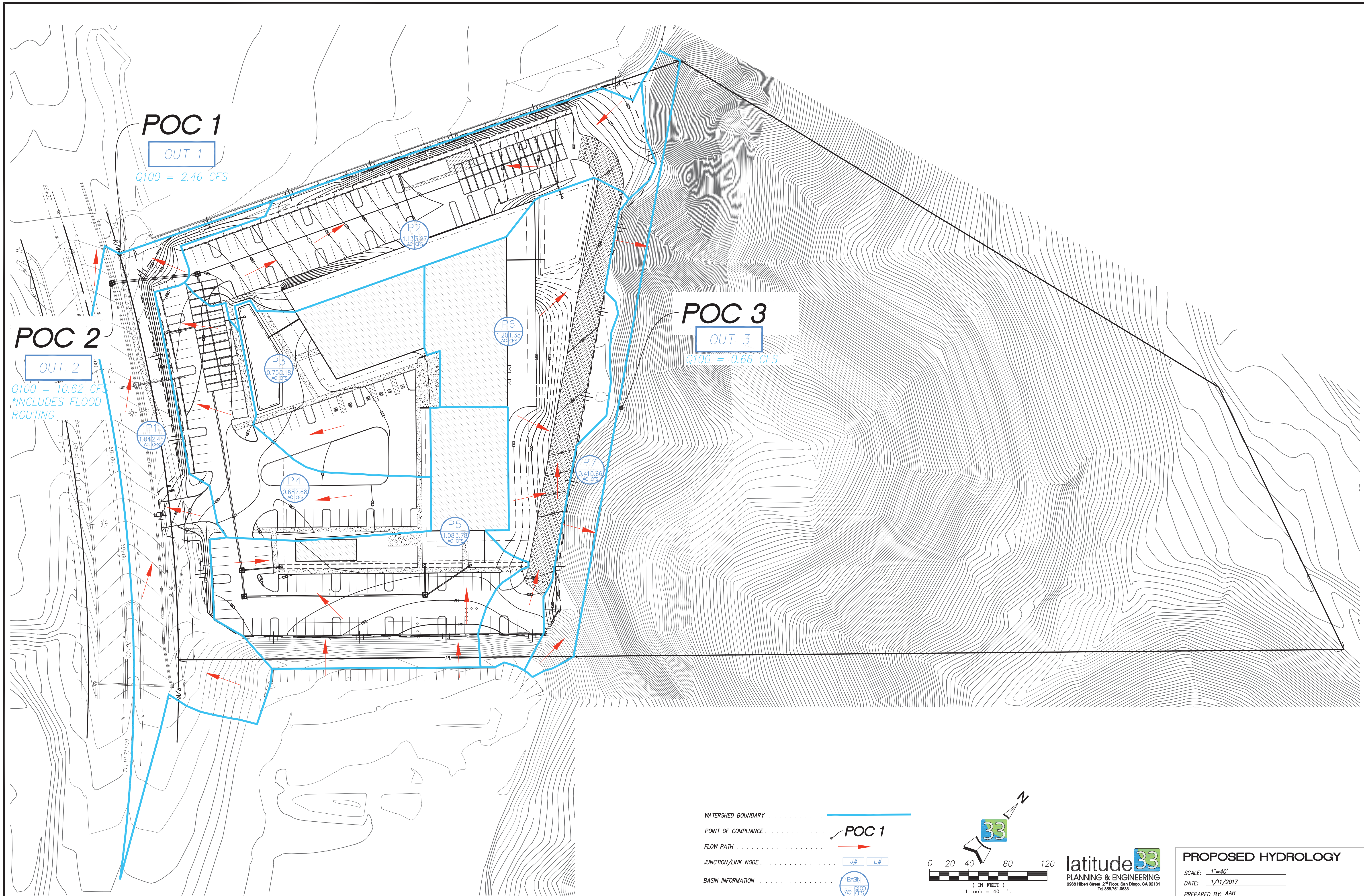
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.2	0.00	0.00
Flow Length (ft) :	172	0.00	0.00
Slope (%) :	22	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.75	0.00	0.00
Velocity (ft/sec) :	0.29	0.00	0.00
Computed Flow Time (min) :	9.86	0.00	0.00

Total TOC (min) 9.86

Subbasin Runoff Results

Total Rainfall (in) 0.58
Total Runoff (in) 0.34
Peak Runoff (cfs) 1.80
Rainfall Intensity 3.513
Weighted Runoff Coefficient 0.5900
Time of Concentration (days hh:mm:ss) 0 00:09:52

APPENDIX C: PROPOSED HYDROLOGIC CALCULATIONS

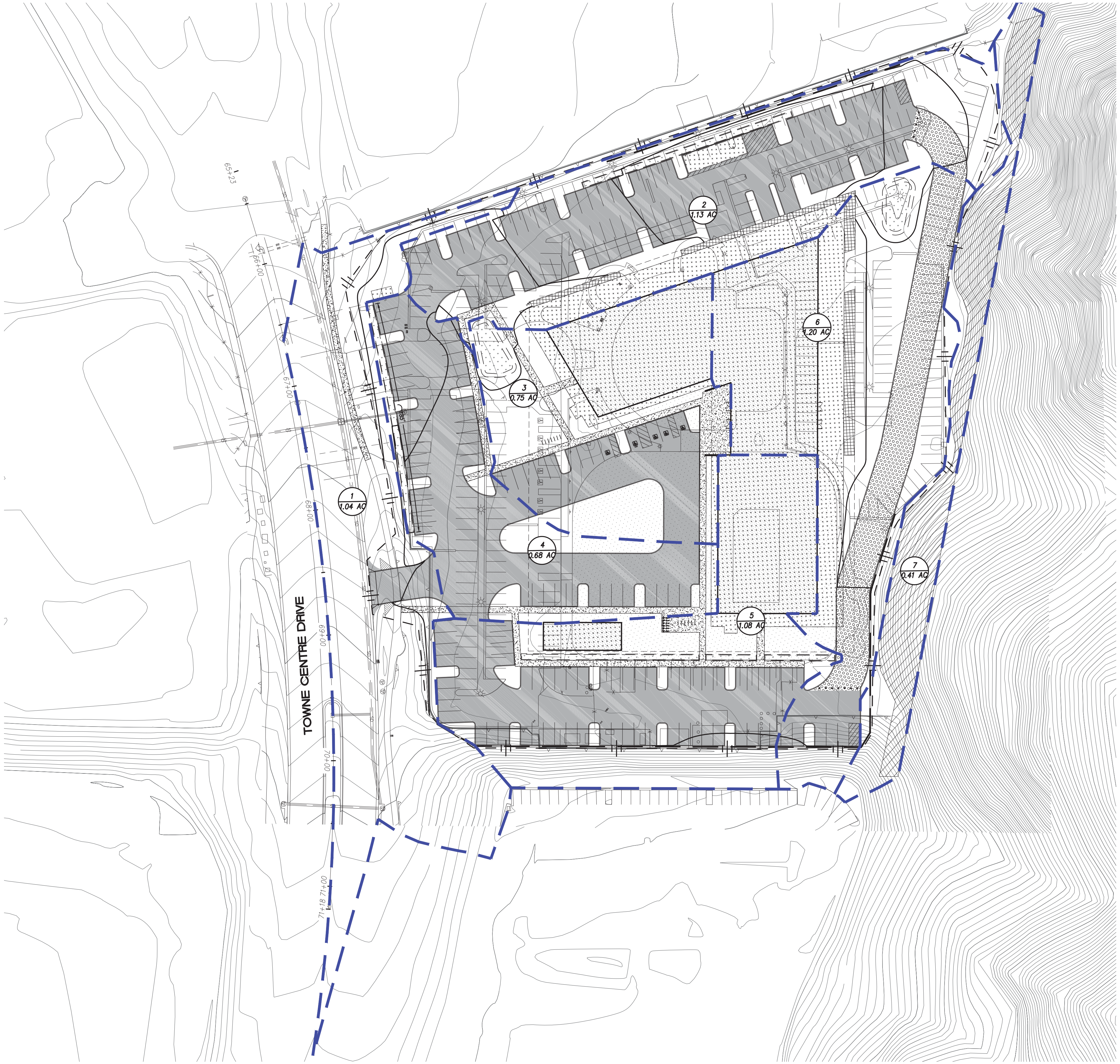


PROPOSED HYDROLOGY

SCALE: 1"=40'

DATE: 1/11/2017

PREPARED BY: AAB



LEGEND

- BUILDING
- ASPHALT
- CONCRETE
- TERRACE
- LANDSCAPE
- BMP AREA
- GRASSCRETE
- DMA
- AREA
- DMA BOUNDARY

PROPOSED DMA TABLE					
DMA NO.	TOTAL AREA	WEIGHTED C	HARDSCAPE (AC)	LANDSCAPE (AC)	GRASSCRETE (AC)
1	1.04 AC	0.54	0.20	0.84	0.00
2	1.13 AC	0.66	0.51	0.59	0.03
3	0.75 AC	0.82	0.62	0.13	0.00
4	0.68 AC	0.90	0.68	0.00	0.00
5	1.08 AC	0.81	0.86	0.22	0.00
6	1.20 AC	0.27	0.36	0.60	0.25
7	0.41 AC	0.45	0.00	0.41	0.00

latitude 33
PLANNING & ENGINEERING
9968 Hibert Street 2nd Floor, San Diego, CA 92131
Tel 858.751.0633

DMA MAP

9775 TOWNE CENTRE DRIVE
ATTACHMENT 1A

Project Description

File Name	PR SSA Model.SPF
Description	H:\1500\1517.00 - BioMed Realty - 9775 Towne Centre Drive\Engineering\Reports\Drainage\SSA\PR Parcels.dwg

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	Rational
Time of Concentration (TOC) Method	SCS TR-55
Link Routing Method	Hydrodynamic
Enable Overflow Ponding at Nodes	YES
Skip Steady State Analysis Time Periods	YES

Analysis Options

Start Analysis On	Jan 13, 2017	00:00:00
End Analysis On	Jan 14, 2017	00:00:00
Start Reporting On	Jan 13, 2017	00:00:00
Antecedent Dry Days	0	days
Runoff (Dry Weather) Time Step	0 01:00:00	days hh:mm:ss
Runoff (Wet Weather) Time Step	0 00:05:00	days hh:mm:ss
Reporting Time Step	0 00:05:00	days hh:mm:ss
Routing Time Step	30	seconds

Number of Elements

	Qty
Rain Gages	0
Subbasins	7
Nodes	12
Junctions	9
Outfalls	3
Flow Diversions	0
Inlets	0
Storage Nodes	0
Links	9
Channels	0
Pipes	9
Pumps	0
Orifices	0
Weirs	0
Outlets	0
Pollutants	0
Land Uses	0

Rainfall Details

Return Period	100 year(s)

Subbasin Summary

SN	Subbasin ID	Area (ac)	Weighted Runoff Coefficient	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	{Site 1}._P1	1.04	0.5400	0.37	0.20	0.20	2.46	0 00:05:00
2	{Site 1}._P2	1.13	0.6600	0.37	0.24	0.27	3.27	0 00:05:00
3	{Site 1}._P3	0.75	0.8200	0.56	0.46	0.35	2.18	0 00:09:34
4	{Site 1}._P4	0.68	0.9000	0.37	0.33	0.22	2.68	0 00:05:00
5	{Site 1}._P5	1.08	0.8100	0.40	0.32	0.35	3.78	0 00:05:26
6	{Site 1}._P6	1.20	0.2700	0.43	0.12	0.14	1.38	0 00:06:00
7	{Site 1}._P7	0.41	0.4500	0.53	0.24	0.10	0.66	0 00:08:51

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft²)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	Jun-01	Junction	388.00	390.50	0.00	0.00	0.00	2.18	388.20	0.00	2.30	0 00:00	0.00	0.00
2	Jun-03	Junction	373.00	388.00	0.00	0.00	0.00	12.34	374.78	0.00	13.22	0 00:00	0.00	0.00
3	Jun-04	Junction	377.00	378.00	0.00	0.00	0.00	3.26	378.00	0.00	0.00	0 00:05	0.00	0.00
4	Jun-05	Junction	376.00	377.00	0.00	6.00	0.00	4.31	376.32	0.00	1.18	0 00:00	0.00	0.00
5	Jun-06	Junction	374.00	388.50	0.00	0.00	0.00	7.09	375.02	0.00	13.48	0 00:00	0.00	0.00
6	Jun-07	Junction	375.00	378.00	0.00	0.00	0.00	2.68	375.46	0.00	2.54	0 00:00	0.00	0.00
7	Jun-08	Junction	380.00	393.00	0.00	0.00	0.00	3.71	380.53	0.00	12.47	0 00:00	0.00	0.00
8	Jun-09	Junction	383.00	394.00	0.00	0.00	0.00	3.78	383.63	0.00	10.37	0 00:00	0.00	0.00
9	Jun-10	Junction	377.00	381.00	0.00	0.00	0.00	1.38	377.48	0.00	3.52	0 00:00	0.00	0.00
10	OUT_1	Outfall	0.00					2.46	0.00					
11	OUT_2	Outfall	371.60					10.62	372.72					
12	OUT_3	Outfall	0.00					0.66	0.00					

Subbasin Hydrology

Subbasin : {Site 1}._P1

Input Data

Area (ac) 1.04
Weighted Runoff Coefficient 0.5400

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
LANDSCAPE	0.84	-	0.45
HARDSCAPE	0.20	-	0.90
Composite Area & Weighted Runoff Coeff.	1.04		0.54

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

Where :

Tc = Time of Concentration (hr)
n = Manning's roughness
Lf = Flow Length (ft)
P = 2 yr, 24 hr Rainfall (inches)
Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (Sf^0.5) (unpaved surface)
V = 20.3282 * (Sf^0.5) (paved surface)
V = 15.0 * (Sf^0.5) (grassed waterway surface)
V = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
V = 9.0 * (Sf^0.5) (cultivated straight rows surface)
V = 7.0 * (Sf^0.5) (short grass pasture surface)
V = 5.0 * (Sf^0.5) (woodland surface)
V = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)

Channel Flow Equation :

V = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
R = Aq / Wp
Tc = (Lf / V) / (3600 sec/hr)

Where :

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
R = Hydraulic Radius (ft)
Aq = Flow Area (ft^2)
Wp = Wetted Perimeter (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)
n = Manning's roughness

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.013	0.00	0.00
Flow Length (ft) :	195	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.75	0.00	0.00
Velocity (ft/sec) :	1.02	0.00	0.00
Computed Flow Time (min) :	3.20	0.00	0.00

Channel Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.013	0.00	0.00
Flow Length (ft) :	460	0.00	0.00
Channel Slope (%) :	2	0.00	0.00
Cross Section Area (ft²) :	.2	0.00	0.00
Wetted Perimeter (ft) :	1.5	0.00	0.00
Velocity (ft/sec) :	4.23	0.00	0.00
Computed Flow Time (min) :	1.81	0.00	0.00

Total TOC (min) 5.01

Subbasin Runoff Results

Total Rainfall (in) 0.37
Total Runoff (in) 0.20
Peak Runoff (cfs) 2.46
Rainfall Intensity 4.379
Weighted Runoff Coefficient 0.5400
Time of Concentration (days hh:mm:ss) 0 00:05:01

Subbasin : {Site 1}._P2

Input Data

Area (ac) 1.13
Weighted Runoff Coefficient 0.6600

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
GRASSCRETE	0.03	-	0.70
LANDSCAPE	0.59	-	0.45
HARDSCAPE	0.51	-	0.90
Composite Area & Weighted Runoff Coeff.	1.13		0.66

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.013	0.00	0.00
Flow Length (ft) :	252	0.00	0.00
Slope (%) :	6.4	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.75	0.00	0.00
Velocity (ft/sec) :	1.70	0.00	0.00
Computed Flow Time (min) :	2.46	0.00	0.00

Total TOC (min) 2.46

Subbasin Runoff Results

Total Rainfall (in) 0.37
Total Runoff (in) 0.24
Peak Runoff (cfs) 3.27
Rainfall Intensity 4.380
Weighted Runoff Coefficient 0.6600
Time of Concentration (days hh:mm:ss) 0 00:02:28

Subbasin : {Site 1}._P3

Input Data

Area (ac) 0.75
Weighted Runoff Coefficient 0.8200

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
HARDSCAPE	0.62	-	0.90
LANDSCAPE	0.13	-	0.45
Composite Area & Weighted Runoff Coeff.	0.75		0.82

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.4	0.00	0.00
Flow Length (ft) :	50	0.00	0.00
Slope (%) :	8	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.75	0.00	0.00
Velocity (ft/sec) :	0.09	0.00	0.00
Computed Flow Time (min) :	9.58	0.00	0.00

Total TOC (min) 9.58

Subbasin Runoff Results

Total Rainfall (in) 0.56
Total Runoff (in) 0.46
Peak Runoff (cfs) 2.18
Rainfall Intensity 3.540
Weighted Runoff Coefficient 0.8200
Time of Concentration (days hh:mm:ss) 0 00:09:35

Subbasin : {Site 1}._P4

Input Data

Area (ac) 0.68
Weighted Runoff Coefficient 0.9000

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
HARDSCAPE	0.68	-	0.90
Composite Area & Weighted Runoff Coeff.	0.68		0.90

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.013	0.00	0.00
Flow Length (ft) :	240	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.75	0.00	0.00
Velocity (ft/sec) :	1.06	0.00	0.00
Computed Flow Time (min) :	3.77	0.00	0.00

Total TOC (min) 3.77

Subbasin Runoff Results

Total Rainfall (in) 0.37
Total Runoff (in) 0.33
Peak Runoff (cfs) 2.68
Rainfall Intensity 4.380
Weighted Runoff Coefficient 0.9000
Time of Concentration (days hh:mm:ss) 0 00:03:46

Subbasin : {Site 1}._P5

Input Data

Area (ac) 1.08
Weighted Runoff Coefficient 0.8100

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
HARDSCAPE	0.86	-	0.90
LANDSCAPE	0.22	-	0.45
Composite Area & Weighted Runoff Coeff.	1.08		0.81

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.4	.013	0.00
Flow Length (ft) :	34	94	0.00
Slope (%) :	41	2	0.00
2 yr, 24 hr Rainfall (in) :	1.75	1.75	0.00
Velocity (ft/sec) :	0.15	0.88	0.00
Computed Flow Time (min) :	3.66	1.78	0.00

Total TOC (min) 5.44

Subbasin Runoff Results

Total Rainfall (in) 0.40
Total Runoff (in) 0.32
Peak Runoff (cfs) 3.78
Rainfall Intensity 4.319
Weighted Runoff Coefficient 0.8100
Time of Concentration (days hh:mm:ss) 0 00:05:26

Subbasin : {Site 1}._P6

Input Data

Area (ac) 1.20
Weighted Runoff Coefficient 0.2700

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
HARDSCAPE	0.36	-	0.90
GRASSCRETE	0.25	-	0.00
LANDSCAPE	0.60	-	0.00
Composite Area & Weighted Runoff Coeff.	1.21		0.27

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.4	.013	0.00
Flow Length (ft) :	33	72	0.00
Slope (%) :	42	7	0.00
2 yr, 24 hr Rainfall (in) :	1.75	1.75	0.00
Velocity (ft/sec) :	0.16	1.38	0.00
Computed Flow Time (min) :	3.54	0.87	0.00

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	336	0.00	0.00
Slope (%) :	3	0.00	0.00
Surface Type :	Paved	Unpaved	Unpaved
Velocity (ft/sec) :	3.52	0.00	0.00
Computed Flow Time (min) :	1.59	0.00	0.00

Total TOC (min) 6.00

Subbasin Runoff Results

Total Rainfall (in) 0.43
Total Runoff (in) 0.12
Peak Runoff (cfs) 1.38
Rainfall Intensity 4.250
Weighted Runoff Coefficient 0.2700
Time of Concentration (days hh:mm:ss) 0 00:06:00

Subbasin : {Site 1}._P7

Input Data

Area (ac) 0.41
Weighted Runoff Coefficient 0.4500

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
LANDSCAPE	0.41	-	0.45
Composite Area & Weighted Runoff Coeff.	0.41		0.45

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.4	0.00	0.00
Flow Length (ft) :	92	0.00	0.00
Slope (%) :	33	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.75	0.00	0.00
Velocity (ft/sec) :	0.17	0.00	0.00
Computed Flow Time (min) :	8.85	0.00	0.00

Total TOC (min) 8.85

Subbasin Runoff Results

Total Rainfall (in) 0.53
Total Runoff (in) 0.24
Peak Runoff (cfs) 0.66
Rainfall Intensity 3.621
Weighted Runoff Coefficient 0.4500
Time of Concentration (days hh:mm:ss) 0 00:08:51

9775 Towne Centre Drive Air Quality Modeling Output

Summary Book

Air Quality

Air Quality Emissions Estimate		Pollutant (lbs/day)					
		ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Construction							
Summer	*2018*	7	114	47	0	10	6
	2019	124	28	23	0	3	2
Winter	*2018*	7	115	48	0	10	6
	2019	124	28	23	0	3	2
Maximum Daily Construction Emissions		**124**	**115**	**48**	**0**	**10**	**6**
Operation							
Summer	Area	5	1	0	0	0	0
	Energy	*0*	*1*	*0*	*0*	*0*	*0*
	Mobile	2	8	20	0	5	1
Winter	Area	5	1	0	0	0	0
	Energy	*0*	*1*	*0*	*0*	*0*	*0*
	Mobile	2	8	20	0	5	1
Maximum Daily Operation Emissions		**7**	**8**	**21**	**0**	**5**	**1**

9775 Town Centre Project

San Diego County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Research & Development	173.93	1000sqft	8.66	173,930.00	0
Enclosed Parking with Elevator	150.41	1000sqft	3.45	150,405.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	539.36	**CH4 Intensity (lb/MWhr)**	0.022	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Updated energy intensity factors to reflect increase RPS procurement

Land Use - Proposed building would be 173,930 square feet, including 165,000 square feet of non-exempt area. 150,405 sf subgrade parking. Project site is 12.108 acres

Grading - Quantitites per project plans grading tabulations; 70,000 cy cut, 29,000 fill, 41,000 cy export. 4.75 sf graded area

Demolition - Project WMP indicates the project would generate 4,974 tons of demolition debris.

Architectural Coating - SDAPCD Rule 67.0.1

Vehicle Trips - Total ADT allocation would be 1,252 ADT / 173.93 = 7.2 adt/ksf. Regional average trip length used.

Area Coating - Rule 67.0.1

Water And Wastewater - Estimated Total Water Use for landscaping is 1,085,523 gallons per year.

Solid Waste - Proejct WMP indicates that the project would generat 280.5 tons of waste per year.

Construction Off-road Equipment Mitigation - SDAPCD Rule 55

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	150.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	150.00
tblArchitecturalCoating	EF_Parking	250.00	150.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	150
tblAreaCoating	Area_EF_Nonresidential_Interior	250	150
tblAreaCoating	Area_EF_Parking	250	150
tblGrading	AcresOfGrading	75.00	4.75
tblGrading	MaterialExported	0.00	41,000.00
tblLandUse	LandUseSquareFeet	150,410.00	150,405.00
tblLandUse	LotAcreage	3.99	8.66
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.022
tblProjectCharacteristics	CO2IntensityFactor	720.49	539.36
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblSolidWaste	SolidWasteGenerationRate	13.22	280.50
tblVehicleTrips	CC_TL	7.30	5.80
tblVehicleTrips	CNW_TL	7.30	5.80
tblVehicleTrips	CW_TL	9.50	5.80
tblVehicleTrips	WD_TR	8.11	7.20
tblWater	OutdoorWaterUseRate	0.00	1,085,523.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Year	lb/day										lb/day					
2018	6.7390	113.9206	46.9808	0.2012	18.2141	2.8487	20.7921	9.9699	2.6286	12.3416	0.0000	21,367.5968	21,367.5968	3.2674	0.0000	21,449.2821
2019	124.4225	27.9762	22.5423	0.0519	1.3364	1.3426	2.6789	0.3626	1.2629	1.6255	0.0000	5,196.0059	5,196.0059	0.7855	0.0000	5,215.6441
Maximum	**124.4225**	**113.9206**	**46.9808**	**0.2012**	**18.2141**	**2.8487**	**20.7921**	**9.9699**	**2.6286**	**12.3416**	**0.0000**	**21,367.5968**	**21,367.5968**	**3.2674**	**0.0000**	**21,449.2821**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	6.7390	113.9206	46.9808	0.2012	7.1937	2.8487	9.7717	3.9122	2.6286	6.2839	0.0000	21,367.5968	21,367.5968	3.2674	0.0000	21,449.2821
2019	124.4225	27.9762	22.5423	0.0519	1.3364	1.3426	2.6789	0.3626	1.2629	1.6255	0.0000	5,196.0059	5,196.0059	0.7855	0.0000	5,215.6441
Maximum	**124.4225**	**113.9206**	**46.9808**	**0.2012**	**7.1937**	**2.8487**	**9.7717**	**3.9122**	**2.6286**	**6.2839**	**0.0000**	**21,367.5968**	**21,367.5968**	**3.2674**	**0.0000**	**21,449.2821**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**56.37**	**0.00**	**46.95**	**58.63**	**0.00**	**43.37**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.4583	3.1000e-004	0.0333	0.0000		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004		0.0710	0.0710	1.9000e-004		0.0757

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Energy	0.0594	0.5401	0.4537	3.2400e-003		0.0410	0.0410		0.0410	0.0410		648.0680	648.0680	0.0124	0.0119	651.9191
Mobile	2.0275	7.6523	19.7648	0.0609	4.8105	0.0596	4.8700	1.2858	0.0559	1.3417		6,177.1697	6,177.1697	0.3468		6,185.8405
Total	**6.5452**	**8.1927**	**20.2518**	**0.0641**	**4.8105**	**0.1007**	**4.9112**	**1.2858**	**0.0970**	**1.3828**		**6,825.3086**	**6,825.3086**	**0.3594**	**0.0119**	**6,837.8353**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.4583	3.1000e-004	0.0333	0.0000		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004		0.0710	0.0710	1.9000e-004		0.0757
Energy	0.0594	0.5401	0.4537	3.2400e-003		0.0410	0.0410		0.0410	0.0410		648.0680	648.0680	0.0124	0.0119	651.9191
Mobile	2.0275	7.6523	19.7648	0.0609	4.8105	0.0596	4.8700	1.2858	0.0559	1.3417		6,177.1697	6,177.1697	0.3468		6,185.8405
Total	**6.5452**	**8.1927**	**20.2518**	**0.0641**	**4.8105**	**0.1007**	**4.9112**	**1.2858**	**0.0970**	**1.3828**		**6,825.3086**	**6,825.3086**	**0.3594**	**0.0119**	**6,837.8353**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2018	1/26/2018	5	20	
2	Site Preparation	Site Preparation	1/27/2018	2/9/2018	5	10	
3	Grading	Grading	2/10/2018	3/23/2018	5	30	
4	Building Construction	Building Construction	3/24/2018	5/17/2019	5	300	
5	Paving	Paving	5/18/2019	6/14/2019	5	20	

6	Architectural Coating	Architectural Coating	6/15/2019	7/12/2019	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 4.75

Acres of Paving: 3.45

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 260,895; Non-Residential Outdoor: 86,965; Striped Parking Area:

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Demolition	Excavators	3	8.00	158	0.38
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Excavators	2	8.00	158	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	130	0.42
Paving	Rollers	2	8.00	80	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Paving Equipment	2	8.00	132	0.36
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	492.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	5,125.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	119.00	53.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	24.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Demolition - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.3883	0.0000	5.3883	0.8160	0.0000	0.8160			0.0000			0.0000
Off-Road	3.7190	38.3225	22.3040	0.0388		1.9386	1.9386		1.8048	1.8048		3,871.7665	3,871.7665	1.0667		3,898.4344
Total	**3.7190**	**38.3225**	**22.3040**	**0.0388**	**5.3883**	**1.9386**	**7.3269**	**0.8160**	**1.8048**	**2.6208**		**3,871.7665**	**3,871.7665**	**1.0667**		**3,898.4344**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Hauling	0.2252	7.8246	1.6138	0.0198	0.4299	0.0308	0.4606	0.1178	0.0295	0.1473		2,151.8962	2,151.8962	0.1897		2,156.6385
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0639	0.0460	0.5135	1.3500e-003	0.1232	8.9000e-004	0.1241	0.0327	8.2000e-004	0.0335		134.5837	134.5837	4.6100e-003		134.6988
Total	**0.2890**	**7.8706**	**2.1273**	**0.0211**	**0.5531**	**0.0317**	**0.5848**	**0.1505**	**0.0303**	**0.1808**		**2,286.4799**	**2,286.4799**	**0.1943**		**2,291.3373**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.1015	0.0000	2.1015	0.3182	0.0000	0.3182			0.0000			0.0000
Off-Road	3.7190	38.3225	22.3040	0.0388		1.9386	1.9386		1.8048	1.8048	0.0000	3,871.7665	3,871.7665	1.0667		3,898.4344
Total	**3.7190**	**38.3225**	**22.3040**	**0.0388**	**2.1015**	**1.9386**	**4.0400**	**0.3182**	**1.8048**	**2.1231**	**0.0000**	**3,871.7665**	**3,871.7665**	**1.0667**		**3,898.4344**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2252	7.8246	1.6138	0.0198	0.4299	0.0308	0.4606	0.1178	0.0295	0.1473		2,151.8962	2,151.8962	0.1897		2,156.6385
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0639	0.0460	0.5135	1.3500e-003	0.1232	8.9000e-004	0.1241	0.0327	8.2000e-004	0.0335		134.5837	134.5837	4.6100e-003		134.6988

Total	0.2890	7.8706	2.1273	0.0211	0.5531	0.0317	0.5848	0.1505	0.0303	0.1808		2,286.4799	2,286.4799	0.1943		2,291.3373

3.3 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.5627	48.1988	22.4763	0.0380		2.5769	2.5769		2.3708	2.3708		3,831.6239	3,831.6239	1.1928		3,861.4448
Total	**4.5627**	**48.1988**	**22.4763**	**0.0380**	**18.0663**	**2.5769**	**20.6432**	**9.9307**	**2.3708**	**12.3014**		**3,831.6239**	**3,831.6239**	**1.1928**		**3,861.4448**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0766	0.0552	0.6162	1.6200e-003	0.1479	1.0600e-003	0.1489	0.0392	9.8000e-004	0.0402		161.5004	161.5004	5.5300e-003		161.6386
Total	**0.0766**	**0.0552**	**0.6162**	**1.6200e-003**	**0.1479**	**1.0600e-003**	**0.1489**	**0.0392**	**9.8000e-004**	**0.0402**		**161.5004**	**161.5004**	**5.5300e-003**		**161.6386**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.0458	0.0000	7.0458	3.8730	0.0000	3.8730			0.0000			0.0000
Off-Road	4.5627	48.1988	22.4763	0.0380		2.5769	2.5769		2.3708	2.3708	0.0000	3,831.6239	3,831.6239	1.1928		3,861.4448
Total	**4.5627**	**48.1988**	**22.4763**	**0.0380**	**7.0458**	**2.5769**	**9.6228**	**3.8730**	**2.3708**	**6.2437**	**0.0000**	**3,831.6239**	**3,831.6239**	**1.1928**		**3,861.4448**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0766	0.0552	0.6162	1.6200e-003	0.1479	1.0600e-003	0.1489	0.0392	9.8000e-004	0.0402		161.5004	161.5004	5.5300e-003		161.6386
Total	**0.0766**	**0.0552**	**0.6162**	**1.6200e-003**	**0.1479**	**1.0600e-003**	**0.1489**	**0.0392**	**9.8000e-004**	**0.0402**		**161.5004**	**161.5004**	**5.5300e-003**		**161.6386**

3.4 Grading - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Fugitive Dust					6.3820	0.0000	6.3820	3.3574	0.0000	3.3574			0.0000			0.0000
Off-Road	5.0901	59.5218	35.0894	0.0620		2.6337	2.6337		2.4230	2.4230		6,244.4284	6,244.4284	1.9440		6,293.0278
Total	**5.0901**	**59.5218**	**35.0894**	**0.0620**	**6.3820**	**2.6337**	**9.0158**	**3.3574**	**2.4230**	**5.7805**		**6,244.4284**	**6,244.4284**	**1.9440**		**6,293.0278**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.5637	54.3375	11.2067	0.1374	2.9852	0.2137	3.1989	0.8181	0.2045	1.0226		14,943.7235	14,943.7235	1.3173		14,976.6559
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0851	0.0613	0.6847	1.8000e-003	0.1643	1.1800e-003	0.1655	0.0436	1.0900e-003	0.0447		179.4449	179.4449	6.1400e-003		179.5984
Total	**1.6489**	**54.3988**	**11.8914**	**0.1392**	**3.1495**	**0.2149**	**3.3644**	**0.8617**	**0.2056**	**1.0673**		**15,123.1684**	**15,123.1684**	**1.3234**		**15,156.2543**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.4890	0.0000	2.4890	1.3094	0.0000	1.3094			0.0000			0.0000
Off-Road	5.0901	59.5218	35.0894	0.0620		2.6337	2.6337		2.4230	2.4230	0.0000	6,244.4284	6,244.4284	1.9440		6,293.0278
Total	**5.0901**	**59.5218**	**35.0894**	**0.0620**	**2.4890**	**2.6337**	**5.1227**	**1.3094**	**2.4230**	**3.7324**	**0.0000**	**6,244.4284**	**6,244.4284**	**1.9440**		**6,293.0278**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.5637	54.3375	11.2067	0.1374	2.9852	0.2137	3.1989	0.8181	0.2045	1.0226		14,943.7235	14,943.7235	1.3173		14,976.6559
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0851	0.0613	0.6847	1.8000e-003	0.1643	1.1800e-003	0.1655	0.0436	1.0900e-003	0.0447		179.4449	179.4449	6.1400e-003		179.5984
Total	**1.6489**	**54.3988**	**11.8914**	**0.1392**	**3.1495**	**0.2149**	**3.3644**	**0.8617**	**0.2056**	**1.0673**		**15,123.1684**	**15,123.1684**	**1.3234**		**15,156.2543**

3.5 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6795	23.3900	17.5804	0.0269		1.4999	1.4999		1.4099	1.4099		2,620.9351	2,620.9351	0.6421		2,636.9883
Total	**2.6795**	**23.3900**	**17.5804**	**0.0269**		**1.4999**	**1.4999**		**1.4099**	**1.4099**		**2,620.9351**	**2,620.9351**	**0.6421**		**2,636.9883**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2733	6.9830	1.8491	0.0148	0.3588	0.0546	0.4134	0.1033	0.0523	0.1555		1,580.4063	1,580.4063	0.1253		1,583.5377
Worker	0.5065	0.3648	4.0737	0.0107	0.9776	7.0400e-003	0.9846	0.2593	6.4900e-003	0.2658		1,067.6972	1,067.6972	0.0365		1,068.6106
Total	**0.7799**	**7.3477**	**5.9228**	**0.0255**	**1.3364**	**0.0617**	**1.3980**	**0.3626**	**0.0587**	**0.4213**		**2,648.1035**	**2,648.1035**	**0.1618**		**2,652.1483**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6795	23.3900	17.5804	0.0269		1.4999	1.4999		1.4099	1.4099	0.0000	2,620.9351	2,620.9351	0.6421		2,636.9883
Total	**2.6795**	**23.3900**	**17.5804**	**0.0269**		**1.4999**	**1.4999**		**1.4099**	**1.4099**	**0.0000**	**2,620.9351**	**2,620.9351**	**0.6421**		**2,636.9883**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2733	6.9830	1.8491	0.0148	0.3588	0.0546	0.4134	0.1033	0.0523	0.1555		1,580.4063	1,580.4063	0.1253		1,583.5377
Worker	0.5065	0.3648	4.0737	0.0107	0.9776	7.0400e-003	0.9846	0.2593	6.4900e-003	0.2658		1,067.6972	1,067.6972	0.0365		1,068.6106

Total	**0.7799**	**7.3477**	**5.9228**	**0.0255**	**1.3364**	**0.0617**	**1.3980**	**0.3626**	**0.0587**	**0.4213**		**2,648.1035**	**2,648.1035**	**0.1618**		**2,652.1483**

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127		2,591.5802	2,591.5802	0.6313		2,607.3635
Total	**2.3612**	**21.0788**	**17.1638**	**0.0269**		**1.2899**	**1.2899**		**1.2127**	**1.2127**		**2,591.5802**	**2,591.5802**	**0.6313**		**2,607.3635**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2439	6.5713	1.6965	0.0146	0.3588	0.0457	0.4045	0.1033	0.0437	0.1470		1,568.8882	1,568.8882	0.1211		1,571.9163
Worker	0.4673	0.3261	3.6820	0.0104	0.9776	6.9700e-003	0.9845	0.2593	6.4200e-003	0.2657		1,035.5376	1,035.5376	0.0331		1,036.3643
Total	**0.7112**	**6.8974**	**5.3785**	**0.0250**	**1.3364**	**0.0527**	**1.3890**	**0.3626**	**0.0502**	**0.4127**		**2,604.4257**	**2,604.4257**	**0.1542**		**2,608.2806**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/day								lb/day			
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127	0.0000	2,591.5802	2,591.5802	0.6313		2,607.3635
Total	**2.3612**	**21.0788**	**17.1638**	**0.0269**		**1.2899**	**1.2899**		**1.2127**	**1.2127**	**0.0000**	**2,591.5802**	**2,591.5802**	**0.6313**		**2,607.3635**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/day								lb/day			
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2439	6.5713	1.6965	0.0146	0.3588	0.0457	0.4045	0.1033	0.0437	0.1470		1,568.8882	1,568.8882	0.1211		1,571.9163
Worker	0.4673	0.3261	3.6820	0.0104	0.9776	6.9700e-003	0.9845	0.2593	6.4200e-003	0.2657		1,035.5376	1,035.5376	0.0331		1,036.3643
Total	**0.7112**	**6.8974**	**5.3785**	**0.0250**	**1.3364**	**0.0527**	**1.3890**	**0.3626**	**0.0502**	**0.4127**		**2,604.4257**	**2,604.4257**	**0.1542**		**2,608.2806**

3.6 Paving - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/day								lb/day			

Off-Road	1.4544	15.2441	14.6648	0.0228		0.8246	0.8246		0.7586	0.7586		2,257.0025	2,257.0025	0.7141		2,274.8548
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4544**	**15.2441**	**14.6648**	**0.0228**		**0.8246**	**0.8246**		**0.7586**	**0.7586**		**2,257.0025**	**2,257.0025**	**0.7141**		**2,274.8548**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0589	0.0411	0.4641	1.3100e-003	0.1232	8.8000e-004	0.1241	0.0327	8.1000e-004	0.0335		130.5300	130.5300	4.1700e-003		130.6342
Total	**0.0589**	**0.0411**	**0.4641**	**1.3100e-003**	**0.1232**	**8.8000e-004**	**0.1241**	**0.0327**	**8.1000e-004**	**0.0335**		**130.5300**	**130.5300**	**4.1700e-003**		**130.6342**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4544	15.2441	14.6648	0.0228		0.8246	0.8246		0.7586	0.7586	0.0000	2,257.0025	2,257.0025	0.7141		2,274.8548
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4544**	**15.2441**	**14.6648**	**0.0228**		**0.8246**	**0.8246**		**0.7586**	**0.7586**	**0.0000**	**2,257.0025**	**2,257.0025**	**0.7141**		**2,274.8548**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0589	0.0411	0.4641	1.3100e-003	0.1232	8.8000e-004	0.1241	0.0327	8.1000e-004	0.0335		130.5300	130.5300	4.1700e-003		130.6342
Total	**0.0589**	**0.0411**	**0.4641**	**1.3100e-003**	**0.1232**	**8.8000e-004**	**0.1241**	**0.0327**	**8.1000e-004**	**0.0335**		**130.5300**	**130.5300**	**4.1700e-003**		**130.6342**

3.7 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	124.0618					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288		281.4481	281.4481	0.0238		282.0423
Total	**124.3282**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**		**281.4481**	**281.4481**	**0.0238**		**282.0423**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0942	0.0658	0.7426	2.1000e-003	0.1972	1.4100e-003	0.1986	0.0523	1.2900e-003	0.0536		208.8479	208.8479	6.6700e-003		209.0146
Total	**0.0942**	**0.0658**	**0.7426**	**2.1000e-003**	**0.1972**	**1.4100e-003**	**0.1986**	**0.0523**	**1.2900e-003**	**0.0536**		**208.8479**	**208.8479**	**6.6700e-003**		**209.0146**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	124.0618					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288	0.0000	281.4481	281.4481	0.0238		282.0423
Total	**124.3282**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**	**0.0000**	**281.4481**	**281.4481**	**0.0238**		**282.0423**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0942	0.0658	0.7426	2.1000e-003	0.1972	1.4100e-003	0.1986	0.0523	1.2900e-003	0.0536		208.8479	208.8479	6.6700e-003		209.0146

Total	0.0942	0.0658	0.7426	2.1000e-003	0.1972	1.4100e-003	0.1986	0.0523	1.2900e-003	0.0536		208.8479	208.8479	6.6700e-003		209.0146

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	2.0275	7.6523	19.7648	0.0609	4.8105	0.0596	4.8700	1.2858	0.0559	1.3417		6,177.1697	6,177.1697	0.3468		6,185.8405
Unmitigated	2.0275	7.6523	19.7648	0.0609	4.8105	0.0596	4.8700	1.2858	0.0559	1.3417		6,177.1697	6,177.1697	0.3468		6,185.8405

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Research & Development	1,252.30	330.47	193.06	1,755,811	1,755,811
Enclosed Parking with Elevator	0.00	0.00	0.00		
Total	1,252.30	330.47	193.06	1,755,811	1,755,811

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Research & Development	5.80	5.80	5.80	33.00	48.00	19.00	82	15	3
Enclosed Parking with Elevator	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Research & Development	0.588316	0.042913	0.184449	0.110793	0.017294	0.005558	0.015534	0.023021	0.001902	0.002024	0.006181	0.000745	0.001271
Enclosed Parking with Elevator	0.588316	0.042913	0.184449	0.110793	0.017294	0.005558	0.015534	0.023021	0.001902	0.002024	0.006181	0.000745	0.001271

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0594	0.5401	0.4537	3.2400e-003		0.0410	0.0410		0.0410	0.0410		648.0680	648.0680	0.0124	0.0119	651.9191
NaturalGas Unmitigated	0.0594	0.5401	0.4537	3.2400e-003		0.0410	0.0410		0.0410	0.0410		648.0680	648.0680	0.0124	0.0119	651.9191

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Research & Development	5508.58	0.0594	0.5401	0.4537	3.2400e-003		0.0410	0.0410		0.0410	0.0410		648.0680	648.0680	0.0124	0.0119	651.9191

Total		0.0594	0.5401	0.4537	3.2400e-003		0.0410	0.0410		0.0410	0.0410		648.0680	648.0680	0.0124	0.0119	651.9191

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Research & Development	5.50858	0.0594	0.5401	0.4537	3.2400e-003		0.0410	0.0410		0.0410	0.0410		648.0680	648.0680	0.0124	0.0119	651.9191
Total		**0.0594**	**0.5401**	**0.4537**	**3.2400e-003**		**0.0410**	**0.0410**		**0.0410**	**0.0410**		**648.0680**	**648.0680**	**0.0124**	**0.0119**	**651.9191**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.4583	3.1000e-004	0.0333	0.0000		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004		0.0710	0.0710	1.9000e-004		0.0757
Unmitigated	4.4583	3.1000e-004	0.0333	0.0000		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004		0.0710	0.0710	1.9000e-004		0.0757

6.2 Area by SubCategory

Unmitigated

SubCategory	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Architectural Coating	0.6798					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.7754					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	3.1400e-003	3.1000e-004	0.0333	0.0000		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004		0.0710	0.0710	1.9000e-004		0.0757
Total	**4.4583**	**3.1000e-004**	**0.0333**	**0.0000**		**1.2000e-004**	**1.2000e-004**		**1.2000e-004**	**1.2000e-004**		**0.0710**	**0.0710**	**1.9000e-004**		**0.0757**

Mitigated

SubCategory	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Architectural Coating	0.6798					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.7754					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	3.1400e-003	3.1000e-004	0.0333	0.0000		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004		0.0710	0.0710	1.9000e-004		0.0757
Total	**4.4583**	**3.1000e-004**	**0.0333**	**0.0000**		**1.2000e-004**	**1.2000e-004**		**1.2000e-004**	**1.2000e-004**		**0.0710**	**0.0710**	**1.9000e-004**		**0.0757**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

9775 Town Centre Project

San Diego County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Research & Development	173.93	1000sqft	8.66	173,930.00	0
Enclosed Parking with Elevator	150.41	1000sqft	3.45	150,405.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	539.36	**CH4 Intensity (lb/MWhr)**	0.022	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Updated energy intensity factors to reflect increase RPS procurement

Land Use - Proposed building would be 173,930 square feet, including 165,000 square feet of non-exempt area. 150,405 sf subgrade parking. Project site is 12.108 acres

Grading - Quantitites per project plans grading tabulations; 70,000 cy cut, 29,000 fill, 41,000 cy export. 4.75 sf graded area

Demolition - Project WMP indicates the project would generate 4,974 tons of demolition debris.

Architectural Coating - SDAPCD Rule 67.0.1

Vehicle Trips - Total ADT allocation would be 1,252 ADT / 173.93 = 7.2 adt/ksf. Regional average trip length used.

Area Coating - Rule 67.0.1

Water And Wastewater - Estimated Total Water Use for landscaping is 1,085,523 gallons per year.

Solid Waste - Proejct WMP indicates that the project would generat 280.5 tons of waste per year.

Construction Off-road Equipment Mitigation - SDAPCD Rule 55

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	150.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	150.00
tblArchitecturalCoating	EF_Parking	250.00	150.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	150
tblAreaCoating	Area_EF_Nonresidential_Interior	250	150
tblAreaCoating	Area_EF_Parking	250	150
tblGrading	AcresOfGrading	75.00	4.75
tblGrading	MaterialExported	0.00	41,000.00
tblLandUse	LandUseSquareFeet	150,410.00	150,405.00
tblLandUse	LotAcreage	3.99	8.66
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.022
tblProjectCharacteristics	CO2IntensityFactor	720.49	539.36
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblSolidWaste	SolidWasteGenerationRate	13.22	280.50
tblVehicleTrips	CC_TL	7.30	5.80
tblVehicleTrips	CNW_TL	7.30	5.80
tblVehicleTrips	CW_TL	9.50	5.80
tblVehicleTrips	WD_TR	8.11	7.20
tblWater	OutdoorWaterUseRate	0.00	1,085,523.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Year	lb/day										lb/day					
2018	6.7949	114.5093	47.7881	0.1989	18.2141	2.8537	20.7921	9.9699	2.6335	12.3416	0.0000	21,108.6395	21,108.6395	3.3165	0.0000	21,191.5510
2019	124.4348	28.0217	22.5242	0.0509	1.3364	1.3434	2.6797	0.3626	1.2636	1.6262	0.0000	5,092.7589	5,092.7589	0.7916	0.0000	5,112.5478
Maximum	**124.4348**	**114.5093**	**47.7881**	**0.1989**	**18.2141**	**2.8537**	**20.7921**	**9.9699**	**2.6335**	**12.3416**	**0.0000**	**21,108.6395**	**21,108.6395**	**3.3165**	**0.0000**	**21,191.5510**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	6.7949	114.5093	47.7881	0.1989	7.1937	2.8537	9.7717	3.9122	2.6335	6.2839	0.0000	21,108.6394	21,108.6394	3.3165	0.0000	21,191.5510
2019	124.4348	28.0217	22.5242	0.0509	1.3364	1.3434	2.6797	0.3626	1.2636	1.6262	0.0000	5,092.7589	5,092.7589	0.7916	0.0000	5,112.5478
Maximum	**124.4348**	**114.5093**	**47.7881**	**0.1989**	**7.1937**	**2.8537**	**9.7717**	**3.9122**	**2.6335**	**6.2839**	**0.0000**	**21,108.6394**	**21,108.6394**	**3.3165**	**0.0000**	**21,191.5510**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**56.37**	**0.00**	**46.95**	**58.63**	**0.00**	**43.37**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.4583	3.1000e-004	0.0333	0.0000		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004		0.0710	0.0710	1.9000e-004		0.0757

Energy	0.0594	0.5401	0.4537	3.2400e-003		0.0410	0.0410		0.0410	0.0410		648.0680	648.0680	0.0124	0.0119	651.9191
Mobile	1.9701	7.8237	20.0291	0.0577	4.8105	0.0602	4.8706	1.2858	0.0564	1.3422		5,851.4126	5,851.4126	0.3526		5,860.2287
Total	**6.4878**	**8.3640**	**20.5161**	**0.0609**	**4.8105**	**0.1013**	**4.9118**	**1.2858**	**0.0976**	**1.3834**		**6,499.5515**	**6,499.5515**	**0.3653**	**0.0119**	**6,512.2236**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.4583	3.1000e-004	0.0333	0.0000		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004		0.0710	0.0710	1.9000e-004		0.0757
Energy	0.0594	0.5401	0.4537	3.2400e-003		0.0410	0.0410		0.0410	0.0410		648.0680	648.0680	0.0124	0.0119	651.9191
Mobile	1.9701	7.8237	20.0291	0.0577	4.8105	0.0602	4.8706	1.2858	0.0564	1.3422		5,851.4126	5,851.4126	0.3526		5,860.2287
Total	**6.4878**	**8.3640**	**20.5161**	**0.0609**	**4.8105**	**0.1013**	**4.9118**	**1.2858**	**0.0976**	**1.3834**		**6,499.5515**	**6,499.5515**	**0.3653**	**0.0119**	**6,512.2236**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2018	1/26/2018	5	20	
2	Site Preparation	Site Preparation	1/27/2018	2/9/2018	5	10	
3	Grading	Grading	2/10/2018	3/23/2018	5	30	
4	Building Construction	Building Construction	3/24/2018	5/17/2019	5	300	
5	Paving	Paving	5/18/2019	6/14/2019	5	20	

6	Architectural Coating	Architectural Coating	6/15/2019	7/12/2019	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 4.75

Acres of Paving: 3.45

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 260,895; Non-Residential Outdoor: 86,965; Striped Parking Area:

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Demolition	Excavators	3	8.00	158	0.38
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Excavators	2	8.00	158	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	130	0.42
Paving	Rollers	2	8.00	80	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Paving Equipment	2	8.00	132	0.36
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	492.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	5,125.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	119.00	53.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	24.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Demolition - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.3883	0.0000	5.3883	0.8160	0.0000	0.8160			0.0000			0.0000
Off-Road	3.7190	38.3225	22.3040	0.0388		1.9386	1.9386		1.8048	1.8048		3,871.7665	3,871.7665	1.0667		3,898.4344
Total	**3.7190**	**38.3225**	**22.3040**	**0.0388**	**5.3883**	**1.9386**	**7.3269**	**0.8160**	**1.8048**	**2.6208**		**3,871.7665**	**3,871.7665**	**1.0667**		**3,898.4344**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Hauling	0.2316	7.9083	1.7351	0.0195	0.4299	0.0315	0.4614	0.1178	0.0301	0.1480		2,116.1874	2,116.1874	0.1968		2,121.1073
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0721	0.0516	0.4871	1.2700e-003	0.1232	8.9000e-004	0.1241	0.0327	8.2000e-004	0.0335		126.3491	126.3491	4.3800e-003		126.4586
Total	**0.3038**	**7.9599**	**2.2222**	**0.0207**	**0.5531**	**0.0324**	**0.5855**	**0.1505**	**0.0310**	**0.1815**		**2,242.5365**	**2,242.5365**	**0.2012**		**2,247.5659**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.1015	0.0000	2.1015	0.3182	0.0000	0.3182			0.0000			0.0000
Off-Road	3.7190	38.3225	22.3040	0.0388		1.9386	1.9386		1.8048	1.8048	0.0000	3,871.7665	3,871.7665	1.0667		3,898.4344
Total	**3.7190**	**38.3225**	**22.3040**	**0.0388**	**2.1015**	**1.9386**	**4.0400**	**0.3182**	**1.8048**	**2.1231**	**0.0000**	**3,871.7665**	**3,871.7665**	**1.0667**		**3,898.4344**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2316	7.9083	1.7351	0.0195	0.4299	0.0315	0.4614	0.1178	0.0301	0.1480		2,116.1874	2,116.1874	0.1968		2,121.1073
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0721	0.0516	0.4871	1.2700e-003	0.1232	8.9000e-004	0.1241	0.0327	8.2000e-004	0.0335		126.3491	126.3491	4.3800e-003		126.4586

Total	**0.3038**	**7.9599**	**2.2222**	**0.0207**	**0.5531**	**0.0324**	**0.5855**	**0.1505**	**0.0310**	**0.1815**		**2,242.5365**	**2,242.5365**	**0.2012**		**2,247.5659**

3.3 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.5627	48.1988	22.4763	0.0380		2.5769	2.5769		2.3708	2.3708		3,831.6239	3,831.6239	1.1928		3,861.4448
Total	**4.5627**	**48.1988**	**22.4763**	**0.0380**	**18.0663**	**2.5769**	**20.6432**	**9.9307**	**2.3708**	**12.3014**		**3,831.6239**	**3,831.6239**	**1.1928**		**3,861.4448**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0866	0.0620	0.5845	1.5200e-003	0.1479	1.0600e-003	0.1489	0.0392	9.8000e-004	0.0402		151.6189	151.6189	5.2500e-003		151.7503
Total	**0.0866**	**0.0620**	**0.5845**	**1.5200e-003**	**0.1479**	**1.0600e-003**	**0.1489**	**0.0392**	**9.8000e-004**	**0.0402**		**151.6189**	**151.6189**	**5.2500e-003**		**151.7503**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.0458	0.0000	7.0458	3.8730	0.0000	3.8730			0.0000			0.0000
Off-Road	4.5627	48.1988	22.4763	0.0380		2.5769	2.5769		2.3708	2.3708	0.0000	3,831.6239	3,831.6239	1.1928		3,861.4448
Total	**4.5627**	**48.1988**	**22.4763**	**0.0380**	**7.0458**	**2.5769**	**9.6228**	**3.8730**	**2.3708**	**6.2437**	**0.0000**	**3,831.6239**	**3,831.6239**	**1.1928**		**3,861.4448**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0866	0.0620	0.5845	1.5200e-003	0.1479	1.0600e-003	0.1489	0.0392	9.8000e-004	0.0402		151.6189	151.6189	5.2500e-003		151.7503
Total	**0.0866**	**0.0620**	**0.5845**	**1.5200e-003**	**0.1479**	**1.0600e-003**	**0.1489**	**0.0392**	**9.8000e-004**	**0.0402**		**151.6189**	**151.6189**	**5.2500e-003**		**151.7503**

3.4 Grading - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Fugitive Dust					6.3820	0.0000	6.3820	3.3574	0.0000	3.3574			0.0000			0.0000
Off-Road	5.0901	59.5218	35.0894	0.0620		2.6337	2.6337		2.4230	2.4230		6,244.4284	6,244.4284	1.9440		6,293.0278
Total	**5.0901**	**59.5218**	**35.0894**	**0.0620**	**6.3820**	**2.6337**	**9.0158**	**3.3574**	**2.4230**	**5.7805**		**6,244.4284**	**6,244.4284**	**1.9440**		**6,293.0278**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.6086	54.9187	12.0493	0.1351	2.9852	0.2188	3.2040	0.8181	0.2093	1.0274		14,695.7456	14,695.7456	1.3667		14,729.9118
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0962	0.0689	0.6495	1.6900e-003	0.1643	1.1800e-003	0.1655	0.0436	1.0900e-003	0.0447		168.4655	168.4655	5.8400e-003		168.6114
Total	**1.7048**	**54.9875**	**12.6987**	**0.1368**	**3.1495**	**0.2200**	**3.3695**	**0.8617**	**0.2104**	**1.0721**		**14,864.2110**	**14,864.2110**	**1.3725**		**14,898.5232**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.4890	0.0000	2.4890	1.3094	0.0000	1.3094			0.0000			0.0000
Off-Road	5.0901	59.5218	35.0894	0.0620		2.6337	2.6337		2.4230	2.4230	0.0000	6,244.4284	6,244.4284	1.9440		6,293.0278
Total	**5.0901**	**59.5218**	**35.0894**	**0.0620**	**2.4890**	**2.6337**	**5.1227**	**1.3094**	**2.4230**	**3.7324**	**0.0000**	**6,244.4284**	**6,244.4284**	**1.9440**		**6,293.0278**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.6086	54.9187	12.0493	0.1351	2.9852	0.2188	3.2040	0.8181	0.2093	1.0274		14,695.7456	14,695.7456	1.3667		14,729.9118
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0962	0.0689	0.6495	1.6900e-003	0.1643	1.1800e-003	0.1655	0.0436	1.0900e-003	0.0447		168.4655	168.4655	5.8400e-003		168.6114
Total	**1.7048**	**54.9875**	**12.6987**	**0.1368**	**3.1495**	**0.2200**	**3.3695**	**0.8617**	**0.2104**	**1.0721**		**14,864.2110**	**14,864.2110**	**1.3725**		**14,898.5232**

3.5 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6795	23.3900	17.5804	0.0269		1.4999	1.4999		1.4099	1.4099		2,620.9351	2,620.9351	0.6421		2,636.9883
Total	**2.6795**	**23.3900**	**17.5804**	**0.0269**		**1.4999**	**1.4999**		**1.4099**	**1.4099**		**2,620.9351**	**2,620.9351**	**0.6421**		**2,636.9883**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2849	6.9948	2.0459	0.0144	0.3588	0.0555	0.4143	0.1033	0.0531	0.1564		1,540.6991	1,540.6991	0.1333		1,544.0321
Worker	0.5722	0.4097	3.8643	0.0101	0.9776	7.0400e-003	0.9846	0.2593	6.4900e-003	0.2658		1,002.3695	1,002.3695	0.0347		1,003.2379
Total	**0.8571**	**7.4045**	**5.9101**	**0.0245**	**1.3364**	**0.0626**	**1.3989**	**0.3626**	**0.0596**	**0.4222**		**2,543.0686**	**2,543.0686**	**0.1681**		**2,547.2699**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6795	23.3900	17.5804	0.0269		1.4999	1.4999		1.4099	1.4099	0.0000	2,620.9351	2,620.9351	0.6421		2,636.9883
Total	**2.6795**	**23.3900**	**17.5804**	**0.0269**		**1.4999**	**1.4999**		**1.4099**	**1.4099**	**0.0000**	**2,620.9351**	**2,620.9351**	**0.6421**		**2,636.9883**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2849	6.9948	2.0459	0.0144	0.3588	0.0555	0.4143	0.1033	0.0531	0.1564		1,540.6991	1,540.6991	0.1333		1,544.0321
Worker	0.5722	0.4097	3.8643	0.0101	0.9776	7.0400e-003	0.9846	0.2593	6.4900e-003	0.2658		1,002.3695	1,002.3695	0.0347		1,003.2379

Total	**0.8571**	**7.4045**	**5.9101**	**0.0245**	**1.3364**	**0.0626**	**1.3989**	**0.3626**	**0.0596**	**0.4222**		**2,543.0686**	**2,543.0686**	**0.1681**		**2,547.2699**

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127		2,591.5802	2,591.5802	0.6313		2,607.3635
Total	**2.3612**	**21.0788**	**17.1638**	**0.0269**		**1.2899**	**1.2899**		**1.2127**	**1.2127**		**2,591.5802**	**2,591.5802**	**0.6313**		**2,607.3635**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2544	6.5767	1.8810	0.0143	0.3588	0.0465	0.4053	0.1033	0.0445	0.1478		1,529.0513	1,529.0513	0.1289		1,532.2727
Worker	0.5285	0.3662	3.4795	9.7600e-003	0.9776	6.9700e-003	0.9845	0.2593	6.4200e-003	0.2657		972.1274	972.1274	0.0314		972.9116
Total	**0.7829**	**6.9429**	**5.3605**	**0.0240**	**1.3364**	**0.0535**	**1.3898**	**0.3626**	**0.0509**	**0.4135**		**2,501.1787**	**2,501.1787**	**0.1602**		**2,505.1843**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127	0.0000	2,591.5802	2,591.5802	0.6313		2,607.3635
Total	**2.3612**	**21.0788**	**17.1638**	**0.0269**		**1.2899**	**1.2899**		**1.2127**	**1.2127**	**0.0000**	**2,591.5802**	**2,591.5802**	**0.6313**		**2,607.3635**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2544	6.5767	1.8810	0.0143	0.3588	0.0465	0.4053	0.1033	0.0445	0.1478		1,529.0513	1,529.0513	0.1289		1,532.2727
Worker	0.5285	0.3662	3.4795	9.7600e-003	0.9776	6.9700e-003	0.9845	0.2593	6.4200e-003	0.2657		972.1274	972.1274	0.0314		972.9116
Total	**0.7829**	**6.9429**	**5.3605**	**0.0240**	**1.3364**	**0.0535**	**1.3898**	**0.3626**	**0.0509**	**0.4135**		**2,501.1787**	**2,501.1787**	**0.1602**		**2,505.1843**

3.6 Paving - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Off-Road	1.4544	15.2441	14.6648	0.0228		0.8246	0.8246		0.7586	0.7586		2,257.0025	2,257.0025	0.7141		2,274.8548
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4544**	**15.2441**	**14.6648**	**0.0228**		**0.8246**	**0.8246**		**0.7586**	**0.7586**		**2,257.0025**	**2,257.0025**	**0.7141**		**2,274.8548**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0666	0.0462	0.4386	1.2300e-003	0.1232	8.8000e-004	0.1241	0.0327	8.1000e-004	0.0335		122.5371	122.5371	3.9500e-003		122.6359
Total	**0.0666**	**0.0462**	**0.4386**	**1.2300e-003**	**0.1232**	**8.8000e-004**	**0.1241**	**0.0327**	**8.1000e-004**	**0.0335**		**122.5371**	**122.5371**	**3.9500e-003**		**122.6359**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4544	15.2441	14.6648	0.0228		0.8246	0.8246		0.7586	0.7586	0.0000	2,257.0025	2,257.0025	0.7141		2,274.8548
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4544**	**15.2441**	**14.6648**	**0.0228**		**0.8246**	**0.8246**		**0.7586**	**0.7586**	**0.0000**	**2,257.0025**	**2,257.0025**	**0.7141**		**2,274.8548**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0666	0.0462	0.4386	1.2300e-003	0.1232	8.8000e-004	0.1241	0.0327	8.1000e-004	0.0335		122.5371	122.5371	3.9500e-003		122.6359
Total	**0.0666**	**0.0462**	**0.4386**	**1.2300e-003**	**0.1232**	**8.8000e-004**	**0.1241**	**0.0327**	**8.1000e-004**	**0.0335**		**122.5371**	**122.5371**	**3.9500e-003**		**122.6359**

3.7 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	124.0618					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288		281.4481	281.4481	0.0238		282.0423
Total	**124.3282**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**		**281.4481**	**281.4481**	**0.0238**		**282.0423**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1066	0.0739	0.7017	1.9700e-003	0.1972	1.4100e-003	0.1986	0.0523	1.2900e-003	0.0536		196.0593	196.0593	6.3300e-003		196.2175
Total	**0.1066**	**0.0739**	**0.7017**	**1.9700e-003**	**0.1972**	**1.4100e-003**	**0.1986**	**0.0523**	**1.2900e-003**	**0.0536**		**196.0593**	**196.0593**	**6.3300e-003**		**196.2175**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	124.0618					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288	0.0000	281.4481	281.4481	0.0238		282.0423
Total	**124.3282**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**	**0.0000**	**281.4481**	**281.4481**	**0.0238**		**282.0423**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1066	0.0739	0.7017	1.9700e-003	0.1972	1.4100e-003	0.1986	0.0523	1.2900e-003	0.0536		196.0593	196.0593	6.3300e-003		196.2175

Total	**0.1066**	**0.0739**	**0.7017**	**1.9700e-003**	**0.1972**	**1.4100e-003**	**0.1986**	**0.0523**	**1.2900e-003**	**0.0536**		**196.0593**	**196.0593**	**6.3300e-003**		**196.2175**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.9701	7.8237	20.0291	0.0577	4.8105	0.0602	4.8706	1.2858	0.0564	1.3422		5,851.4126	5,851.4126	0.3526		5,860.2287
Unmitigated	1.9701	7.8237	20.0291	0.0577	4.8105	0.0602	4.8706	1.2858	0.0564	1.3422		5,851.4126	5,851.4126	0.3526		5,860.2287

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Research & Development	1,252.30	330.47	193.06	1,755,811	1,755,811
Enclosed Parking with Elevator	0.00	0.00	0.00		
Total	1,252.30	330.47	193.06	1,755,811	1,755,811

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Research & Development	5.80	5.80	5.80	33.00	48.00	19.00	82	15	3
Enclosed Parking with Elevator	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Research & Development	0.588316	0.042913	0.184449	0.110793	0.017294	0.005558	0.015534	0.023021	0.001902	0.002024	0.006181	0.000745	0.001271
Enclosed Parking with Elevator	0.588316	0.042913	0.184449	0.110793	0.017294	0.005558	0.015534	0.023021	0.001902	0.002024	0.006181	0.000745	0.001271

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0594	0.5401	0.4537	3.2400e-003		0.0410	0.0410		0.0410	0.0410		648.0680	648.0680	0.0124	0.0119	651.9191
NaturalGas Unmitigated	0.0594	0.5401	0.4537	3.2400e-003		0.0410	0.0410		0.0410	0.0410		648.0680	648.0680	0.0124	0.0119	651.9191

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Research & Development	5508.58	0.0594	0.5401	0.4537	3.2400e-003		0.0410	0.0410		0.0410	0.0410		648.0680	648.0680	0.0124	0.0119	651.9191

Total		**0.0594**	**0.5401**	**0.4537**	**3.2400e-003**		**0.0410**	**0.0410**		**0.0410**	**0.0410**		**648.0680**	**648.0680**	**0.0124**	**0.0119**	**651.9191**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Research & Development	5.50858	0.0594	0.5401	0.4537	3.2400e-003		0.0410	0.0410		0.0410	0.0410		648.0680	648.0680	0.0124	0.0119	651.9191
Total		**0.0594**	**0.5401**	**0.4537**	**3.2400e-003**		**0.0410**	**0.0410**		**0.0410**	**0.0410**		**648.0680**	**648.0680**	**0.0124**	**0.0119**	**651.9191**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.4583	3.1000e-004	0.0333	0.0000		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004		0.0710	0.0710	1.9000e-004		0.0757
Unmitigated	4.4583	3.1000e-004	0.0333	0.0000		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004		0.0710	0.0710	1.9000e-004		0.0757

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.6798					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.7754					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	3.1400e-003	3.1000e-004	0.0333	0.0000		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004		0.0710	0.0710	1.9000e-004		0.0757
Total	**4.4583**	**3.1000e-004**	**0.0333**	**0.0000**		**1.2000e-004**	**1.2000e-004**		**1.2000e-004**	**1.2000e-004**		**0.0710**	**0.0710**	**1.9000e-004**		**0.0757**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.6798					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.7754					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	3.1400e-003	3.1000e-004	0.0333	0.0000		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004		0.0710	0.0710	1.9000e-004		0.0757
Total	**4.4583**	**3.1000e-004**	**0.0333**	**0.0000**		**1.2000e-004**	**1.2000e-004**		**1.2000e-004**	**1.2000e-004**		**0.0710**	**0.0710**	**1.9000e-004**		**0.0757**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: C:\Users\jte\Desktop\8293_CalRoads\CO_80
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= 0.5 M/S Z0= 100. CM ALT= 107. (M)
BRG= WORST CASE VD= 0.0 CM/S
CLAS= 7 (G) VS= 0.0 CM/S
MIXH= 1000. M AMB= 2.8 PPM
SIGTH= 5. DEGREES TEMP= 9.4 DEGREE (C)

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 2

JOB: C:\Users\jte\Desktop\8293_CalRoads\CO_80
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

II. LINK VARIABLES

LINK DESCRIPTION	* LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Link_1	* *****	*****	*****	***** *	AG	3074	2.6	0.0	15.0
B. Link_2	* *****	*****	*****	***** *	AG	3074	2.6	0.0	15.0
C. Link_3	* *****	*****	*****	***** *	AG	3074	2.6	0.0	15.0
D. Link_4	* *****	*****	*****	***** *	AG	3074	2.6	0.0	15.0
E. Link_5	* *****	*****	*****	***** *	AG	3074	2.6	0.0	15.0
F. Link_6	* *****	*****	*****	***** *	AG	3074	2.6	0.0	15.0
G. Link_7	* *****	*****	*****	***** *	AG	3074	2.6	0.0	16.0
H. Link_8	* *****	*****	*****	***** *	AG	3074	2.6	0.0	16.0
I. Link_9	* *****	*****	*****	***** *	AG	3074	2.6	0.0	16.0
J. Link_10	* *****	*****	*****	***** *	AG	3074	2.6	0.0	16.0
K. Link_11	* *****	*****	*****	***** *	AG	685	2.6	0.0	7.3
L. Link_12	* *****	*****	*****	***** *	AG	685	2.6	0.0	7.3
M. Link_13	* *****	*****	*****	***** *	AG	685	2.6	0.0	7.3
N. Link_14	* *****	*****	*****	***** *	AG	685	2.6	0.0	7.3
O. Link_15	* *****	*****	*****	***** *	AG	2103	2.6	0.0	7.3
P. Link_16	* *****	*****	*****	***** *	AG	2103	2.6	0.0	7.3
Q. Link_17	* *****	*****	*****	***** *	AG	2103	2.6	0.0	7.3
R. Link_18	* *****	*****	*****	***** *	AG	2103	2.6	0.0	7.3
S. Link_19	* *****	*****	*****	***** *	AG	2103	2.6	0.0	7.3
T. Link_20	* *****	*****	*****	***** *	AG	532	2.6	0.0	7.3
U. Link_21	* *****	*****	*****	***** *	AG	532	2.6	0.0	7.3
V. Link_22	* *****	*****	*****	***** *	AG	532	2.6	0.0	7.3
W. Link_23	* *****	*****	*****	***** *	AG	532	2.6	0.0	7.3
X. Link_24	* *****	*****	*****	***** *	AG	532	2.6	0.0	7.3
Y. Link_25	* *****	*****	*****	***** *	AG	532	2.6	0.0	7.3
Z. Link_26	* *****	*****	*****	***** *	AG	532	2.6	0.0	7.3
a. Link_27	* *****	*****	*****	***** *	AG	532	2.6	0.0	7.3
b. Link_28	* *****	*****	*****	***** *	AG	532	2.6	0.0	7.3
c. Link_29	* *****	*****	*****	***** *	AG	157	2.6	0.0	3.7
d. Link_30	* *****	*****	*****	***** *	AG	157	2.6	0.0	3.7
e. Link_31	* *****	*****	*****	***** *	AG	157	2.6	0.0	3.7
f. Link_32	* *****	*****	*****	***** *	AG	157	2.6	0.0	3.7
g. Link_33	* *****	*****	*****	***** *	AG	157	2.6	0.0	3.7
h. Link_34	* *****	*****	*****	***** *	AG	157	2.6	0.0	3.7
i. Link_35	* *****	*****	*****	***** *	AG	157	2.6	0.0	3.7
j. Link_36	* *****	*****	*****	***** *	AG	315	2.6	0.0	7.3
k. Link_37	* *****	*****	*****	***** *	AG	315	2.6	0.0	7.3
l. Link_38	* *****	*****	*****	***** *	AG	315	2.6	0.0	7.3
m. Link_39	* *****	*****	*****	***** *	AG	315	2.6	0.0	7.3
n. Link_40	* *****	*****	*****	***** *	AG	315	2.6	0.0	7.3
o. Link_41	* *****	*****	*****	***** *	AG	315	2.6	0.0	7.3
p. Link_42	* *****	*****	*****	***** *	AG	315	2.6	0.0	7.3
q. Link_43	* *****	*****	*****	***** *	AG	315	2.6	0.0	7.3
r. Link_44	* *****	*****	*****	***** *	AG	1626	2.6	0.0	11.0
s. Link_45	* *****	*****	*****	***** *	AG	1626	2.6	0.0	11.0
t. Link_46	* *****	*****	*****	***** *	AG	1626	2.6	0.0	11.0
u. Link_47	* *****	*****	*****	***** *	AG	1626	2.6	0.0	11.0
v. Link_48	* *****	*****	*****	***** *	AG	4645	2.6	0.0	11.0
w. Link_49	* *****	*****	*****	***** *	AG	4645	2.6	0.0	11.0
x. Link_50	* *****	*****	*****	***** *	AG	4645	2.6	0.0	11.0
y. Link_51	* *****	*****	*****	***** *	AG	4645	2.6	0.0	11.0

III. RECEPTOR LOCATIONS

RECEPTOR	* COORDINATES (M) X	Y	Z
1. R_001	* 481224	******	1.8
2. R_002	* 481180	******	1.8

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 3

JOB: C:\Users\jte\Desktop\8293_CalRoads\CO_80
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	* BRG (DEG)	* PRED CONC (PPM)	* CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. R_001	* 247.	* 4.0	* 0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2. R_002	* 91.	* 4.2	* 0.0	0.0	0.0	0.1	0.2	0.3	0.0	0.1

CONC/LINK

RECEPTOR	* I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	a	b	c
1. R_001	* 0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2. R_002	* 0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

RECEPTOR	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y
1. R_001	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.4	0.3	0.1	0.0
2. R_002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: C:\Users\jte\Desktop\8293_CalRoads\CO_La
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= 0.5 M/S Z0= 100. CM ALT= 115. (M)
BRG= WORST CASE VD= 0.0 CM/S
CLAS= 7 (G) VS= 0.0 CM/S
MIXH= 1000. M AMB= 2.8 PPM
SIGTH= 5. DEGREES TEMP= 9.4 DEGREE (C)

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 2

JOB: C:\Users\jte\Desktop\8293_CalRoads\CO_La
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

II. LINK VARIABLES

LINK DESCRIPTION	* LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Link_1	*****	*****	*****	*****	AG	288	2.6	0.0	7.3
B. Link_2	*****	*****	*****	*****	AG	288	2.6	0.0	7.3
C. Link_3	*****	*****	*****	*****	AG	288	2.6	0.0	7.3
D. Link_4	*****	*****	*****	*****	AG	288	2.6	0.0	7.3
E. Link_5	*****	*****	*****	*****	AG	288	2.6	0.0	7.3
F. Link_6	*****	*****	*****	*****	AG	2408	2.6	0.0	7.3
G. Link_7	*****	*****	*****	*****	AG	2408	2.6	0.0	7.3
H. Link_8	*****	*****	*****	*****	AG	2024	2.6	0.0	7.3
I. Link_9	*****	*****	*****	*****	AG	2024	2.6	0.0	7.3
J. Link_10	*****	*****	*****	*****	AG	2024	2.6	0.0	7.3
K. Link_11	*****	*****	*****	*****	AG	2024	2.6	0.0	7.3
L. Link_12	*****	*****	*****	*****	AG	384	2.6	0.0	7.3
M. Link_13	*****	*****	*****	*****	AG	384	2.6	0.0	7.3
N. Link_14	*****	*****	*****	*****	AG	384	2.6	0.0	7.3
O. Link_15	*****	*****	*****	*****	AG	384	2.6	0.0	7.3
P. Link_16	*****	*****	*****	*****	AG	3239	2.6	0.0	14.0
Q. Link_17	*****	*****	*****	*****	AG	3239	2.6	0.0	14.0
R. Link_18	*****	*****	*****	*****	AG	3239	2.6	0.0	14.0
S. Link_19	*****	*****	*****	*****	AG	3239	2.6	0.0	14.0
T. Link_20	*****	*****	*****	*****	AG	683	2.6	0.0	7.3
U. Link_21	*****	*****	*****	*****	AG	683	2.6	0.0	7.3
V. Link_22	*****	*****	*****	*****	AG	683	2.6	0.0	7.3
W. Link_23	*****	*****	*****	*****	AG	683	2.6	0.0	7.3
X. Link_24	*****	*****	*****	*****	AG	994	2.6	0.0	7.3
Y. Link_25	*****	*****	*****	*****	AG	994	2.6	0.0	7.3
Z. Link_26	*****	*****	*****	*****	AG	994	2.6	0.0	7.3
a. Link_27	*****	*****	*****	*****	AG	53	2.6	0.0	7.3
b. Link_28	*****	*****	*****	*****	AG	53	2.6	0.0	7.3
c. Link_29	*****	*****	*****	*****	AG	53	2.6	0.0	7.3
d. Link_30	*****	*****	*****	*****	AG	258	2.6	0.0	7.3
e. Link_31	*****	*****	*****	*****	AG	258	2.6	0.0	7.3
f. Link_32	*****	*****	*****	*****	AG	258	2.6	0.0	7.3
g. Link_33	*****	*****	*****	*****	AG	807	2.6	0.0	7.3
h. Link_34	*****	*****	*****	*****	AG	807	2.6	0.0	7.3
i. Link_35	*****	*****	*****	*****	AG	807	2.6	0.0	7.3
j. Link_36	*****	*****	*****	*****	AG	807	2.6	0.0	7.3
k. Link_37	*****	*****	*****	*****	AG	1974	2.6	0.0	7.3
l. Link_38	*****	*****	*****	*****	AG	1974	2.6	0.0	7.3
m. Link_39	*****	*****	*****	*****	AG	1943	2.6	0.0	7.3
n. Link_40	*****	*****	*****	*****	AG	1943	2.6	0.0	7.3
o. Link_41	*****	*****	*****	*****	AG	31	2.6	0.0	7.3
p. Link_42	*****	*****	*****	*****	AG	31	2.6	0.0	7.3
q. Link_43	*****	*****	*****	*****	AG	31	2.6	0.0	7.3
r. Link_44	*****	*****	*****	*****	AG	31	2.6	0.0	7.3
s. Link_45	*****	*****	*****	*****	AG	2398	2.6	0.0	11.0
t. Link_46	*****	*****	*****	*****	AG	2398	2.6	0.0	11.0
u. Link_47	*****	*****	*****	*****	AG	2398	2.6	0.0	11.0
v. Link_48	*****	*****	*****	*****	AG	2398	2.6	0.0	11.0
w. Link_49	*****	*****	*****	*****	AG	372	2.6	0.0	7.3
x. Link_50	*****	*****	*****	*****	AG	372	2.6	0.0	7.3
y. Link_51	*****	*****	*****	*****	AG	372	2.6	0.0	7.3
z. Link_52	*****	*****	*****	*****	AG	820	2.6	0.0	7.3
0. Link_53	*****	*****	*****	*****	AG	820	2.6	0.0	7.3
1. Link_54	*****	*****	*****	*****	AG	820	2.6	0.0	7.3
2. Link_55	*****	*****	*****	*****	AG	332	2.6	0.0	7.3
3. Link_56	*****	*****	*****	*****	AG	332	2.6	0.0	7.3
4. Link_57	*****	*****	*****	*****	AG	332	2.6	0.0	7.3
5. Link_58	*****	*****	*****	*****	AG	1152	2.6	0.0	7.3

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 3

JOB: C:\Users\jte\Desktop\8293_CalRoads\CO_La
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	* COORDINATES (M) X	Y	Z
1. R_001	480618	******	1.8
2. R_002	480583	******	1.8
3. R_003	480578	******	1.8
4. R_004	480608	******	1.8

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	* BRG * (DEG)	* PRED * CONC * (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. R_001	283.	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2. R_002	69.	3.9	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
3. R_003	98.	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4. R_004	178.	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

CONC/LINK

RECEPTOR	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1. R_001	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
2. R_002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3. R_003	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4. R_004	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0

RECEPTOR	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	0	1	2	3	4	5
1. R_001	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2. R_002	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3. R_003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
4. R_004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: C:\Users\jte\Desktop\8293_CalRoads\CO_To
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= 0.5 M/S Z0= 100. CM ALT= 118. (M)
BRG= WORST CASE VD= 0.0 CM/S
CLAS= 7 (G) VS= 0.0 CM/S
MIXH= 1000. M AMB= 2.8 PPM
SIGTH= 5. DEGREES TEMP= 9.4 DEGREE (C)

II. LINK VARIABLES

LINK DESCRIPTION	* LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Link_1	*****	*****	*****	*****	AG	745	2.6	0.0	11.0
B. Link_2	*****	*****	*****	*****	AG	745	2.6	0.0	11.0
C. Link_3	*****	*****	*****	*****	AG	745	2.6	0.0	11.0
D. Link_4	*****	*****	*****	*****	AG	1292	2.6	0.0	7.3
E. Link_5	*****	*****	*****	*****	AG	1292	2.6	0.0	7.3
F. Link_6	*****	*****	*****	*****	AG	1292	2.6	0.0	7.3
G. Link_7	*****	*****	*****	*****	AG	1292	2.6	0.0	7.3
H. Link_8	*****	*****	*****	*****	AG	1292	2.6	0.0	7.3
I. Link_9	*****	*****	*****	*****	AG	516	2.6	0.0	11.0
J. Link_10	*****	*****	*****	*****	AG	516	2.6	0.0	11.0
K. Link_11	*****	*****	*****	*****	AG	516	2.6	0.0	11.0
L. Link_12	*****	*****	*****	*****	AG	516	2.6	0.0	11.0
M. Link_13	*****	*****	*****	*****	AG	516	2.6	0.0	11.0
N. Link_14	*****	*****	*****	*****	AG	763	2.6	0.0	7.3
O. Link_15	*****	*****	*****	*****	AG	763	2.6	0.0	7.3
P. Link_16	*****	*****	*****	*****	AG	763	2.6	0.0	7.3
Q. Link_17	*****	*****	*****	*****	AG	763	2.6	0.0	7.3
R. Link_18	*****	*****	*****	*****	AG	966	2.6	0.0	11.0
S. Link_19	*****	*****	*****	*****	AG	966	2.6	0.0	11.0
T. Link_20	*****	*****	*****	*****	AG	966	2.6	0.0	11.0
U. Link_21	*****	*****	*****	*****	AG	484	2.6	0.0	7.3
V. Link_22	*****	*****	*****	*****	AG	484	2.6	0.0	7.3
W. Link_23	*****	*****	*****	*****	AG	484	2.6	0.0	7.3
X. Link_24	*****	*****	*****	*****	AG	1594	2.6	0.0	11.0
Y. Link_25	*****	*****	*****	*****	AG	1594	2.6	0.0	11.0
Z. Link_26	*****	*****	*****	*****	AG	1594	2.6	0.0	11.0
a. Link_27	*****	*****	*****	*****	AG	1249	2.6	0.0	7.3
b. Link_28	*****	*****	*****	*****	AG	1249	2.6	0.0	7.3
c. Link_29	*****	*****	*****	*****	AG	1249	2.6	0.0	7.3

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 2

JOB: C:\Users\jte\Desktop\8293_CalRoads\CO_To
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	* COORDINATES (M) X	Y	Z
1. R_001	480603	******	1.8
2. R_002	480602	******	1.8
3. R_003	480571	******	1.8
4. R_004	480571	******	1.8

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	* BRG (DEG)	* PRED CONC (PPM)	* CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. R_001	347.	3.3	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
2. R_002	258.	3.5	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0
3. R_003	12.	3.5	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
4. R_004	169.	3.5	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0

RECEPTOR	* CONC/LINK I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	a	b	c
1. R_001	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
2. R_002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
3. R_003	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.0
4. R_004	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0

GEOCON
INCORPORATED

GEOTECHNICAL
ENVIRONMENTAL
MATERIALS

GEOTECHNICAL INVESTIGATION

9775 TOWNE CENTRE DRIVE
SAN DIEGO, CALIFORNIA

PREPARED FOR

BMR-APEX LP
SAN DIEGO, CALIFORNIA

DECEMBER 16, 2016
PROJECT NO. G2059-42-01

Project No. G2059-42-01
December 16, 2016

BMR-APEX LP
17190 Bernardo Center Drive
San Diego, California 92128

Attention: Mr. Federico Mina

Subject: GEOTECHNICAL INVESTIGATION
9775 TOWNE CENTRE DRIVE
SAN DIEGO, CALIFORNIA

Dear Mr. Mina:

In accordance with your request and authorization of our proposal (LG-16427, dated October 28, 2016), we herein submit the results of our geotechnical investigation for the subject project. We performed our investigation to evaluate the underlying soil and geologic conditions and potential geologic hazards and to assist in the design of the proposed building and associated improvements and provide storm water management recommendations.

The accompanying report presents the results of our study and conclusions and recommendations pertaining to the geotechnical aspects of the proposed project. The site is suitable for the proposed building and improvements provided the recommendations of this report are incorporated into the design and construction of the planned project.

Should you have questions regarding this report, or if we may be of further service, please contact the undersigned at your convenience.

Very truly yours,

GEOCON INCORPORATED

Noel G. Borja
Senior Staff Engineer

Rodney C. Mikesell
GE 2533

Garry W. Cannon
CEG 2201
RCE 56468

NGB:RCM:GWC:dmc

(1) Addressee
(3del) Latitude 33
Attention: Mr. Jon Arenez

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GEOTECHNICAL INVESTIGATION

1. PURPOSE AND SCOPE

This report presents the results of our geotechnical investigation for the proposed new office building located at 9775 Towne Centre Drive in San Diego, California (see Vicinity Map, Figure 1). The purpose of this geotechnical investigation is to evaluate the surface and subsurface soil conditions; general site geology; and to identify geotechnical constraints that may impact the planned improvements to the property. This report also provides 2016 CBC seismic design criteria; grading recommendations; shoring, tie-back, and soil nail wall recommendations; building foundation and concrete slab-on-grade recommendations; concrete flatwork, preliminary pavement recommendations; and retaining wall and lateral load recommendations.

The field investigation consisted of drilling five, small-diameter borings to evaluate the underlying geologic conditions within the area of planned improvements. We also performed infiltration testing at four locations using a Soil Moisture Corp Aardvark Permeameter.

The locations of the small-diameter borings and infiltration tests are shown the *Geologic Map*, Figure 2, and on the *Geologic Cross-Sections,* Figure 3. The base map used for Figure 2 is an electoric CAD file provided Latitude 33. Logs of the exploratory borings and a detailed discussion of the field investigation are presented in Appendix A.

We performed laboratory tests on selected soil samples obtained during the field investigation to evaluate pertinent physical properties for engineering analyses and to assist in providing recommendations for site grading and foundation design criteria. Details of the laboratory testing and a summary of test results are presented in Appendix B.

The conclusions and recommendations presented herein are based on analyses of the data obtained from the field investigation, laboratory tests, and our experience with similar soil and geologic conditions.

2. SITE AND PROJECT DESCRIPTION

The site is located at 9775 Towne Centre Drive, east of Towne Centre Court (see Site Vicinity Map, Figure 1). An existing building occupies the central portion of the site surrounded by asphalt concrete and concrete pavement aeras. The property is bordered by existing multi-story buildings to the northwest and southeast, by Towne Centre Drive on the southwest, and by an approximately 200-foot-high, native decending hillside to the east.

Based on our discussions with you and review of the referenced project plan, proposed development will consist of demolishing the existing structure and grading the site to construct a 4-story building with a multi-level, subterranean, parking garage. We understand the depth of the proposed parking structure will be approximately 30 feet below surface grade, with a small turn-around area that will be 40 feet below surface grade.

The above locations, site descriptions, and proposed development are based on our site reconnaissance, review of published geologic literature, field investigations, and discussions with the project civil engineer. If development plans differ from those described herein, Geocon Incorporated should be contacted for review of the plans and possible revisions to this report.

3. GENERAL GEOLOGY AND GEOLOGIC SETTING

The project site is located within the Peninsular Ranges Geomorphic Province. The region is characterized by northwest-trending structural blocks and intervening fault zones. The rock types in the Peninsular Ranges include igneous rocks, associated with the Cretaceous-age Southern California Batholith, intruded into older metamorphic rock. In the western part of the county and along the coastal areas the basement rock is overlain by a thick sequence of Cretaceous to Tertiary-age sedimentary deposits, which are the result of transgressive and regressive cycles of the sea. These deposits in turn are partially covered by several Quaternary-age terrace deposits.

The site is located atop a ridge with canyon drainages bordering the site along the northeast to east. These drainages flow northward toward Sorrento Creek, which flows northwest to the ocean.

4. SOIL AND GEOLOGIC CONDITIONS

During our field investigation, we encountered two surficial units consisting of undocumented fill and very old terrace deposits and one geologic unit consisting of the Ardath Formation. The surficial and geologic units are discussed herein. The approcimate occurrence and thickness of the units encountered, including descriptions, are shown on the Geologic Map (Figure 2), Geologic Cross Sections (Figure 3), and on the exploratory boring logs in Appendix A. We prepared the geologic cross-sections using interpolation between exploratory borings; therefore, actual geologic conditions between the borings may vary from those illustrated and should be considered approximate.

4.1 Undocumented Fill (Qudf)

We encountered minor fill less than 2 feet thick in borings B-1, B-2, B-4, and B-5. The fill consists of silty to clayey sand and sandy to silty clay. The fill is likely associated with original grading of the parking lots. We expect all of the undocumented fill within the building pad will be removed to achieve the subterranean pad grade. Fill outside of the building pad in pavement and hardscape areas should be removed to expose the undelying terrace deposits or Ardath Formation and replaced as compacted fill.

4.2 Very Old Terrace Deposits (Qt)

We encountered early to middle Pleistocene-age terrace deposits mapped by Kennedy and Tan (2008) as very old paralic deposits at grade or below the undocumented fill in our exploratory borings. The terrace depoists had a thicknesses up to approximately 16 feet at the boring locations. This unit consists of dense to very dense, damp to moist, silty sand. This unit can be interlayered with gravel, cobble, and cemented layers. Difficult excavation and localized cementation may occur within this unit. The very old terrace deposits are suitable for support of properly compacted fill and structural loading.

4.3 Ardath Formation (Ta)

We encountered the Ardath Formation underlying the very old terrace deposits in our exploratory borings. The Ardath Formation consists of dense to very dense, stiff to hard, mottled yellowish brown and gray to olive brown, interbedded sandstoneand siltstone. We expect the foundation system for the proposed new building will bear on the Ardath Formation. The Ardath Formation is suitable for support of structural loading in its present condition.

5. GROUNDWATER

We did not encounter groundwater or seepage during the site investigation. We do not expect groundwater or seepage to be encountered during construction of the proposed development; however, it is not uncommon for seepage conditions to exist within the near surface elevations or develop where none previously existed. Seepage is dependent on seasonal precipitation, irrigation, land use, among other factors, and varies as a result. Proper surface drainage will be important to future performance of the project.

6. GEOLOGIC HAZARDS

6.1 Geologic Hazard Category

The City of San Diego (2008), Sheet 34 defines the site as Hazard Category 51: *Level mesas – underlain by terrace deposits and bedrock, nominal risk* and as a Hazard Category 53: *Level or sloping terrain, unfavorable geologic structure, low to moderate risk*. The natieve hillside east of the site is defiend as Category 25: *Ardath: neutral or favorable geologic structure.*

6.2 Faulting

An active fault is defined by the California Geological Survey (CGS) as a fault showing evidence for activity within the last 11,000 years. The site is not located within a State of California Earthquake

Fault Zone. The nearest active fault is the Newport-Inglewood/Rose Canyon Fault Zone, which is located approximately 4 miles west of the site.

The City of San Diego (2008) Map Sheet 34 maps a fault traversing the descending slope located northeast and east of the site and labels the fault as *potentially active, inactive, presumed inactive, or activity unknown*. Kennedy and Tan (2008) show unfaulted very old terrace deposits over the fault; therefore, the faulting is older than 11,000 years. A review of the *USGS Quaternary Fault and Fold Database of the United States* (http://geohazards.usgs.gov) indicates that the fault mapped by the City of San Diego Seismic Safety Study (2008) and Kennedy and Tan (2008) is not a Quaternary-aged fault.

6.3 Seismicity

According to the computer program *EZ-FRISK* (Version 7.65), seven known active faults are located within a search radius of 50 miles from the property. We used the 2008 USGS fault database that provides several models and combinations of fault data to evaluate the fault information. The nearest known active faults are the Newport-Inglewood/Rose Canyon Fault system, located approximately 4 miles west of the site and is the dominant source of potential ground motion. Earthquakes that might occur on the Newport-Inglewood/Rose Canyon Fault Zone or other faults within the southern California and northern Baja California area are potential generators of significant ground motion at the site. The estimated deterinistic maximum earthquake magnitude and peak ground acceleration for the Newport-Inglewood Fault are 7.5 and 0.45g, respectively. Table 6.3.1 lists the estimated maximum earthquake magnitude and peak ground acceleration for these and other faults in relationship to the site location. We used acceleration attenuation relationships developed by Boore-Atkinson (2008) NGA USGS2008, Campbell-Bozorgnia (2008) NGA USGS, and Chiou-Youngs (2007) NGA USGS 2008 acceleration-attenuation relationships in our analysis.

TABLE 6.3.1
DETERMINISTIC SITE PARAMETERS

Fault Name	Distance from Site (miles)	Maximum Earthquake Magnitude (Mw)	Peak Ground Acceleration		
			Boore-Atkinson 2008 (g)	Campbell-Bozorgnia 2008 (g)	Chiou-Youngs 2007 (g)
Newport-Inglewood	4	7.5	0.36	0.36	0.45
Rose Canyon	4	6.9	0.31	0.35	0.38
Coronado Bank	17	7.4	0.17	0.13	0.16
Palos Verdes Connected	17	7.7	0.19	0.14	0.18
Elsinore	34	7.85	0.13	0.09	0.11
Earthquake Valley	41	6.8	0.06	0.05	0.04
Palos Verdes	49	7.3	0.07	0.05	0.05

It is our opinion the site could be subjected to moderate to severe ground shaking in the event of an earthquake along any of the faults listed on Table 6.3.1 or other faults in the southern California/ northern Baja California region. We do not consider the site to possess a greater risk than that of the surrounding developments.

We used the computer program *EZ-FRISK* to perform a probabilistic seismic hazard analysis. The computer program *EZ-FRISK* operates under the assumption that the occurrence rate of earthquakes on each mapped Quaternary fault is proportional to the faults slip rate. The program accounts for earthquake magnitude as a function of fault rupture length, and site acceleration estimates are made using the earthquake magnitude and distance from the site to the rupture zone. The program also accounts for uncertainty in each of following: (1) earthquake magnitude, (2) rupture length for a given magnitude, (3) location of the rupture zone, (4) maximum possible magnitude of a given earthquake, and (5) acceleration at the site from a given earthquake along each fault. By calculating the expected accelerations from considered earthquake sources, the program calculates the total average annual expected number of occurrences of site acceleration greater than a specified value. We utilized acceleration-attenuation relationships suggested by Boore-Atkinson (2008) NGA USGS 2008, Campbell-Bozorgnia (2008) NGA USGS 2008, and Chiou-Youngs (2007) NGA USGS 2008 in the analysis. Table 6.3.2 presents the site-specific probabilistic seismic hazard parameters including acceleration-attenuation relationships and the probability of exceedence.

TABLE 6.3.2
PROBABILISTIC SEISMIC HAZARD PARAMETERS

Probability of Exceedence	**Peak Ground Acceleration**		
	Boore-Atkinson 2008 (g)	**Campbell-Bozorgnia 2008 (g)**	**Chiou-Youngs 2007 (g)**
2% in a 50 Year Period	0.45	0.47	0.53
5% in a 50 Year Period	0.30	0.31	0.34
10% in a 50 Year Period	0.21	0.21	0.22

While listing peak accelerations is useful for comparison of potential effects of fault activity in a region, other considerations are important in seismic design, including the frequency and duration of motion and the soil conditions underlying the site. Seismic design of the structures should be evaluated in accordance with the 2016 California Building Code (CBC) guidelines or guidelines currently adopted by the City of San Diego.

6.4 Ground Rupture

The risk associated with ground rupture hazard is low due to the absence of faults traversing the subject site.

6.5 Seiches and Tsunamis

The property is located at an elevation of about 390 feet above MSL and is about 2½ miles from the Pacific Ocean; therefore, the risk of inundation hazard due to tsunamis is low.

The site is not located near or downstream of any large body of water; therefore, the risk associated with inundation due to seiche is low.

6.6 Liquefaction and Seismically Induced Settlement

Due to the absence of a near surface groundwater elevation and the dense to very dense nature of the on-site soils, the risk associated with ground failure or settlement due to liquefaction is low.

6.7 Landslides

We did not observe indications of landsliding or landslide deposits during this investigation. The City of San Diego (2008) maps an area approximately 400 feet east of the site within the native hillside slope as *Landslides: confirmed, known, or highly suspected.* It is our opinion landslides are not present within the subject property or in an area that could affect the project. The risk associated with landslide hazard is low.

7. CONCLUSIONS AND RECOMMENDATIONS

7.1 General

7.1.1 From a geotechnical engineering standpoint, it is our opinion that the site is suitable for development of the proposed project provided the recommendations presented herein are implemented in design and construction of the project.

7.1.2 Our field investigation indicates the site is underlain by minor undocumented fill overlying very old terrace deposits and the Ardath Formation.

7.1.3 The site is located approximately 4 miles from the nearest active fault, the Newport-Inglewood/Rose Canyon Fault Zone. It is our opinion that active or potentially active faults do not cross the site.

7.1.4 The risk associated with geologic hazards due to ground rupture, liquefaction, and landslides are low.

7.1.5 We did not encounter groundwater or seepage during our field investigation. We do not expect groundwater or seepage to be encountered during construction of the proposed development.

7.1.6 Excavation of the undocumented fill should generally be possible with moderate to heavy effort using conventional, heavy-duty equipment during grading and trenching operations. We expect excavations for the subterranean parking garage will extend into the very old terrace deposits and the Ardath Formaiton. Excavations into these units may require very heavy effort and possible rock breaking if cemented zones are encountered.

7.1.7 Excavation for the subterranean parking garage will likely remove all undocumented fill within the building pad. We anticipate that the foundation for the building will bear entirely on the Ardath Formation. In structural improvement aeas outside of the building pad, the undocumented fill should be removed and replaced as compacted fill. Where highly expansive clays are encountered, we recommend the expansive soils be part of the export operation and not be reused as compacted fill in structural improvement areas. The very old terrace deposits and Ardath Formaiton are suitable for the support of compacted fill and settlement-sensitive structures.

7.1.8 Surface settlement monuments will not be required on the project; however, monitoring of temporary shoring, as discussed herein, should be performed.

7.1.9 Subsurface conditions observed may be extrapolated to reflect general soil and geologic conditions; however, variations in subsurface conditions between exploratory borings should be expected.

7.1.10 With the exception of retaining wall drains, we do not expect other subdrains are required for this project.

7.1.11 Final grading or foundation plans have not been provided for our review. Geocon Incorporated should review the plans prior to the submittal to regulatory agencies for approval. Additional analyses may be required once the plans have been provided.

7.2 Excavation and Soil Characteristics

7.2.1 Excavation of the undocumented fill should generally be possible with moderate to heavy effort using conventional, heavy-duty equipment. We expect very heavy effort will be required in the very old terrace deposits and Ardath Formation. Excavatins in the very old terrace deposits and Ardath Formation may encountered cemented zone that require rock breaking to facilite removal. Oversize material from the excavations will require special handling.

7.2.2 The soil encountered in our field investigation is considred to be both "non-expansive" (Expansion Index [EI] of 20 or less) and "expansive" (EI greater than 20) as defined by 2016 California Building Code (CBC) Section 1803.5.3. Table 7.2 presents soil classifications based on the expansion index.

TABLE 7.2
EXPANSION CLASSIFICATION BASED ON EXPANSION INDEX

Expansion Index (EI)	Expansion Classification	2016 CBC Expansion Classification
0 – 20	Very Low	Non-Expansive
21 – 50	Low	Expansive
51 – 90	Medium	
91 – 130	High	
Greater Than 130	Very High	

7.2.3 We performed laboratory tests on samples of the site materials to evaluate the percentage of water-soluble sulfate content. Appendix B presents the results from the laboratory water-soluble sulfate content tests. The test results indicate that on-site materials at the locations tested possess "Not Applicable" and "S0" sulfate exposure to concrete structures, as defined by 2016 CBC Section 1904 and ACI 318-14 Chapter 19. The presence of water-soluble sulfates is not a visually discernible characteristic. Therefore, other soil samples from the site could yield different concentrations. Additionally, over time landscaping activities (i.e. addition of fertilizers and other soil nutrients) may affect the concentration.

7.2.4 Geocon Incorporated does not practice in the field of corrosion engineering. Therefore, if improvements that could be susceptible to corrosion are planned, further evaluation by a corrosion engineer may be needed.

7.3 Slope Stability

7.3.1 Slope stability analyses were performed utilizing average drained direct shear strength parameters from the laboratory shear test results. These analyses indicate that the existing native hillslide slope east of the site has a calculated factors of safety of at least 1.5 under static conditions for both deep-seated failure and shallow sloughing conditions. Slope stability calculations for both deep-seated and surficial slope stability are presented on Figures 4 and 5, respectively.

7.4 Grading

7.4.1 Grading should be performed in accordance with the *Recommended Grading Specifications* in Appendix D. Where the recommendations of this report conflict with Appendix D, the recommendations of this section take precedence.

7.4.2 A pre-construction conference with the city inspector, owner, general contractor, civil engineer, and soil engineer in attendance should be held at the site prior to the beginning of grading operations. Special soil handling requirements can be discussed at that time.

7.4.3 Earthwork should be observed and compacted fill tested by representatives of Geocon Incorporated.

7.4.4 Grading of the site should commence with the demolition of existing structures, pavement, removal of existing improvements, vegetation, and deleterious debris. Deleterious debris should be exported from the site and should not be mixed with the fill. Existing underground improvements within the proposed structure area should be removed and relocated. The resulting depressions should be properly backfilled in accordance with the procedures described herein.

7.4.5 Based on discussions with you and the results of our field investigation, we expect excavations to achieve eleveations for the subterranean parking garage will expose very old terrace deposits and the Ardath Formation. Remedial grading will not be required below finish subgrade elevations for the subterranean parking garage.

7.4.6 In areas of surface improvments (pavement, hardscape, etc.) outside of the building pad, undocumented fill should be removed and replaced as compacted fill. Where expansive soils are encountered (EI greater than 90), the expasnive soils should not be resued in structural improvement areas and should be exported from the site or used in non-structural areas. Where very old terrace deposts are encountered at subgrade elevaitons, no additional removals are requied.

7.4.7 Prior to placing fill, the base of excvations should be scarified to a depth of 12 inches, moisture conditioned as necessary, and compacted to a dry density of at least 90 percent of the laboratory maximum dry density near to slightly above optimum moisture content as determined by ASTM Test Method D 1557. Excavated soil that is generally free of deleterious debris and contamination can be placed as fill and compacted in layers to the design finish-grade elevations. Fill and backfill materials should be placed in loose thicknesses of 6 to 8 inches and compacted to a dry density of at least 90 percent of the relative compaction near to slightly above optimum moisture content.

7.4.8 Import fill (if necessary) should consist of granular materials with a “very low” to “low” expansion potential (EI of 50 or less) free of deleterious material or stones larger than 3 inches and should be compacted as recommended herein. Geocon Incorporated should be notified of the import source and should perform laboratory testing of import soil prior to its arrival at the site to evaluate its suitability as fill material.

7.5 Seismic Design Criteria

7.5.1 We used the computer program *U.S. Seismic Design Maps*, provided by the USGS. Table 7.5.1 summarizes site-specific design criteria obtained from the 2016 California Building Code (CBC; Based on the 2015 International Building Code [IBC] and ASCE 7-10), Chapter 16 Structural Design, Section 1613 Earthquake Loads. The short spectral response uses a period of 0.2 second. The building structure and improvements should be designed using a Site Class C. We evaluated the Site Class in accordance with Section 1613.3.2 of the 2016 CBC and Table 20.3-1 of ASCE 7-10 based on our experience with the site subsurface soils and exploratory boring information. The values presented in Table 7.5.1 are for the risk-targeted maximum considered earthquake (MCE_R).

TABLE 7.5.1
2016 CBC SEISMIC DESIGN PARAMETERS

Parameter	Value	2013 CBC Reference
Site Class	C	Table 1613.3.2
MCE_R Ground Motion Spectral Response Acceleration – Class B (short), S_S	1.093g	Figure 1613..3.1(1)
MCE_R Ground Motion Spectral Response Acceleration – Class B (1 sec), S_1	0.421g	Figure 1613.3.1(2)
Site Coefficient, F_A	1.000	Table 1613.3.3(1)
Site Coefficient, F_V	1.379	Table 1613.3.3(2)
Site Class Modified MCE_R Spectral Response Acceleration (short), S_{MS}	1.093g	Section 1613.3.3 (Eqn 16-37)
Site Class Modified MCE_R Spectral Response Acceleration – (1 sec), S_{M1}	0.580g	Section 1613.3.3 (Eqn 16-38)
5% Damped Design Spectral Response Acceleration (short), S_{DS}	0.729g	Section 1613.3.4 (Eqn 16-39)
5% Damped Design Spectral Response Acceleration (1 sec), S_{D1}	0.387g	Section 1613.3.4 (Eqn 16-40)

7.5.2 Table 7.5.2 presents additional seismic design parameters for projects located in Seismic Design Categories of D through F in accordance with ASCE 7-10 for the mapped maximum considered geometric mean (MCE_G).

TABLE 7.5.2
2016 CBC SITE ACCELERATION DESIGN PARAMETERS

Parameter	Value	ASCE 7-10 Reference
Mapped MCE_G Peak Ground Acceleration, PGA	0.460g	Figure 22-7
Site Coefficient, F_{PGA}	1.000	Table 11.8-1
Site Class Modified MCE_G Peak Ground Acceleration, PGA_M	0.460g	Section 11.8.3 (Eqn 11.8-1)

7.5.3 Conformance to the criteria in Tables 7.5.1 and 7.5.2 for seismic design does not constitute any kind of guarantee or assurance that significant structural damage or ground failure will not occur if a maximum level earthquake occurs. The primary goal of seismic design is to protect life and not to avoid all damage, since such design may be economically prohibitive.

7.6 Excavation Slopes, Shoring, and Tiebacks

7.6.1 Excavations to achieve basement level grade will likely require vertical shoring due to the excavation depth and proximity of adjacent improvements. Deflection of the shoring system should be limited so as to not impact adjacent structures and improvements.

7.6.2 The recommendations herein are provided for stable excavations and are submitted to the shoring and structural engineers to design a shoring system for the proposed excavations. The contractor should construct the temporary shoring system as designed by the project shoring engineer. The stability of the excavations is dependent on the design and construction of the shoring system. It is the responsibility of the contractor to provide a safe excavation during the construction of the proposed project. Geocon Incorporated cannot be responsible for site safety and the stability of the proposed excavations.

7.6.3 Temporary slopes should be made in conformance with OSHA requirements. The old terrace deposit and Ardath Formation can be considered Type A soil (Type B soil if seepage, groundwater, or cohesionless soil is encountered) in accordance with OSHA requirements. In general, no special shoring requirements will be necessary if temporary excavations will be less than 4 feet in height. Temporary excavations greater than 4 feet in height, however, should be sloped at an appropriate inclination. These excavations should not be allowed to become saturated or to dry appreciably. Surcharge loads should not be permitted to a distance equal to the height of the excavation from the top of the excavation. The top of the excavation should be a minimum of 15 feet from the edge of existing improvements. Excavations steeper than those recommended or closer than 15 feet from an existing buildings and surface improvement should be shored in accordance with applicable OSHA codes and regulations.

7.6.4 The design of temporary shoring is governed by soil and groundwater conditions and by the depth and width of the excavated area. Continuous support of the excavation face can be provided by a system of soldier piles and wood lagging. Excavations exceeding 15 feet may require tie back anchors or internal bracing to provide additional wall restraint.

7.6.5 In general, ground conditions are moderately suited to soldier pile and tieback anchor construction techniques. However, localized gravel, cobble, and cemented material will likely be encountered that could be difficult to drill. Additionally, relatively clean sands may be encountered within the excavation that may result in some raveling of the unsupported excavation.

7.6.6 For level backfill conditions behind the shoring system, temporary shoring should be designed using a lateral pressure envelope acting on the back of the shoring and applying a pressure equal to 26H, 17H, or 21H, for a triangular, rectangular, or trapezoidal distribution, respectively, where H is the height, in feet, of the shoring (resulting pressure in pounds per square foot) as shown in Figure 6. These values are based on estimated maximum wall height up to 40 feet. Triangular distribution should be used for cantilevered shoring and the trapezoidal and rectangular distribution should be used for multi-braced systems such as tieback anchors and rakers. The project shoring engineer should determine the applicable soil distribution for the design of the temporary shoring system. Additional lateral earth pressure due to the surcharging effects of adjacent structures, soil, or traffic loads should be considered, where appropriate, during design of the shoring system.

7.6.7 Passive soil pressure resistance for embedded portions of soldier piles can be based upon an equivalent passive soil fluid weight of 500 + 375D, where D is the depth of embedment (resulting in pounds per square foot), as shown on Figure 7. The passive resistance can be assumed to act over a width of three pile diameters. Typically, soldier piles are embedded a minimum of 0.5 times the maximum height of the excavation (this depth is to include footing excavations) if tieback anchors are not employed. The project structural engineer should determine the actual embedment depth.

7.6.8 Drilled shafts for the soldier piles should be observed by Geocon Incorporated prior to the placement of steel reinforcement to check that the exposed soil conditions are similar to those expected and that footing excavations have been extended to the appropriate bearing strata, and design depths. If unexpected soil conditions are encountered, foundation modifications may be required.

7.6.9 Lateral movement of shoring is associated with vertical ground settlement outside of the excavation. Therefore, it is essential that the soldier pile and tieback system allow very limited amounts of lateral displacement. Earth pressures acting on a lagging wall can cause movement of the shoring toward the excavation and result in ground subsidence outside of the excavation. Consequently, horizontal movements of the shoring wall should be accurately monitored and recorded during excavation and anchor construction.

7.6.10 Survey points should be established at the top of the pile on at least 20 percent of the soldier piles. An additional point located at an intermediate point between the top of the pile and the base of the excavation should be monitored on at least 20 percent of the piles if tieback anchors will be used. These points should be monitored on a weekly basis during excavation work and on a monthly basis thereafter until the permanent support system is constructed.

7.6.11 The project civil engineer should provide the approximate location, depth, and pipe type of the underground utilities adjacent to the site to the shoring engineer to help select the appropriate shoring type and design. The shoring system should be designed to limit horizontal and vertical soldier pile movement to a maximum of 1 inch and ½ inch, respectively. The amount of horizontal deflection can be assumed to be essentially zero along the Active Zone and Effective Zone boundary. The magnitude of movement for intermediate depths and distances from the shoring wall can be linearly interpolated. We understand the City of San Diego may require the developer to prepare a hold harmless agreement for the planned construction and development regarding potential damage to the existing utilities and improvements.

7.6.12 Tieback anchors employed in shoring should be designed such that anchors fully penetrate the Active Zone behind the shoring. The Active Zone can be considered the wedge of soil from the face of the shoring to a plane extending upward from the base of the excavation at a 30-degree angle from vertical, as shown on Figure 8. Normally, tieback anchors are contractor-designed and installed, and there are numerous anchor construction methods available. Non-shrinkage grout should be used for the construction of the tieback anchors.

7.6.13 The recommendations contained herein including the lateral earth pressures assume a temporary wall condition. Geocon Incorporated should be consulted to provide additional recommendations if the shoring wall will be a permanent structure.

7.6.14 Experience has shown that the use of pressure grouting during formation of the bonded portion of the anchor will increase the soil-grout bond stress. A pressure grouting tube should be installed during the construction of the tieback. Post grouting should be performed if adequate capacity cannot be obtained by other construction methods.

7.6.15 Anchor capacity is a function of construction method, depth of anchor, batter, diameter of the bonded section, and the length of the bonded section. Anchor capacity should be evaluated using the strength parameters shown in Table 7.6.

TABLE 7.6
SOIL STRENGTH PARAMETERS FOR TEMPORARY SHORING

Description	Cohesion (psf)	Friction Angle (Degrees)
Very Old Terrace Deposits	485	26
Ardath Formation	425	36

7.6.16 Grout should only be placed in the tieback anchor's bonded section prior to testing. Tieback anchors should be proof-tested to at least 130 percent of the anchor's design working load. Following a successful proof test, the tieback anchors should be locked off at 80 percent of the allowable working load. Tieback anchor test failure criteria should be established in project plans and specifications. The tieback anchor test failure criteria should be based upon a maximum allowable displacement at 130 percent of the anchor's working load (anchor creep) and a maximum residual displacement within the anchor following stressing. Tieback anchor stressing should only be conducted after sufficient hydration has occurred within the grout. Tieback anchors that fail to meet project specified test criteria should be replaced or additional anchors should be constructed.

7.6.17 Lagging should keep pace with excavation and tieback anchor construction. The excavation should not be advanced deeper than three feet below the bottom of lagging at any time. These unlagged gaps of up to three feet should only be allowed to stand for short periods of time in order to decrease the probability of soil instability and should never be unsupported overnight. Backfilling should be conducted when necessary between the back of lagging and excavation sidewalls to reduce sloughing in this zone and all voids should be filled by the end of each day. Further, the excavation should not be advanced further than four feet below a row of tiebacks prior to those tiebacks being proof tested and locked off.

7.6.18 If tieback anchors are employed, an accurate survey of existing utilities and other underground structures adjacent to the shoring wall should be conducted. The survey should include both locations and depths of existing utilities. Locations of anchors should be adjusted as necessary during the design and construction process to accommodate the existing and proposed utilities.

7.6.19 The condition of existing buildings, streets, sidewalks, and other structures/ improvements around the perimeter of the planned excavation should be documented prior to the start of shoring and excavation work. Special attention should be given to documenting existing cracks or other indications of differential settlement within these adjacent structures, pavements and other improvements. Underground utilities sensitive to settlement should be videotaped prior to construction to check the integrity of pipes. In addition, monitoring points should be established indicating location and elevation around the excavation and on existing buildings. These points should be monitored on a weekly basis during excavation work and on a monthly basis thereafter. Inclinometers should be installed and monitored behind any shoring sections that will be excavated deeper than 30 feet below the existing ground surface.

7.6.20 Tieback anchors within the City right-of-way should be removed in conformance with City of San Diego requirements. Geocon Incorporated should observe and document the removal of the anchors.

7.7 Conventional Shallow Foundations

7.7.1 The following shallow foundation recommendations assume all structural footings will be founded directly on the old terrace deposit or Ardath Formation. Foundations can consist of continuous strip footings and/or isolated spread footings. Continuous footings should be at least 18 inches wide and extend at least 24 inches below lowest adjacent pad grade. Isolated spread footings should have a minimum width and depth of 2 feet. Concrete reinforcement for continuous footings should consist of at least four, No. 5 steel, reinforcing bars placed horizontally in the footings; two near the top and two near the bottom. The project structural engineer should design the concrete reinforcement for the spread footings. A typical wall/column footing dimension detail is presented on Figure 9.

7.7.2 Concrete reinforcement for continuous footings should consist of at least four No. 5 steel, reinforcing bars placed horizontally in the footings; two near the top and two near the bottom. Steel reinforcement for the spread footings should be designed by the project structural engineer.

7.7.3 The minimum reinforcement recommended herein is based on soil characteristics only (EI of 90 or less) and is not intended to replace reinforcement required for structural considerations.

7.7.4 The recommended allowable bearing pressure for foundations with minimum dimensions described herein is 6,000 psf for footings bearing in undisturbed very old terrace deposits and 8,000 psf for footings bearing in undisturbed Ardath Formation. The allowable soil bearing pressure may be increased by an additional 500 psf for each additional foot of depth and 300 psf for each additional foot of width, to a maximum allowable bearing capacity of 8,000 psf for the very old terrace deposit and 10,000 psf for the Ardath Formation. The values presented herein are for dead plus live loads and may be increased by one-third when considering transient loads due to wind or seismic forces. These values are based on an excavation depth of approximately 20 to 40 feet.

7.7.5 We estimate the total and differential settlements under the imposed allowable loads to be ½ inch using an 8-foot square foundation. We estimate the total and differential settlements under the imposed allowable loads to be 1-inch using a 15-foot-square foundation. We should be contacted to provide additional settlement calculations for larger foundations.

7.7.6 Where buildings or other improvements are planned near the top of a slope steeper than 3:1 (horizontal to vertical), special foundations and/or design considerations are recommended due to the tendency for lateral soil movement to occur. Building and retaining wall footings should be deepened such that the bottom outside edge of the footing is at least 7 feet horizontally from the face of the slope.

7.7.7 Foundation excavations should be observed by the geotechnical engineer (a representative of Geocon Incorporated) prior to the placement of reinforcing steel to check that the exposed soil conditions are similar to those expected and that they have been extended to the appropriate bearing strata. Foundation modifications may be required if unexpected soil conditions are encountered.

7.8 Concrete Slabs-on-Grade

7.8.1 The concrete slab-on-grade for the structure should be at least 5 inches thick. As a minimum, reinforcement for slabs-on-grade should consist of No. 4 steel, reinforcing bars placed at 18 inches on center in both directions.

7.8.2 The concrete slab-on-grade recommendations are based on soil support characteristics only. The project structural engineer should evaluate the structural requirements of the concrete slabs for supporting equipment and storage loads.

7.8.3 A vapor retarder should underlie slabs that may receive moisture-sensitive floor coverings or may be used to store moisture-sensitive materials. The vapor-retarder design should be consistent with the guidelines presented in the American Concrete Institute's (ACI) *Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials* (ACI 302.2R-06). The project architect or developer should specify the type of vapor retarder used based on the type of floor covering that will be installed and if the structure will possess a humidity-controlled environment.

7.8.4 The bedding sand or crushed aggregate thickness (if needed) should be determined by the project foundation engineer, architect, and/or developer. However, we should be contacted to provide recommendations if the bedding sand is thicker than 6 inches. It is common to see 3 to 4 inches of sand or crushed aggregate

7.8.5 The foundation design engineer should provide appropriate concrete mix design criteria and curing measures to assure proper curing of the slab by reducing the potential for rapid moisture loss and subsequent cracking and/or slab curl. We suggest that the foundation design engineer present the concrete mix design and proper curing methods on the foundation plans. It is critical that the foundation contractor understands and follows the recommendations presented on the foundation plans.

7.8.6 Exterior concrete flatwork not subject to vehicular traffic should be a minimum of 4 inches thick and, when in excess of 8 feet square, should be reinforced with 6 x 6 - W2.9/W2.9 (6 x 6 - 6/6) welded wire mesh or No. 3 steel, reinforcing bars at 24 inches on center in both directions to reduce the potential for cracking.

7.8.7 Concrete slabs should be provided with crack control joints to reduce and/or control shrinkage cracking. Crack control spacing should be determined by the project structural engineer based upon the slab thickness and intended usage. Criteria of the American Concrete Institute (ACI) should be taken into consideration when establishing crack control spacing.

7.8.8 Special subgrade presaturation is not deemed necessary prior to placing concrete; however, the exposed foundation and slab subgrade soil should be moisturized to maintain a moist condition as would be expected in any such concrete placement.

7.8.9 Where exterior flatwork abuts the structure at entrant or exit areas, the exterior slab should be dowelled into the structure's foundation stemwall. This recommendation is intended to reduce the potential for differential elevations that could result from differential settlement or minor heave of the flatwork. Dowelling details should be designed by the project structural engineer.

7.8.10 Geocon Incorporated should be consulted to provide additional design parameters as required by the structural engineer.

7.8.11 The recommendations presented herein are intended to reduce the potential for cracking of slabs and foundations as a result of differential movement. However, even with the incorporation of the recommendations presented herein, foundations and slabs-on-grade will still crack. The occurrence of concrete shrinkage cracks is independent of the soil supporting characteristics. Their occurrence may be reduced and/or controlled by: limiting the slump of the concrete; the use of crack control joints; and proper concrete placement and curing. Literature provided by the Portland Concrete Association (PCA) and American Concrete Institute (ACI) present recommendations for proper concrete mix, construction, and curing practices, and should be incorporated into project construction.

7.9 Retaining Walls

7.9.1 Retaining walls that are allowed to rotate more than 0.001H (where H equals the height of the retaining portion of the wall) at the top of the wall and having a level backfill surface should be designed for an active soil pressure equivalent to the pressure exerted by a fluid density of 35 pcf. Where the backfill will be inclined at 2:1 (horizontal:vertical), an active soil pressure of 52 pcf is recommended. These active pressures assume low expansive soil (Expansion Index less than 50) will be used as retaining wall backfill.

7.9.2 Where walls are restrained from movement at the top, an additional uniform pressure of 8H psf should be added to the active soil pressure where the wall possesses a height of 8 feet or less and 13H where the wall is greater than 8 feet.

7.9.3 Retaining walls subject to vehicular loads within a horizontal distance equal to two-thirds the wall height, a surcharge equivalent to 2 feet of fill soil should be added.

7.9.4 Soil contemplated for use as retaining wall backfill, including import materials, should identified prior to backfill. At that time Geocon Incorporated should obtain samples for laboratory testing to evaluate its suitability. Modified lateral earth pressures may be necessary if the backfill soil does not meet the required expansion index or shear strength. City or regional standard wall designs, if used, are based on a specific active lateral earth pressure and/or soil friction angle. In this regard, on-site soil to be used as backfill may or may not meet the values for standard wall designs. Geocon Incorporated should be consulted to assess the suitability of the on-site soil for use as wall backfill if standard wall designs will be used.

7.9.5 Unrestrained walls will move laterally when backfilled and loading is applied. The amount of lateral deflection is dependent on the wall height, the type of soil used for backfill, and loads acting on the wall. The wall designer should provide appropriate lateral deflection quantities for planned retaining walls structures, if applicable. These lateral values should be considered when planning types of improvements above retaining wall structures.

7.9.6 Retaining walls should be provided with a drainage system adequate to prevent the buildup of hydrostatic forces and should be waterproofed as required by the project architect. The use of drainage openings through the base of the wall (weep holes) is not recommended where the seepage could be a nuisance or otherwise adversely affect the property adjacent to the base of the wall. The above recommendations assume a properly compacted granular (EI of less than 50) free-draining backfill material with no hydrostatic forces or imposed surcharge load. :Figure 10 presents a typical retaining wall drainage detail. Figure 11 presents a soldier pile wall drainage detail. If conditions different than those described are expected, Geocon Incorporated should be contacted for additional recommendations.

7.9.7 The structural engineer should determine the seismic design category for the project in accordance with Section 1613 of the 2016 CBC. If the project possesses a seismic design category of D, E, or F, retaining walls that support more than 6 feet of backfill should be designed with seismic lateral pressure in accordance with Section 18.3.5.12 of the 2016 CBC. The seismic load is dependent on the retained height where H is the height of the wall, in feet, and the calculated loads result in pounds per square foot (psf) exerted at the base of the wall and zero at the top of the wall. A seismic load of 21H should be used for design. We used the peak ground acceleration adjusted for Site Class effects, PGA_M, of 0.460g calculated from ASCE 7-10 Section 11.8.3 and applied a pseudo-static coefficient of 0.33.

7.9.8 Foundation excavations should be observed by the geotechnical engineer (a representative of Geocon Incorporated) prior to the placement of reinforcing steel and concrete to observe that the exposed soil conditions are consistent with those anticipated and that they have been extended to the appropriate bearing strata. If unanticipated soil conditions are encountered, foundation modifications may be required.

7.10 Lateral Loading

7.10.1 To resist lateral loads, a passive pressure exerted by an equivalent fluid weight of 350 pounds per cubic foot (pcf) should be used for design of footings or shear keys poured neat against compacted fill. The allowable passive pressure assumes a horizontal surface extending at least 5 feet or three times the height of the surface generating the passive pressure, whichever is greater. The upper 12 inches of material not protected by floor slabs or pavement should not be included in the design for lateral resistance. Where walls are planned adjacent to and/or on descending slopes, a passive pressure of 150 pcf should be used in design.

7.10.2 If friction is to be used to resist lateral loads, an allowable coefficient of friction between soil and concrete of 0.35 should be used for design for footings founded in compacted fill or formational materials. The recommended passive pressure may be used concurrently with frictional resistance and may be increased by one-third for transient wind or seismic loading.

7.11 Preliminary Flexible and Rigid Pavement Recommendations

7.11.1 We calculated the flexible pavement sections for varying traffic indices (TIs) in general conformance with the *Caltrans Method of Flexible Pavement Design* (Highway Design Manual, Section 608.4). The project civil engineer or traffic engineer should provide the actual TI that is appropriate for the project based on anticipated traffic loading and volumes. Final pavement sections should be based on the R-Value of the subgrade soil encountered at final subgrade elevation. For preliminary design, we used an R-Value of 5 for the subgrade soil and 78 for the base materials. Table 7.11.1 presents the preliminary flexible pavement sections.

TABLE 7.11.1
PRELIMINARY ASPHALT CONCRETE PAVEMENT SECTIONS

Traffic Index	Asphalt Concrete (inches)	Class 2 Aggregate Base (inches)
4.5	3	8
5	3	10
5.5	3	12
6	4	9.5
6.5	4	13.5
7	4	15.5
7.5	4.5	14.5

7.11.2 Prior to placing base materials, the upper 12 inches of the subgrade soil should be scarified, moisture conditioned as necessary, and recompacted to a dry density of at least 95 percent of the laboratory maximum dry density near to slightly above optimum moisture content as determined by ASTM D 1557. Similarly, the base material should be compacted to a dry density of at least 95 percent of the laboratory maximum dry density near to slightly above optimum moisture content. Asphalt concrete should be compacted to a density of at least 95 percent of the laboratory Hveem density in accordance with ASTM D 2726.

7.11.3 Base materials should conform to Section 26-1.02B of the *Standard Specifications for The State of California Department of Transportation (Caltrans)* with a ¾-inch maximum size aggregate. The asphalt concrete should conform to Section 203-6 of the *Standard Specifications for Public Works Construction (Greenbook)*.

7.11.4 A rigid Portland cement concrete (PCC) pavement section should be placed in driveway entrance aprons, trash bin loading/storage areas and loading dock areas. The concrete pad for trash truck areas should be large enough such that the truck wheels will be positioned on the concrete during loading. We calculated the rigid pavement section in general conformance with the procedure recommended by the American Concrete Institute report ACI 330R-08 *Guide for Design and Construction of Concrete Parking Lots* using the parameters presented in Table 7.11.2.

TABLE 7.11.2
RIGID PAVEMENT DESIGN PARAMETERS

Design Parameter	Design Value
Modulus of subgrade reaction, k	100 pci
Modulus of rupture for concrete, M_R	500 psi
Traffic Category, TC	A and C
Average daily truck traffic, ADTT	10 and 100

7.11.5 Based on the criteria presented herein, the PCC pavement sections should have a minimum thickness as presented in Table 7.11.3.

TABLE 7.11.3
RIGID PAVEMENT RECOMMENDATIONS

Location	Portland Cement Concrete (inches)
Automobile Parking Areas (TC=A)	5.5
Heavy Truck and Fire Lane Areas (TC=C)	7.0

7.11.6 The PCC pavement should be placed over subgrade soil that is compacted to a dry density of at least 95 percent of the laboratory maximum dry density near to slightly above optimum moisture content. This pavement section is based on a minimum concrete compressive strength of approximately 3,250 psi (pounds per square inch). Base materials will not be required below concrete improvements.

7.11.7 A thickened edge or integral curb should be constructed on the outside of concrete slabs subjected to wheel loads. The thickened edge should be 1.2 times the slab thickness or a minimum thickness of 2 inches, whichever results in a thicker edge, and taper back to the recommended slab thickness 4 feet behind the face of the slab (e.g., a 7-inch-thick slab would have a 9-inch-thick edge). Reinforcing steel will not be necessary within the concrete for geotechnical purposes with the possible exception of dowels at construction joints as discussed herein.

7.11.8 To control the location and spread of concrete shrinkage cracks, crack-control joints (weakened plane joints) should be included in the design of the concrete pavement slab. Crack-control joints should not exceed 30 times the slab thickness with a maximum spacing of 12.5 feet and 15 feet for the 5.5 and 7-inch-thick slabs, respectively, and should be sealed with an appropriate sealant to prevent the migration of water through the control joint to the subgrade materials. The depth of the crack-control joints should be determined by the referenced ACI report.

7.11.9 To provide load transfer between adjacent pavement slab sections, a butt-type construction joint should be constructed. The butt-type joint should be thickened by at least 20 percent at the edge and taper back at least 4 feet from the face of the slab. As an alternative to the butt-type construction joint, dowelling can be used between construction joints for pavements of 7 inches or thicker. As discussed in the referenced ACI guide, dowels should consist of smooth, 1-inch-diameter reinforcing steel 14 inches long embedded a minimum of 6 inches into the slab on either side of the construction joint. Dowels should be located at the midpoint of the slab, spaced at 12 inches on center and lubricated to allow joint movement while still transferring loads. In addition, tie bars should be installed at the as recommended in Section 3.8.3 of the referenced ACI guide. The structural engineer should provide other alternative recommendations for load transfer.

7.12 Storm Water Management

7.12.1 If storm water management devices are not properly designed and constructed, there is a risk for distress to improvements and properties located hydrologically down gradient or adjacent to these devices. Factors such as the amount of water being detained, its residence time, and soil permeability have an important effect on seepage transmission and the potential adverse impacts that may occur if the storm water management features are not properly designed and constructed. We have not performed a hydrogeological study at the site. If infiltration of storm water runoff into the subsurface occurs, downstream improvements may be subjected to seeps, springs, slope instability, raised groundwater, movement of foundations and slabs, or other undesirable impacts as a result of water infiltration.

7.12.2 A summary of our study and storm water management recommendations are provided in Appendix C.

7.13 Site Drainage and Moisture Protection

7.13.1 Adequate site drainage is critical to reduce the potential for differential soil movement, erosion and subsurface seepage. Under no circumstances should water be allowed to pond adjacent to footings and improvements. The site should be graded and maintained such that surface drainage is directed away from structures in accordance with 2016 CBC 1804.4 or other applicable standards. In addition, surface drainage should be directed away from the top of slopes into swales or other controlled drainage devices. Roof and pavement drainage should be directed into conduits that carry runoff away from the proposed structure.

7.13.2 In the case of basement walls or building walls retaining landscaping areas, a water-proofing system should be used on the wall and joints and a Miradrain drainage panel (or equivalent) should be placed over the waterproofing. The project architect or civil engineer should provide detailed specifications on the plans for all waterproofing and drainage.

7.13.3 Underground utilities should be leak free. Utility and irrigation lines should be checked periodically for leaks, and detected leaks should be repaired promptly. Detrimental soil movement could occur if water is allowed to infiltrate the soil for prolonged periods of time.

7.13.4 Landscaping planters adjacent to paved areas are not recommended due to the potential for surface or irrigation water to infiltrate the pavement's subgrade and base course. We recommend that area drains to collect excess irrigation water and transmit it to drainage structures or impervious above-grade planter boxes be used. In addition, where landscaping is planned adjacent to the pavement, we recommend construction of a cutoff wall along the edge of the pavement that extends at least 6 inches below the bottom of the base materials.

7.14 Slope Maintenance

7.14.1 Slopes that are steeper than 3:1 (horizontal:vertical) may, under conditions that are both difficult to prevent and predict, be susceptible to near-surface (surficial) slope instability. The instability is typically limited to the outer 3 feet of a portion of the slope and usually does not directly impact the improvements on the pad areas above or below the slope. The occurrence of surficial instability is more prevalent on fill slopes and is generally preceded by a period of heavy rainfall, excessive irrigation, or the migration of subsurface seepage. The disturbance and/or loosening of the surficial soils, as might result from root growth, soil expansion, or excavation for irrigation lines and slope planting, may also be a significant contributing factor to surficial instability. It is therefore recommended that, to the maximum extent practical: (a) disturbed/loosened surficial soils be either removed or properly recompacted, (b) irrigation systems be periodically inspected and maintained to eliminate leaks and excessive irrigation, and (c) surface drains on and adjacent to slopes be periodically maintained to preclude ponding or erosion. Although the incorporation of the above recommendations should reduce the potential for surficial slope instability, it will not eliminate the possibility and, therefore, it may be necessary to rebuild or repair a portion of the project's slopes in the future.

7.15 Grading and Foundation Plan Review

7.15.1 The geotechnical engineer and engineering geologist should review the grading and foundation plans prior to final submittal to check their compliance with the recommendations of this report and to determine the need for additional comments, recommendations and/or analysis.

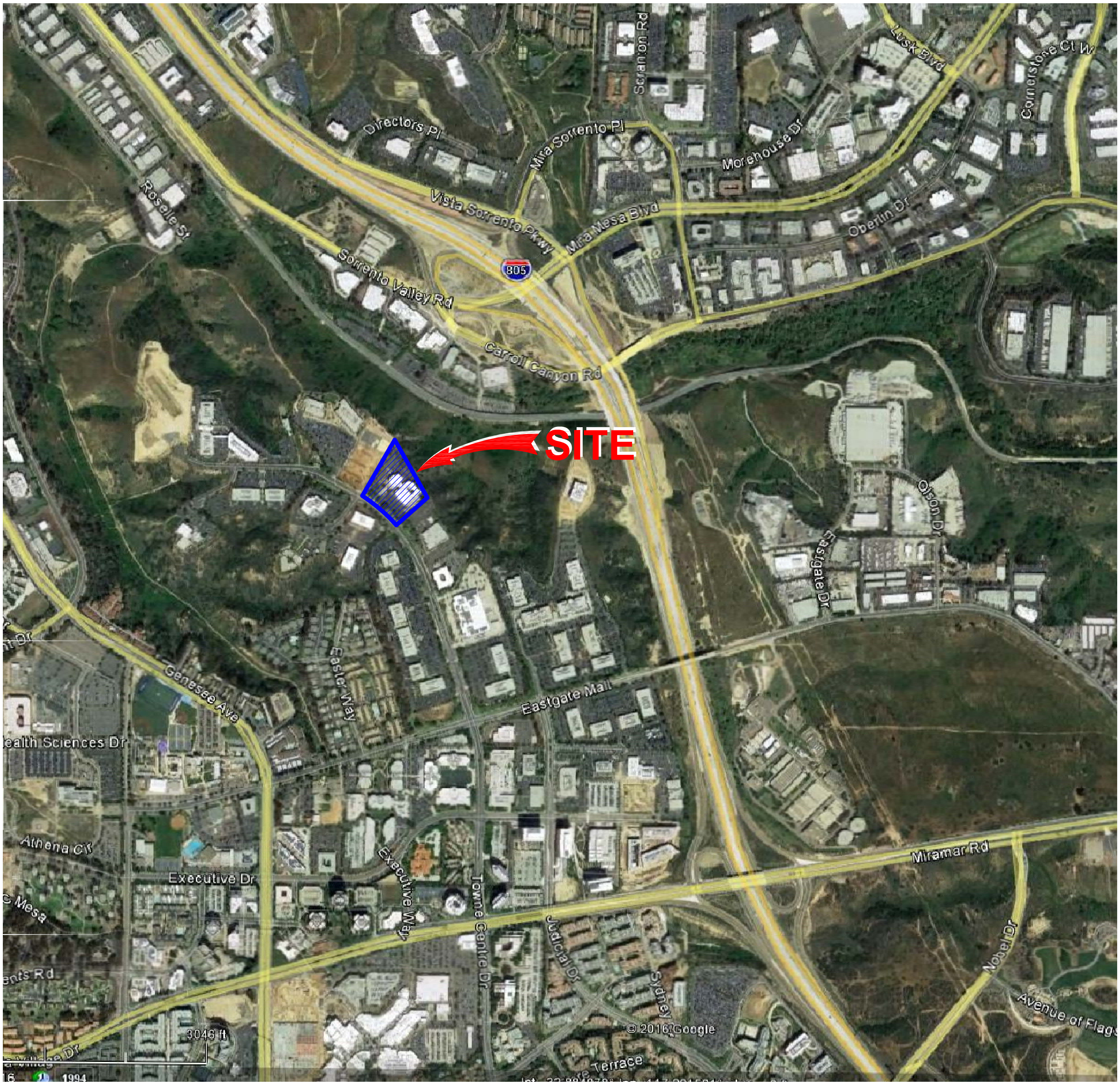
LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. The firm that performed the geotechnical investigation for the project should be retained to provide testing and observation services during construction to provide continuity of geotechnical interpretation and to check that the recommendations presented for geotechnical aspects of site development are incorporated during site grading, construction of improvements, and excavation of foundations. If another geotechnical firm is selected to perform the testing and observation services during construction operations, that firm should prepare a letter indicating their intent to assume the responsibilities of project geotechnical engineer of record. A copy of the letter should be provided to the regulatory agency for their records. In addition, that firm should provide revised recommendations concerning the geotechnical aspects of the proposed development, or a written acknowledgement of their concurrence with the recommendations presented in our report. They should also perform additional analyses deemed necessary to assume the role of Geotechnical Engineer of Record.

2. The recommendations of this report pertain only to the site investigated and are based upon the assumption that the soil conditions do not deviate from those disclosed in the investigation. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that anticipated herein, Geocon Incorporated should be notified so that supplemental recommendations can be given. The evaluation or identification of the potential presence of hazardous or corrosive materials was not part of the scope of services provided by Geocon Incorporated.

3. This report is issued with the understanding that it is the responsibility of the owner or his representative to ensure that the information and recommendations contained herein are brought to the attention of the architect and engineer for the project and incorporated into the plans, and the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.

4. The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they be due to natural processes or the works of man on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of three years.



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N

NO SCALE

VICINITY MAP

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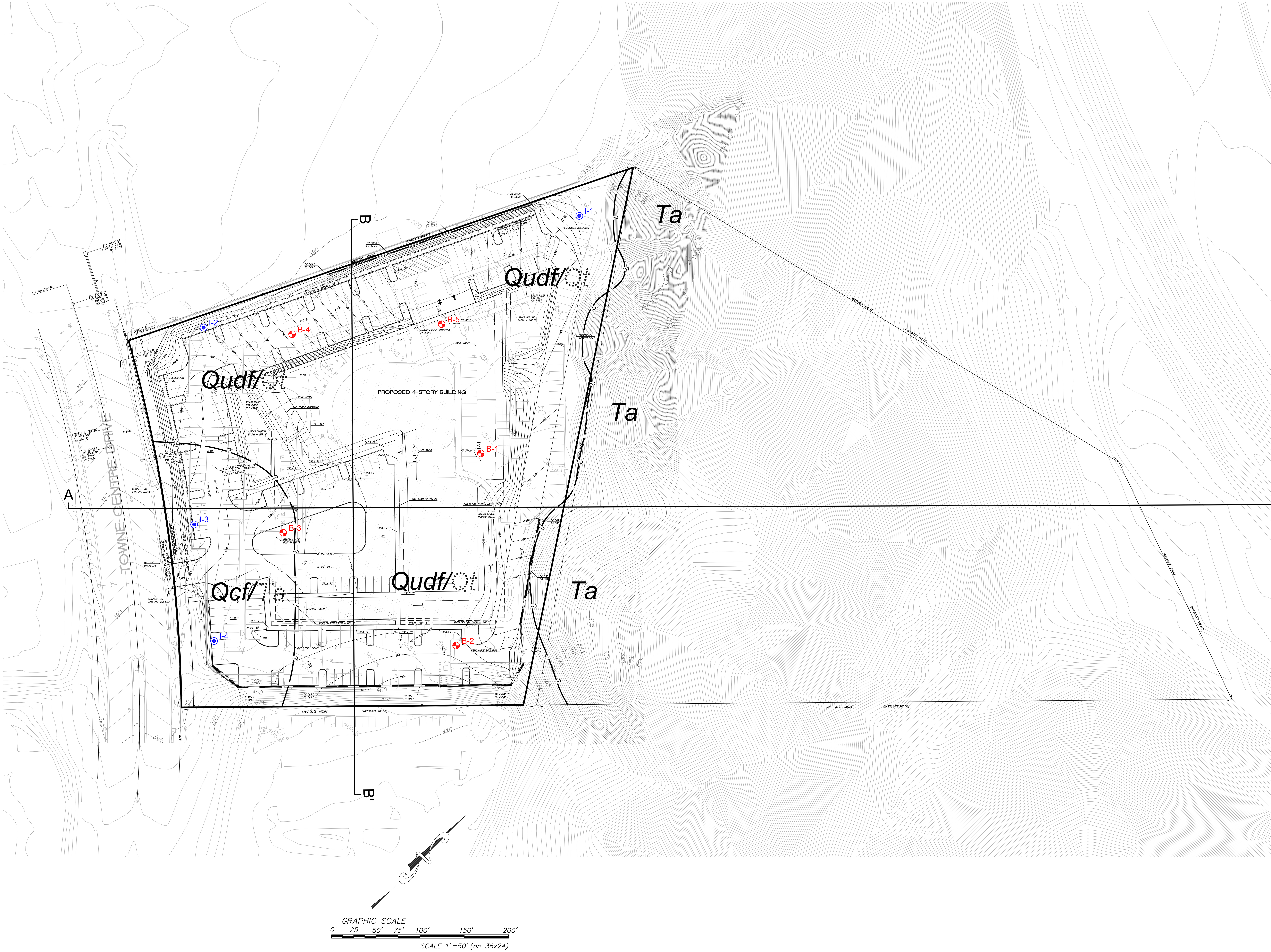
9775 TOWNE CENTRE DRIVE
SAN DIEGO, CALIFORNIA

RM / AML		DSK/GTYPD	DATE 12 - 16 - 2016	PROJECT NO. G2059 - 42 - 01	FIG. 1

Plotted:12/15/2016 3:54PM \| By:ALVIN LADRILLONO \| File Location:Y:\PROJECTS\G2059-42-01 (9775 Towne Centre Dr)\DETAILS\G2059-42-01 Vic Map.dwg



GEOCON LEGEND

Qudf........UNDOCUMENTED FILL

Qt........VERY OLD TERRACE DEPOSITS (Dotted Where Buried)

Ta........ARDATH SHALE (Dotted Where Buried)

........APPROX. LOCATION OF GEOLOGIC CONTACT (Queried Where Uncertain)

B-5 ....APPROX. LOCATION OF BORING

I-4 ....APPROX. LOCATION OF INFILTRATIION TEST

B B' ....APPROX. LOCATION OF GEOLOGIC CROSS SECTION

GEOLOGIC MAP

9775 TOWNE CENTRE DRIVE
SAN DIEGO, CALIFORNIA

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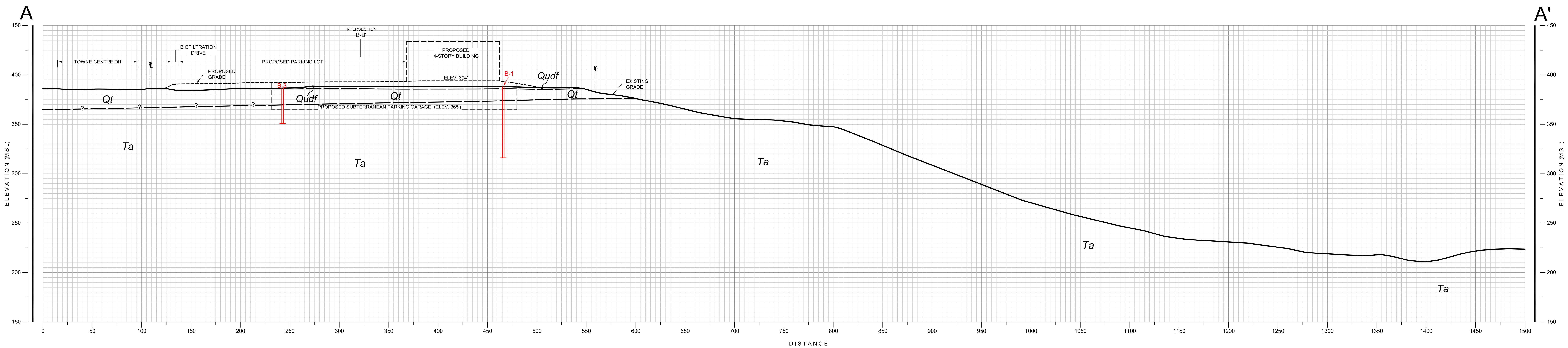
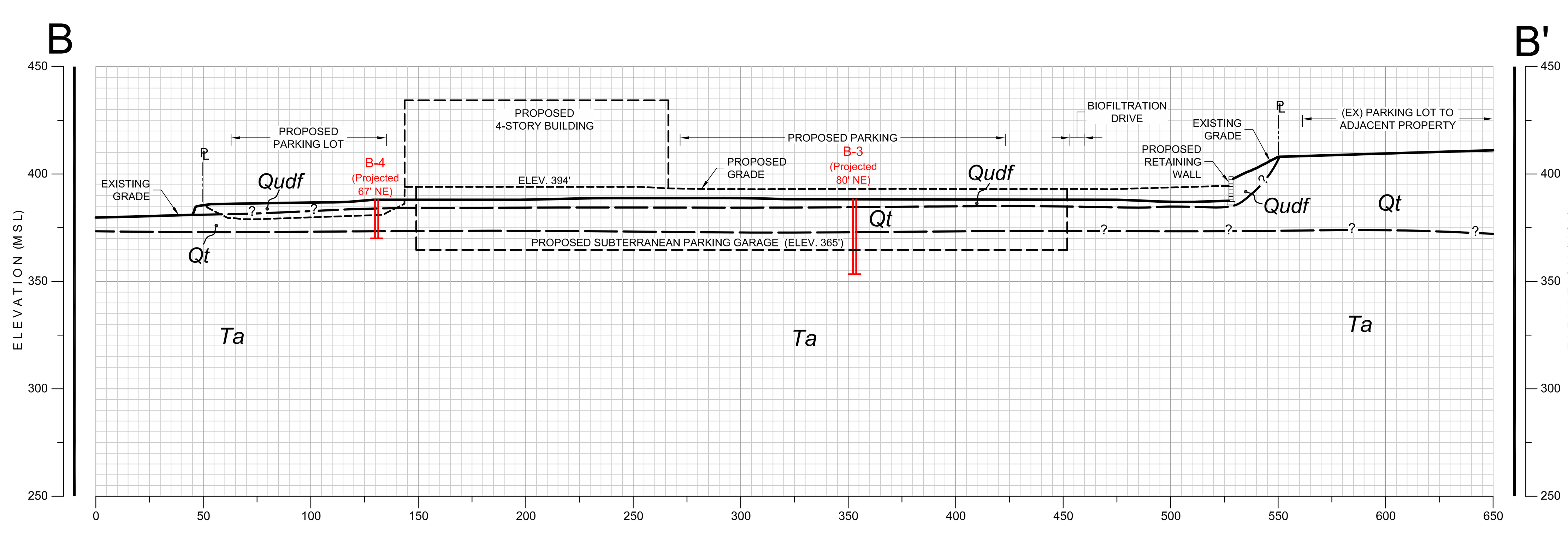
SCALE 1" = 50'	DATE 12 - 16 - 2016
PROJECT NO. G2059 - 42 - 01	FIGURE 2
SHEET 1 OF 1	

Plotted:12/16/2016 10:42AM | By:ALVIN LADRILLONO | File Location:Y:\PROJECTS\G2059-42-01 (9775 Towne Centre Dr)\SHEETS\G2059-42-01 Site Plan.dwg



GEOLOGIC CROSS-SECTION A-A'

SCALE: 1" = 50' (Vert. = Horiz.)



GEOLOGIC CROSS-SECTION B-B'

SCALE: 1" = 50' (Vert. = Horiz.)

GEOCON LEGEND

Qudf ........UNDOCUMENTED FILL

Qt ....VERY OLD TERRACE DEPOSITS

Ta ....ARDATH SHALE

........APPROX. LOCATION OF GEOLOGIC CONTACT (Queried Where Uncertain)

B-4 ....APPROX. LOCATION OF BORING

GEOLOGIC CROSS SECTION

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SAN DIEGO, CALIFORNIA

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SCALE 1" = 50'	DATE 12 - 16 - 2016		
PROJECT NO. G2059 - 42 - 01		FIGURE 3	
SHEET 1 OF 1			

Plotted:12/16/2016 10:40AM | By:ALVIN LADRILLONO | File Location:Y:\PROJECTS\G2059-42-01 (9775 Towne Centre Dr)\SHEETS\G2059-42-01 XSections.dwg

9775 Towne Centre Drive
Project No. G2059-42-01
Cross-Section A-A'
Name: AA'-1.gsz
Date: 12/16/2016 Time: 1:20:24 PM
Analysis: Proposed Upper Slope (Static)

MATERIAL DESCRIPTION:
Name: Qt - Very Old Terrace Deposits (2); Unit Weight: 130 pcf; Cohesion: 485 psf; Phi: 26 °
Name: Ta - Ardath Shale; Unit Weight: 130 pcf; Cohesion: 425 psf; Phi: 36 °

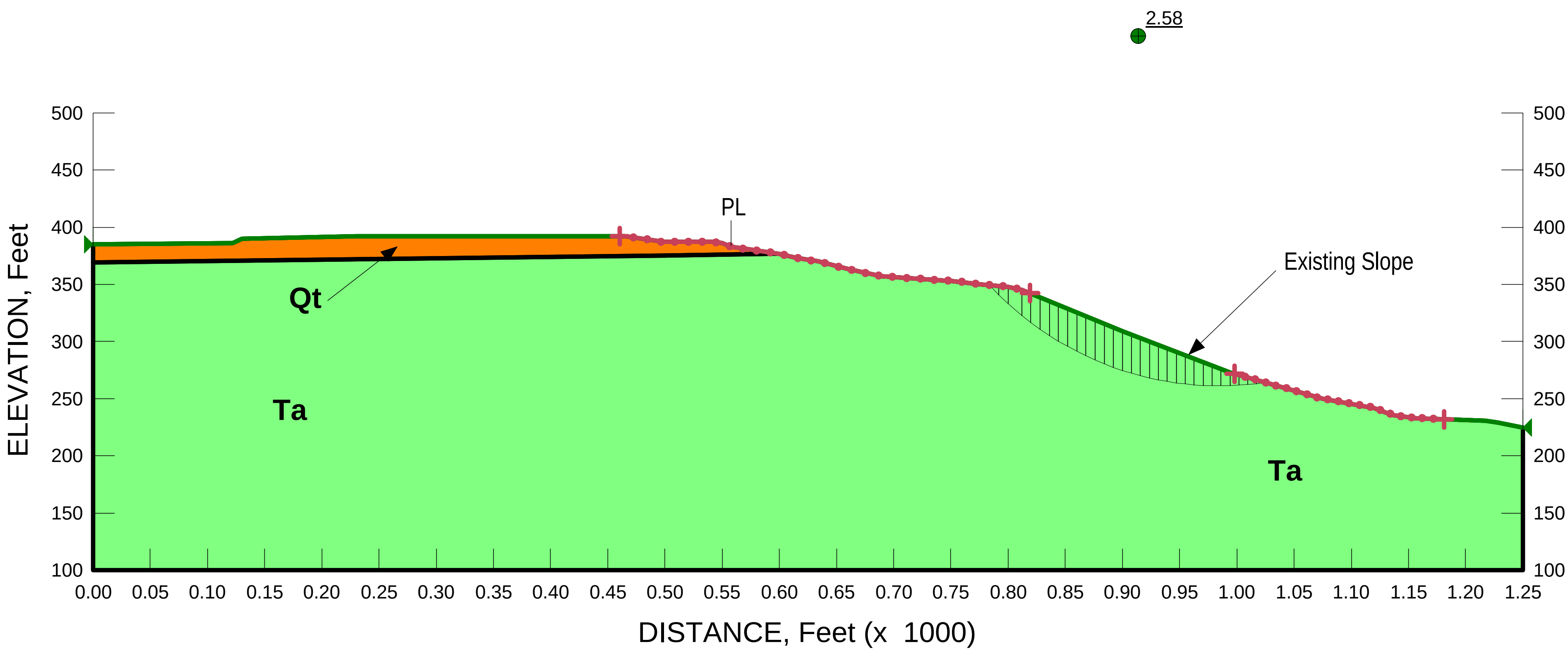

FIGURE 4

ASSUMED CONDITIONS :

SLOPE HEIGHT	H	= Infinite
DEPTH OF SATURATION	Z	= 3 feet
SLOPE INCLINATION	2 : 1	(Horizontal : Vertical)
SLOPE ANGLE	i	= 26.6 degrees
UNIT WEIGHT OF WATER	γ_w	= 62.4 pounds per cubic foot
TOTAL UNIT WEIGHT OF SOIL	γ_t	= 130 pounds per cubic foot
ANGLE OF INTERNAL FRICTION	ϕ	= 36 degrees
APPARENT COHESION	C	= 425 pounds per square foot

SLOPE SATURATED TO VERTICAL DEPTH Z BELOW SLOPE FACE

SEEPAGE FORCES PARALLEL TO SLOPE FACE

ANALYSIS :

$$\mathrm{FS} = \frac{C + (\gamma_t - \gamma_w)\ Z \cos^2 i \tan \phi}{\gamma_t\ Z \sin i \cos i} = 3.5$$

REFERENCES :

1......Haefeli, R. *The Stability of Slopes Acted Upon by Parallel Seepage*, Proc. Second International Conference, SMFE, Rotterdam, 1948, 1, 57-62

2......Skempton, A. W., and F.A. Delory, *Stability of Natural Slopes in London Clay*, Proc. Fourth International Conference, SMFE, London, 1957, 2, 378-81

SURFICIAL SLOPE STABILITY ANALYSIS

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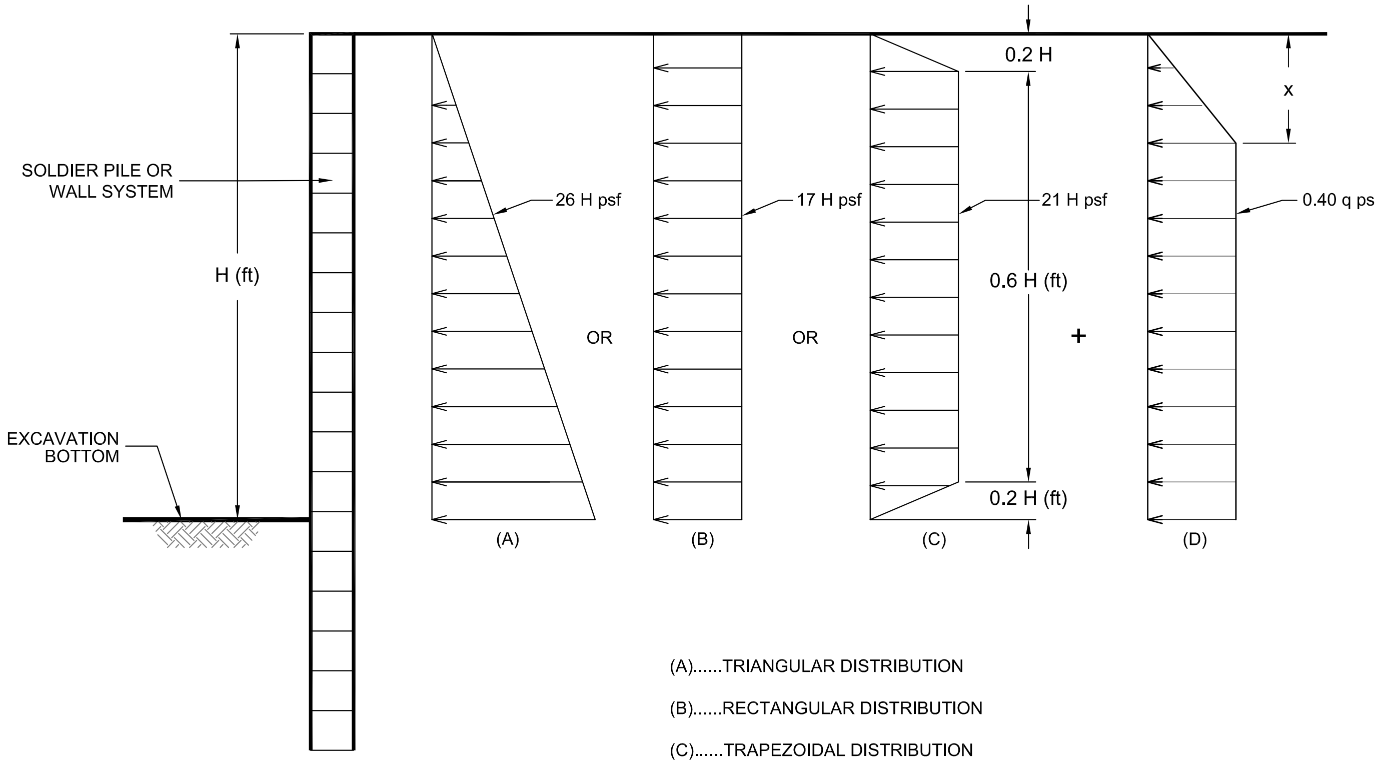
RM / AML		DSK/GTYPD	DATE 12 - 16 - 2016	PROJECT NO. G2059 - 42 - 01	FIG. 5



(A)......TRIANGULAR DISTRIBUTION

(B)......RECTANGULAR DISTRIBUTION

(C)......TRAPEZOIDAL DISTRIBUTION

(D)......SURCHARGE DISTRIBUTION

NO SCALE

LATERAL ACTIVE PRESSURES FOR VERTICAL EXCATIONS

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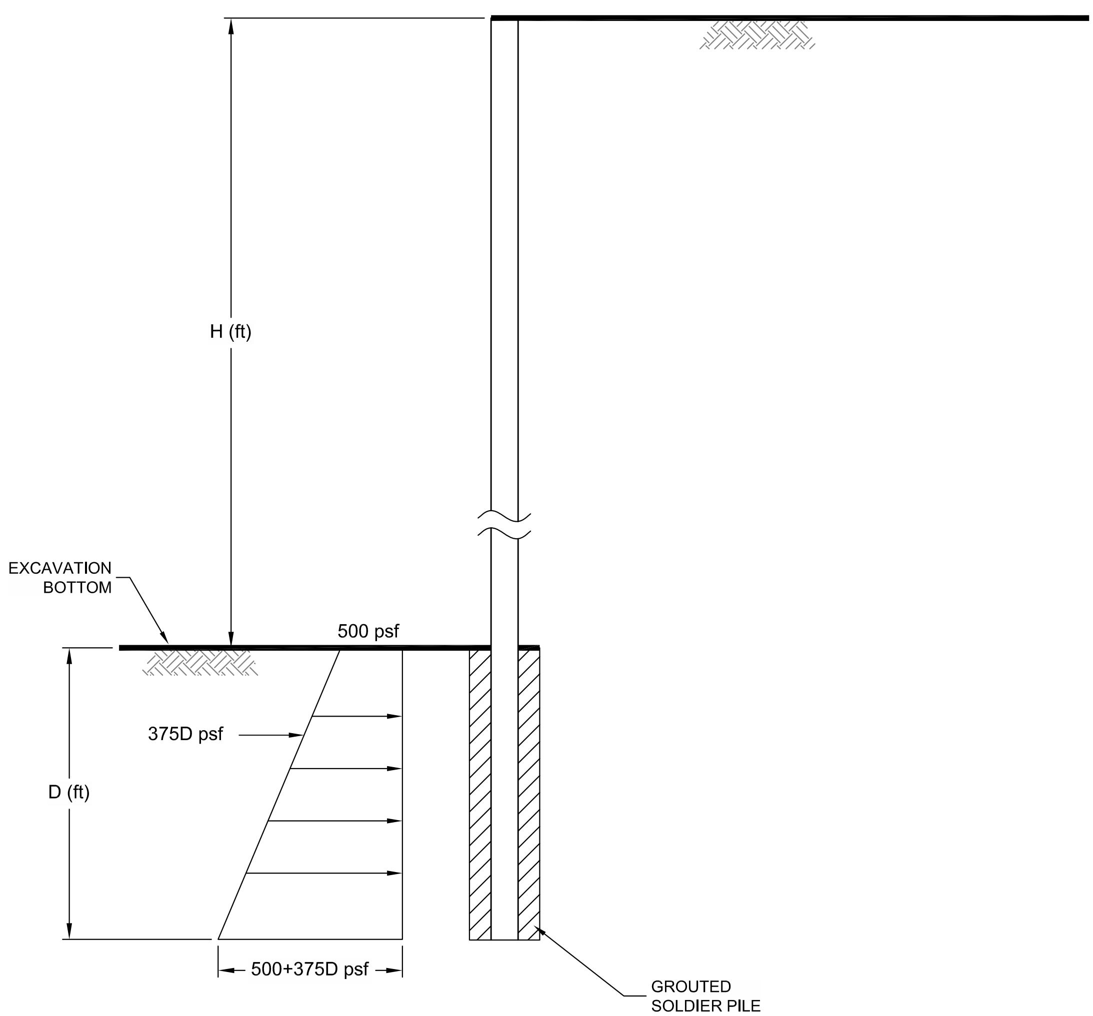
RM / AML		DSK/GTYPD	DATE 12 - 16 - 2016	PROJECT NO. G2059 - 42 - 01	FIG. 6



NO SCALE

SOLDIER PILE PASSIVE PRESSURE DISTRIBUTION

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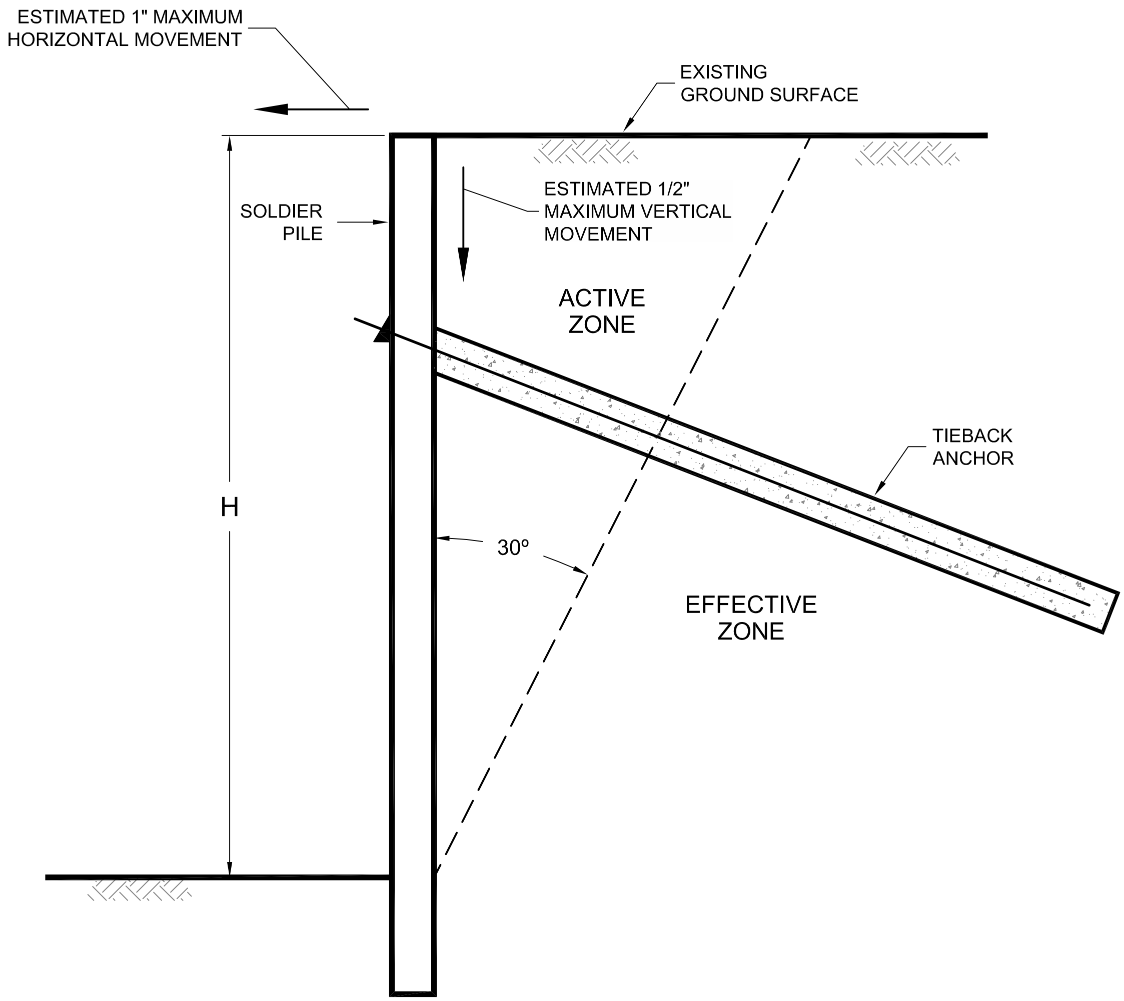
RM / AML		DSK/GTYPD	DATE 12 - 16 - 2016	PROJECT NO. G2059 - 42 - 01	FIG. 7



NO SCALE

RECOMMENDED EFFECTIVE ZONE FOR TIEBACK ANCHORS

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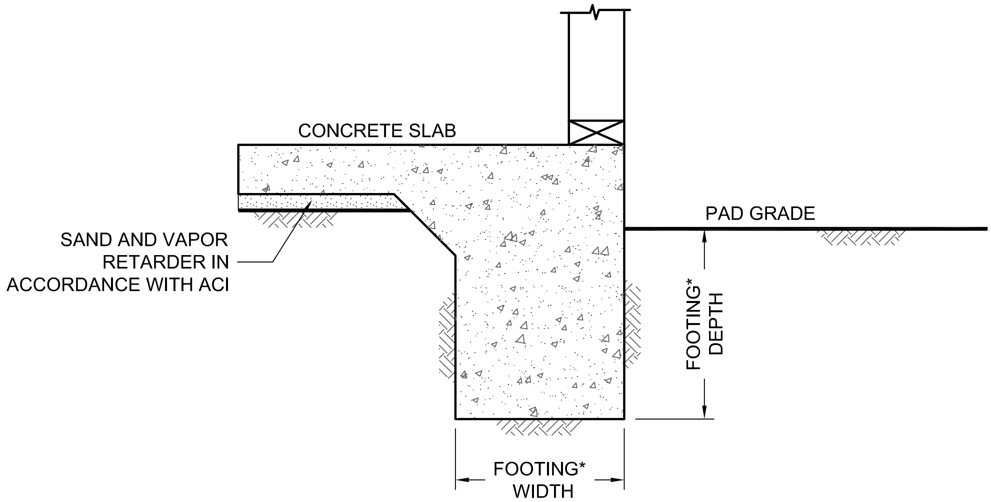
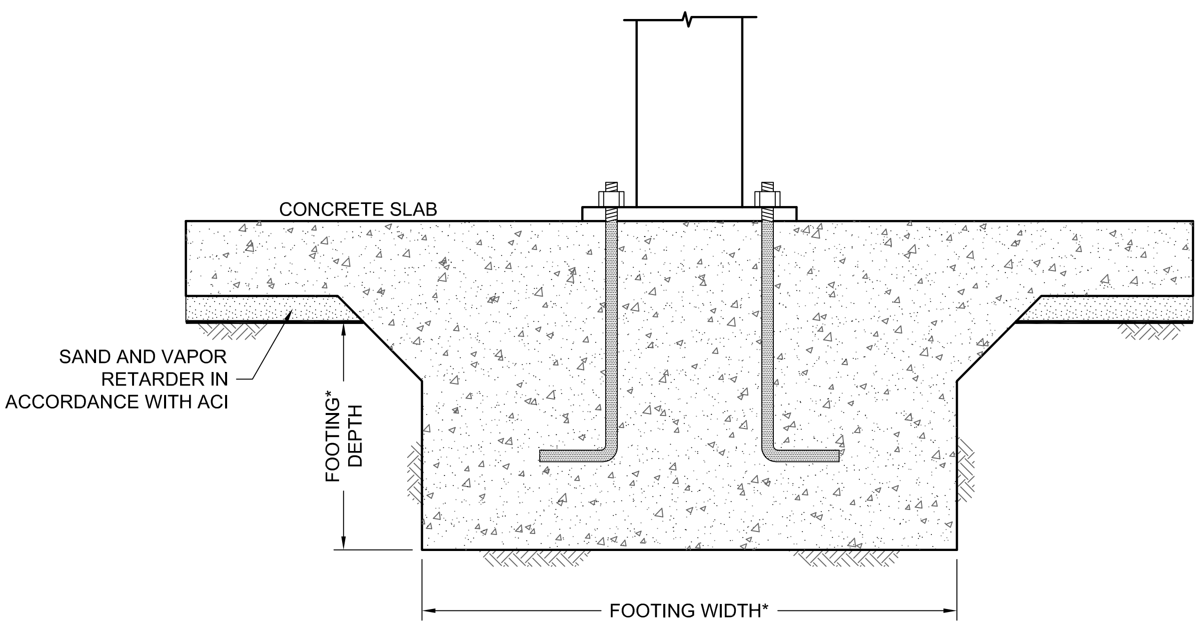
RM / AML		DSK/GTYPD	DATE 12 - 16 - 2016	PROJECT NO. G2059 - 42 - 01	FIG. 8





*....SEE REPORT FOR FOUNDATION WIDTH AND DEPTH RECOMMENDATION

NO SCALE

WALL / COLUMN FOOTING DIMENSION DETAIL

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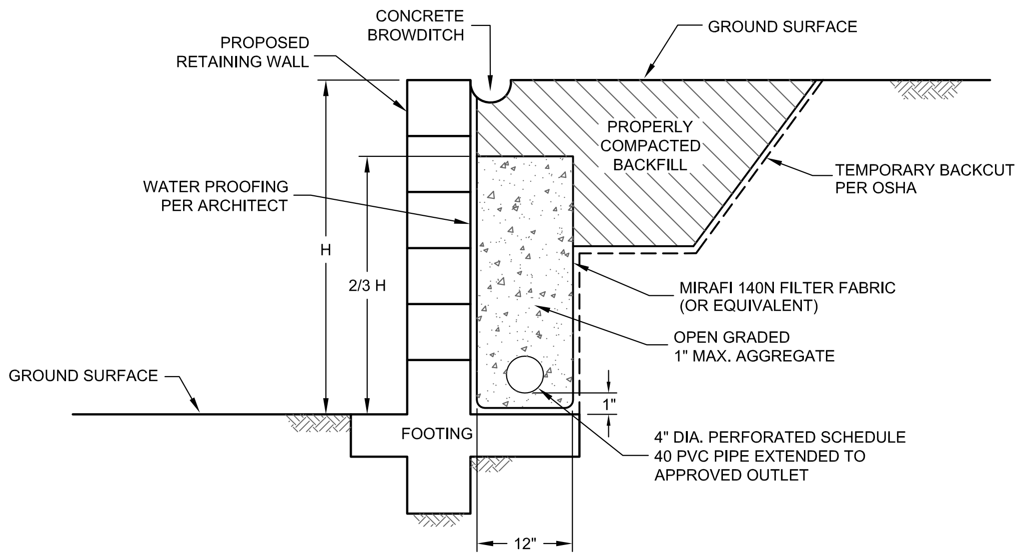
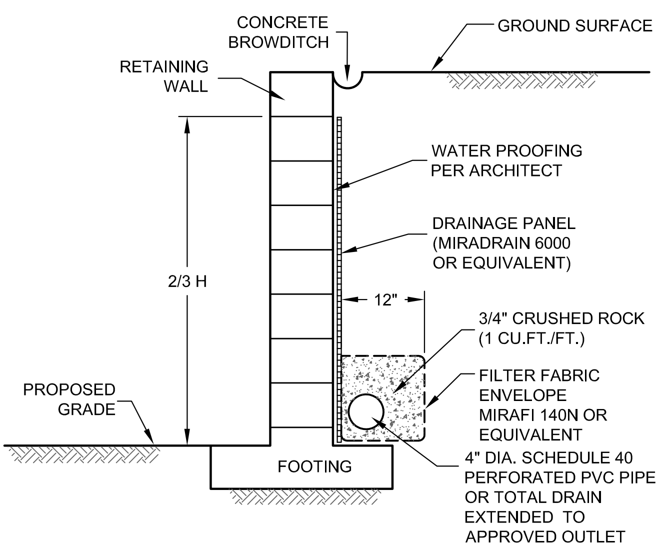
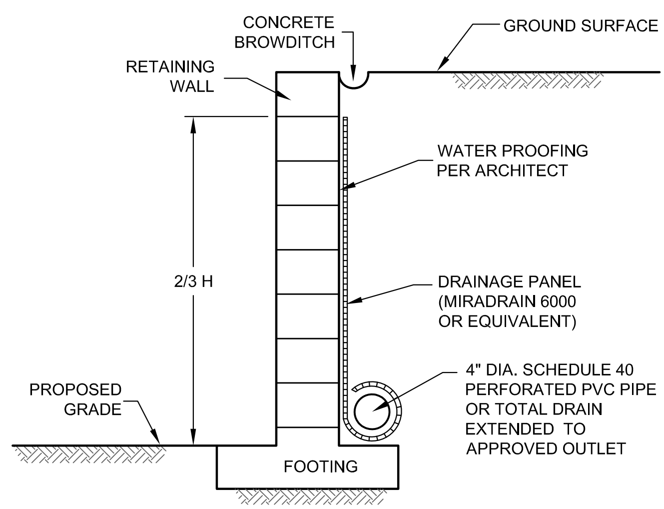
RM / AML		DSK/GTYPD	DATE 12 - 16 - 2016	PROJECT NO. G2059 - 42 - 01	FIG. 9

Plotted:12/15/2016 3:51PM | By:ALVIN LADRILLONO | File Location:Y:\PROJECTS\G2059-42-01 (9775 Towne Centre Dr)\DETAILS\Wall-Column Footing Dimension Detail (COLFOOT2).dwg







NOTE :

DRAIN SHOULD BE UNIFORMLY SLOPED TO GRAVITY OUTLET
OR TO A SUMP WHERE WATER CAN BE REMOVED BY PUMPING

NO SCALE

TYPICAL RETAINING WALL DRAIN DETAIL

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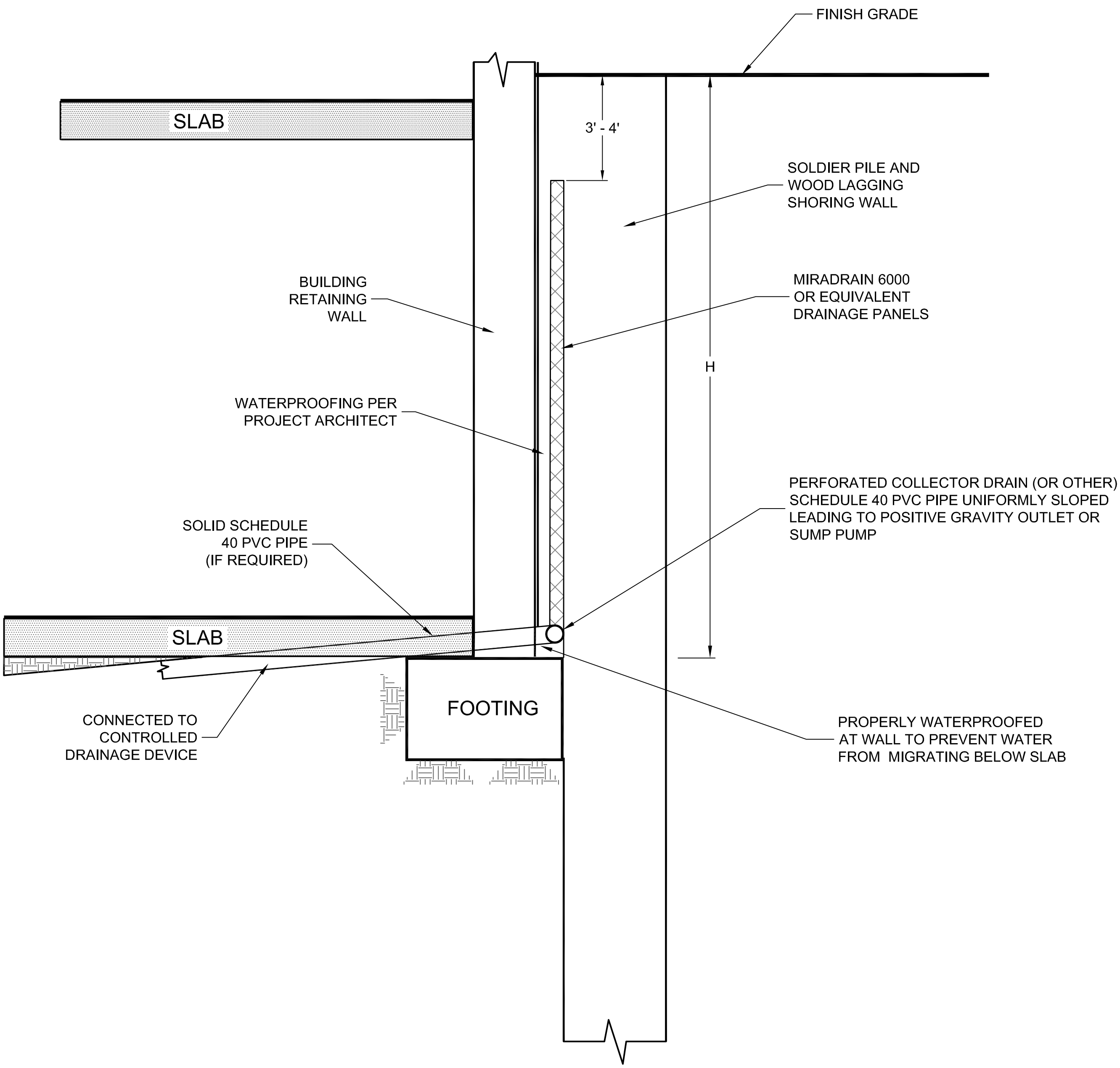
RM / AML		DSK/GTYPD	DATE 12 - 16 - 2016	PROJECT NO. G2059 - 42 - 01	FIG. 10

Plotted:12/15/2016 3:51PM | By:ALVIN LADRILLONO | File Location:Y:\PROJECTS\G2059-42-01 (9775 Towne Centre Dr)\DETAILS\Typical Retaining Wall Drainage Detail (RWDD7A).dwg



SOLDIER PILE WALL DRAINAGE DETAIL

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9775 TOWNE CENTRE DRIVE
SAN DIEGO, CALIFORNIA

RM / AML		DSK/GTYPD	DATE 12 - 16 - 2016	PROJECT NO. G2059 - 42 - 01	FIG. 11

APPENDIX A

APPENDIX A

FIELD INVESTIGATION

We performed the field investigation on November 21 and 22, 2016 and consisted of drilling five, small-diameter borings and four, 8-inch diameter infiltration test holes. The approximate locations of the exploratory borings and infiltration tests are shown on Figure 2.

The borings were drilled to depths ranging from approximately 18.5 to 70.5 feet below existing grade using a CME 75 drill rig equipped with 8-inch diameter hollow-stem augers. We obtained relatively undisturbed samples from the borings by driving a 3-inch-diameter, sampler 12 inches into the undisturbed soil mass with blows from a hammer weighing 140 pounds, dropped from a height of 30 inches. The sampler was lined with 1-inch by 2.5-inch-diameter brass rings to facilitate sampling. Bulk samples were also collected.

The soil conditions encountered in the borings were visually examined, classified, and logged in general accordance with American Society for Testing and Materials (ASTM) practice for Description and Identification of Soils (Visual-Manual Procedure D 2488). Logs of the exploratory borings are presented on Figures A-1 through A-5. The logs depict the soil and geologic conditions encountered and the depth at which samples were obtained.

PROJECT NO. G2059-42-01

BORING B 1

ELEV. (MSL.) **387'** DATE COMPLETED **11-21-2016**

EQUIPMENT **IR A-300** BY: **N. BORJA**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					6" **ASPHALT** Over 4" **BASE**			
	B1-1			CL	**UNDOCUMENTED FILL** Stiff, moist, olive brown, Sandy CLAY			
2				SM	**VERY OLD TERRACE DEPOSITS** Dense, moist, reddish brown to brown, Silty, fine to coarse SAND			
	B1-2					61		
4								
	B1-3				-Becomes medium dense to dense	44	108.9	11.0
6								
8					-Excavates with trace gravel at 8-9 feet			
10	B1-4					65	111.4	10.4
	B1-5							
12								
				ML	**ARDATH SHALE** Hard, damp, mottled gray and yellowish brown, Sandy SILTSTONE			
14								
	B1-6					100/9"	103.1	22.2
16	B1-7							
18								
20	B1-8					50/4"	106.1	18.6
22								
24				CL	Hard, moist, mottled, yellowish brown and light gray, Sandy to Silty CLAY			
	B1-9					50/5"	106.6	19.2
26								
28								
				SM/ML	Very dense, damp, mottled gray and yellowish brown, Silty, fine SAND to			

Figure A-1,
Log of Boring B 1, Page 1 of 3

G2059-42-01.GPJ

SAMPLE SYMBOLS			
	... SAMPLING UNSUCCESSFUL	... STANDARD PENETRATION TEST	... DRIVE SAMPLE (UNDISTURBED)
	... DISTURBED OR BAG SAMPLE	... CHUNK SAMPLE	... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G2059-42-01

BORING B 1

ELEV. (MSL.) **387'** DATE COMPLETED **11-21-2016**

EQUIPMENT **IR A-300** BY: **N. BORJA**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
30	B1-10				Sandy SILT	50/5"	104.0	19.4
				CH	Hard, moist, yellowish to olive brown, Silty, FAT CLAY; highly plastic			
32								
				SM	Very dense, damp, yellowish brown, Silty, fine SAND			
34								
	B1-11					50/3"		
36								
38								
					-Becomes mottled yellowish brown and gray			
40	B1-12					50/3.5"		
42								
44				SM/ML	Very dense, damp, mottled yellowish brown and light gray, Silty, fine SAND to Sandy SILT			
	B1-13					50/4"		
46								
					-Concretion encountered from 47-48 feet			
48				SM	Very dense, damp, light gray, Silty, fine to medium SAND			
50	B1-14					50/4.5"		
52								
54					-Excavates with lenses of Sandy SILT			
	B1-15					50/4.5"		
56								
58								
				ML	Hard, damp, mottled yellowish brown and light gray, Sandy SILT			

Figure A-1,
Log of Boring B 1, Page 2 of 3

G2059-42-01.GPJ

SAMPLE SYMBOLS			
	... SAMPLING UNSUCCESSFUL	... STANDARD PENETRATION TEST	... DRIVE SAMPLE (UNDISTURBED)
	... DISTURBED OR BAG SAMPLE	... CHUNK SAMPLE	... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G2059-42-01

BORING B 1

ELEV. (MSL.) 387' DATE COMPLETED 11-21-2016

EQUIPMENT IR A-300 BY: N. BORJA

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
60	B1-16					85/9"	108.1	18.7
62								
64					-Becomes gray			
66	B1-17					50/4"		
68				SM	Very dense, damp, gray, Silty, fine SAND; trace sea shells			
70	B1-18					50/4"		
					BORING TERMINATED AT 70.5 FEET Groundwater not encountered Backfilled with 23.7 ft³ of bentonite			

Figure A-1,
Log of Boring B 1, Page 3 of 3

G2059-42-01.GPJ

SAMPLE SYMBOLS			
	... SAMPLING UNSUCCESSFUL	... STANDARD PENETRATION TEST	... DRIVE SAMPLE (UNDISTURBED)
	... DISTURBED OR BAG SAMPLE	... CHUNK SAMPLE	... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G2059-42-01

BORING B 2

ELEV. (MSL.) **388'** DATE COMPLETED **11-21-2016**

EQUIPMENT **IR A-300** BY: **N. BORJA**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0	B2-1			CH	**UNDOCUMENTED FILL** Stiff, moist, dark olive brown to grayish brown, Sandy to Silty CLAY; highly plastic			
2	B2-2			CH	**VERY OLD TERRACE DEPOSITS** Very stiff to hard, moist, grayish brown, Silty CLAY; highly plastic	43		
4	B2-3			CL	Hard, moist, gray to grayish brown, Sandy CLAY	68		
6								
8				SM	Dense, moist, tan brown, Silty, fine to medium SAND			
10	B2-4				-Becomes mottled reddish brown and tan brown	76	113.2	7.4
12					-Excavates with trace gravel and cobble between 12 and 13 feet			
14								
16	B2-5					50/5"		
18	B2-6			SM	**ARDATH SHALE** Very dense, damp, mottled light gray and lights yellowish brown, Silty, fine SAND	50/5.5"		

BORING TERMINATED AT 19 FEET
Groundwater not encountered
Backfilled on 11/21/2016

Figure A-2,
Log of Boring B 2, Page 1 of 1

G2059-42-01.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

BORING B 3

ELEV. (MSL.) **386'** DATE COMPLETED **11-21-2016**

EQUIPMENT **IR A-300** BY: **J. LAYOG**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					6" **ASPHALT** Over 7.5" **BASE**			
	B3-1			SM	**VERY OLD TERRACE DEPOSITS** Loose, moist to wet, orange brown, Silty, fine to coarse SAND; trace mica and mafic staining			
	B3-2					10		
	B3-3					15	106.4	15.8
					-Becomes dense			
	B3-4				-Becomes very dense	78	106.6	16.1
					-Layer of rounded gravel approx. 6-inch thick			
	B3-5				-Becomes dense, fine grained	66		
				SM	**ARDATH SHALE** Very dense, moist, light gray and orange, Silty, fine SANDSTONE			
	B3-6					76		
				ML	Hard, moist, olive brown and yellowish brown, Silty to Clayey SILT			
	B3-7					50/5"	103.9	21.7

Depth scale: 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28

Figure A-3,
Log of Boring B 3, Page 1 of 2

G2059-42-01.GPJ

SAMPLE SYMBOLS	... SAMPLING UNSUCCESSFUL	... STANDARD PENETRATION TEST	... DRIVE SAMPLE (UNDISTURBED)
	... DISTURBED OR BAG SAMPLE	... CHUNK SAMPLE	... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

BORING B 3

ELEV. (MSL.) **386'** DATE COMPLETED **11-21-2016**

EQUIPMENT **IR A-300** BY: **J. LAYOG**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
30								
32								
34								
	B3-8					50/5"		
					BORING TERMINATED AT 35.5 FEET Groundwater not encountered Backfilled with 12.2 ft³ of bentonite on 11/22/2016			

Figure A-3,
Log of Boring B 3, Page 2 of 2

G2059-42-01.GPJ

SAMPLE SYMBOLS

- ... SAMPLING UNSUCCESSFUL
- ... STANDARD PENETRATION TEST
- ... DRIVE SAMPLE (UNDISTURBED)
- ... DISTURBED OR BAG SAMPLE
- ... CHUNK SAMPLE
- ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G2059-42-01

BORING B 4

ELEV. (MSL.) 386' DATE COMPLETED 11-21-2016

EQUIPMENT IR A-300 BY: J. LAYOG

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					6" **ASPHALT** Over 4" **BASE**			
	B4-1			CL	**UNDOCUMENTED FILL** Stiff, moist, dark brown, fine to medium Sandy CLAY; trace fine gravel			
2				SM	**VERY OLD TERRACE DEPOSITS** Very dense, moist, reddish brown to brown, Silty, fine to coarse SAND; trace fine gravel			
	B4-2					40		
4								
	B4-3					76/11"		
6								
8								
					-Becomes dense, damp, light brown, fine grained			
10	B4-4					74	96.4	8.0
12								
14								
	B4-5					77		
16				SM	**ARDATH SHALE** Very dense, moist, light brown and orange with black specks, Silty, fine SAND; trace silt; few gravel			
18	B4-6					50/4"		

BORING TERMINATED AT 18.5 FEET
Groundwater not encountered
Backfilled on 11/22/2016

Figure A-4,
Log of Boring B 4, Page 1 of 1

G2059-42-01.GPJ

SAMPLE SYMBOLS
- ... SAMPLING UNSUCCESSFUL
- ... STANDARD PENETRATION TEST
- ... DRIVE SAMPLE (UNDISTURBED)
- ... DISTURBED OR BAG SAMPLE
- ... CHUNK SAMPLE
- ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G2059-42-01

BORING B 5

ELEV. (MSL.) **387'** DATE COMPLETED **11-21-2016**

EQUIPMENT **IR A-300** BY: **J. LAYOG**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					3/4" **ASPHALT** Over 6" **BASE**			
	B5-1			SC	**UNDOCUMENTED FILL** Medium dense, moist, dark brown to brown, Clayey, fine to medium SAND			
2	B5-2			SM	**VERY OLD TERRACE DEPOSITS** Dense, moist, brown and orange, Silty, fine to medium SAND	77		
4				SM/ML	Dense, moist, light gray and orange with mafic staining, Silty, fine to medium, SANDSTONE to Sandy SILTSTONE			
	B5-3					77		
6				SM	Very dense, moist, reddish brown, Silty, fine to coarse SAND; trace silt			
8								
10	B5-4					76/11"		
12								
14					-Becomes fine grained			
	B5-5					54		
16								
					-Layer of gravel approx. 6-inch thick			
18				SM	**ARDATH SHALE** Very dense, moist, light gray and orange, Silty, fine SANDSTONE			
	B5-6					50/5"		

BORING TERMINATED AT 19 FEET
Groundwater not encountered
Backfilled on 11/22/2016

Figure A-5,
Log of Boring B 5, Page 1 of 1

G2059-42-01.GPJ

SAMPLE SYMBOLS			
	... SAMPLING UNSUCCESSFUL	... STANDARD PENETRATION TEST	... DRIVE SAMPLE (UNDISTURBED)
	... DISTURBED OR BAG SAMPLE	... CHUNK SAMPLE	... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

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APPENDIX B

APPENDIX B

LABORATORY TESTING

We performed the laboratory tests in accordance with the currently accepted versions of the generally accepted American Society for Testing Materials (ASTM) procedures or other suggested procedures. We tested selected soil samples for their in-place density and moisture content, shear strength, expansion index, R-value, pH and resistivity, water-soluble sulfate, and gradation. The results of our laboratory tests are presented on the following tables and graphs.

TABLE B-I
SUMMARY OF LABORATORY IN PLACE MOISTURE AND DENSITY TEST RESULTS

Boring and Sample No.	Depth (feet)	Dry Density (pcf)	Moisture Content (%)
B1-4	10	111.4	10.4
B1-8	20	106.1	18.6
B1-10	30	104.0	19.4
B2-5	10	113.2	7.4
B3-3	5	106.4	15.8
B3-4	10	106.6	16.0
B3-7	25	103.9	21.7

TABLE B-II
SUMMARY OF LABORATORY DIRECT SHEAR TEST RESULTS
ASTM D 3080

Boring No.	Depth (feet)	Dry Density (pcf)	Moisture Content (%)		Unit Cohesion (psf)	Angle of Shear Resistance (degrees)
			Initial	Final		
B1-3	5	108.9	11.0	15.4	580	29
B1-6	15	103.1	22.2	24.8	690	36
B1-9	25	106.6	19.2	21.3	290	45
B1-16	60	108.1	18.7	22.9	300	39
B4-4	10	96.4	8.0	22.9	600	24

[1] Ultimate at end of test at 0.2 inch deflection.

TABLE B-III
SUMMARY OF LABORATORY EXPANSION INDEX TEST RESULTS
ASTM D 4829

Boring No.	Moisture Content (%)		Dry Density (pcf)	Expansion Index	Expansion Classification
	Before Test	After Test			
B1-5	8.8	14.1	114.7	5	Very Low
B2-1	12.4	26.4	99.3	114	High
B3-1	8.5	18.2	112.4	12	Very Low

TABLE B-IV
SUMMARY OF LABORATORY WATER-SOLUBLE SULFATE TEST RESULTS
CALIFORNIA TEST NO. 417

Boring No.	Water-Soluble Sulfate (%)	Sulfate Severity	Sulfate Class
B1-5	0.027	Not Applicable	S0
B3-1	0.021	Not Applicable	S0

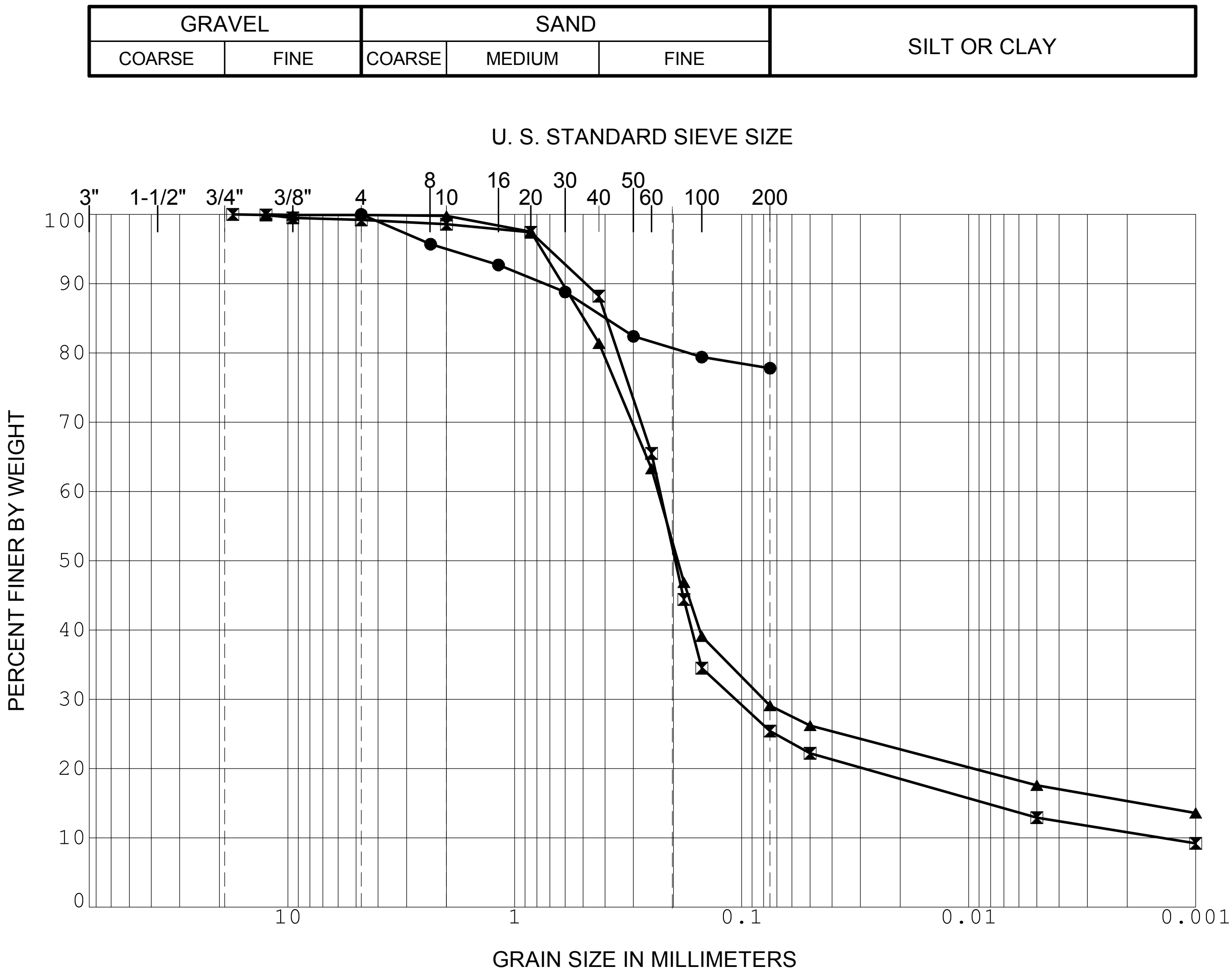
TABLE B-V
SUMMARY OF LABORATORY POTENTIAL OF HYDROGEN (PH) AND RESISTIVITY TEST RESULTS
CALIFORNIA TEST NO. 643

Boring No.	Depth (feet)	pH	Minimum Resistivity (ohm-centimeters)
B1-5	10 – 15	8.1	2,200

TABLE B-VI
SUMMARY OF LABORATORY RESISTANCE VALUE (R-VALUE) TEST RESULTS
ASTM D 2844

Sample No.	R-Value
B4-1	0

PROJECT NO. G2059-42-01



	SAMPLE	DEPTH (ft)	CLASSIFICATION	NAT WC	LL	PL	PI
●	B2-1	1.0	(CL) Lean CLAY with sand				
⧗	I-2	0.0	(SC) Clayey Sand				
▲	I-4	0.0	(SC) Clayey Sand				

GRADATION CURVE

9775 TOWNE CENTRE DRIVE

SAN DIEGO, CALIFORNIA

G2059-42-01.GPJ

Figure B-1

GEOCON

APPENDIX C

APPENDIX C

STORM WATER MANAGEMENT

If storm water management devices are not properly designed and constructed, there is a risk for distress to improvements and properties located hydrologically down gradient or adjacent to these devices. Factors such as the amount of water being detained, its residence time, and soil permeability have an important effect on seepage transmission and the potential adverse impacts that may occur if the storm water management features are not properly designed and constructed. We have not performed a hydrogeological study at the site. If infiltration of storm water runoff into the subsurface occurs, downstream improvements may be subjected to seeps, springs, slope instability, raised groundwater, movement of foundations and slabs, or other undesirable impacts as a result of water infiltration.

Hydrologic Soil Group

The United States Department of Agriculture (USDA), Natural Resources Conservation Services, provides general information regarding soil conditions for areas within the United States. The USDA website also provides the Hydrologic Soil Group. Table C-1 presents the descriptions of the hydrologic soil groups. If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

TABLE C-1
HYDROLOGIC SOIL GROUP DEFINITIONS

Soil Group	Soil Group Definition
A	Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.
B	Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.
C	Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.
D	Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

The subject property is underlain by very old terrace deposits and the Ardath Formation. The subject site falls within Hydraulic Soil Groups C and D, which have a very slow infiltration rating. Table C-2 presents the information from the USDA website for the property.

TABLE C-2
USDA WEB SOIL SURVEY – HYDROLOGIC SOIL GROUP

Map Unit Name	Map Unit Symbol	Approximate Percentage of Property	Hydrologic Soil Group
Altamont clay, 30 to 50 percent slopes	AtF	5.5	C
Chesterton fine sandy loam, 5 to percent slopes	CfC	94.5	D

In-Situ Testing

We performed 4 field-saturated, hydraulic conductivity tests at the site using a Soil Moisture Corp Aardvark Permeameter at the locations presented on the Geologic Map, Figure 2. All of the borings were drilled with a small-diameter drill rig using an 8-inch auger. Table C-3 presents the results of the saturated hydraulic conductivity testing.

We used the guidelines presented in the Riverside County Low Impact Development BMP Design Handbook which references the United States Bureau of Reclamation Well Permeameter Test Method (USBR 7300-89). Based on this widely accepted guideline, the saturated hydraulic conductivity (Ksat) is equal to the infiltration rate. Therefore, the Ksat value determined from the Aardvark Permeameter test is the unfactored infiltration rate. The Ksat (infiltration rate) equation provided in the Riverside County Handbook was used to compute the unfactored infiltration rate.

TABLE C-3
UNFACTORED, FIELD-SATURATED, INFILTRATION TEST RESULTS
USING THE SOILMOISTURE CORP AARDVARK PERMEAMETER

Test No.	Depth (feet)	Geologic Unit	Field Infiltration Rate, I (inches/hour)
I-1	4.2	Qvop	0.004
I-2	4.3	Qvop	0.003
I-3	3.6	Qvop	0.001
I-4	3.9	Qvop	0.001

Soil permeability values from in-situ tests can vary significantly from one location to another due to the non-homogeneous characteristics inherent to most soil. However, if a sufficient amount of field and laboratory test data is obtained, a general trend of soil permeability can usually be evaluated. For this project and for storm water purposes, the test results presented herein should be considered approximate values.

STORM WATER MANAGEMENT CONCLUSIONS

Soil Types

Very Old Terrace Deposits – Old Terrace Deposits underlie the site. Based on our exploratory borings and laboratory testing, the very old terrace deoists are comprised of very dense silty sand and very stiff sandy to silty clay. Because of the dense and stiff nature of this soil, there is a high potential for lateral water migration. Additionally, the rates indicate the soils are not suitable for full or partial infiltration.

Infiltration Rates

The results of the testing show infiltration rates ranging from approximately 0.0011 to 0.004 inches per hour. The rates are not high enough to support full or partial infiltration.

Groundwater

Groundwater was not encountered during our geotechnical investigation. We expect groundwater is at a depth greater than 100 feet below current grades. Groundwater is not a constraint for storm water infiltration.

Soil or Groundwater Contamination

We are unaware of contaminated soil or groundwater on the property. Therefore, infiltration associated with this risk is considered feasible.

Storm Water Management Devices

Liners and subdrains are recommended in the design and construction of the planned storm water devices. The liners should be impermeable (e.g. High-density polyethylene, HDPE, with a thickness of about 30 mil or equivalent Polyvinyl Chloride**,** PVC) to prevent water migration. The subdrains should be perforated within the liner area, installed at the base and above the liner, be at least 3 inches in diameter and consist of Schedule 40 PVC pipe. The subdrains outside of the liner should consist of solid pipe. The penetration of the liners at the subdrains should be properly waterproofed. The subdrains should be connected to a proper outlet. The devices should also be installed in accordance with the manufacturer's recommendations.

Storm Water Standard Worksheets

The SWS requests the geotechnical engineer complete the *Categorization of Infiltration Feasibility Condition* (Worksheet C.4-1 or I-8) worksheet information to help evaluate the potential for infiltration on the property. The attached Worksheet C.4-1 presents the completed information for the submittal process.

The regional storm water standards also have a worksheet (Worksheet D.5-1 or Form I-9) that helps the project civil engineer estimate the factor of safety based on several factors. Table C-4 describes the suitability assessment input parameters related to the geotechnical engineering aspects for the factor of safety determination.

TABLE C-4
SUITABILITY ASSESSMENT RELATED CONSIDERATIONS FOR INFILTRATION FACILITY SAFETY FACTORS

Consideration	High Concern – 3 Points	Medium Concern – 2 Points	Low Concern – 1 Point
Assessment Methods	Use of soil survey maps or simple texture analysis to estimate short-term infiltration rates. Use of well permeameter or borehole methods without accompanying continuous boring log. Relatively sparse testing with direct infiltration methods	Use of well permeameter or borehole methods with accompanying continuous boring log. Direct measurement of infiltration area with localized infiltration measurement methods (e.g., infiltrometer). Moderate spatial resolution	Direct measurement with localized (i.e. small-scale) infiltration testing methods at relatively high resolution or use of extensive test pit infiltration measurement methods.
Predominant Soil Texture	Silty and clayey soils with significant fines	Loamy soils	Granular to slightly loamy soils
Site Soil Variability	Highly variable soils indicated from site assessment or unknown variability	Soil boring/test pits indicate moderately homogenous soils	Soil boring/test pits indicate relatively homogenous soils
Depth to Groundwater/ Impervious Layer	<5 feet below facility bottom	5-15 feet below facility bottom	>15 feet below facility bottom

Table C-5 presents the estimated factor values for the evaluation of the factor of safety. The factor of safety is determined using the information contained in Table C-4 and the results of our geotechnical investigation. Table C-5 only presents the suitability assessment safety factor (Part A) of the worksheet. The project civil engineer should evaluate the safety factor for design (Part B of Worksheet D.5-1) and use the combined safety factor for the design infiltration rate.

TABLE C-5
FACTOR OF SAFETY WORKSHEET D.5-1 DESIGN VALUES – PART A[1]

Suitability Assessment Factor Category	Assigned Weight (w)	Factor Value (v)	Product (p = w x v)
Assessment Methods	0.25	2	0.50
Predominant Soil Texture	0.25	3	0.75
Site Soil Variability	0.25	2	0.50
Depth to Groundwater/Impervious Layer	0.25	1	0.25
Suitability Assessment Safety Factor, $S_A = \Sigma p$			2.0

[1] The project civil engineer should complete Worksheet D.5-1 or Form I-9 to determine the overall factor of safety.

CONCLUSIONS

Our results indicate the site has very dense and very still sols that inhibit infiltration. Because of these site conditions, it is our opinion that there is a high probability for lateral water migration. It is our opinion that full and partial infiltration is infeasible on this site. Liners and subdrains should be installed within BMP areas.

GEOCON

Aardvark Permeameter Data Analysis

Project Name:	9775 Towne Centre Drive	Date:	11/21/2016
Project Number:	G2059-42-01	By:	JTL
Borehole Location:	I-1	Ref. EL (feet, MSL):	389.0
		Bottom EL (feet, MSL):	384.8

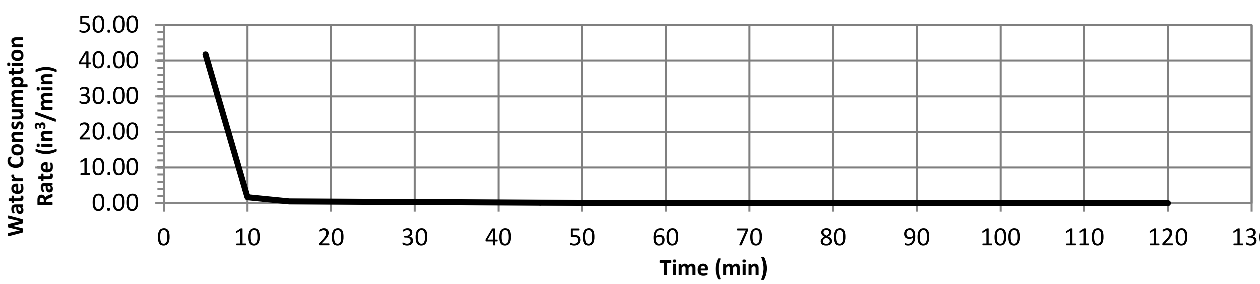
Borehole Diameter (inches):	8.00
Borehole Depth, **H** (inches):	50.00
Distance Between Reservoir & Top of Borehole (inches):	29.50
Depth to Water Table, **s** (feet):	100
Height APM Raised from Bottom (inches):	1.00

Wetted Area, **A** (in^2): 169.33

Distance Between Resevoir and APM, **D** (inches):	71.25
Head Height Calculated, **h** (inches):	4.74
Head Height Recorded, **h** (inches):	4.25
Distance Between Constant Head and Water Table, **L** (inches):	1155

Reading	Time (min)	Time Elapsed (min)	Reservoir Water Weight (g)	Resevoir Water Weight (lbs)	Interval Water Consumption (lbs)	Total Water Consumption (lbs)	*Water Consumption Rate (in^3/min)
1	0.00			23.370			
2	5.00	5.00		15.835	7.535	7.535	41.772
3	10.00	5.00		15.540	0.295	7.830	1.635
4	15.00	5.00		15.445	0.095	7.925	0.527
5	45.00	30.00		15.260	0.185	8.110	0.171
6	60.00	15.00		15.245	0.015	8.125	0.028
7	75.00	15.00		15.230	0.015	8.140	0.028
8	90.00	15.00		15.220	0.010	8.150	0.018
9	105.00	15.00		15.210	0.010	8.160	0.018
10	120.00	15.00		15.200	0.010	8.170	0.018
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							

Steady Flow Rate, Q (in^3/min): 0.018



Field-Saturated Hydraulic Conductivity (Infiltration Rate)

Case 1: L/h > 3 K_{sat} = 7.10E-05 in/min 0.004 in/hr

GEOCON

Aardvark Permeameter Data Analysis

Project Name:	9775 Towne Centre Drive	Date:	11/21/2016
Project Number:	G2059-42-01	By:	JTL
Borehole Location:	I-2	Ref. EL (feet, MSL):	385.0
		Bottom EL (feet, MSL):	380.7

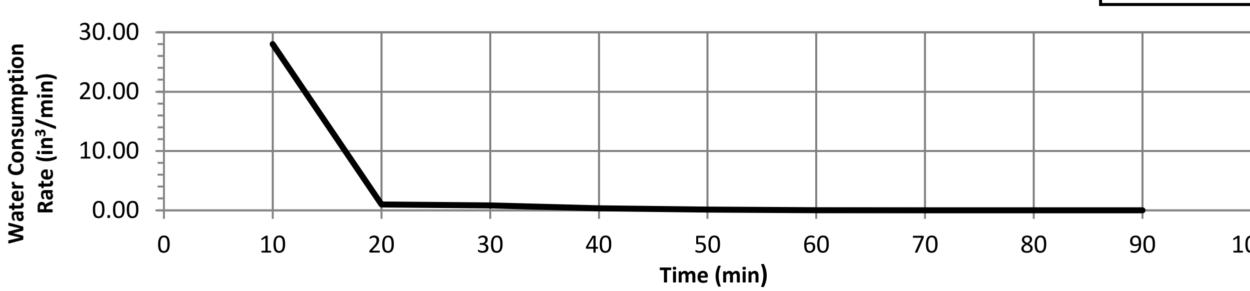
Borehole Diameter (inches):	8.00
Borehole Depth, **H** (inches):	52.00
Distance Between Reservoir & Top of Borehole (inches):	29.50
Depth to Water Table, **s** (feet):	100
Height APM Raised from Bottom (inches):	2.00

Wetted Area, **A** (in^2): 194.55

Distance Between Resevoir and APM, **D** (inches):	72.25
Head Height Calculated, **h** (inches):	5.74
Head Height Recorded, **h** (inches):	5.25
Distance Between Constant Head and Water Table, **L** (inches):	1154

Reading	Time (min)	Time Elapsed (min)	Reservoir Water Weight (g)	Resevoir Water Weight (lbs)	Interval Water Consumption (lbs)	Total Water Consumption (lbs)	*Water Consumption Rate (in^3/min)
1	0.00			24.130			
2	10.00	10.00		14.025	10.105	10.105	28.010
3	20.00	10.00		13.660	0.365	10.470	1.012
4	30.00	10.00		13.350	0.310	10.780	0.859
5	40.00	10.00		13.220	0.130	10.910	0.360
6	50.00	10.00		13.170	0.050	10.960	0.139
7	60.00	10.00		13.155	0.015	10.975	0.042
8	70.00	10.00		13.150	0.005	10.980	0.014
9	80.00	10.00		13.145	0.005	10.985	0.014
10	90.00	10.00		13.140	0.005	10.990	0.014
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							

Steady Flow Rate, Q (in^3/min): 0.014



Field-Saturated Hydraulic Conductivity (Infiltration Rate)

Case 1: L/h > 3 K_{sat} = 4.26E-05 in/min 0.003 in/hr

Aardvark Permeameter Data Analysis

Project Name:	9775 Towne Centre Drive	Date:	11/21/2016
Project Number:	G2059-42-01	By:	JTL
Borehole Location:	I-3	Ref. EL (feet, MSL):	384.0
		Bottom EL (feet, MSL):	380.4

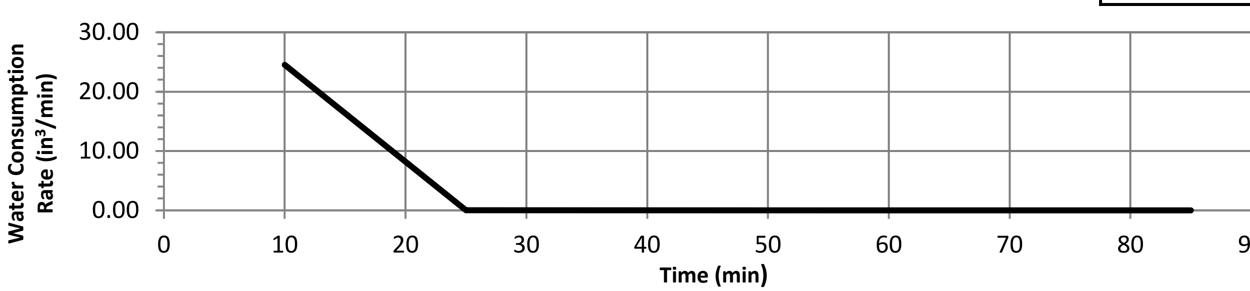
Borehole Diameter (inches):	8.00
Borehole Depth, **H** (inches):	43.00
Distance Between Reservoir & Top of Borehole (inches):	29.50
Depth to Water Table, **s** (feet):	100
Height APM Raised from Bottom (inches):	2.00

Wetted Area, **A** (in^2): 193.79

Distance Between Resevoir and APM, **D** (inches):	63.25
Head Height Calculated, **h** (inches):	5.71
Head Height Recorded, **h** (inches):	5.13
Distance Between Constant Head and Water Table, **L** (inches):	1163

Reading	Time (min)	Time Elapsed (min)	Reservoir Water Weight (g)	Resevoir Water Weight (lbs)	Interval Water Consumption (lbs)	Total Water Consumption (lbs)	*Water Consumption Rate (in^3/min)
1	0.00			24.600			
2	10.00	10.00		15.755	8.845	8.845	24.517
3	25.00	15.00		15.750	0.005	8.850	0.009
4	55.00	30.00		15.745	0.005	8.855	0.005
5	85.00	30.00		15.740	0.005	8.860	0.005
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							

Steady Flow Rate, Q (in^3/min): 0.005



Field-Saturated Hydraulic Conductivity (Infiltration Rate)

Case 1: L/h > 3 K_{sat} = 1.43E-05 in/min 0.001 in/hr

GEOCON

Aardvark Permeameter Data Analysis

Project Name:	9775 Towne Centre Drive	Date:	11/21/2016
Project Number:	G2059-42-01	By:	JTL
Borehole Location:	I-4	Ref. EL (feet, MSL):	386.0
		Bottom EL (feet, MSL):	382.1

Borehole Diameter (inches):	8.00
Borehole Depth, **H** (inches):	47.00
Distance Between Reservoir & Top of Borehole (inches):	29.50
Depth to Water Table, **s** (feet):	100
Height APM Raised from Bottom (inches):	2.00

Wetted Area, **A** (in^2): 194.13

Distance Between Resevoir and APM, **D** (inches):	67.25
Head Height Calculated, **h** (inches):	5.72
Head Height Recorded, **h** (inches):	5.25
Distance Between Constant Head and Water Table, **L** (inches):	1159

Reading	Time (min)	Time Elapsed (min)	Reservoir Water Weight (g)	Resevoir Water Weight (lbs)	Interval Water Consumption (lbs)	Total Water Consumption (lbs)	*Water Consumption Rate (in^3/min)
1	0.00			24.890			
2	10.00	10.00		16.135	8.755	8.755	24.268
3	20.00	10.00		16.110	0.025	8.780	0.069
4	30.00	10.00		16.090	0.020	8.800	0.055
5	40.00	10.00		16.065	0.025	8.825	0.069
6	50.00	10.00		16.045	0.020	8.845	0.055
7	60.00	10.00		16.025	0.020	8.865	0.055
8	70.00	10.00		16.020	0.005	8.870	0.014
9	90.00	20.00		16.015	0.005	8.875	0.007
10	110.00	20.00		16.010	0.005	8.880	0.007
11							
12							
13							
14							
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18							
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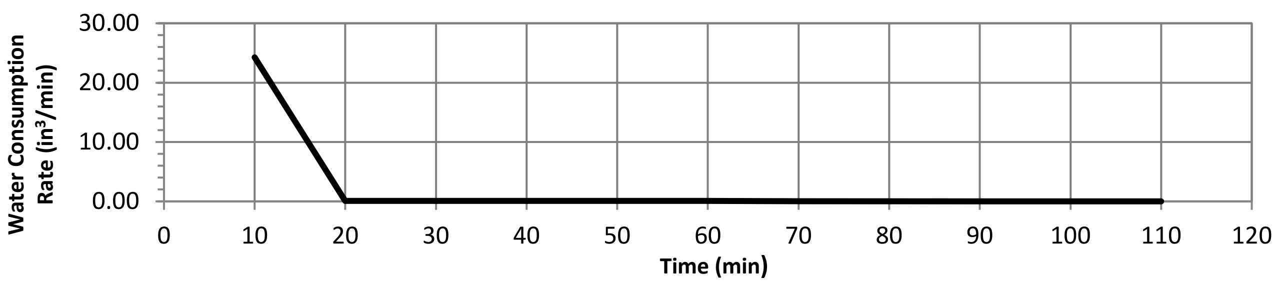
Steady Flow Rate, Q (in^3/min): 0.007



Field-Saturated Hydraulic Conductivity (Infiltration Rate)

Case 1: L/h > 3 K_{sat} = 2.14E-05 in/min 0.001 in/hr

Categorization of Infiltration Feasibility Condition			Worksheet C.4-1
Part 1 - Full Infiltration Feasibility Screening Criteria **Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?**			
Criteria	Screening Question	Yes	No
1	**Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		X
Provide basis: We performed 4 infiltration tests in the very old terrace deposits. The results of the infiltration rates are the following: I-1: 0.004 in/hr; I-3: 0.001 in/hr I-2: 0.003 in/hr I-4: 0.001 in/hr This shows the soil does not have an estimated reliable infiltration rate greater than 0.5 inches per hour.			
2	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		X
Provide basis: The site in underlain by very old terrace deposits. Based on the comprehensive study presented in the geotechnical report, infiltration could not be incorporated without increasing the risk of lateral water migration to adjacent properties and streets.			

Worksheet C.4-1 Page 2 of 4			
Criteria	Screening Question	**Yes**	**No**
3	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis: Based on information obtained during our study, groundwater is at a depth of at least 70 feet below the existing ground surface.			
4	**Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis: Infiltration is not anticipated to have a negative impact on nearby water balance or discharge of contaminated groundwater to surface waters.			
Part 1 Result*	If all answers to rows 1 - 4 are "**Yes**" a full infiltration design is potentially feasible. The feasibility screening category is **Full Infiltration** If any answer from row 1-4 is "**No**", infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design. Proceed to Part 2		Full Infiltration is not feasible

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by the City to substantiate findings.

<table>
<tr><th colspan="4">Worksheet C.4-1 Page 3 of 4</th></tr>
<tr><td colspan="4"><u>Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria</u>

Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?</td></tr>
<tr><td>Criteria</td><td>Screening Question</td><td>Yes</td><td>No</td></tr>
<tr><td>5</td><td>Do soil and geologic conditions allow for infiltration in any appreciable rate or volume? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.</td><td></td><td>X</td></tr>
<tr><td colspan="4">Provide basis:

The unfactored infiltration rates are:

I-1: 0.004 in/hr
I-2: 0.003 in/hr
I-3: 0.001 in/hr
I-4: 0.001 in/hr

The infiltration rates are less than 0.01. Therefore, the site is not feasible for infiltration.</td></tr>
<tr><td>6</td><td>Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.</td><td></td><td>X</td></tr>
<tr><td colspan="4">Provide basis:

The site in underlain by very old terrace deposits. Based on the comprehensive study presented in the geotechnical report, infiltration could not be incorporated without increasing the risk of lateral water migration to adjacent properties and streets.</td></tr>
</table>

Worksheet C.4-1 Page 4 of 4			
Criteria	Screening Question	Yes	No
7	**Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis: Based on information obtained from our geotechnical investigation, groundwater is at a depth of at least 70 feet below the existing ground surface. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
8	**Can infiltration be allowed without violating downstream water rights**? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis: We are unaware of any downstream water rights that could be impacted from infiltration. The project civil engineer should confirm.			
Part 2 Result*	If all answers from row 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is **Partial Infiltration.** If any answer from row 5-8 is no, then infiltration of any volume is considered to be **infeasible** within the drainage area. The feasibility screening category is **No Infiltration.**		Partial Infiltration is not feasible

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by the City to substantiate findings.

APPENDIX D

APPENDIX D

RECOMMENDED GRADING SPECIFICATIONS

FOR

9775 TOWNE CENTRE DRIVE
SAN DIEGO, CALIFORNIA

DECEMBER 16, 2016
PROJECT NO. G2059-42-01

RECOMMENDED GRADING SPECIFICATIONS

1. GENERAL

1.1 These Recommended Grading Specifications shall be used in conjunction with the Geotechnical Report for the project prepared by Geocon. The recommendations contained in the text of the Geotechnical Report are a part of the earthwork and grading specifications and shall supersede the provisions contained hereinafter in the case of conflict.

1.2 Prior to the commencement of grading, a geotechnical consultant (Consultant) shall be employed for the purpose of observing earthwork procedures and testing the fills for substantial conformance with the recommendations of the Geotechnical Report and these specifications. The Consultant should provide adequate testing and observation services so that they may assess whether, in their opinion, the work was performed in substantial conformance with these specifications. It shall be the responsibility of the Contractor to assist the Consultant and keep them apprised of work schedules and changes so that personnel may be scheduled accordingly.

1.3 It shall be the sole responsibility of the Contractor to provide adequate equipment and methods to accomplish the work in accordance with applicable grading codes or agency ordinances, these specifications and the approved grading plans. If, in the opinion of the Consultant, unsatisfactory conditions such as questionable soil materials, poor moisture condition, inadequate compaction, and/or adverse weather result in a quality of work not in conformance with these specifications, the Consultant will be empowered to reject the work and recommend to the Owner that grading be stopped until the unacceptable conditions are corrected.

2. DEFINITIONS

2.1 **Owner** shall refer to the owner of the property or the entity on whose behalf the grading work is being performed and who has contracted with the Contractor to have grading performed.

2.2 **Contractor** shall refer to the Contractor performing the site grading work.

2.3 **Civil Engineer** or **Engineer of Work** shall refer to the California licensed Civil Engineer or consulting firm responsible for preparation of the grading plans, surveying and verifying as-graded topography.

2.4 **Consultant** shall refer to the soil engineering and engineering geology consulting firm retained to provide geotechnical services for the project.

2.5 **Soil Engineer** shall refer to a California licensed Civil Engineer retained by the Owner, who is experienced in the practice of geotechnical engineering. The Soil Engineer shall be responsible for having qualified representatives on-site to observe and test the Contractor's work for conformance with these specifications.

2.6 **Engineering Geologist** shall refer to a California licensed Engineering Geologist retained by the Owner to provide geologic observations and recommendations during the site grading.

2.7 **Geotechnical Report** shall refer to a soil report (including all addenda) which may include a geologic reconnaissance or geologic investigation that was prepared specifically for the development of the project for which these Recommended Grading Specifications are intended to apply.

3. MATERIALS

3.1 Materials for compacted fill shall consist of any soil excavated from the cut areas or imported to the site that, in the opinion of the Consultant, is suitable for use in construction of fills. In general, fill materials can be classified as *soil* fills, *soil-rock* fills or *rock* fills, as defined below.

3.1.1 **Soil fills** are defined as fills containing no rocks or hard lumps greater than 12 inches in maximum dimension and containing at least 40 percent by weight of material smaller than ¾ inch in size.

3.1.2 **Soil-rock fills** are defined as fills containing no rocks or hard lumps larger than 4 feet in maximum dimension and containing a sufficient matrix of soil fill to allow for proper compaction of soil fill around the rock fragments or hard lumps as specified in Paragraph 6.2. **Oversize rock** is defined as material greater than 12 inches.

3.1.3 **Rock fills** are defined as fills containing no rocks or hard lumps larger than 3 feet in maximum dimension and containing little or no fines. Fines are defined as material smaller than ¾ inch in maximum dimension. The quantity of fines shall be less than approximately 20 percent of the rock fill quantity.

3.2 Material of a perishable, spongy, or otherwise unsuitable nature as determined by the Consultant shall not be used in fills.

3.3 Materials used for fill, either imported or on-site, shall not contain hazardous materials as defined by the California Code of Regulations, Title 22, Division 4, Chapter 30, Articles 9 and 10; 40CFR; and any other applicable local, state or federal laws. The Consultant shall not be responsible for the identification or analysis of the potential presence of hazardous materials. However, if observations, odors or soil discoloration cause Consultant to suspect the presence of hazardous materials, the Consultant may request from the Owner the termination of grading operations within the affected area. Prior to resuming grading operations, the Owner shall provide a written report to the Consultant indicating that the suspected materials are not hazardous as defined by applicable laws and regulations.

3.4 The outer 15 feet of *soil-rock* fill slopes, measured horizontally, should be composed of properly compacted *soil* fill materials approved by the Consultant. *Rock* fill may extend to the slope face, provided that the slope is not steeper than 2:1 (horizontal:vertical) and a soil layer no thicker than 12 inches is track-walked onto the face for landscaping purposes. This procedure may be utilized provided it is acceptable to the governing agency, Owner and Consultant.

3.5 Samples of soil materials to be used for fill should be tested in the laboratory by the Consultant to determine the maximum density, optimum moisture content, and, where appropriate, shear strength, expansion, and gradation characteristics of the soil.

3.6 During grading, soil or groundwater conditions other than those identified in the Geotechnical Report may be encountered by the Contractor. The Consultant shall be notified immediately to evaluate the significance of the unanticipated condition.

4. CLEARING AND PREPARING AREAS TO BE FILLED

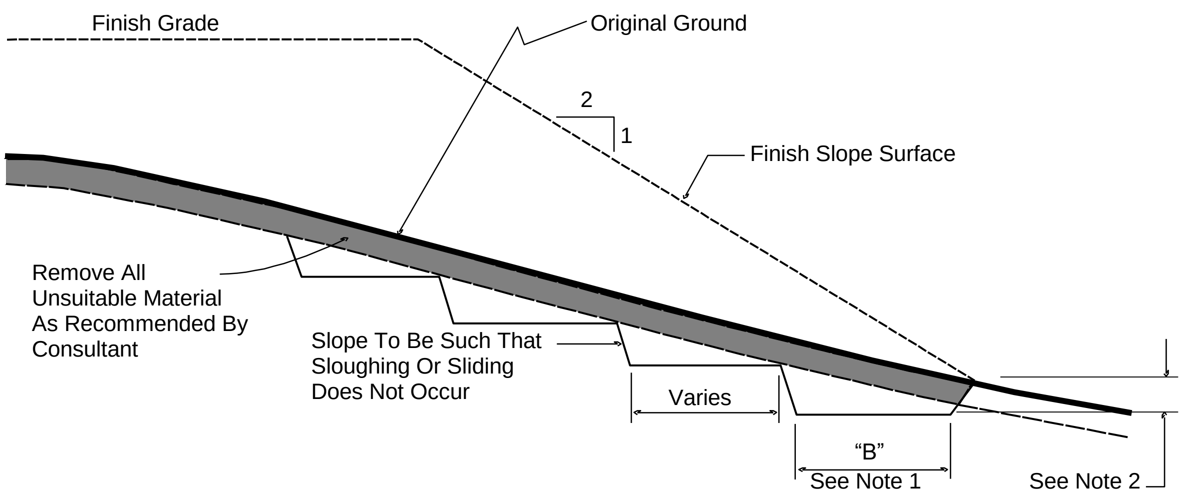
4.1 Areas to be excavated and filled shall be cleared and grubbed. Clearing shall consist of complete removal above the ground surface of trees, stumps, brush, vegetation, man-made structures, and similar debris. Grubbing shall consist of removal of stumps, roots, buried logs and other unsuitable material and shall be performed in areas to be graded. Roots and other projections exceeding 1½ inches in diameter shall be removed to a depth of 3 feet below the surface of the ground. Borrow areas shall be grubbed to the extent necessary to provide suitable fill materials.

4.2 Asphalt pavement material removed during clearing operations should be properly disposed at an approved off-site facility or in an acceptable area of the project evaluated by Geocon and the property owner. Concrete fragments that are free of reinforcing steel may be placed in fills, provided they are placed in accordance with Section 6.2 or 6.3 of this document.

4.3 After clearing and grubbing of organic matter and other unsuitable material, loose or porous soils shall be removed to the depth recommended in the Geotechnical Report. The depth of removal and compaction should be observed and approved by a representative of the Consultant. The exposed surface shall then be plowed or scarified to a minimum depth of 6 inches and until the surface is free from uneven features that would tend to prevent uniform compaction by the equipment to be used.

4.4 Where the slope ratio of the original ground is steeper than 5:1 (horizontal:vertical), or where recommended by the Consultant, the original ground should be benched in accordance with the following illustration.

TYPICAL BENCHING DETAIL



No Scale

DETAIL NOTES: (1) Key width "B" should be a minimum of 10 feet, or sufficiently wide to permit complete coverage with the compaction equipment used. The base of the key should be graded horizontal, or inclined slightly into the natural slope.

(2) The outside of the key should be below the topsoil or unsuitable surficial material and at least 2 feet into dense formational material. Where hard rock is exposed in the bottom of the key, the depth and configuration of the key may be modified as approved by the Consultant.

4.5 After areas to receive fill have been cleared and scarified, the surface should be moisture conditioned to achieve the proper moisture content, and compacted as recommended in Section 6 of these specifications.

5. COMPACTION EQUIPMENT

5.1 Compaction of *soil* or *soil-rock* fill shall be accomplished by sheepsfoot or segmented-steel wheeled rollers, vibratory rollers, multiple-wheel pneumatic-tired rollers, or other types of acceptable compaction equipment. Equipment shall be of such a design that it will be capable of compacting the *soil* or *soil-rock* fill to the specified relative compaction at the specified moisture content.

5.2 Compaction of *rock* fills shall be performed in accordance with Section 6.3.

6. PLACING, SPREADING AND COMPACTION OF FILL MATERIAL

6.1 *Soil* fill, as defined in Paragraph 3.1.1, shall be placed by the Contractor in accordance with the following recommendations:

6.1.1 *Soil* fill shall be placed by the Contractor in layers that, when compacted, should generally not exceed 8 inches. Each layer shall be spread evenly and shall be thoroughly mixed during spreading to obtain uniformity of material and moisture in each layer. The entire fill shall be constructed as a unit in nearly level lifts. Rock materials greater than 12 inches in maximum dimension shall be placed in accordance with Section 6.2 or 6.3 of these specifications.

6.1.2 In general, the *soil* fill shall be compacted at a moisture content at or above the optimum moisture content as determined by ASTM D 1557.

6.1.3 When the moisture content of *soil* fill is below that specified by the Consultant, water shall be added by the Contractor until the moisture content is in the range specified.

6.1.4 When the moisture content of the *soil* fill is above the range specified by the Consultant or too wet to achieve proper compaction, the *soil* fill shall be aerated by the Contractor by blading/mixing, or other satisfactory methods until the moisture content is within the range specified.

6.1.5 After each layer has been placed, mixed, and spread evenly, it shall be thoroughly compacted by the Contractor to a relative compaction of at least 90 percent. Relative compaction is defined as the ratio (expressed in percent) of the in-place dry density of the compacted fill to the maximum laboratory dry density as determined in accordance with ASTM D 1557. Compaction shall be continuous over the entire area, and compaction equipment shall make sufficient passes so that the specified minimum relative compaction has been achieved throughout the entire fill.

6.1.6 Where practical, soils having an Expansion Index greater than 50 should be placed at least 3 feet below finish pad grade and should be compacted at a moisture content generally 2 to 4 percent greater than the optimum moisture content for the material.

6.1.7 Properly compacted *soil* fill shall extend to the design surface of fill slopes. To achieve proper compaction, it is recommended that fill slopes be over-built by at least 3 feet and then cut to the design grade. This procedure is considered preferable to track-walking of slopes, as described in the following paragraph.

6.1.8 As an alternative to over-building of slopes, slope faces may be back-rolled with a heavy-duty loaded sheepsfoot or vibratory roller at maximum 4-foot fill height intervals. Upon completion, slopes should then be track-walked with a D-8 dozer or similar equipment, such that a dozer track covers all slope surfaces at least twice.

6.2 *Soil-rock* fill, as defined in Paragraph 3.1.2, shall be placed by the Contractor in accordance with the following recommendations:

6.2.1 Rocks larger than 12 inches but less than 4 feet in maximum dimension may be incorporated into the compacted *soil* fill, but shall be limited to the area measured 15 feet minimum horizontally from the slope face and 5 feet below finish grade or 3 feet below the deepest utility, whichever is deeper.

6.2.2 Rocks or rock fragments up to 4 feet in maximum dimension may either be individually placed or placed in windrows. Under certain conditions, rocks or rock fragments up to 10 feet in maximum dimension may be placed using similar methods. The acceptability of placing rock materials greater than 4 feet in maximum dimension shall be evaluated during grading as specific cases arise and shall be approved by the Consultant prior to placement.

6.2.3 For individual placement, sufficient space shall be provided between rocks to allow for passage of compaction equipment.

6.2.4 For windrow placement, the rocks should be placed in trenches excavated in properly compacted *soil* fill. Trenches should be approximately 5 feet wide and 4 feet deep in maximum dimension. The voids around and beneath rocks should be filled with approved granular soil having a Sand Equivalent of 30 or greater and should be compacted by flooding. Windrows may also be placed utilizing an "open-face" method in lieu of the trench procedure, however, this method should first be approved by the Consultant.

6.2.5 Windrows should generally be parallel to each other and may be placed either parallel to or perpendicular to the face of the slope depending on the site geometry. The minimum horizontal spacing for windrows shall be 12 feet center-to-center with a 5-foot stagger or offset from lower courses to next overlying course. The minimum vertical spacing between windrow courses shall be 2 feet from the top of a lower windrow to the bottom of the next higher windrow.

6.2.6 Rock placement, fill placement and flooding of approved granular soil in the windrows should be continuously observed by the Consultant.

6.3 *Rock* fills, as defined in Section 3.1.3, shall be placed by the Contractor in accordance with the following recommendations:

6.3.1 The base of the *rock* fill shall be placed on a sloping surface (minimum slope of 2 percent). The surface shall slope toward suitable subdrainage outlet facilities. The *rock* fills shall be provided with subdrains during construction so that a hydrostatic pressure buildup does not develop. The subdrains shall be permanently connected to controlled drainage facilities to control post-construction infiltration of water.

6.3.2 *Rock* fills shall be placed in lifts not exceeding 3 feet. Placement shall be by rock trucks traversing previously placed lifts and dumping at the edge of the currently placed lift. Spreading of the *rock* fill shall be by dozer to facilitate *seating* of the rock. The *rock* fill shall be watered heavily during placement. Watering shall consist of water trucks traversing in front of the current rock lift face and spraying water continuously during rock placement. Compaction equipment with compactive energy comparable to or greater than that of a 20-ton steel vibratory roller or other compaction equipment providing suitable energy to achieve the required compaction or deflection as recommended in Paragraph 6.3.3 shall be utilized. The number of passes to be made should be determined as described in Paragraph 6.3.3. Once a *rock* fill lift has been covered with *soil* fill, no additional *rock* fill lifts will be permitted over the *soil* fill.

6.3.3 Plate bearing tests, in accordance with ASTM D 1196, may be performed in both the compacted *soil* fill and in the *rock* fill to aid in determining the required minimum number of passes of the compaction equipment. If performed, a minimum of three plate bearing tests should be performed in the properly compacted *soil* fill (minimum relative compaction of 90 percent). Plate bearing tests shall then be performed on areas of *rock* fill having two passes, four passes and six passes of the compaction equipment, respectively. The number of passes required for the *rock* fill shall be determined by comparing the results of the plate bearing tests for the *soil* fill and the *rock* fill and by evaluating the deflection variation with number of passes. The required number of passes of the compaction equipment will be performed as necessary until the plate bearing deflections are equal to or less than that determined for the properly compacted *soil* fill. In no case will the required number of passes be less than two.

6.3.4 A representative of the Consultant should be present during *rock* fill operations to observe that the minimum number of “passes” have been obtained, that water is being properly applied and that specified procedures are being followed. The actual number of plate bearing tests will be determined by the Consultant during grading.

6.3.5 Test pits shall be excavated by the Contractor so that the Consultant can state that, in their opinion, sufficient water is present and that voids between large rocks are properly filled with smaller rock material. In-place density testing will not be required in the *rock* fills.

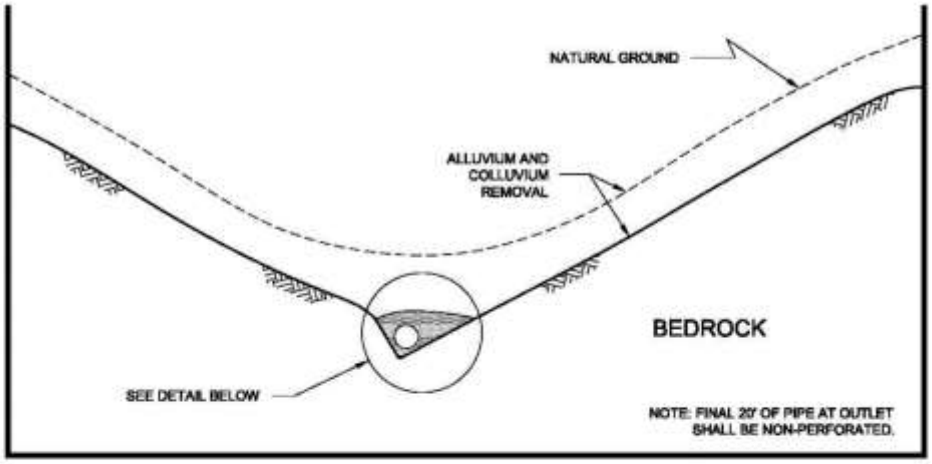
6.3.6 To reduce the potential for “piping” of fines into the *rock* fill from overlying *soil* fill material, a 2-foot layer of graded filter material shall be placed above the uppermost lift of *rock* fill. The need to place graded filter material below the *rock* should be determined by the Consultant prior to commencing grading. The gradation of the graded filter material will be determined at the time the *rock* fill is being excavated. Materials typical of the *rock* fill should be submitted to the Consultant in a timely manner, to allow design of the graded filter prior to the commencement of *rock* fill placement.

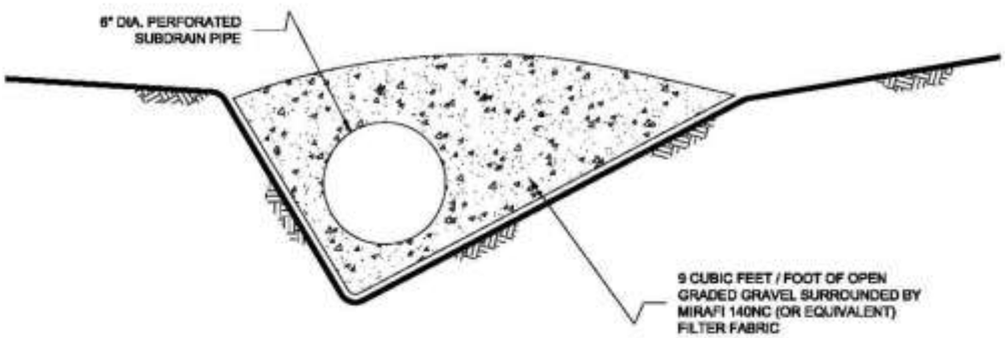
6.3.7 *Rock* fill placement should be continuously observed during placement by the Consultant.

7. SUBDRAINS

7.1 The geologic units on the site may have permeability characteristics and/or fracture systems that could be susceptible under certain conditions to seepage. The use of canyon subdrains may be necessary to mitigate the potential for adverse impacts associated with seepage conditions. Canyon subdrains with lengths in excess of 500 feet or extensions of existing offsite subdrains should use 8-inch-diameter pipes. Canyon subdrains less than 500 feet in length should use 6-inch-diameter pipes.

TYPICAL CANYON DRAIN DETAIL





NOTES:

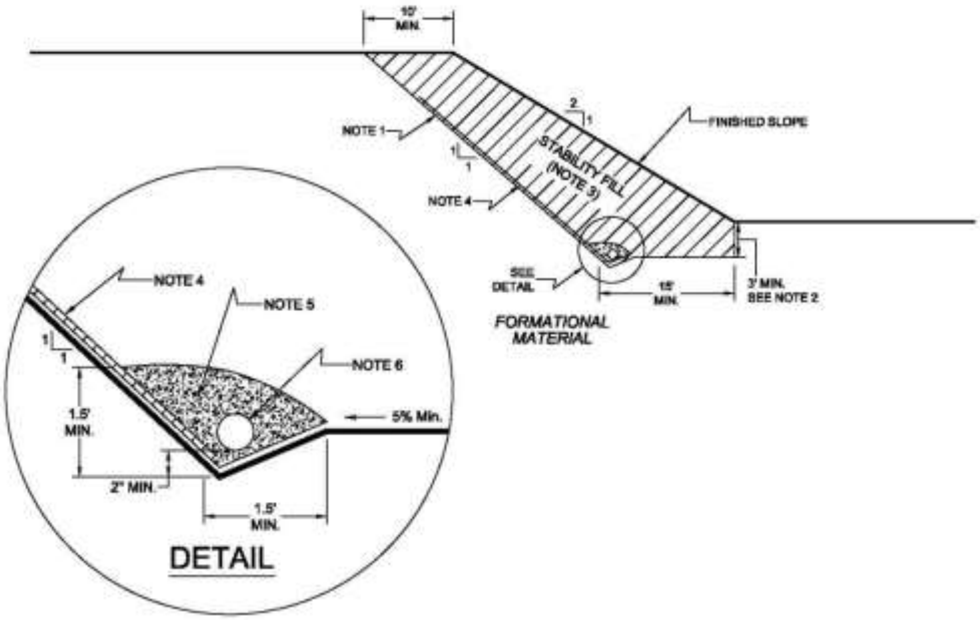
1......8-INCH DIAMETER, SCHEDULE 80 PVC PERFORATED PIPE FOR FILLS IN EXCESS OF 100-FEET IN DEPTH OR A PIPE LENGTH OF LONGER THAN 500 FEET.

2......6-INCH DIAMETER, SCHEDULE 40 PVC PERFORATED PIPE FOR FILLS LESS THAN 100-FEET IN DEPTH OR A PIPE LENGTH SHORTER THAN 500 FEET.

NO SCALE

7.2 Slope drains within stability fill keyways should use 4-inch-diameter (or lager) pipes.

TYPICAL STABILITY FILL DETAIL



NOTES:

1....EXCAVATE BACKCUT AT 1:1 INCLINATION (UNLESS OTHERWISE NOTED).

2....BASE OF STABILITY FILL TO BE 3 FEET INTO FORMATIONAL MATERIAL, SLOPING A MINIMUM 5% INTO SLOPE.

3....STABILITY FILL TO BE COMPOSED OF PROPERLY COMPACTED GRANULAR SOIL.

4....CHIMNEY DRAINS TO BE APPROVED PREFABRICATED CHIMNEY DRAIN PANELS (MIRADRAIN G200N OR EQUIVALENT) SPACED APPROXIMATELY 20 FEET CENTER TO CENTER AND 4 FEET WIDE. CLOSER SPACING MAY BE REQUIRED IF SEEPAGE IS ENCOUNTERED.

5....FILTER MATERIAL TO BE 3/4-INCH, OPEN-GRADED CRUSHED ROCK ENCLOSED IN APPROVED FILTER FABRIC (MIRAFI 140NC).

6....COLLECTOR PIPE TO BE 4-INCH MINIMUM DIAMETER, PERFORATED, THICK-WALLED PVC SCHEDULE 40 OR EQUIVALENT, AND SLOPED TO DRAIN AT 1 PERCENT MINIMUM TO APPROVED OUTLET.

NO SCALE

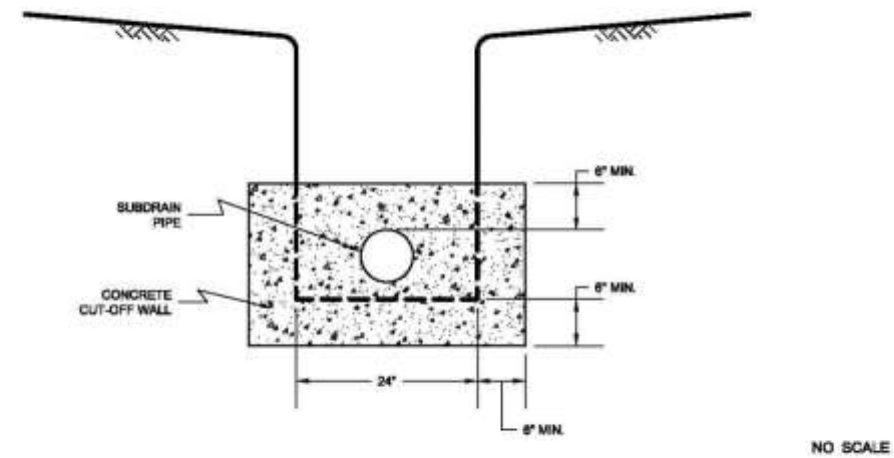
7.3 The actual subdrain locations will be evaluated in the field during the remedial grading operations. Additional drains may be necessary depending on the conditions observed and the requirements of the local regulatory agencies. Appropriate subdrain outlets should be evaluated prior to finalizing 40-scale grading plans.

7.4 *Rock* fill or *soil-rock* fill areas may require subdrains along their down-slope perimeters to mitigate the potential for buildup of water from construction or landscape irrigation. The subdrains should be at least 6-inch-diameter pipes encapsulated in gravel and filter fabric. *Rock* fill drains should be constructed using the same requirements as canyon subdrains.

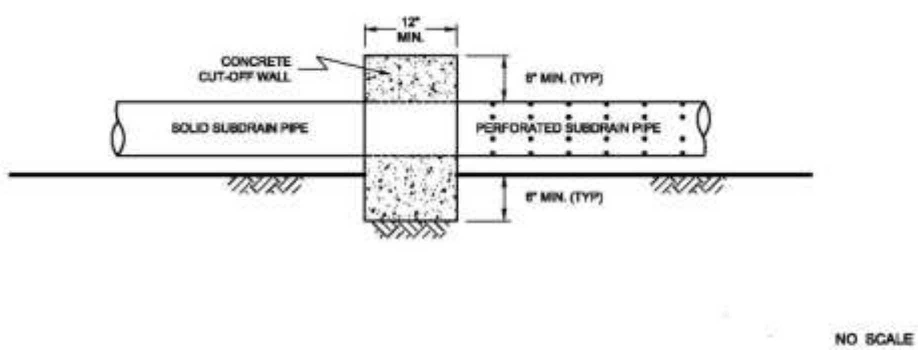
7.5 Prior to outletting, the final 20-foot segment of a subdrain that will not be extended during future development should consist of non-perforated drainpipe. At the non-perforated/ perforated interface, a seepage cutoff wall should be constructed on the downslope side of the pipe.

TYPICAL CUT OFF WALL DETAIL

FRONT VIEW

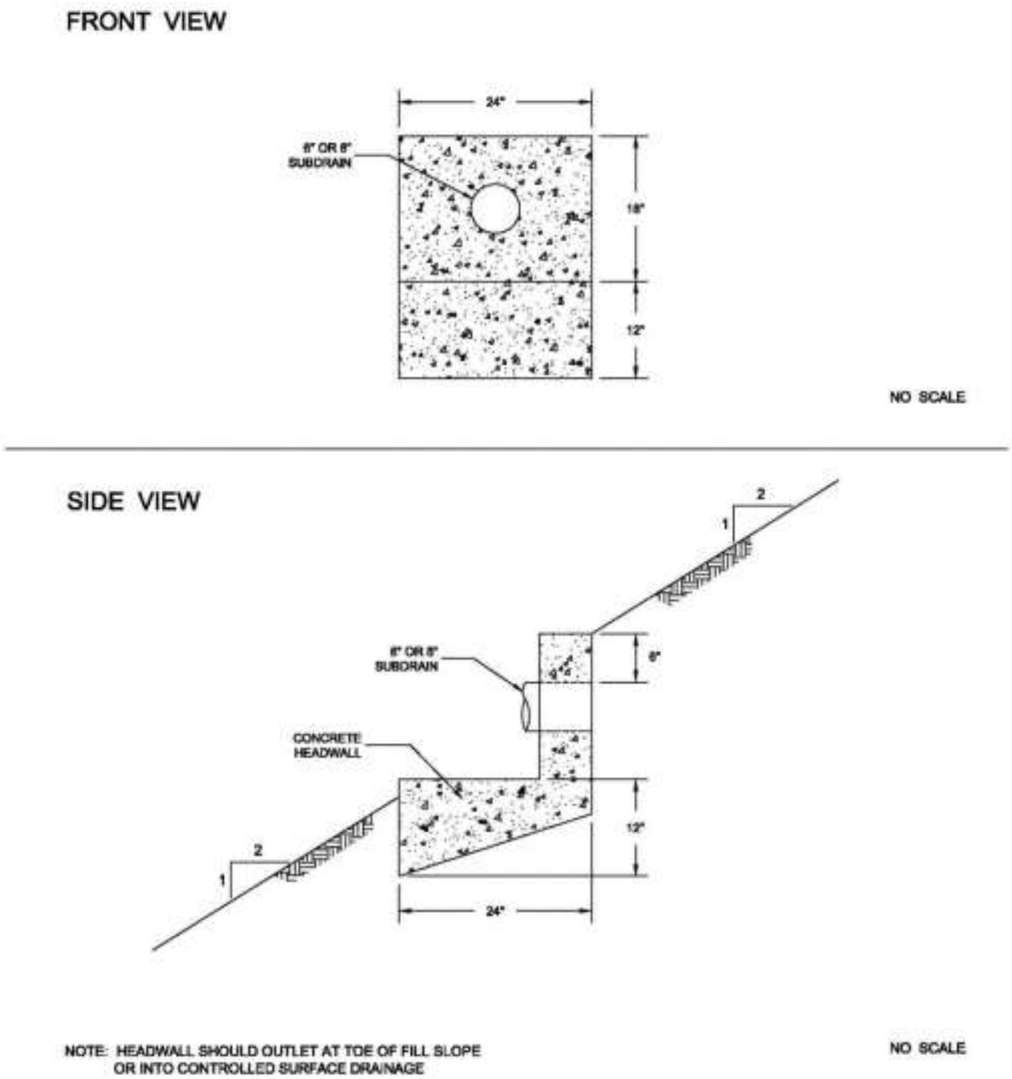


SIDE VIEW



7.6 Subdrains that discharge into a natural drainage course or open space area should be provided with a permanent headwall structure.

TYPICAL HEADWALL DETAIL



7.7 The final grading plans should show the location of the proposed subdrains. After completion of remedial excavations and subdrain installation, the project civil engineer should survey the drain locations and prepare an "as-built" map showing the drain locations. The final outlet and connection locations should be determined during grading operations. Subdrains that will be extended on adjacent projects after grading can be placed on formational material and a vertical riser should be placed at the end of the subdrain. The grading contractor should consider videoing the subdrains shortly after burial to check proper installation and functionality. The contractor is responsible for the performance of the drains.

8. OBSERVATION AND TESTING

8.1 The Consultant shall be the Owner's representative to observe and perform tests during clearing, grubbing, filling, and compaction operations. In general, no more than 2 feet in vertical elevation of *soil* or *soil-rock* fill should be placed without at least one field density test being performed within that interval. In addition, a minimum of one field density test should be performed for every 2,000 cubic yards of *soil* or *soil-rock* fill placed and compacted.

8.2 The Consultant should perform a sufficient distribution of field density tests of the compacted *soil* or *soil-rock* fill to provide a basis for expressing an opinion whether the fill material is compacted as specified. Density tests shall be performed in the compacted materials below any disturbed surface. When these tests indicate that the density of any layer of fill or portion thereof is below that specified, the particular layer or areas represented by the test shall be reworked until the specified density has been achieved.

8.3 During placement of *rock* fill, the Consultant should observe that the minimum number of passes have been obtained per the criteria discussed in Section 6.3.3. The Consultant should request the excavation of observation pits and may perform plate bearing tests on the placed *rock* fills. The observation pits will be excavated to provide a basis for expressing an opinion as to whether the *rock* fill is properly seated and sufficient moisture has been applied to the material. When observations indicate that a layer of *rock* fill or any portion thereof is below that specified, the affected layer or area shall be reworked until the *rock* fill has been adequately seated and sufficient moisture applied.

8.4 A settlement monitoring program designed by the Consultant may be conducted in areas of *rock* fill placement. The specific design of the monitoring program shall be as recommended in the Conclusions and Recommendations section of the project Geotechnical Report or in the final report of testing and observation services performed during grading.

8.5 We should observe the placement of subdrains, to check that the drainage devices have been placed and constructed in substantial conformance with project specifications.

8.6 Testing procedures shall conform to the following Standards as appropriate:

8.6.1 Soil and Soil-Rock Fills:

8.6.1.1 Field Density Test, ASTM D 1556, *Density of Soil In-Place By the Sand-Cone Method.*

8.6.1.2 Field Density Test, Nuclear Method, ASTM D 6938, *Density of Soil and Soil-Aggregate In-Place by Nuclear Methods (Shallow Depth).*

8.6.1.3 Laboratory Compaction Test, ASTM D 1557, *Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-Pound Hammer and 18-Inch Drop*.

8.6.1.4. Expansion Index Test, ASTM D 4829, *Expansion Index Test*.

9. PROTECTION OF WORK

9.1 During construction, the Contractor shall properly grade all excavated surfaces to provide positive drainage and prevent ponding of water. Drainage of surface water shall be controlled to avoid damage to adjoining properties or to finished work on the site. The Contractor shall take remedial measures to prevent erosion of freshly graded areas until such time as permanent drainage and erosion control features have been installed. Areas subjected to erosion or sedimentation shall be properly prepared in accordance with the Specifications prior to placing additional fill or structures.

9.2 After completion of grading as observed and tested by the Consultant, no further excavation or filling shall be conducted except in conjunction with the services of the Consultant.

10. CERTIFICATIONS AND FINAL REPORTS

10.1 Upon completion of the work, Contractor shall furnish Owner a certification by the Civil Engineer stating that the lots and/or building pads are graded to within 0.1 foot vertically of elevations shown on the grading plan and that all tops and toes of slopes are within 0.5 foot horizontally of the positions shown on the grading plans. After installation of a section of subdrain, the project Civil Engineer should survey its location and prepare an *as-built* plan of the subdrain location. The project Civil Engineer should verify the proper outlet for the subdrains and the Contractor should ensure that the drain system is free of obstructions.

10.2 The Owner is responsible for furnishing a final as-graded soil and geologic report satisfactory to the appropriate governing or accepting agencies. The as-graded report should be prepared and signed by a California licensed Civil Engineer experienced in geotechnical engineering and by a California Certified Engineering Geologist, indicating that the geotechnical aspects of the grading were performed in substantial conformance with the Specifications or approved changes to the Specifications.

LIST OF REFERENCES

City of San Diego (2008), *Seismic Safety Study, Geologic Hazards and Faults, Map Sheet 34*;

Chiou, B. S. J., and Youngs, R. R., (2008), *A NGA Model for the Average Horizontal Component of Peak Ground Motion and Response Spectra*, preprint for article to be published in NGA Special Edition for Earthquake Spectra;

Kennedy, M. P., and Tan, S. S., (2008), *Geologic Map of the San Diego 30' x 60' Quadrangle, California*, USGS Regional Geologic Map Series, 1:100,000 Scale, Map No. 3;

Risk Engineering (2015), *EZ-FRISK, Version 7.65*;

USDA (1953), Aerial photographs AXN 4M 86;

USGS (2016), *Quaternary Fault and Fold Database of the United States:* U.S. Geological Survey website, http://earthquakes,usgs.gov/hazards/qfaults, accessed December 14, 2016;

RECON

An Employee-Owned Company

Reference: 9775 Towne Centre Drive Noise Measurements

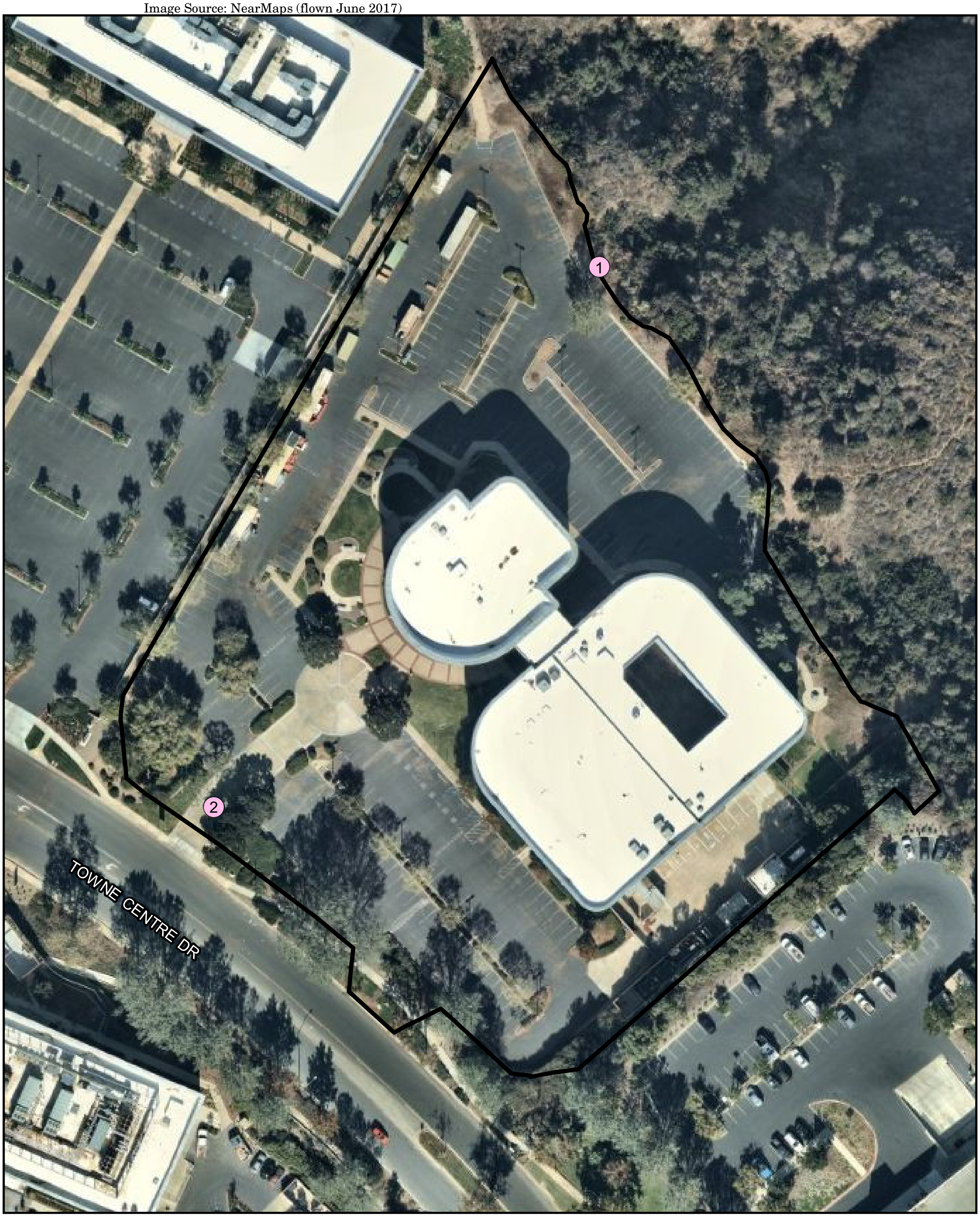
Two short-term noise measurements were taken on December 15, 2017. Measurements were taken using a Larson-Davis Model LxT Type 1 Integrating Sound Level Meter, serial number 3827. Measurements were taken at the locations shown in Figure 1. Meter was calibrated before and after measurements. The following parameters were used:

Filter:	A-weighted
Response:	Slow
Time History Period:	5 seconds
Height	5 feet above ground

The first measurement was located on the eastern side of the project site overlooking Sorrento Valley. The primary source of noise at this location was vehicle traffic on I-805. The average measured noise level during the first measurement was 60.6 dB(A) L_{eq}.

A second measurement was located at the project driveway on the western side of the project site, 50 feet west of Towne Centre Drive. The primary source of noise at this location was vehicle traffic on Towne Centre Drive which included 142 passenger cars and three medium-sized trucks. The average measured noise level during the second measurement was 70.7 dB(A) L_{eq}.

Image Source: NearMaps (flown June 2017)



0 Feet 100

Project Boundary

Noise Measurement Location

FIGURE 1

Noise Measurements

RECON

M:\JOBS5\8521\common_gis\fig1_nosatt.mxd 12/20/2017 sab

Summary

Filename	LxT_Data.016		
Serial Number	3827		
Model	SoundExpert™ LxT		
Firmware Version	2.301		
User			
Location			
Job Description			
Note			
Measurement Description			
Start	2017/12/14 15:51:52		
Stop	2017/12/14 16:06:53		
Duration	0:15:00.7		
Run Time	0:15:00.7		
Pause	0:00:00.0		
Pre Calibration	2017/12/14 15:47:45		
Post Calibration	None		
Calibration Deviation	---		

Overall Settings

RMS Weight	A Weighting		
Peak Weight	A Weighting		
Detector	Slow		
Preamp	PRMLxT1L		
Microphone Correction	Off		
Integration Method	Linear		
OBA Range	Normal		
OBA Bandwidth	1/1 and 1/3		
OBA Freq. Weighting	A Weighting		
OBA Max Spectrum	At Lmax		
Overload	121.8 dB		
	A	**C**	**Z**
Under Range Peak	**78.1**	75.1	80.1 dB
Under Range Limit	**26.0**	25.2	32.0 dB
Noise Floor	16.3	16.1	22.0 dB

Results

LAeq	70.7 dB	
LAE	100.3 dB	
EA	1.180 mPa²h	
LApeak (max)	2017/12/14 15:53:00	104.4 dB
LASmax	2017/12/14 15:52:59	91.3 dB
LASmin	2017/12/14 15:52:04	50.7 dB
SEA	-99.9 dB	

LAS > 85.0 dB (Exceedence Counts / Duration)	1	11.9 s
LAS > 115.0 dB (Exceedence Counts / Duration)	0	0.0 s
LApeak > 135.0 dB (Exceedence Counts / Duration)	0	0.0 s
LApeak > 137.0 dB (Exceedence Counts / Duration)	0	0.0 s
LApeak > 140.0 dB (Exceedence Counts / Duration)	0	0.0 s

Community Noise	**Ldn**	**LDay 07:00-22:00**	**LNight 22:00-07:00**	**Lden**	**LDay 07:00-19:00**	**LEvening 19:00-22:00**	**LNight 22:00-07:00**
	70.7	70.7	-99.9	70.7	70.7	-99.9	-99.9

LCeq	76.4 dB
LAeq	70.7 dB
LCeq - LAeq	5.7 dB
LAIeq	72.1 dB
LAeq	70.7 dB
LAIeq - LAeq	1.4 dB
# Overloads	0
Overload Duration	0.0 s
# OBA Overloads	0
OBA Overload Duration	0.0 s

Statistics

LAS5.00	68.2 dB
LAS10.00	65.7 dB
LAS33.30	62.3 dB
LAS50.00	60.2 dB
LAS66.60	57.5 dB
LAS90.00	52.4 dB

Calibration History

Preamp	**Date**	**dB re. 1V/Pa**
Direct	2016/12/05 8:48:15	-26.0
Direct	2016/12/05 8:20:31	-26.0
Direct	2016/12/05 7:57:36	-26.0
PRMLxT1L	2017/12/14 15:47:45	-28.1
PRMLxT1L	2017/12/14 15:42:02	-28.1
PRMLxT1L	2017/12/14 15:24:40	-28.1
PRMLxT1L	2017/12/06 15:08:31	-28.1
PRMLxT1L	2017/12/05 14:07:38	-28.0
PRMLxT1L	2017/09/28 18:26:44	-28.0
PRMLxT1L	2017/09/27 15:43:37	-27.9
PRMLxT1L	2017/09/27 15:43:15	-27.9
PRMLxT1L	2017/09/19 13:38:18	-28.0
PRMLxT1L	2017/09/19 13:17:29	-27.8
PRMLxT1L	2017/09/19 13:00:16	-27.9

Summary			
Filename	LxT_Data.015		
Serial Number	3827		
Model	SoundExpert™ LxT		
Firmware Version	2.301		
User			
Location			
Job Description			
Note			
Measurement Description			
Start	2017/12/14 15:25:52		
Stop	2017/12/14 15:40:55		
Duration	0:15:02.1		
Run Time	0:15:02.1		
Pause	0:00:00.0		
Pre Calibration	2017/12/14 15:24:42		
Post Calibration	None		
Calibration Deviation	---		
Overall Settings			
RMS Weight	A Weighting		
Peak Weight	A Weighting		
Detector	Slow		
Preamp	PRMLxT1L		
Microphone Correction	Off		
Integration Method	Linear		
OBA Range	Normal		
OBA Bandwidth	1/1 and 1/3		
OBA Freq. Weighting	A Weighting		
OBA Max Spectrum	At Lmax		
Overload	121.8 dB		
	A	**C**	**Z**
Under Range Peak	**78.1**	75.1	80.1 dB
Under Range Limit	**26.0**	25.2	32.0 dB
Noise Floor	16.3	16.1	22.0 dB
Results			
LAeq	60.6 dB		
LAE	90.2 dB		
EA	115.790 µPa²h		
LApeak (max)	2017/12/14 15:40:05	85.8 dB	
LASmax	2017/12/14 15:40:05	73.8 dB	
LASmin	2017/12/14 15:30:40	57.4 dB	
SEA	-99.9 dB		
LAS > 85.0 dB (Exceedence Counts / Duration)	0	0.0 s	
LAS > 115.0 dB (Exceedence Counts / Duration)	0	0.0 s	
LApeak > 135.0 dB (Exceedence Counts / Duration)	0	0.0 s	
LApeak > 137.0 dB (Exceedence Counts / Duration)	0	0.0 s	
LApeak > 140.0 dB (Exceedence Counts / Duration)	0	0.0 s	

Community Noise	**Ldn**	**LDay 07:00-22:00**	**LNight 22:00-07:00**	**Lden**	**LDay 07:00-19:00**	**LEvening 19:00-22:00**	**LNight 22:00-07:00**
	60.6	60.6	-99.9	60.6	60.6	-99.9	-99.9

LCeq	68.3 dB
LAeq	60.6 dB
LCeq - LAeq	7.6 dB
LAIeq	62.1 dB
LAeq	60.6 dB
LAIeq - LAeq	1.4 dB
# Overloads	0
Overload Duration	0.0 s
# OBA Overloads	0
OBA Overload Duration	0.0 s
Statistics	
LAS5.00	62.4 dB
LAS10.00	61.4 dB
LAS33.30	60.2 dB
LAS50.00	59.9 dB
LAS66.60	59.5 dB
LAS90.00	58.9 dB

Calibration History

Preamp	**Date**	**dB re. 1V/Pa**
Direct	2016/12/05 8:48:15	-26.0
Direct	2016/12/05 8:20:31	-26.0
Direct	2016/12/05 7:57:36	-26.0
PRMLxT1L	2017/12/14 15:24:40	-28.1
PRMLxT1L	2017/12/06 15:08:31	-28.1
PRMLxT1L	2017/12/05 14:07:38	-28.0
PRMLxT1L	2017/09/28 18:26:44	-28.0
PRMLxT1L	2017/09/27 15:43:37	-27.9
PRMLxT1L	2017/09/27 15:43:15	-27.9
PRMLxT1L	2017/09/19 13:38:18	-28.0
PRMLxT1L	2017/09/19 13:17:29	-27.8
PRMLxT1L	2017/09/19 13:00:16	-27.9
PRMLxT1L	2017/09/19 12:39:38	-28.0
PRMLxT1L	2017/09/19 12:25:16	-28.0

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Traffic Noise Prediction Model

Data Input Sheet

Project Name : Towne Centre Project
Project Number : 8521
Modeled Condition : Existing

Surface Refelction: CNEL
Assessment Metric: Hard
Peak ratio to ADT: 10.00
Traffic Desc. (Peak or ADT) : ADT

Segment	Roadway	Segment	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	K-Factor
1	Towne Centre Drive	North of Eastgate Mall (2035)	14,800	40	210	96.00	3.00	1.00	80.00	10.00	10.00	
2	Genesee Avenue	I-5 Northbound Ramps to Eastgate Mall (Existing without project)	29,537	45	50	96.00	3.00	1.00	80.00	10.00	10.00	
3	Eastgate Mall	Genesee Avenue to Towne Centre Drive (Existing without project)	14,318	40	50	96.00	3.00	1.00	80.00	10.00	10.00	
4	Eastgate Mall	Towne Centre Drive to Judicial Drive (Existing without project)	13,594	40	50	96.00	3.00	1.00	80.00	10.00	10.00	
5	Towne Centre Drive	North of Eastgate Mall (Existing without project)	10,074	40	50	96.00	3.00	1.00	80.00	10.00	10.00	
6	Towne Centre Drive	Eastgate Mall to Executive Drive (Existing without project)	12,565	30	50	96.00	3.00	1.00	80.00	10.00	10.00	
7	Towne Centre Drive	Executive Drive to La Jolla Village Drive (Existing without project)	18,374	30	50	96.00	3.00	1.00	80.00	10.00	10.00	
8	La Jolla Village Drive	East of Towne Centre Drive (Existing without project)	61,681	45	50	96.00	3.00	1.00	80.00	10.00	10.00	
9	Genesee Avenue	I-5 Northbound Ramps to Eastgate Mall (Existing plus project)	29,582	45	50	96.00	3.00	1.00	80.00	10.00	10.00	
10	Eastgate Mall	Genesee Avenue to Towne Centre Drive (Existing plus project)	14,472	40	50	96.00	3.00	1.00	80.00	10.00	10.00	
11	Eastgate Mall	Towne Centre Drive to Judicial Drive (Existing plus project)	13,680	40	50	96.00	3.00	1.00	80.00	10.00	10.00	
12	Towne Centre Drive	North of Eastgate Mall (Existing plus project)	10,499	40	50	96.00	3.00	1.00	80.00	10.00	10.00	
13	Towne Centre Drive	Eastgate Mall to Executive Drive (Existing plus project)	12,750	30	50	96.00	3.00	1.00	80.00	10.00	10.00	
14	Towne Centre Drive	Executive Drive to La Jolla Village Drive (Existing plus project)	18,519	30	50	96.00	3.00	1.00	80.00	10.00	10.00	
15	La Jolla Village Drive	East of Towne Centre Drive (Existing plus project)	61,812	45	50	96.00	3.00	1.00	80.00	10.00	10.00	

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Traffic Noise Prediction Model

Predicted Noise Levels

Project Name : Towne Centre Project
Project Number : 8521
Modeled Condition : Existing
Assessment Metric: Hard

			Noise Levels, dBA Hard				Distance to Traffic Noise Level Contours, Feet					
Segment	Roadway	Segment	Auto	MT	HT	Total	75 dB	70 dB	65 dB	60 dB	55 dB	50 dB
1	Towne Centre Drive	North of Eastgate Mall (2035)	61.1	54.9	55.0	63	13	40	127	400	1,265	4,001
2	Genesee Avenue	I-5 Northbound Ramps to Eastgate Mall (Existing without project)	71.8	65.0	64.7	73	34	107	338	1,069	3,380	10,690
3	Eastgate Mall	Genesee Avenue to Towne Centre Drive (Existing without project)	67.2	61.0	61.1	69	12	39	123	388	1,227	3,881
4	Eastgate Mall	Towne Centre Drive to Judicial Drive (Existing without project)	66.9	60.8	60.9	69	12	37	117	371	1,172	3,707
5	Towne Centre Drive	North of Eastgate Mall (Existing without project)	65.6	59.5	59.6	67	9	27	87	275	869	2,748
6	Towne Centre Drive	Eastgate Mall to Executive Drive (Existing without project)	63.0	58.5	60.9	66	6	19	62	195	615	1,945
7	Towne Centre Drive	Executive Drive to La Jolla Village Drive (Existing without project)	64.6	60.2	62.5	68	9	29	91	288	910	2,877
8	La Jolla Village Drive	East of Towne Centre Drive (Existing without project)	75.0	68.2	67.9	76	69	218	690	2,183	6,902	21,826
9	Genesee Avenue	I-5 Northbound Ramps to Eastgate Mall (Existing plus project)	71.8	65.0	64.7	73	34	107	338	1,069	3,380	10,690
10	Eastgate Mall	Genesee Avenue to Towne Centre Drive (Existing plus project)	67.2	61.1	61.1	69	12	39	123	388	1,227	3,881
11	Eastgate Mall	Towne Centre Drive to Judicial Drive (Existing plus project)	67.0	60.8	60.9	69	12	37	117	371	1,172	3,707
12	Towne Centre Drive	North of Eastgate Mall (Existing plus project)	65.8	59.7	59.7	68	9	28	89	281	889	2,812
13	Towne Centre Drive	Eastgate Mall to Executive Drive (Existing plus project)	63.1	58.6	60.9	66	6	20	63	199	629	1,991
14	Towne Centre Drive	Executive Drive to La Jolla Village Drive (Existing plus project)	64.7	60.2	62.6	68	9	29	91	288	910	2,877
15	La Jolla Village Drive	East of Towne Centre Drive (Existing plus project)	75.0	68.2	67.9	77	71	223	706	2,233	7,063	22,334

Onsite Noise Sources

Source Name	Reference	Noise Level dB(A)
Cooling Tower-1	Unit	96
Cooling Tower-2	Unit	98
HVAC	Unit	89
Dock-1	Unit	86
Dock-2	Unit	86
Dock-3	Unit	86
Generator	Unit	110

Contributions Onsite Noise Sources

Source name	Noise Level dB(A) L_{eq1h}
IND-1 GF 60.0	
Cooling Tower-1	20.4
Cooling Tower-2	22.7
Dock-1	36.9
Dock-2	37.1
Dock-3	37.5
Generator	60.0
HVAC	29.8
IND-2 GF 74.3	
Cooling Tower-1	23.0
Cooling Tower-2	25.0
Dock-1	41.6
Dock-2	41.9
Dock-3	42.1
Generator	74.3
HVAC	24.3
IND-3 GF 61.5	
Cooling Tower-1	31.3
Cooling Tower-2	43.1
Dock-1	39.2
Dock-2	38.8
Dock-3	38.4
Generator	61.4
HVAC	23.6
IND-4 GF 52.1	
Cooling Tower-1	33.5
Cooling Tower-2	45.2
Dock-1	29.9
Dock-2	29.8
Dock-3	29.7
Generator	50.9
HVAC	33.0
IND-5 GF 49.7	
Cooling Tower-1	36.3
Cooling Tower-2	46.2
Dock-1	9.7
Dock-2	9.5
Dock-3	9.3
Generator	46.7
HVAC	33.0
IND-6 GF 54.5	
Cooling Tower-1	41.9
Cooling Tower-2	54.2
Dock-1	10.1
Dock-2	10.1
Dock-3	10.0
Generator	33.0
HVAC	31.4

MECHANICAL EQUIPMENT SOUND DATA FACTORY TESTING

MODEL NO.	MAX CFM	MANUFACTURER	EQUIPMENT TYPE	NOISE TYPE	DB BY OCTAVE BAND								dB
					63	125	250	500	1000	2000	4000	8000	
VIBRO-ACOUSTIC RFL-MV	**29,500**	**HUNTAIR**	**PWL**		**87**	**80**	**81**	**79**	**66**	**61**	**58**	**52**	**89.1**
VIBRO-ACOUSTIC RFL-MV	36,400	HUNTAIR	PWL		89	81	80	80	68	61	60	54	90.5
VIBRO-ACOUSTIC RFL-MV	52,400	HUNTAIR	PWL		90	82	79	76	68	62	60	55	91.1
VIBRO-ACOUSTIC RFL-MV	57,500	HUNTAIR	PWL		90	82	78	75	66	60	58	53	91.0
VIBRO-ACOUSTIC RFL-MV	64,400	HUNTAIR	PWL		90	82	82	82	70	63	62	56	91.7
VIBRO-ACOUSTIC RFL-MV	71,400	HUNTAIR	PWL		91	83	79	77	70	63	61	56	92.1
VIBRO-ACOUSTIC RFL-MV	73,100	HUNTAIR	PWL		90	82	82	82	70	63	62	56	91.7
VIBRO-ACOUSTIC RFL-MV	75,300	HUNTAIR	PWL		91	83	81	83	72	64	63	57	92.6
VIBRO-ACOUSTIC RFL-MV	93,900	HUNTAIR	PWL		91	83	85	82	70	64	61	55	92.9

Cooling Tower Data Sheet

Matt Bradshaw
VERTICAL SYSTEMS
4340 Viewridge Ave
Suite C
San Diego, CA 92123
USA
Cell Phone: 415-370-8953
Email: mbradshaw@vertisys.net

Project : Takeda CT
Equipment Reference: CT-1,2 (Plume Abatement)
Product Type : AT/UT/USS Cooling Tower

Date: 4/13/2017 Page: 1

Selection Criteria

Capacity (Tons):	1,000.00
Capacity (MBH):	15,000.00
Fluid Type:	Water
Flow (GPM):	3000.0
Entering Fluid Temp (°F):	93.0
Leaving Fluid Temp (°F):	83.0
Wet Bulb (°F):	72.0

IBC Design Criteria

Importance Factor (I_P)	1.0
Seismic (S_{DS})	up to 0.84 g
Wind Load (P)	up to 119 psf
:	

Product line is CTI/ECC certified. Selection is rated in accordance with CTI Standard 201 RS.

Qty	Model	Capacity (Tons)	Percent Capacity
1	USS 212-4L28	1,188.00	118.8

All Weights, Dimensions and Technical Data are Shown per Unit

Fans:	2
# Fan Motors @ HP:	(2) @ 25.00 (460/3/60)
Air Flow (CFM)	201,200
Inlet Pressure Drop (psi):	2.1
Evaporated Water Rate (gpm):	24.00

Overall Length:	28' 2.000"
Overall Width:	11' 10.000"
Overall Height:	17' 6.250"
Operating Weight (lbs):	34,220
Shipping Weight (lbs):	19,560
Heaviest Section (lbs):	6,730

	Pricing
Base Model:	83,647
Options Selected	
(2) Fan Motor: Inverter Capable, Premium Efficient	0
EVAPAK Fill	0
IBC Standard Structural Design	0
Louver Access Door	0
Plume Abatement Coil	40,685
304 Stainless Steel Upper	33,894
304 Welded Stainless Steel Cold Water Basin	21,180
5-Probe Electronic Water Level Control Package	1,929
Ladder	1,700

evapSelect Version: US Feb 2017

Vibration Switch	946
(2) Equalizer Connection; Bottom; 3"; BFW/GRVD	676
(2) Grooved Extra Connection <4" (<102 mm); Side; 2.00"	333
Total Net Price per Unit:	**184,990 USD**
Number of Units:	x 1
Total Net Price for Location:	**184,990 USD**
Estimated Inland Freight:	3,675
Freight Allowed Price:	**188,665 USD**

Sound Data (Sound Pressure Levels in dB(A))

	End	Mtr Side	Opp End	Opp Mtr Side	Top
S.P.L. dB(A) at 5'	80	81	80	81	83
S.P.L. dB(A) at 50'	65	67	65	67	72

Note 1: Sound Data shown is for 2 Cells operating at full speed

Note 2: The use of frequency inverters (Variable Frequency Drives) can increase sound levels.

Note 3: Sound option(s) selected: None

Layout Criteria

Recommended Clearances Around Units (Feet)

From Unit Ends to Wall:	3.00	Between Unit Ends:	3.00
From Sides to Wall:	3.00	Between Unit Sides:	6.00

Refer to the Equipment Layout Manual or contact your Sales Representative for more details on layout criteria.

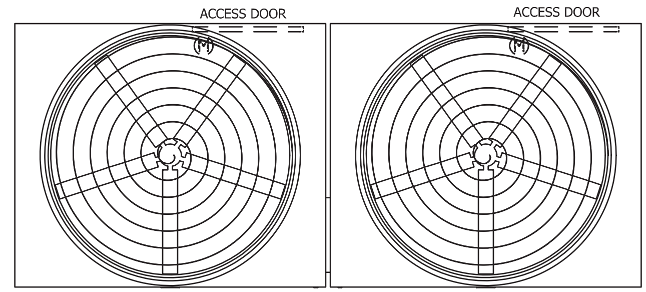
UNIT	AT Cooling Tower		EVAPCO, INC.	DWG. #	T3122848-DRE-ST	REV.	-
MODEL #	USS 212-4L28	SCALE NTS		SERIAL #		DATE	04/13/2017

NOTES:
1. (M)- FAN MOTOR LOCATION
2. HEAVIEST SECTION IS UPPER SECTION
3. MPT DENOTES MALE PIPE THREAD
   FPT DENOTES FEMALE PIPE THREAD
   BFW DENOTES BEVELED FOR WELDING
   GVD DENOTES GROOVED
   FLG DENOTES FLANGE
4. +UNIT WEIGHT DOES NOT INCLUDE ACCESSORIES (SEE ACCESSORY DRAWINGS)
5. MAKE-UP WATER PRESSURE
   20 psi MIN [137 kPa], 50 psi MAX [344 kPa]
6. 3/4" [19MM] DIA. MOUNTING HOLES. REFER TO RECOMMENDED STEEL SUPPORT DRAWING
7. DIMENSIONS LISTED AS FOLLOWS:
   ENGLISH FT-IN
   [METRIC] [mm]

PLAN VIEW

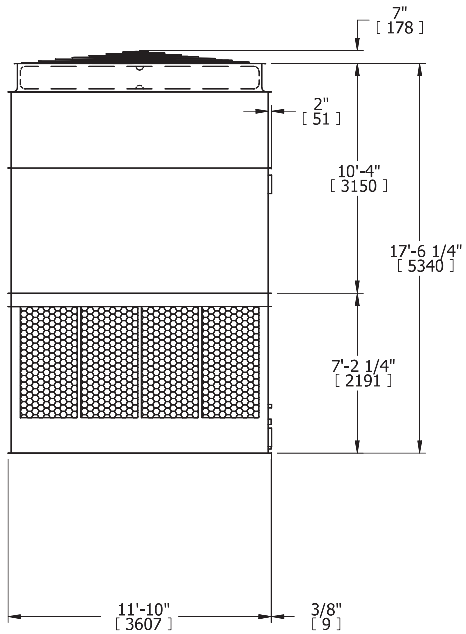
FACE C

FACE B

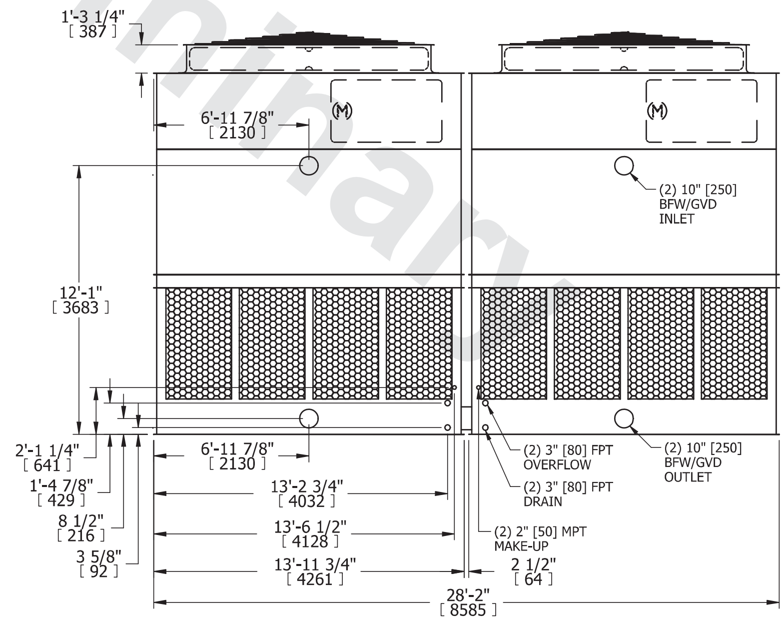


FACE D

FACE A



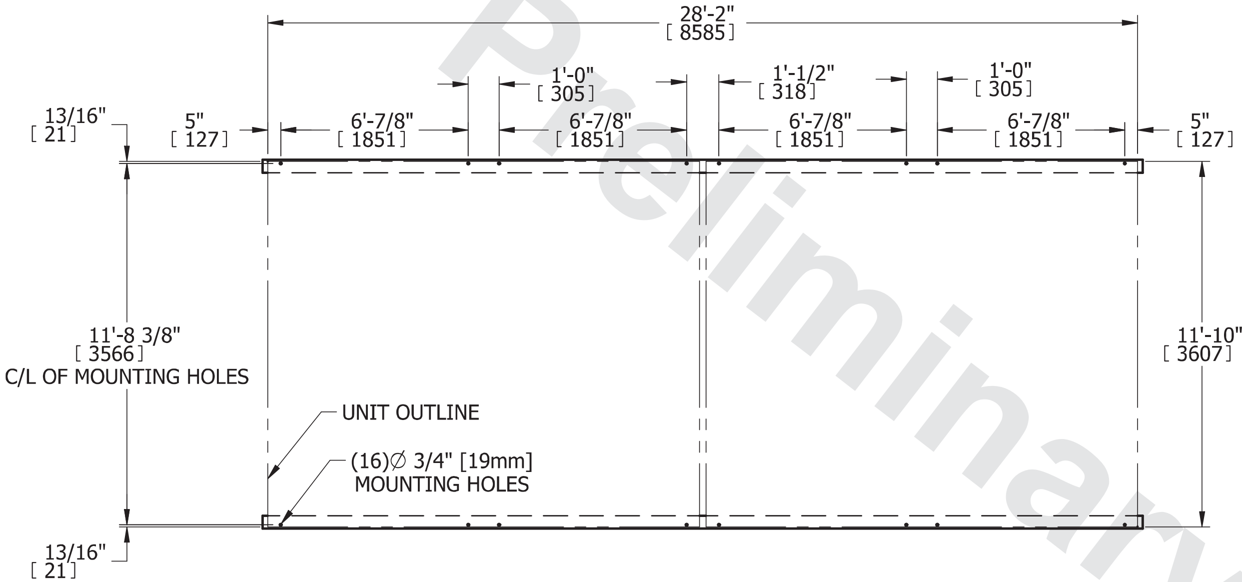
FACE B



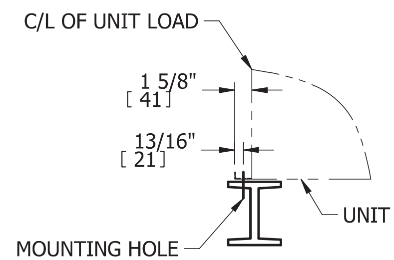
FACE A

SHIPPING WEIGHT	19560 lbs+[8875] kg+	OPERATING WEIGHT	34220 lbs+[15525] kg+	HEAVIEST SECTION WEIGHT	6730 lbs+[3055] kg+	NO. OF SHIPPING SECTIONS	4	DRAWN BY:	KDS

UNIT		DWG. #	
USS 212-4L28	EVAPCO, INC.	SLIX1228-DD	
TITLE		SCALE	DRAWN BY
STEEL SUPPORT CONFIGURATION		N.T.S.	JLG



PLAN VIEW

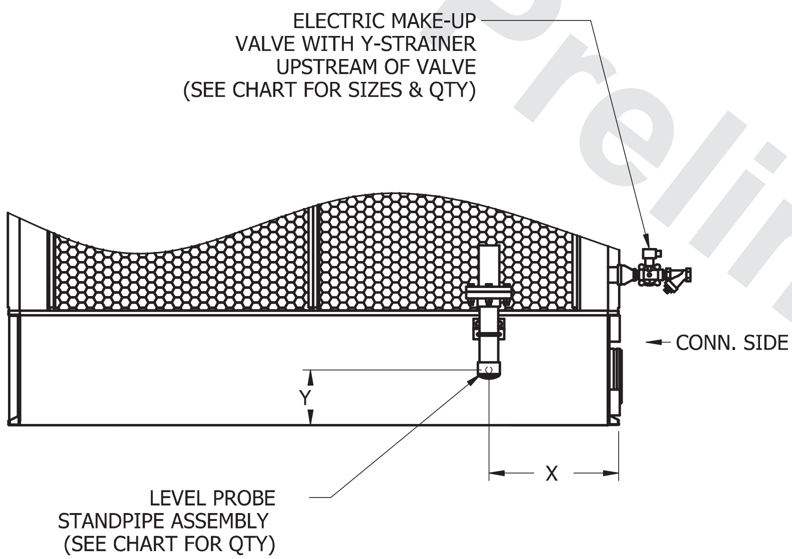


TYPICAL END VIEW

NOTES:

1. BEAMS SHOULD BE SIZED IN ACCORDANCE WITH ACCEPTED STRUCTURAL PRACTICES. MAXIMUM DEFLECTION OF BEAM UNDER UNIT TO BE 1/360 OF UNIT LENGTH NOT TO EXCEED 1/2" [13mm].
2. DEFLECTION MAY BE CALCULATED BY USING 55% OF THE OPERATING WEIGHT AS A UNIFORM LOAD ON EACH BEAM. SEE CERTIFIED PRINT FOR OPERATING WEIGHT.
3. SUPPORT BEAMS AND ANCHOR HARDWARE ARE TO BE FURNISHED BY OTHERS. ANCHOR HARDWARE TO BE ASTM A325 5/8" [16mm] BOLT OR EQUIVALENT.
4. BEAMS MUST BE LOCATED UNDER THE FULL LENGTH OF THE PAN SECTION.
5. SUPPORTING BEAM SURFACE MUST BE LEVEL. DO NOT LEVEL THE UNIT BY PLACING SHIMS BETWEEN THE UNIT MOUNTING FLANGE AND THE SUPPORTING BEAM.
6. ANCHORING ARRANGEMENT SHOWN HAS A MAXIMUM WIND RATING OF 60 PSF [2.88 KPa] ON CASED VERTICAL SURFACES.
7. THE FACTORY RECOMMENDED STEEL SUPPORT CONFIGURATION IS SHOWN. CONSULT THE FACTORY FOR ALTERNATE SUPPORT CONFIGURATIONS.
8. UNIT SHOULD BE POSITIONED ON STEEL SUCH THAT THE ANCHORING HARDWARE FULLY PENETRATES THE BEAM'S FLANGE AND CLEARS THE BEAM'S WEB.
9. FOR ALL MULTIPLE CELL UNITS, OPERATING WEIGHT OF EACH CELL IS FOUND BY DIVIDING TOTAL OPERATING WEIGHT BY THE NUMBER OF CELLS.
10. WHEN VIBRATION ISOLATION IS REQUIRED, THE VIBRATION ISOLATORS (BY OTHERS) MUST BE LOCATED UNDER THE SUPPORTING STEEL BEAMS AND NOT BETWEEN THE SUPPORTING STEEL BEAMS AND THE UNIT.
11. DIMENSIONS LISTED AS FOLLOWS: ENGLISH FT-IN
    [METRIC] [mm]

UNIT	TITLE		DWG. #	SCALE	DRAWN BY
USS 212-4L28	ELECTRIC WATER LEVEL CONTROL LOCATION	EVAPCO, INC.	ELT3MWML-DD	N.T.S.	JLG

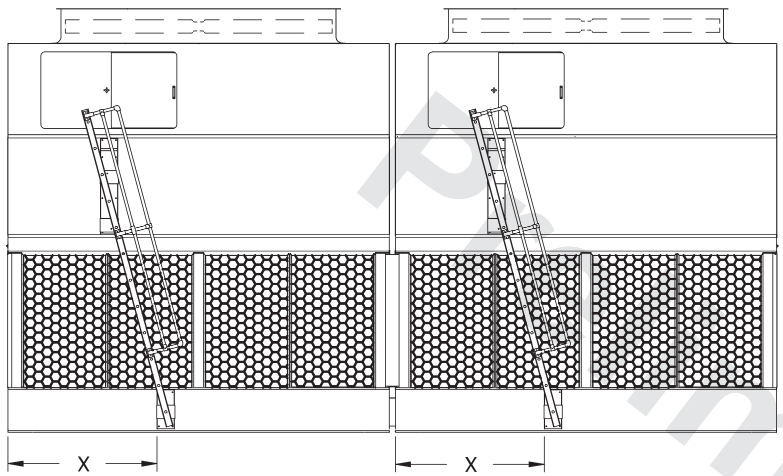


FACE B

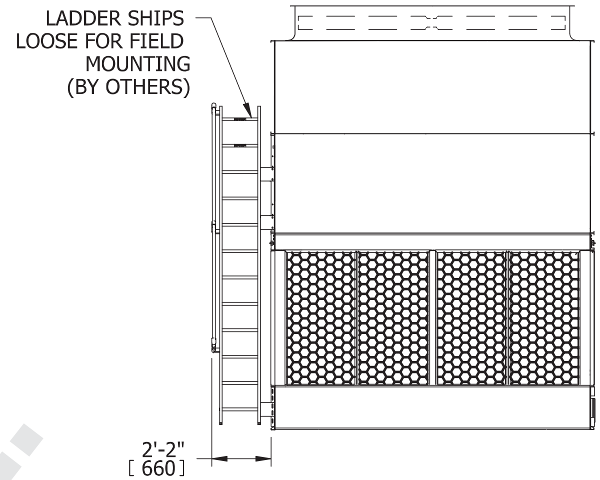
UNIT SELECTED	BOX SIZE	VALVE			Y-STRAINER			STANDPIPE		
		QTY	SIZE	PART NO.	QTY	SIZE	PART NO.	QTY	X	Y
☐	2.4Mx9-12	1	1" [25]	017-00153P	1	1" [25]	017-00280P	1	1'-8" [508]	8 1/2" [216]
☐	2.4Mx14-21	1	1 1/2" [40]	017-00154P	1	1 1/2" [40]	017-00281P	1	1'-8" [508]	8 1/2" [216]
☐	2.4Mx24	2	1" [25]	017-00153P	2	1" [25]	017-00280P	1	1'-8" [508]	8 1/2" [216]
☐	2.4Mx28 (2C)	2	1 1/2" [40]	017-00154P	2	1 1/2" [40]	017-00281P	1	1'-8" [508]	8 1/2" [216]
☐	2.4Mx36 (3C)	3	1" [25]	017-00153P	3	1" [25]	017-00280P	1	1'-8" [508]	8 1/2" [216]
☐	2.4Mx42 (3C)	3	1 1/2" [40]	017-00154P	3	1 1/2" [40]	017-00281P	1	1'-8" [508]	8 1/2" [216]
☐	8.5x6-12	1	1" [25]	017-00153P	1	1" [25]	017-00280P	1	1'-8" [508]	8 1/2" [216]
☐	8.5x14-21	1	1 1/2" [40]	017-00154P	1	1 1/2" [40]	017-00281P	1	1'-8" [508]	8 1/2" [216]
☐	8.5x24	2	1" [25]	017-00153P	2	1" [25]	017-00280P	1	1'-8" [508]	8 1/2" [216]
☐	8.5x28 (2C)	2	1 1/2" [40]	017-00154P	2	1 1/2" [40]	017-00281P	1	1'-8" [508]	8 1/2" [216]
☐	8.5x36,42 (3C)	3	1 1/2" [40]	017-00154P	3	1 1/2" [40]	017-00281P	1	1'-8" [508]	8 1/2" [216]
☐	12x12,14	1	1 1/2" [40]	017-00154P	1	1 1/2" [40]	017-00281P	1	1'-8" [508]	8 1/2" [216]
☐	12x18,20	1	2" [50]	017-00155P	1	2" [50]	017-00282P	1	1'-8" [508]	8 1/2" [216]
☐	12x24,28	2	1 1/2" [40]	017-00154P	2	1 1/2" [40]	017-00281P	1	1'-8" [508]	8 1/2" [216]
☐	12x36 (2C)	2	2" [50]	017-00155P	2	2" [50]	017-00282P	1	1'-8" [508]	8 1/2" [216]
☐	12x40	2	2" [50]	017-00155P	2	2" [50]	017-00282P	1	1'-8" [508]	8 1/2" [216]
☐	3Mx12	1	1 1/2" [40]	017-00154P	1	1 1/2" [40]	017-00281P	1	1'-8" [508]	8 1/2" [216]
☐	3Mx18	1	2" [50]	017-00155P	1	2" [50]	017-00282P	1	1'-8" [508]	8 1/2" [216]
☐	3Mx24	2	1 1/2" [40]	017-00154P	2	1 1/2" [40]	017-00281P	1	1'-8" [508]	8 1/2" [216]
☐	3Mx36 (2C)	2	2" [50]	017-00155P	2	2" [50]	017-00282P	1	1'-8" [508]	8 1/2" [216]
☐	6x17	2	1" [25]	017-00153P	2	1" [25]	017-00280P	1	1'-1 1/2" [343]	8 1/2" [216]
☐	7.5x17	2	1" [25]	017-00153P	2	1" [25]	017-00280P	1	1'-1 1/2" [343]	8 1/2" [216]

NOTES:
1. PIPING BY OTHERS.
2. LEVEL PROBE STANDPIPE ASSEMBLY, MAKE-UP VALVE AND Y-STRAINER TO SHIP LOOSE FOR FIELD MOUNTING BY OTHERS.
3. SEE CERTIFIED PRINT FOR MAKE-UP LOCATION.
4. STANDPIPE TO BE HEAT TRACED AND INSULATED FOR WINTER OPERATION (BY OTHERS).
5. THE ELECTRONIC WATER LEVEL CONTROL ON THIS UNIT WILL MAINTAIN THE PROPER OPERATING WATER LEVEL.
HOWEVER, BEFORE INITIAL START-UP THE UNIT MUST BE MANUALLY FILLED TO WITHIN 1" OF THE OVERFLOW.
6. FOR EASE OF MAINTENANCE, A SHUT-OFF VALVE IS RECOMMENDED UPSTREAM OF Y-STRAINER.
7. DIMENSIONS LISTED AS FOLLOWS: ENGLISH FT-IN
[METRIC] [mm]

UNIT: USS 212-4L28	EVAPCO, INC.	DWG. #: LDT21228DC	
TITLE: SLOPED LADDER INSTALLATION PACKAGE		SCALE: N.T.S.	DRAWN BY: TLS



FACE C



FACE B

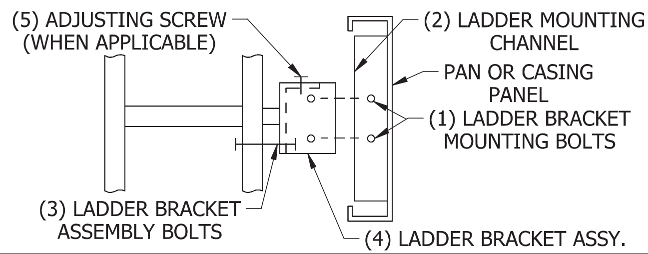
NOTE:
1. REFER TO RIGGING PACK FOR LADDER AND PLATFORM MOUNTING INSTRUCTIONS.
2. DIMENSIONS LISTED AS FOLLOWS: ENGLISH FT-IN [METRIC] mm

MODEL #	X DIM	
	FT-IN	[mm]
AT/USS 212-128, 328 AT 212-2I28, 2J28, 2K28, 2L28, 2M28	5'-15/16"	1548
AT/USS 212-228, 428, 628, 828 AT 212-3I28, 3J28, 3K28, 3L28, 3M28, 3N28	5'-2"	1575
AT/USS 212-528, 728, 928 AT 212-4I28, 4J28, 4K28, 4L28, 4M28, 4N28	5'-2 1/8"	1578

RIG LADDER BEFORE PIPING UNIT

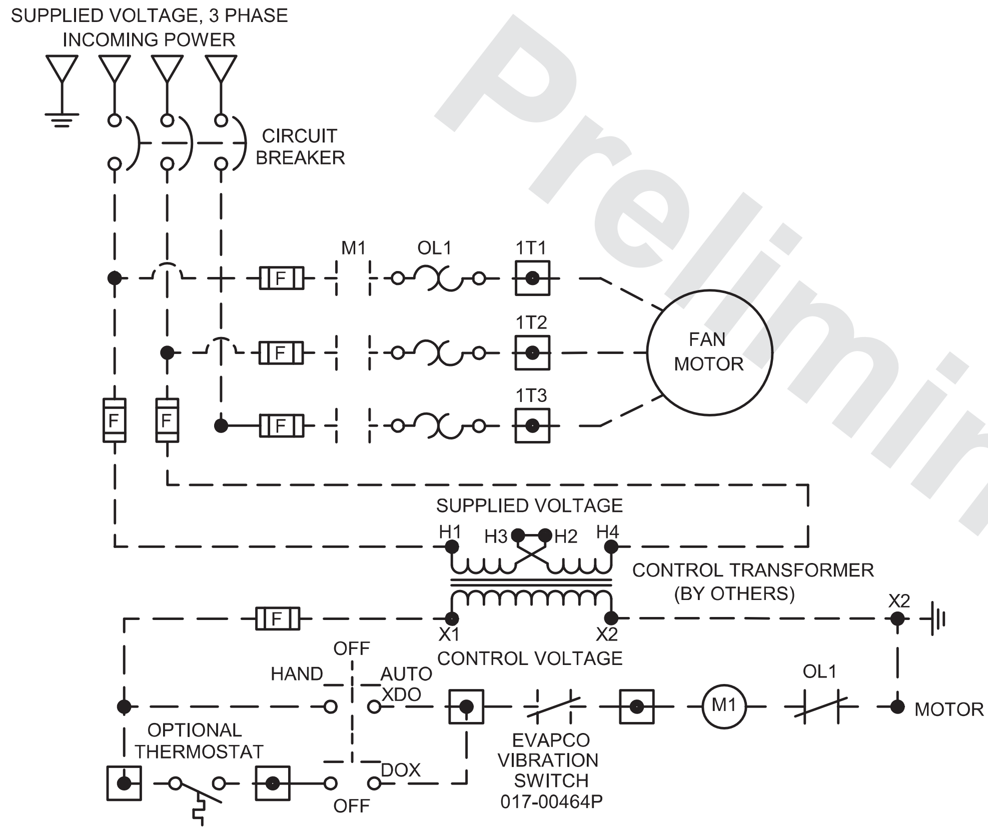
* THE BOTTOM OF THE LADDER IS AT THE BASE OF THE UNIT. IF THE UNIT IS ELEVATED THEN A LADDER EXTENSION SHOULD BE CONSIDERED. (CONSULT FACTORY). LADDER EXTENSIONS OF UP TO 3 FEET CAN BE ADDED WITHOUT ANY ADDITIONAL SUPPORT. FOR A LADDER EXTENSION LONGER THAN 3 FEET ADDITIONAL SUPPORT MUST BE PROVIDED BY OTHERS.

CUSTOMER INSTALLATION NOTES:
- A. REMOVE LADDER BRACKET MOUNTING BOLTS (1) FROM LADDER MOUNTING CHANNELS (2) ON PAN CASING SECTIONS.
- B. LOOSEN, BUT DO NOT REMOVE, LADDER BRACKET ASSY. BOLTS (3).
- C. TO ASSEMBLE, SLIDE LADDER BRACKET ASSY. (4) OVER LADDER MOUNTING CHANNELS (2) LOCATED ON PAN AND CASING (DO NOT REMOVE LADDER BRACKET ASSY. (4) FROM LADDER.)
- D. ALIGN HOLES AND REINSTALL LADDER BRACKET MOUNTING BOLTS (1) THROUGH LADDER BRACKET ASSY. (4) AND LADDER MOUNTING CHANNELS (2).
- E. TIGHTEN ALL BOLTS.
- F. TIGHTEN ADJUSTING SCREW (5) IN THE ADJUSTABLE MOUNTING BRACKETS WHEN APPLICABLE.



EVAPCO, INC.

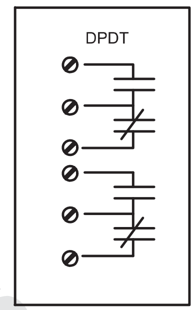
TITLE	DESCRIPTION:	DWG. #
VIBRATION SWITCH	USS 212-4L28 SINGLE SPEED	04/13/2017 V1AU0000-EE



SWITCH CONTACT RATING:

15 AMPS, 125, OR 480 Vac; 1/8 HP, 125 Vac; 1/4 HP, 250 Vac; 1/2 AMP, 125 Vdc; 1/4 AMP, 250 Vdc.

WIRING DIAGRAM:



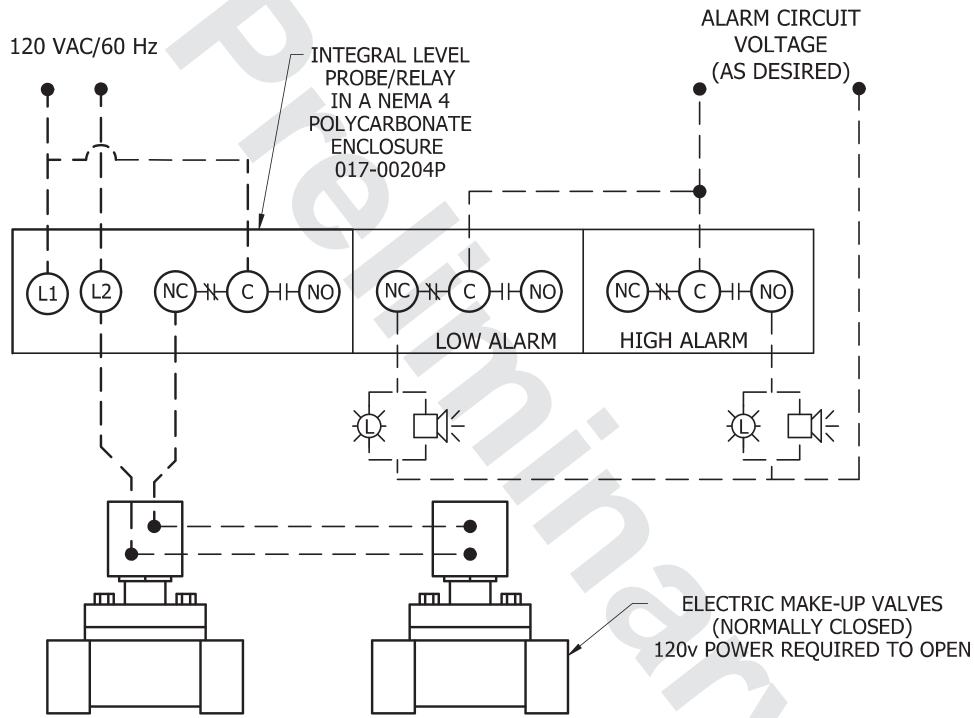
NOTES:

1. DASHED LINES INDICATE WIRING(BY OTHERS)

ADJUSTMENT

ADJUST THE SWITCH SO THAT DURING FULL SPEED START-UP AND UNDER NORMAL CONDITIONS, THE CONTACTS DO NOT TRIP. FIRST, WITH THE MOTOR OFF, TURN THE ADJUSTMENT SCREW COUNTER-CLOCKWISE (MORE SENSITIVE DIRECTION) UNTIL THE SWITCH TRIPS. NEXT, TURN THE ADJUSTMENT SCREW CLOCKWISE 1/8 TURN (LESS SENSITIVE DIRECTION). RESET THE SWITCH BY DEPRESSING THE PUSH-BUTTON RESET LOCATED ON TOP OF THE SWITCH. START THE MOTOR ON FULL SPEED. IF THE MOTOR TRIPS THE SWITCH, THEN TURN THE ADJUSTMENT SCREW CLOCKWISE AN ADDITIONAL 1/8 TURN. RESET THE SWITCH AND START THE MOTOR AGAIN. REPEAT THE ABOVE PROCEDURE UNTIL THE MOTOR CONTINUES TO RUN.

UNIT USS 212-4L28	EVAPCO, INC.	DWG. # D2IX0000-B
TITLE ELECTRIC WATER LEVEL CONTROL WIRING		SCALE N.T.S. / DRAWN BY JLG



NOTES:
1. DASHED LINES INDICATE WIRING BY OTHERS.
2. TYPICAL WIRING PER PROBE.

Model: **1250REOZMD**

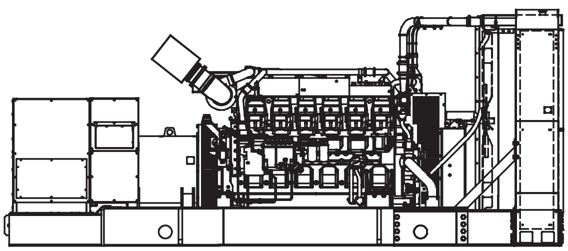
KOHLER. Power Systems

380-4160 V **Diesel**

Tier 2 EPA-Certified for Stationary Emergency Applications

Ratings Range

		60 Hz
Standby:	**kW**	940-1280
	kVA	1175-1600
Prime:	**kW**	860-1160
	kVA	1075-1450



Standard Features

- Kohler Co. provides one-source responsibility for the generating system and accessories.
- The generator set and its components are prototype-tested, factory-built, and production-tested.
- The 60 Hz generator set offers a UL 2200 listing.
- The generator set accepts rated load in one step.
- The 60 Hz generator set meets NFPA 110, Level 1, when equipped with the necessary accessories and installed per NFPA standards.
- A standard one-year limited warranty covers all systems and components. Two-, five-, and ten-year extended warranties are also available.
- Alternator features:
  - The pilot-excited, permanent magnet (PM) alternator provides superior short-circuit capability.
  - The brushless, rotating-field alternator has broadrange reconnectability.
- Other features:
  - Kohler designed controllers for guaranteed system integration and remote communication. See Controllers on page 3.
  - The low coolant level shutdown prevents overheating (standard on radiator models only).
  - An electronic, isochronous governor delivers precise frequency regulation.
  - Multiple circuit breaker configurations.

Generator Set Ratings

				150°C Rise Standby Rating		130°C Rise Standby Rating		125°C Rise Prime Rating		105°C Rise Prime Rating	
Alternator	**Voltage**	**Ph**	**Hz**	**kW/kVA**	**Amps**	**kW/kVA**	**Amps**	**kW/kVA**	**Amps**	**kW/kVA**	**Amps**
7M4046	220/380	3	60	940/1175	1785	940/1175	1785	860/1075	1633	860/1075	1633
	240/416	3	60	1180/1475	2047	1110/1388	1926	1090/1363	1891	1020/1275	1770
	277/480	3	60	1250/1563	1879	1220/1525	1834	1140/1425	1714	1120/1400	1684
7M4048	220/380	3	60	1030/1288	1956	1030/1288	1956	940/1175	1785	940/1175	1785
	240/416	3	60	1250/1563	2169	1180/1475	2047	1140/1425	1978	1100/1375	1908
	277/480	3	60	1270/1588	1909	1270/1588	1909	1160/1450	1744	1160/1450	1744
7M4050	220/380	3	60	1160/1450	2203	1160/1450	2203	1060/1325	2013	1060/1325	2013
	240/416	3	60	1280/1600	2221	1280/1600	2221	1160/1450	2012	1160/1450	2012
	277/480	3	60	1280/1600	1925	1280/1600	1925	1160/1450	1744	1160/1450	1744
7M4052	220/380	3	60	1280/1600	2431	1280/1600	2431	1160/1450	2203	1160/1450	2203
	240/416	3	60	1280/1600	2221	1280/1600	2221	1160/1450	2012	1160/1450	2012
	277/480	3	60	1280/1600	1925	1280/1600	1925	1160/1450	1744	1160/1450	1744
7M4172	220/380	3	60	1270/1588	2412	1260/1575	2393	1160/1450	2203	1160/1450	2203
7M4174	220/380	3	60	1280/1600	2431	1280/1600	2431	1160/1450	2203	1160/1450	2203
7M4288	347/600	3	60	1280/1600	1540	1280/1600	1540	1160/1450	1395	1160/1450	1395
7M4366	2400/4160	3	60	1280/1600	222	1280/1600	222	1160/1450	201	1160/1450	201
7M4368	2400/4160	3	60	1280/1600	222	1280/1600	222	1160/1450	201	1160/1450	201

RATINGS: All three-phase units are rated at 0.8 power factor. *Standby Ratings:* The standby rating is applicable to varying loads for the duration of a power outage. There is no overload capability for this rating. *Prime Power Ratings:* At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO-8528-1 and ISO-3046-1. For limited running time and continuous ratings, consult the factory. Obtain technical information bulletin (TIB-101) for ratings guidelines, complete ratings definitions, and site condition derates. The generator set manufacturer reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever.

Alternator Specifications

Specifications		Alternator
Type		4-Pole, Rotating-Field
Exciter type		Brushless, Permanent-Magnet Pilot Exciter
Voltage regulator		Solid State, Volts/Hz
Insulation:		NEMA MG1
Material		Class H, Synthetic, Nonhygroscopic
Temperature rise		130°C, 150°C Standby
Bearing: quantity, type		1, Sealed
Coupling		Flexible Disc
Amortisseur windings		Full
Rotor balancing		125%
Voltage regulation, no-load to full-load		Controller Dependent
One-step load acceptance at 60 Hz		100% of Rating
Unbalanced load capability		100% of Rated Standby Current
Peak motor starting kVA:		(35% dip for voltages below)
480 V	7M4046 (4 bus bar)	3900
480 V	7M4048 (4 bus bar)	3700
480 V	7M4050 (4 bus bar)	4500
480 V	7M4052 (4 bus bar)	5500
380 V	7M4172 (4 bus bar)	2600
380 V	7M4174 (4 bus bar)	4200
600 V	7M4288 (4 bus bar)	5400
4160 V	7M4366 (6 lead)	3900
4160 V	7M4368 (6 lead)	4900

- NEMA MG1, IEEE, and ANSI standards compliance for temperature rise and motor starting.
- Sustained short-circuit current of up to 300% of the rated current for up to 10 seconds.
- Sustained short-circuit current enabling downstream circuit breakers to trip without collapsing the alternator field.
- Self-ventilated and dripproof construction.
- Superior voltage waveform from two-thirds pitch windings and skewed stator.
- Digital solid-state, volts-per-hertz voltage regulator with ±0.25% no-load to full-load regulation.
- Brushless alternator with brushless pilot exciter for excellent load response.

Application Data

Engine

Engine Specifications	
Manufacturer	Mitsubishi
Engine model	S12R-Y2PTAW-1
Engine type	4-Cycle, Turbocharged
Cylinder arrangement	12 V
Displacement, L (cu. in.)	49.0 (2992)
Bore and stroke, mm (in.)	170 x 180 (6.69 x 7.09)
Compression ratio	14.5:1
Piston speed, m/min. (ft./min.)	648 (2126)
Main bearings: quantity, type	7, Precision Half-Shell
Rated rpm	1800
Max. power at rated rpm, kWm (BHP)	1403 (1881)
Cylinder head material	Cast Iron
Crankshaft material	Forged Steel
Governor type	Electronic
Frequency regulation, no-load to full-load	Isochronous
Frequency regulation, steady state	±0.25%
Frequency	Fixed
Air cleaner type, all models	Dry

Exhaust

Exhaust System	
Exhaust manifold type	Dry
Exhaust flow at rated kW, m^3/min. (cfm)	356 (12570)
Exhaust temperature at rated kW, dry exhaust, °C (°F)	497 (927)
Maximum allowable back pressure, kPa (in. Hg)	5.9 (1.7)
Exhaust outlet size at engine hookup, mm (in.)	See ADV drawing

Engine Electrical

Engine Electrical System	
Battery charging alternator:	
Ground (negative/positive)	Negative
Volts (DC)	24
Ampere rating	30
Starter motor rated voltage (DC)	Dual, 24
Battery, recommended cold cranking amps (CCA):	
Quantity, CCA rating each	Four, 1150
Battery voltage (DC)	12

Fuel

Fuel System	
Fuel supply line, min. ID, mm (in.)	19 (0.75)
Fuel return line, min. ID, mm (in.)	19 (0.75)
Max. fuel flow, Lph (gph)	480 (127)
Max. fuel pump restriction, kPa (in. Hg)	10 (3.0)
Max. return line restriction, kPa (in. Hg)	20 (5.9)
Fuel filter: quantity, type	4, Secondary
Recommended fuel	#2 Diesel

Lubrication

Lubricating System	
Type	Full Pressure
Oil pan capacity, L (qt.)	150 (159)
Oil pan capacity with filter, L (qt.)	180 (190)
Oil filter: quantity, type	4, Cartridge
Oil cooler	Water-Cooled

Application Data

Cooling

Radiator System	
Ambient temperature, °C (°F)*	40 (104)
Engine jacket water capacity, L (gal.)	130 (34)
Radiator system capacity, including engine, L (gal.)	327 (86)
Engine jacket water flow, Lpm (gpm)	1850 (489)
Charge cooler water flow, Lpm (gpm)	340 (90)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	511 (29045)
Heat rejected to charge cooler water at rated kW, dry exhaust, kW (Btu/min.)	511 (29045)
Water pump type	Centrifugal
Fan diameter, including blades, mm (in.)	1829 (72)
Fan kWm (HP)	57 (76)
Max. restriction of cooling air, intake and discharge side of radiator, kPa (in. H_2O)	0.125 (0.5)

High Ambient Radiator System	
Ambient temperature, °C (°F)*	50 (122)
Engine water capacity, L (gal.)	130 (34)
Radiator system capacity, including engine, L (gal.)	341 (90)
Engine jacket water flow, Lpm (gpm)	1850 (489)
Charge cooler water flow, Lpm (gpm)	340 (90)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	511 (29045)
Heat rejected to charge cooler water at rated kW, dry exhaust, kW (Btu/min.)	511 (29045)
Water pump type	Centrifugal
Fan diameter, including blades, mm (in.)	1829 (72)
Fan kWm (HP)	57 (76)
Max. restriction of cooling air, intake and discharge side of radiator, kPa (in. H_2O)	0.125 (0.5)

* Enclosure with enclosed silencer reduces ambient temperature capability by 5°C (9°F).

Remote Radiator System†	
Exhaust manifold type	Dry
Connection sizes:	
Jacket water engine inlet, mm (in.)	95 (3.75)
Jacket water engine outlet, mm (in.)	95 (3.75)
Intercooler water engine inlet, mm (in.)	83 (3.25)
Intercooler water engine outlet, mm (in.)	83 (3.25)
Static head allowable above engine, kPa (ft. H_2O)	98 (32.8)

† Contact your local distributor for cooling system options and specifications based on your specific requirements.

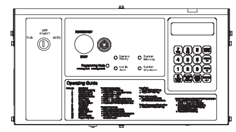
Operation Requirements

Air Requirements	
Radiator-cooled cooling air, m^3/min. (scfm)‡	1756 (62000)
High ambient radiator-cooled cooling air, m^3/min. (scfm)‡	1699 (60000)
Cooling air required for generator set when equipped with city water cooling or remote radiator, based on 14°C (25°F) rise, m^3/min. (scfm)‡	677 (23900)
Combustion air, m^3/min. (cfm)	135 (4767)
Heat rejected to ambient air:	
Engine, kW (Btu/min.)	118 (6703)
Alternator, kW (Btu/min.)	71 (4038)

‡ Air density = 1.20 kg/m^3 (0.075 lbm/ft^3)

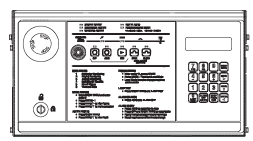
Fuel Consumption	
Diesel, Lph (gph) at % load	**Standby Rating**
100%	392 (103.4)
75%	284 (75.1)
50%	193 (51.0)
25%	110 (29.2)
Diesel, Lph (gph) at % load	**Prime Rating**
100%	344 (90.9)
75%	259 (68.4)
50%	176 (46.4)
25%	105 (27.6)

Controllers



Decision-Maker® 550 Controller
Provides advanced control, system monitoring, and system diagnostics with remote monitoring capabilities.
- Digital display and keypad provide easy local data access
- Measurements are selectable in metric or English units
- Remote communication thru a PC via network or modem configuration
- Controller supports Modbus® protocol
- Integrated voltage regulator with ±0.25% regulation
- Built-in alternator thermal overload protection
- NFPA 110 Level 1 capability

Refer to G6-46 for additional controller features and accessories.



Decision-Maker® 6000 Paralleling Controller
Provides advanced control, system monitoring, and system diagnostics with remote monitoring capabilities for paralleling multiple generator sets.
- Paralleling capability with first-on logic, synchronizer, kW and kVAR load sharing, and protective relays
- Digital display and keypad provide easy local data access
- Measurements are selectable in metric or English units
- Remote communication thru a PC via network or modem configuration
- Controller supports Modbus® protocol
- Integrated voltage regulator with ±0.25% regulation
- Built-in alternator thermal overload protection
- NFPA 110 Level 1 capability

Refer to G6-107 for additional controller features and accessories.

KOHLER CO., Kohler, Wisconsin 53044 USA
Phone 920-457-4441, Fax 920-459-1646
For the nearest sales and service outlet in the
US and Canada, phone 1-800-544-2444
KOHLERPower.com

Kohler Power Systems
Asia Pacific Headquarters
7 Jurong Pier Road
Singapore 619159
Phone (65) 6264-6422, Fax (65) 6264-6455

Standard Features

- Alternator Protection
- Alternator Strip Heater (standard on 3300 volt and above)
- Customer Connection (standard with Decision-Maker® 6000 controller only)
- Local Emergency Stop Switch
- Oil Drain Extension
- Operation and Installation Literature
- Radiator Core Guard

Available Options

Approvals and Listings

- ❑ California OSHPD Approval
- ❑ CSA Approval
- ❑ IBC Seismic Certification
- ❑ UL 2200 Listing

Enclosed Unit

- ❑ Sound Enclosure/Fuel Tank Package
- ❑ Weather Enclosure/Fuel Tank Package

Open Unit

- ❑ Exhaust Silencer, Hospital (kit: PA-361626)
- ❑ Exhaust Silencer, Critical (kit: PA-361617)
- ❑ Flexible Exhaust Connector, Stainless Steel

Fuel System

- ❑ Flexible Fuel Lines
- ❑ Fuel Pressure Gauge
- ❑ Fuel/Water Separator

Controller

- ❑ Common Failure Relay
- ❑ Communication Products and PC Software
- ❑ Customer Connection (Decision-Maker® 550 controller only)
- ❑ Decision-Maker® Paralleling System (DPS) (Decision-Maker® 6000 controller only)
- ❑ Dry Contact (isolated alarm)
- ❑ Prime Power Switch
- ❑ Remote Audiovisual Alarm Panel (Decision-Maker® 550 controller only)
- ❑ Remote Emergency Stop
- ❑ Remote Mounting Cable
- ❑ Remote Serial Annunciator Panel
- ❑ Run Relay

Cooling System

- ❑ Block Heater; 9000 W, 208 V, 1 Ph
- ❑ Block Heater; 9000 W, 240 V, (Select 1 Ph or 3 Ph)
- ❑ Block Heater; 9000 W, 380 V, 3 Ph
- ❑ Block Heater; 9000 W, 480 V, (Select 1 Ph or 3 Ph) Recommended for Ambient Temperatures Below 20°C (68°F)
- ❑ High Ambient Radiator
- ❑ Remote Radiator Cooling Setup

Electrical System

- ❑ Alternator Strip Heater (available up to 600 volt)
- ❑ Battery
- ❑ Battery Charger, Equalize/Float Type
- ❑ Battery Heater
- ❑ Battery Rack and Cables
- ❑ Line Circuit Breaker (NEMA type 1 enclosure)
- ❑ Line Circuit Breaker with Shunt Trip (NEMA type 1 enclosure)

Paralleling System

- ❑ Remote Voltage Adjustment Control
- ❑ Voltage Sensing (Decision-Maker® 6000 controller only)

Miscellaneous

- ❑ Air Cleaner, Heavy Duty
- ❑ Air Cleaner Restriction Indicator
- ❑ Crankcase Emission Canister
- ❑ Engine Fluids (oil and coolant) Added
- ❑ Oil Temperature Gauge
- ❑ Rated Power Factor Testing
- ❑ Spring Isolators

Literature

- ❑ General Maintenance
- ❑ NFPA 110
- ❑ Overhaul
- ❑ Production

Warranty

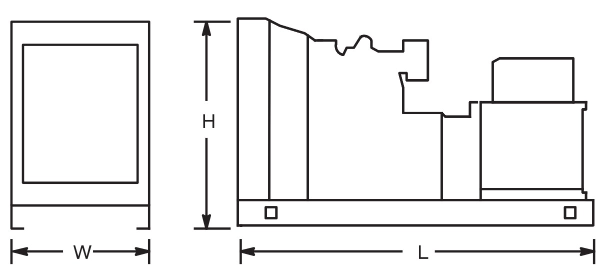
- ❑ 2-Year Basic
- ❑ 2-Year Prime
- ❑ 5-Year Basic
- ❑ 5-Year Comprehensive
- ❑ 10-Year Major Components

Other Options

- ❑ ______________________________
- ❑ ______________________________
- ❑ ______________________________
- ❑ ______________________________

Dimensions and Weights

Overall Size, L x W x H, max., mm (in.):	6353 x 2232 x 2490 (250.1 x 87.9 x 98.0)
Weight (radiator model), wet, max., kg (lb.):	12020 (26500)



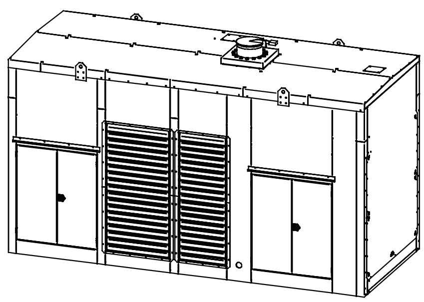
Note: This drawing is provided for reference only and should not be used for planning the installation. Contact your local distributor for more detailed information.

DISTRIBUTED BY:

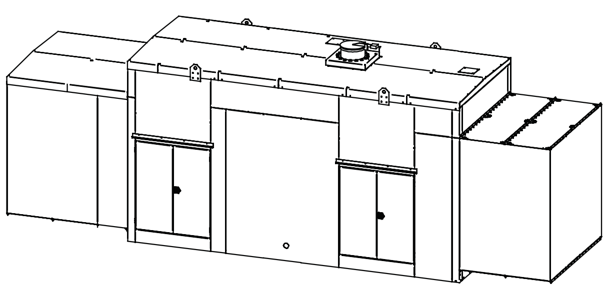
KOHLER POWER SYSTEMS

Steel/Galvaneel Steel Enclosure and Subbase Fuel Tank Package

ISO 9001 KOHLER POWER SYSTEMS NATIONALLY REGISTERED



Weather Enclosure with Internal Silencer shown



Sound Enclosure Level 1 and Level 2 with Internal Silencer shown

Applicable to the following:

1250-2250REOZDD
1250-2000REOZMD

Weather Enclosure Standard Features

- Internal or external silencer, flexible exhaust connector, and rain cap.
- Mounts to lift base or subbase fuel tank. Steel or galvaneel steel construction with hinged and removable doors.
- Fade-, scratch-, and corrosion-resistant Kohler® cream beige powder-baked finish.
- Lockable, flush-mounted door latches.
- Air inlet louvers reduce rain and snow entry.

Sound Enclosures Standard Features

- Includes all of the weather enclosure features with the addition of acoustic insulation material.
- Vertical air inlet and outlet hoods with 90 degree angles to redirect air and reduce noise.
- Acoustic insulation that meets UL 94 HF1 flammability classification.
- Sound enclosure level 1 that offers sound reduction of 15 dB(A) at 7 m (23 ft.) using 51 mm (2 in.) of acoustic insulation and acoustic-lined air inlet hoods.
- Sound enclosure level 2 that offers sound reduction of 25 dB(A) at 7 m (23 ft.) using 51 mm (2 in.) of acoustic insulation, acoustic-lined air inlet hoods, and acoustic-lined air discharge hood.

Subbase Fuel Tank Features

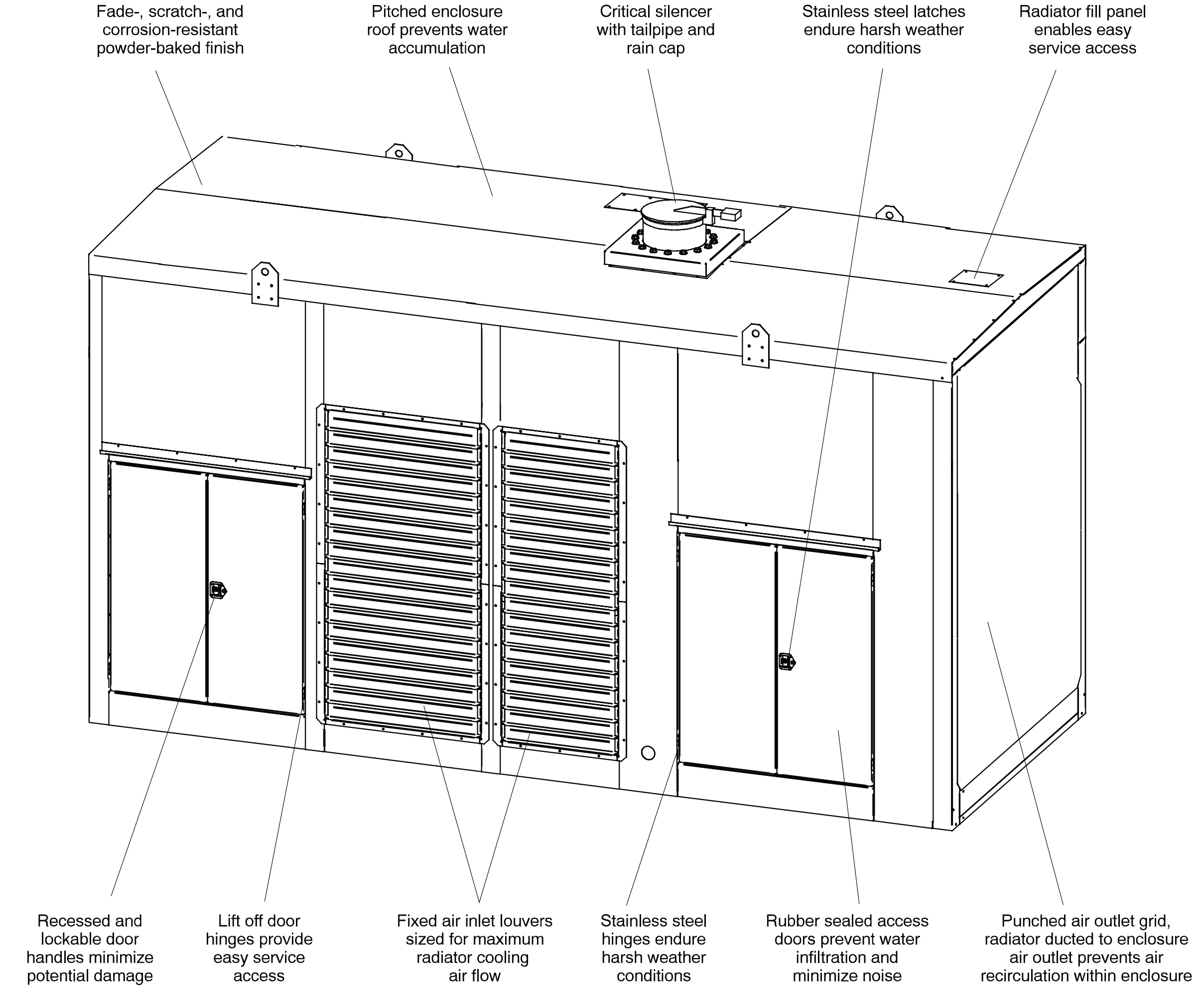
- The above-ground rectangular secondary containment tank mounts directly to the generator set, below the generator set skid (subbase).
- Both the inner and outer tanks have emergency relief vents.
- Flexible fuel lines are provided with subbase fuel tank selection.
- The containment tank's double-wall construction protects against fuel leaks or ruptures. The inner (primary) tank is sealed inside the outer (secondary) tank. The outer tank contains the fuel if the inner tank leaks or ruptures.

Enclosure and Subbase Fuel Tank Combinations

There are six enclosure configurations available with the subbase fuel tanks.

Weather Enclosure with External Silencer
Sound Enclosure Level 1 with External Silencer
Sound Enclosure Level 2 with External Silencer
Weather Enclosure with Internal Silencer
Sound Enclosure Level 1 with Internal Silencer
Sound Enclosure Level 2 with Internal Silencer

Steel/Galvaneel Steel Weather Enclosure



Enclosure ships assembled on subbase fuel tank or lifting base.

Note: Sample model shown, other models are similar.

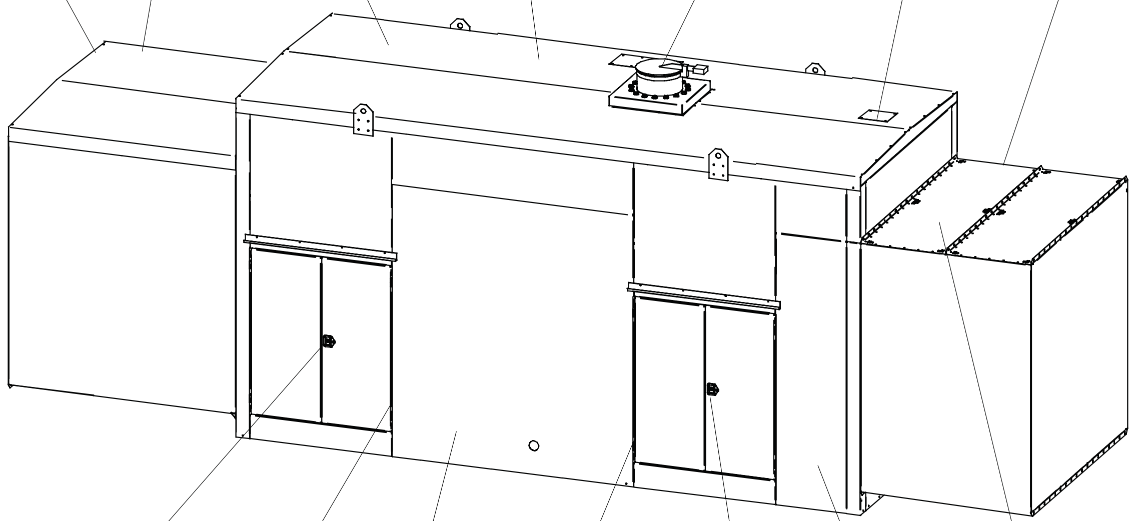
1500-21715-A

Steel/Galvaneel Steel Weather Enclosure Features

- Heavy-duty formed panels, solid construction. Preassembled package offering corrosion resistant (galvaneel steel), dent resilient structure mounting directly to lift base or fuel tank.
- Powder-baked paint. Superior finish, durability, and appearance.
- Internal critical exhaust silencer. Offers maximum component life, operator safety, and includes rain shield and cap. Models with external silencer are also available.

  NOTE: Installing an additional length of exhaust tail pipe may increase backpressure levels. Please refer to the generator set spec sheet for the maximum backpressure value.
- Service access. Multi-personnel doors for easy access to generator set control and servicing of the fuel fill, fuel gauge, oil fill, and battery.
- Interchangeable modular panel construction allows design flexibility without compromising building standards.
- Bolted panels facilitate service, future modification upgrades, or field replacement.
- Cooling/combustion air intake. Weather protective designs using fixed air inlet louvers. Sized for maximum cooling airflow.
- Cooling air discharge. Weather protective design featuring horizontal air discharge. Exhausts air through a removable punched air outlet grille.

Level 1 and Level 2 Steel/Galvaneel Steel Sound Enclosure



Enclosure ships assembled on subbase fuel tank or lifting base.

Note: Sample model shown, other models are similar.

1500-21715-A

Level 1 and Level 2 Sound Enclosure Features

- Heavy-duty formed panels, solid construction. Preassembled package offering corrosion resistant, dent resilient structure mounting directly to lift base or fuel tank.
- Powder-baked paint. Superior finish, durability, and appearance.
- Internal exhaust silencer offering maximum component life and operator safety. Models with external silencer are also available.

  NOTE: Installing an additional length of exhaust tail pipe may increase backpressure levels. Please refer to the generator set spec sheet for the maximum backpressure value.
- Service access. Multi-personnel doors for easy access to generator set control and servicing of the fuel fill, fuel gauge, oil fill, and battery.
- Interchangeable modular panel construction. Allows complete serviceability or replacement without compromising enclosure design.
- Bolted panels facilitate service, future modification upgrades, or field replacement.
- Cooling/combustion air intake. Attenuated models offering 90° vertical air inlet hood redirects air to reduce noise.
- Cooling air discharge. Attenuated models offering 90° vertical air outlet hood. Redirects cooling air up and above enclosure to reduce noise.

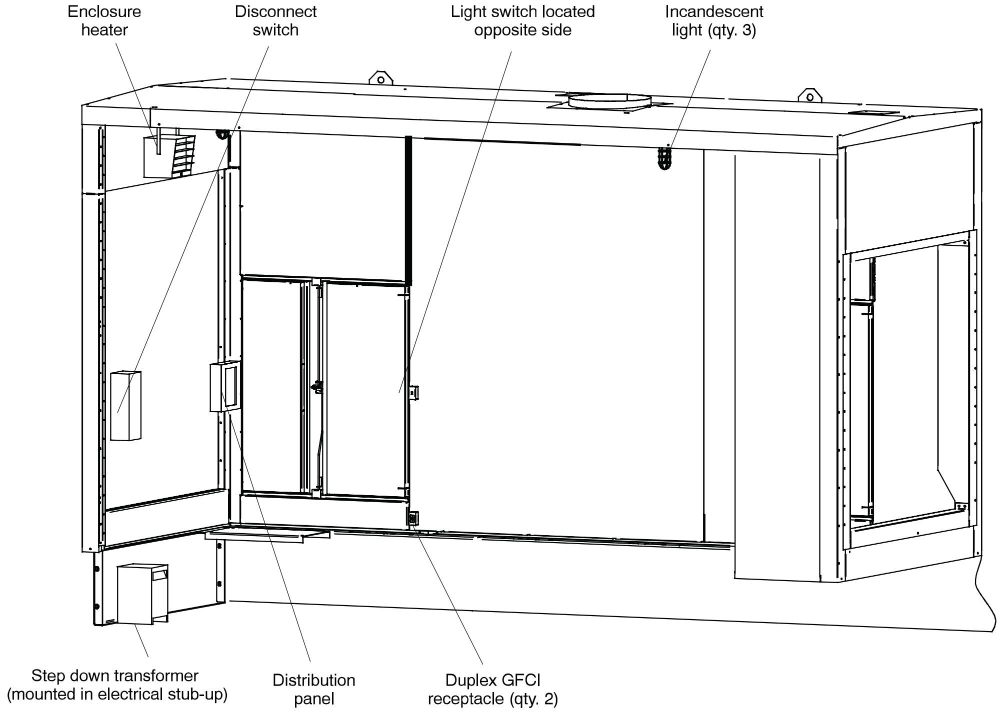
Level 1 Sound Enclosure Features

- Attenuated design using a critical silencer. Acoustic insulation UL 94 HF1 listed for flame resistance; design offering 15 dB(A) attenuation using 51 mm (2 in.) of mechanically restrained acoustic insulation.

Level 2 Sound Enclosure Features

- Attenuated design using a hospital silencer. Acoustic insulation UL 94 HF1 listed for flame resistance; design offering 25 dB(A) attenuation using 51 mm (2 in.) of mechanically restrained acoustic insulation.
- Perforated interior liner and acoustic-lined air discharge hood.

Steel/Galvaneel Steel Weather and Sound Enclosure Options



Note: Sample model shown, other models are similar.

1500-21709-A

Enclosure Construction Type Options

❑ **Steel Enclosure**
❑ **Galvaneel Steel Enclosure**

Enclosure Silencer Options

❑ **External Critical Silencer**, weather enclosure
❑ **External Critical Silencer**, sound enclosure, level 1
❑ **External Hospital Silencer**, sound enclosure, level 2

❑ **Internal Critical Silencer**, weather enclosure
❑ **Internal Critical Silencer**, sound enclosure, level 1
❑ **Internal Hospital Silencer**, sound enclosure, level 2

Steel/Galvaneel Steel Weather and Sound Enclosure Options, continued

Electrical Accessories

DC Light Package

- ❑ **DC Light Package (DLP).** Prewired qty. 2, internal 24 VDC light package offering an economical alternative light source within the enclosure, as a complement to the BEP or a source of light when AC power is not available. Battery drain limited with fuse protection and controlled through a 0–60 minute, spring-wound, no-hold timer.
- ❑ Additional 24 VDC lights, qty. 2

Basic Electrical Package (BEP)

Distribution Panel/Load Center. Prewired AC power distribution of all factory-installed features including block heater, two GFCI-protected internal 120-volt service receptacles, internal lighting, and commercial grade wall switch. The single-phase or three-phase load center powered by building source power and protected by a main circuit breaker, rated for 100 amps or 200 amps with 12 branch circuits for future expansion. AC power distribution installed in accordance with NEC and all wiring within EMT thin wall conduit. Incandescent or fluorescent AC lights located within UL-listed fixtures designed for wet locations.

- ❑ BEP, single-phase load center, 120/208/240 VAC
- ❑ BEP, three-phase load center, 120/208/240 VAC
- ❑ 100 amp rated main circuit breaker (available with 1250–2250REOZDD models only)
- ❑ 200 amp rated main circuit breaker
- ❑ BEP with two 4-foot florescent lights
- ❑ BEP with three AC incandescent lights
- ❑ Additional AC lights (qty. 2)
- ❑ Additional GFCI duplex receptacles (qty. 2) internal mounted
- ❑ Additional GFCI duplex receptacles (qty. 2) external mounted

- ❑ **Emergency Lights.** Mounted inside the enclosure with batteries, dual-head base.

Heater, 5 kW Ceiling Mounted. Electrical utility heater prewired to load center internal to enclosure. Rated at 17100 Btu. Includes adjustable louvers offering down flow and horizontal air tuning, built-in thermostat with automatic fan delay controls.

- ❑ Heater, single phase at 208 or 240 VAC
- ❑ Heater, three phase at 208 or 240 VAC

- ❑ **Exhaust Fan.** Mounted inside the enclosure.

Miscellaneous Enclosure Accessories

- ❑ **Viewing Window.** Control panel viewing window.

Emergency Stop Switch. Generator set emergency stop switch (break glass, pushbutton style).

- ❑ Emergency stop switch, qty. 1
- ❑ Emergency stop switch, qty. 2

Battery Charger, Mounted. Mounting and prewiring of DC output and AC input when optional BEP is selected. Battery charger located inside the enclosure and accessible through an access door.

- ❑ Battery charger with alarms
- ❑ Battery charger without alarms

- ❑ **Door Latches for Padlocks.** Door latches for padlocks on each door.

- ❑ **Automatic Door Holders.** Door holders for each door.

- ❑ **Panic Bars.** Internal release handle for each door.

For Weather Enclosure Packages only

- ❑ **Outlet Hood for Weather Enclosure only.** Outlet 90° hood.

- ❑ **Motorized Outlet Hood.** Outlet 90° hood with galvaneel steel construction.

- ❑ **Motorized Inlet Louvers.** Inlet 45° louvers with galvaneel steel construction.

- ❑ **Gravity Outlet Dampers.** Outlet 90° louvers with galvaneel steel construction.

- ❑ **Walkway.** Steel staircase with a supported platform attached. Designed to provide access to elevated doors. Not assembled.

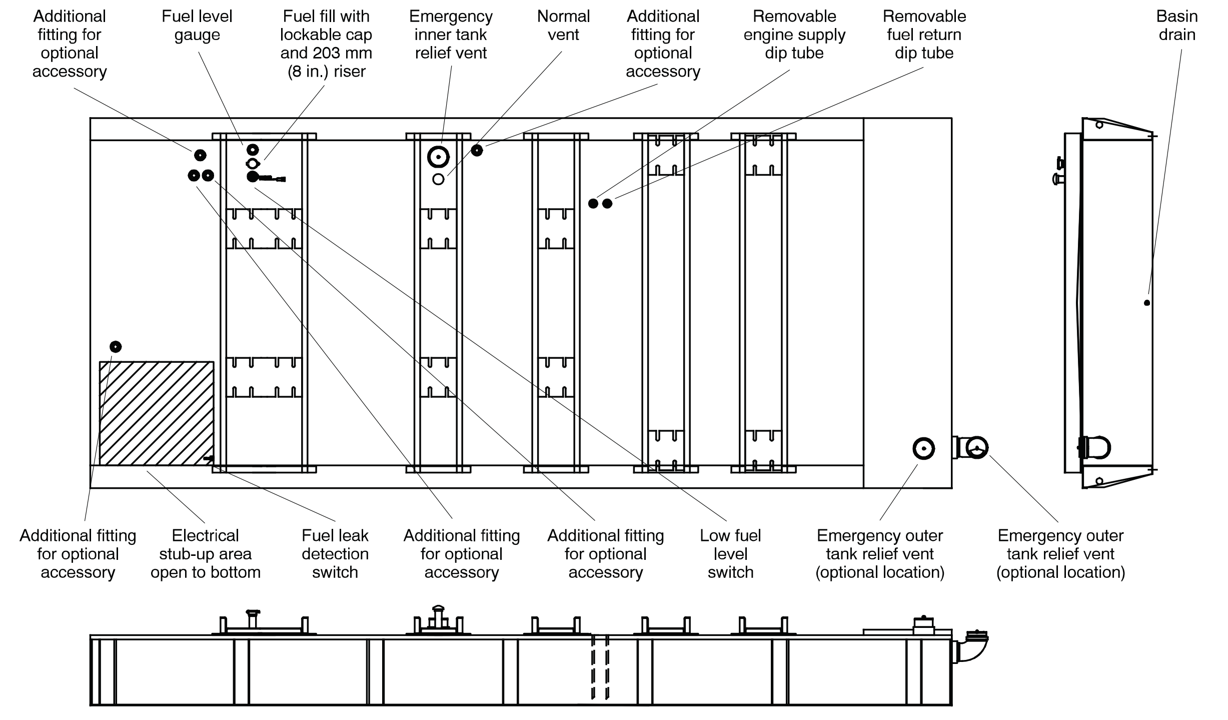
Stepdown Transformer. 480 volt primary and 120/208 volt secondary. Mounted in electrical stub-up area.

- ❑ 37.5 kVA, single-phase
- ❑ 45 kVA, three-phase
- ❑ 50 kVA, single-phase
- ❑ 75 kVA, three-phase

Disconnect. Disconnect switch for transformer.

- ❑ 37.5 kVA, single-phase
- ❑ 45 kVA, three-phase
- ❑ 50 kVA, single-phase
- ❑ 75 kVA, three-phase

Subbase Fuel Tank



Note: Sample model shown, other models are similar.

Standard Subbase Fuel Tank Features

- Extended operation. Usable tank capacities of 2501–35095 L (660–9260 gal.).
- UL listed. Secondary containment generator set base tank meeting UL 142 requirements.
- NFPA compliant. Designed to comply with the installation standards of NFPA 30 and NFPA 37.
- Integral external lift lugs. Enables crane with spreader-bar lifting of the complete package (empty tank, mounted generator set, and enclosure) to ensure safety.
- Emergency pressure relief vents. Vents ensure adequate venting of inner and outer tank under extreme pressure and/or emergency conditions.
- Normal vent with cap. Vent is raised above lockable fuel fill.
- Low fuel level switch. Annunciates a 50% low fuel level condition at generator set control.
- Leak detection switch. Annunciates a contained primary tank fuel leak condition at generator set control.
- Electrical stub-up.

Available Subbase Fuel Tank Accessories

Tank Accessories

Alarm Panels

- ❑ Alarm panel located inside the enclosure.
- ❑ Three alarm panel for high, low, and fuel leak mounted inside the enclosure.
- ❑ Three alarm panel for high, low, and fuel leak with alarm horn and switch mounted next to generator set control panel outside the enclosure.

- ❑ **Supply Fuel Transfer System.** Electronic Control Module (ECM) with 15 Lpm (4 gpm) and 1/3 hp motor, solenoid valve, fuel strainer and critical high shutdown. Mounted, plumbed, and wired as a Modular Fuel Transfer System. (1250/1600 kW models only)
- ❑ **Supply Fuel Transfer System.** Electronic Control Module (ECM) with 26.5 Lpm (7 gpm) and 1/3 hp motor, solenoid valve, fuel strainer and critical high shutdown. Mounted, plumbed, and wired as a Modular Fuel Transfer System. (1750-2250 kW models only)

- ❑ **Return Fuel Transfer System.** A 26.5 Lpm (7 gpm) pump returns fuel to the main tank. Option adder to Modular Supply Fuel Transfer System. (1250/1600 kW models only)
- ❑ **Return Fuel Transfer System.** A 38 Lpm (10 gpm) pump returns fuel to the main tank. Option adder to Modular Supply Fuel Transfer System. (1750-2250 kW models only)

State Tank Accessories

- ❑ **Fill Pipe Extension** to within 152mm (6 in.) of bottom.

Fill/Spill Containment. Above ground fill/spill container for fuel overfill spills during fill-up. External mount or internal mount.

- ❑ 19 L (5 gal.)
- ❑ 19 L (5 gal.) with 95% shutoff
- ❑ 19 L (5 gal.) will fill to within of 152 mm (6 in.) of bottom
- ❑ 26.5 L (7 gal.) (FDEP Approved)
- ❑ 26.5 L (7 gal.) with 95% shutoff (FDEP Approved)

Normal Vent Options

- ❑ 3.6 m (12 ft.) vent above grade without spill containment
- ❑ 3.6 m (12 ft.) vent above grade with spill containment

High Fuel Switch

- ❑ High fuel level float switch
- ❑ High fuel level float switch (FDEP Approved)

Fuel in Containment

- ❑ Fuel in containment switch (FDEP Approved)

Fuel Supply Options

- ❑ Fire safety valve (installed on fuel supply)
- ❑ Ball valve (installed on fuel supply)

Fuel Tank Capacity, L (gal.)	Est. Fuel Supply Hours at 60 Hz with Full Load	1250/1500REOZDD with 40°C Radiator — Max. Dimensions, mm (in.) — Length	Width	Height	Max. Weight, † kg (lb.)	Fuel Tank Height, mm (in.)	Sound Pressure Reduction at 7 m (23 ft.)
Weather Enclosure with Internal Silencer and Subbase Fuel Tank *							
Lifting Base	0	7011 (276)	2743 (108)	4153 (164)	18160 (40000)	305 (12)	—
2501 (660)	7/5.5				19477 (42900)		
3790 (1000)	10.5/8.5			4255 (168)	19704 (43400)	406 (16)	
4738 (1250)	13/11			4331 (171)	19840 (43700)	483 (19)	
5875 (1550)	16/13.5			4420 (174)	19976 (44000)	572 (22.5)	
7580 (2000)	21/17.5	7494 (295)		4509 (178)	20339 (44800)	660 (26)	
10157 (2680)	28/24	9322 (367)			20975 (46200)		
13455 (3550)	37.5/31.5	11685 (460)			21837 (48100)		
17813 (4700)	49.5/42	10922 (430)		5074 (200)	22927 (50500)	914 (36)	
21717 (5730)	60.5/51	12878 (507)			23699 (52200)		
25772 (6800)	72/60.5	10415 (410)	3658 (144)	5239 (207)	25606 (56400)		
30434 (8030)	85/72	12040 (474)			26423 (58200)		
35095 (9260)	98/83	13691 (539)			27285 (60100)		
Sound Enclosure with Internal Silencer and Subbase Fuel Tank *							
Lifting Base	0	10669 (420)	2743 (108)	4153 (164)	19749 (43500)	305 (12)	Level 1 −15dB(A) or Level 2 −25 dB(A)
2501 (660)	7/5.5				21066 (46400)		
3790 (1000)	10.5/8.5			4255 (168)	21293 (46900)	406 (16)	
4738 (1250)	13/11			4331 (171)	21429 (47200)	483 (19)	
5875 (1550)	16/13.5			4420 (174)	21565 (47500)	572 (22.5)	
7580 (2000)	21/17.5			4509 (178)	21928 (48300)	660 (26)	
10157 (2680)	28/24	11456 (451)			22564 (49700)		
13455 (3550)	37.5/31.5	13818 (544)			23426 (51600)		
17813 (4700)	49.5/42	13056 (514)		5074 (200)	24516 (54000)	914 (36)	
21717 (5730)	60.5/51	15012 (591)			25288 (55700)		
25772 (6800)	72/60.5	12548 (494)	3658 (144)	5239 (207)	27195 (59900)		
30434 (8030)	85/72	14174 (558)			28012 (61700)		
35095 (9260)	98/83	15285 (623)			28847 (63600)		

Fuel Tank Capacity, L (gal.)	Est. Fuel Supply Hours at 60 Hz with Full Load	1250/1500REOZDD with 50°C Radiator — Max. Dimensions, mm (in.) — Length	Width	Height	Max. Weight, † kg (lb.)	Fuel Tank Height, mm (in.)	Sound Pressure Reduction at 7 m (23 ft.)
Weather Enclosure with Internal Silencer and Subbase Fuel Tank *							
Lifting Base	0	7011 (276)	3200 (126)	4153 (164)	18932 (41700)	305 (12)	—
2501 (660)	7/5.5				20385 (44900)		
3790 (1000)	10.5/8.5			4204 (166)	20566 (45300)	356 (14)	
4738 (1250)	13/11			4268 (168)	20702 (45600)	419 (16.5)	
5875 (1550)	16/13.5			4344 (171)	20884 (46000)	495 (19.5)	
7580 (2000)	21/17.5			4471 (176)	21111 (46500)	622 (24.5)	
10157 (2680)	28/24	8205 (323)		4509 (178)	21656 (47700)	660 (26)	
13455 (3550)	37.5/31.5	10211 (402)			22473 (49500)		
17813 (4700)	49.5/42	9551 (376)		5074 (200)	23608 (52000)	914 (36)	
21717 (5730)	60.5/51	11176 (440)			24334 (53600)		
25772 (6800)	72/60.5	12878 (507)			25106 (55300)		
30434 (8030)	85/72	12040 (474)	3658 (144)	5239 (207)	26968 (59400)		
35095 (9260)	98/83	13691 (539)			27785 (61200)		
Sound Enclosure with Internal Silencer and Subbase Fuel Tank *							
Lifting Base	0	12497 (492)	3200 (126)	4153 (164)	20612 (45400)	305 (12)	Level 1 −15dB(A) or Level 2 −25 dB(A)
2501 (660)	7/5.5				22064 (48600)		
3790 (1000)	10.5/8.5			4204 (166)	22246 (49000)	356 (14)	
4738 (1250)	13/11			4268 (168)	22382 (49300)	419 (16.5)	
5875 (1550)	16/13.5			4344 (174)	22564 (49700)	495 (19.5)	
7580 (2000)	21/17.5			4471 (176)	22791 (50200)	622 (24.5)	
10157 (2680)	28/24			4509 (178)	23336 (51400)	660 (26)	
13455 (3550)	37.5/31.5	13259 (522)			24153 (53200)		
17813 (4700)	49.5/42	12599 (496)		5074 (200)	25288 (55700)	914 (36)	
21717 (5730)	60.5/51	14224 (560)			26014 (57300)		
25772 (6800)	72/60.5	15926 (627)			26786 (59000)		
30434 (8030)	85/72	15088 (594)	3658 (144)	5239 (207)	28647 (63100)		
35095 (9260)	98/83	16739 (659)			29465 (64900)		

* Data in table is for reference only. Refer to your authorized Kohler distributor for enclosure and subbase fuel tank specification details.
† Max. weight includes the generator set (wet), enclosure, silencer, and tank (no fuel).

Fuel Tank Capacity, L (gal.)	Est. Fuel Supply Hours at 60 Hz with Full Load	1750REOZDD with 40°C Radiator				Fuel Tank Height, mm (in.)	Sound Pressure Reduction at 7 m (23 ft.)
		Max. Dimensions, mm (in.)			Max. Weight, † kg (lb.)		
		Length	Width	Height			
Weather Enclosure with Internal Silencer and Subbase Fuel Tank *							
Lifting Base	0	7011 (276)	2743 (108)	4179 (165)	18614 (41000)	305 (12)	—
2501 (660)	5				19931 (43900)		
3790 (1000)	8			4280 (169)	20158 (44400)	406 (16)	
4738 (1250)	10			4357 (172)	20294 (44700)	483 (19)	
5875 (1550)	12.5			4445 (175)	20430 (45000)	572 (22.5)	
7580 (2000)	16	7494 (295)		4534 (179)	20793 (45800)	660 (26)	
10157 (2680)	21.5	9322 (367)			21429 (47200)		
13455 (3550)	28.5	11685 (460)			22291 (49100)		
17813 (4700)	37.5	10922 (430)		5100 (201)	23381 (51500)	914 (36)	
21717 (5730)	46	12878 (507)			24153 (53200)		
25772 (6800)	54.5	10415 (410)	3658 (144)	5308 (209)	25878 (57000)		
30434 (8030)	64.5	12040 (474)			26695 (58800)		
35095 (9260)	74.5	13691 (539)			27512 (60600)		
Sound Enclosure with Internal Silencer and Subbase Fuel Tank *							
Lifting Base	0	12497 (492)	2743 (108)	4179 (165)	20203 (44500)	305 (12)	Level 1 −15dB(A) or Level 2 −25 dB(A)
2501 (660)	5				21520 (47400)		
3790 (1000)	8			4280 (169)	21747 (47900)	406 (16)	
4738 (1250)	10			4357 (172)	21883 (48200)	483 (19)	
5875 (1550)	12.5			4445 (175)	22019 (48500)	572 (22.5)	
7580 (2000)	16			4534 (179)	22382 (49300)	660 (26)	
10157 (2680)	21.5				23018 (50700)		
13455 (3550)	28.5	14732 (580)			23880 (52600)		
17813 (4700)	37.5	13970 (550)		5100 (201)	24970 (55000)	914 (36)	
21717 (5730)	46	15926 (627)			25742 (56700)		
25772 (6800)	54.5	13492 (530)	3658 (144)	5308 (209)	27467 (60500)		
30434 (8030)	64.5	15088 (594)			28284 (62300)		
35095 (9260)	74.5	16739 (659)			29101 (64100)		

Fuel Tank Capacity, L (gal.)	Est. Fuel Supply Hours at 60 Hz with Full Load	1750REOZDD with 50°C Radiator				Fuel Tank Height, mm (in.)	Sound Pressure Reduction at 7 m (23 ft.)
		Max. Dimensions, mm (in.)			Max. Weight, † kg (lb.)		
		Length	Width	Height			
Weather Enclosure with Internal Silencer and Subbase Fuel Tank *							
Lifting Base	0	7011 (276)	3200 (126)	4179 (165)	19386 (42700)	305 (12)	—
2501 (660)	5				20839 (45900)		
3790 (1000)	8			4230 (167)	21020 (46300)	356 (14)	
4738 (1250)	10			4369 (172)	21156 (46600)	419 (16.5)	
5875 (1550)	12.5			4496 (177)	21338 (47000)	495 (19.5)	
7580 (2000)	16			4534 (179)	21565 (47500)	622 (24.5)	
10157 (2680)	21.5	8205 (323)			22110 (48700)	660 (26)	
13455 (3550)	28.5	10211 (402)		5100 (201)	22927 (50500)		
17813 (4700)	37.5	9551 (376)			24062 (53000)	914 (36)	
21717 (5730)	46	11176 (440)			24788 (54600)		
25772 (6800)	54.5	12878 (507)		5265 (208)	25560 (56300)		
30434 (8030)	64.5	12040 (474)	3658 (144)		27422 (60400)		
35095 (9260)	74.5	13691 (539)			28239 (62200)		
Sound Enclosure with Internal Silencer and Subbase Fuel Tank *							
Lifting Base	0	12497 (492)	3200 (126)	4179 (165)	21066 (46400)	305 (12)	Level 1 −15dB(A) or Level 2 −25 dB(A)
2501 (660)	5				22518 (49600)		
3790 (1000)	8			4230 (167)	23426 (51600)	356 (14)	
4738 (1250)	10			4369 (172)	23563 (51900)	419 (16.5)	
5875 (1550)	12.5			4496 (177)	23699 (52200)	495 (19.5)	
7580 (2000)	16			4534 (179)	24062 (53000)	622 (24.5)	
10157 (2680)	21.5				24698 (54400)	660 (26)	
13455 (3550)	28.5	13259 (522)		5100 (201)	25560 (56300)		
17813 (4700)	37.5	12599 (496)			26650 (58700)	914 (36)	
21717 (5730)	46	14224 (560)			27422 (60400)		
25772 (6800)	54.5	15926 (627)			29147 (64200)		
30434 (8030)	64.5	15088 (594)	3658 (144)	5265 (208)	29964 (66000)		
35095 (9260)	74.5	16739 (659)			30781 (67800)		

* Data in table is for reference only. Refer to your authorized Kohler distributor for enclosure and subbase fuel tank specification details.
† Max. weight includes the generator set (wet), enclosure, silencer, and tank (no fuel).

Fuel Tank Capacity, L (gal.)	Est. Fuel Supply Hours at 60 Hz with Full Load	2000REOZDD with 40°C Radiator				Fuel Tank Height, mm (in.)	Sound Pressure Reduction at 7 m(23 ft.)
		Max. Dimensions, mm (in.)			Max. Weight, † kg (lb.)		
		Length	Width	Height			
Weather Enclosure with Internal Silencer and Subbase Fuel Tank *							
Lifting Base	0	7620 (300)	2743 (108)	4280 (169)	20339 (44800)	305 (12)	—
2501 (660)	4				21701 (47800)		
3790 (1000)	6.5			4331 (171)	21883 (48200)	356 (14)	
4738 (1250)	8			4407 (174)	22064 (48600)	432 (17)	
5875 (1550)	10			4484 (177)	22201 (48900)	508 (20)	
7580 (2000)	13.5	8509 (335)		4534 (179)	22609 (49800)	559 (22)	
10157 (2680)	18	10770 (424)			23381 (51500)		
13455 (3550)	24	13666 (538)			24334 (53600)		
17813 (4700)	31.5	10795 (425)		5201 (205)	25061 (55200)	914 (36)	
21717 (5730)	38.5	12751 (502)			25833 (56900)		
25772 (6800)	45.5	10338 (407)	3658 (144)	5409 (213)	27830 (61300)		
30434 (8030)	54	11964 (471)			28647 (63100)		
35095 (9260)	62.5	13564 (534)			29465 (64900)		
Sound Enclosure with Internal Silencer and Subbase Fuel Tank *							
Lifting Base	0	12497 (492)	2743 (108)	4280 (169)	22110 (48700)	305 (12)	Level 1 −15dB(A) or Level 2 −25 dB(A)
2501 (660)	4				23472 (51700)		
3790 (1000)	6.5			4331 (171)	23653 (52100)	356 (14)	
4738 (1250)	8			4407 (174)	23835 (52500)	432 (17)	
5875 (1550)	10			4484 (177)	23971 (52800)	508 (20)	
7580 (2000)	13.5			4534 (179)	24380 (53700)	559 (22)	
10157 (2680)	18	13513 (532)			25152 (55400)		
13455 (3550)	24	16409 (646)			26105 (57500)		
17813 (4700)	31.5	13539 (533)		5201 (205)	26831 (59100)	914 (36)	
21717 (5730)	38.5	15494 (610)			27603 (60800)		
25772 (6800)	45.5	13081 (515)	3658 (144)	5409 (213)	29601 (65200)		
30434 (8030)	54	14707 (579)			30418 (67000)		
35095 (9260)	62.5	16307 (642)			31235 (68800)		

Fuel Tank Capacity, L (gal.)	Est. Fuel Supply Hours at 60 Hz with Full Load	2000REOZDD w/ 50°C and 2250REOZDD w/ 40/50°C Rad.				Fuel Tank Height, mm (in.)	Sound Pressure Reduction at 7 m(23 ft.)
		Max. Dimensions, mm (in.)			Max. Weight, † kg (lb.)		
		Length	Width	Height			
Weather Enclosure with Internal Silencer and Subbase Fuel Tank *							
Lifting Base	0	7620 (300)	3200 (126)	4280 (169)	21156 (46600)	305 (12)	—
2501 (660)	4				22609 (49800)		
3790 (1000)	6.5/6			4293 (170)	22882 (50400)	318 (12.5)	
4738 (1250)	8/7.5			4357 (172)	23018 (50700)	381 (15)	
5875 (1550)	10/9			4420 (174)	23154 (51000)	445 (17.5)	
7580 (2000)	13.5/12			4522 (178)	23381 (51500)	546 (21.5)	
10157 (2680)	18/16	9373 (369)		4534 (179)	24062 (53000)	559 (22)	
13455 (3550)	24/21.5	12294 (484)			25015 (55100)		
17813 (4700)	31.5/28.5	9398 (370)		5201 (205)	25787 (56800)	914 (36)	
21717 (5730)	38.5/35	11024 (434)			26514 (58400)		
25772 (6800)	45.5/41.5	10338 (407)	3658 (144)	5366 (212)	28829 (63500)		
30434 (8030)	54/49	11964 (471)			29646 (65300)		
35095 (9260)	62.5/56.5	13564 (534)			30463 (67100)		
Sound Enclosure with Internal Silencer and Subbase Fuel Tank *							
Lifting Base	0	13107 (516)	3200 (126)	4280 (169)	23018 (50700)	305 (12)	Level 1 −15dB(A) or Level 2 −25 dB(A)
2501 (660)	4				24471 (53900)		
3790 (1000)	6.5/6			4293 (170)	24743 (54500)	318 (12.5)	
4738 (1250)	8/7.5			4357 (172)	24879 (54800)	381 (15)	
5875 (1550)	10/9			4420 (174)	25015 (55100)	445 (17.5)	
7580 (2000)	13.5/12			4522 (178)	25242 (55600)	546 (21.5)	
10157 (2680)	18/16			4534 (179)	25923 (57100)	559 (22)	
13455 (3550)	24/21.5	15342 (604)			26877 (59290)		
17813 (4700)	31.5/28.5	13107 (516)		5201 (205)	27649 (60900)	914 (36)	
21717 (5730)	38.5/35	14072 (554)			28375 (62500)		
25772 (6800)	45.5/41.5	13386 (527)	3658 (144)	5366 (212)	30690 (67600)		
30434 (8030)	54/49	15012 (591)			31508 (69400)		
35095 (9260)	62.5/56.5	16612 (654)			32325 (71200)		

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† Max. weight includes the generator set (wet), enclosure, silencer, and tank (no fuel).

Fuel Tank Capacity, L (gal.)	Est. Fuel Supply Hours at 60 Hz with Full Load	1250REOZMD with 40°C/50°C Radiator — Max. Dimensions, mm (in.) Length	Width	Height	Max. Weight, † kg (lb.)	Fuel Tank Height, mm (in.)	Sound Pressure Reduction at 7 m (23 ft.)
Weather Enclosure with Internal Silencer and Subbase Fuel Tank *							
Lifting Base	0	6858 (270)	2743 (108)	3950 (156)	15981 (35200)	305 (12)	—
2501 (660)	6				17525 (38000)		
3790 (1000)	9.5			4052 (160)	17434 (38400)	406 (16)	
4738 (1250)	12			4128 (163)	17615 (38800)	483 (19)	
5875 (1550)	15			4230 (167)	17797 (39200)	584 (23	
7580 (2000)	19	7366 (290)		4306 (170)	18115 (39900)	660 (26)	
10157 (2680)	25.5	9221 (363)			18796 (41400)		
13455 (3550)	34	9068 (357)		4509 (178)	19204 (42300)	864 (34)	
17813 (4700)	45	11405 (449)			20112 (44300)		
21717 (5730)	55	12751 (502)		4560 (180)	20839 (45900)	914 (36)	
25772 (6800)	65.5	10262 (404)	3658 (144)	5036 (199)	23381 (51500)		
30434 (8030)	77.5	11888 (468)			24198 (53300)		
35095 (9260)	89.5	13564 (534)			25015 (55100)		
Sound Enclosure with Internal Silencer and Subbase Fuel Tank *							
Lifting Base	0	10973 (432)	2743 (108)	3950 (156)	17434 (38400)	305 (12)	Level 1 −15dB(A) or Level 2 −25 dB(A)
2501 (660)	6				18705 (41200)		
3790 (1000)	9.5			4052 (160)	18886 (41600)	406 (16)	
4738 (1250)	12			4128 (163)	19068 (42000)	483 (19)	
5875 (1550)	15			4230 (167)	19250 (42400)	584 (23	
7580 (2000)	19			4306 (170)	19567 (43100)	660 (26)	
10157 (2680)	25.5	11507 (453)			20248 (44600)		
13455 (3550)	34	11354 (447)		4509 (178)	20657 (45500)	864 (34)	
17813 (4700)	45	13691 (539)			21565 (47500)		
21717 (5730)	55	15037 (592)		4560 (180)	22291 (49100)	914 (36)	
25772 (6800)	65.5	12548 (494)	3658 (144)	5036 (199)	24834 (54700)		
30434 (8030)	77.5	14174 (558)			25651 (56500)		
35095 (9260)	89.5	15850 (624)			26468 (58300)		

Fuel Tank Capacity, L (gal.)	Est. Fuel Supply Hours at 60 Hz with Full Load	1600REOZMD with 40°C/50°C Radiator — Max. Dimensions, mm (in.) Length	Width	Height	Max. Weight, † kg (lb.)	Fuel Tank Height, mm (in.)	Sound Pressure Reduction at 7 m (23 ft.)
Weather Enclosure with Internal Silencer and Subbase Fuel Tank *							
Lifting Base	0	7316 (288)	2743 (108)	4280 (169)	18705 (41200)	305 (12)	—
2501 (660)	5				20021 (44100)		
3790 (1000)	7.5			4357 (172)	20203 (44500)	381 (15)	
4738 (1250)	9.5			4420 (174)	20339 (44800)	445 (17.5)	
5875 (1550)	12			4509 (178)	20521 (45200)	533 (21)	
7580 (2000)	15.5	7874 (310)		4585 (181)	20884 (46000)	610 (24)	
10157 (2680)	20.5	9906 (390)			21565 (47500)		
13455 (3550)	27.5	12497 (492)			22473 (49500)		
17813 (4700)	36.5	10795 (425)		5201 (205)	23426 (51600)	914 (36)	
21717 (5730)	44.5	12751 (502)			24198 (53300)		
25772 (6800)	52.5	10287 (405)	3658 (144)	5417 (214)	26241 (57800)		
30434 (8030)	62	11913 (469)			27058 (59600)		
35095 (9260)	72	13589 (535)			27921 (61500)		
Sound Enclosure with Internal Silencer and Subbase Fuel Tank *							
Lifting Base	0	12192 (480)	2743 (108)	4280 (169)	20430 (45000)	305 (12)	Level 1 −15dB(A) or Level 2 −25 dB(A)
2501 (660)	5				21747 (47900)		
3790 (1000)	7.5			4357 (172)	21928 (48300)	381 (15)	
4738 (1250)	9.5			4420 (174)	22064 (48600)	445 (17.5)	
5875 (1550)	12			4509 (178)	22246 (49000)	533 (21)	
7580 (2000)	15.5			4585 (181)	22609 (49800)	610 (24)	
10157 (2680)	20.5	12650 (498)			23290 (51300)		
13455 (3550)	27.5	15240 (600)			24198 (53300)		
17813 (4700)	36.5	13539 (533)		5201 (205)	25152 (55400)	914 (36)	
21717 (5730)	44.5	15494 (610)			25923 (57100)		
25772 (6800)	52.5	13031 (513)	3658 (144)	5417 (214)	27966 (61600)		
30434 (8030)	62	14656 (577)			28784 (63400)		
35095 (9260)	72	16333 (643)			29646 (65300)		

* Data in table is for reference only. Refer to your authorized Kohler distributor for enclosure and subbase fuel tank specification details.
† Max. weight includes the generator set (wet), enclosure, silencer, and tank (no fuel).

KOHLER CO., Kohler, Wisconsin 53044 USA
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7 Jurong Pier Road
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Fuel Tank Capacity, L (gal.)	Est. Fuel Supply Hours at 60 Hz with Full Load	1750/2000REOZMD with 40°C/50°C Radiator				Fuel Tank Height, mm (in.)	Sound Pressure Reduction at 7 m (23 ft.)
		Max. Dimensions, mm (in.)			Max. Weight, † kg (lb.)		
		Length	Width	Height			
Weather Enclosure with Internal Silencer and Subbase Fuel Tank *							
Lifting Base	0	7316 (288)	3048 (120)	4306 (170)	21066 (46400)	305 (12)	—
2501 (660)	4.5/5.4				22473 (49500)		
3790 (1000)	7/6			4344 (171)	22655 (49900)	343 (13.5)	
4738 (1250)	8.5/7.5			4407 (174)	22791 (50200)	406 (16)	
5875 (1550)	10.5/9.5			4484 (177)	22972 (50600)	483 (19)	
7580 (2000)	14/12			4598 (181)	23199 (51100)	597 (23.5)	
10157 (2680)	18.5/16.5	8890 (350)		4611 (182)	23835 (52500)	610 (24)	
13455 (3550)	25/22	11253 (443)			24698 (54400)		
17813 (4700)	33/29	9729 (383)		5227 (206)	25696 (56600)	914 (36)	
21717 (5730)	40/35.5	11481 (452)			26423 (58200)		
25772 (6800)	48.42	13285 (523)			27195 (59900)		
30434 (8030)	56.5/50	11862 (467)	3658 (144)	5392 (213)	29555 (65100)		
35095 (9260)	65/57.5	13589 (535)			30373 (66900)		
Sound Enclosure with Internal Silencer and Subbase Fuel Tank *							
Lifting Base	0	12802 (504)	3048 (120)	4306 (170)	22836 (50300)	305 (12)	Level 1 −15dB(A) or Level 2 −25 dB(A)
2501 (660)	4.5/5.4				24244 (53400)		
3790 (1000)	7/6			4344 (171)	24425 (53800)	343 (13.5)	
4738 (1250)	8.5/7.5			4407 (174)	24561 (54100)	406 (16)	
5875 (1550)	10.5/9.5			4484 (177)	24743 (54500)	483 (19)	
7580 (2000)	14/12			4598 (181)	24970 (55000)	597 (23.5)	
10157 (2680)	18.5/16.5			4611 (182)	25606 (56400)	610 (24)	
13455 (3550)	25/22	14301 (563)			26468 (58300)		
17813 (4700)	33/29	12802 (504)		5227 (206)	27467 (60500)	914 (36)	
21717 (5730)	40/35.5	14529 (572)			28193 (62100)		
25772 (6800)	48.42	16333 (643)			28965 (63800)		
30434 (8030)	56.5/50	14910 (587)	3658 (144)	5392 (213)	31326 (69000)		
35095 (9260)	65/57.5	16637 (655)			32143 (70800)		

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† Max. weight includes the generator set (wet), enclosure, silencer, and tank (no fuel).

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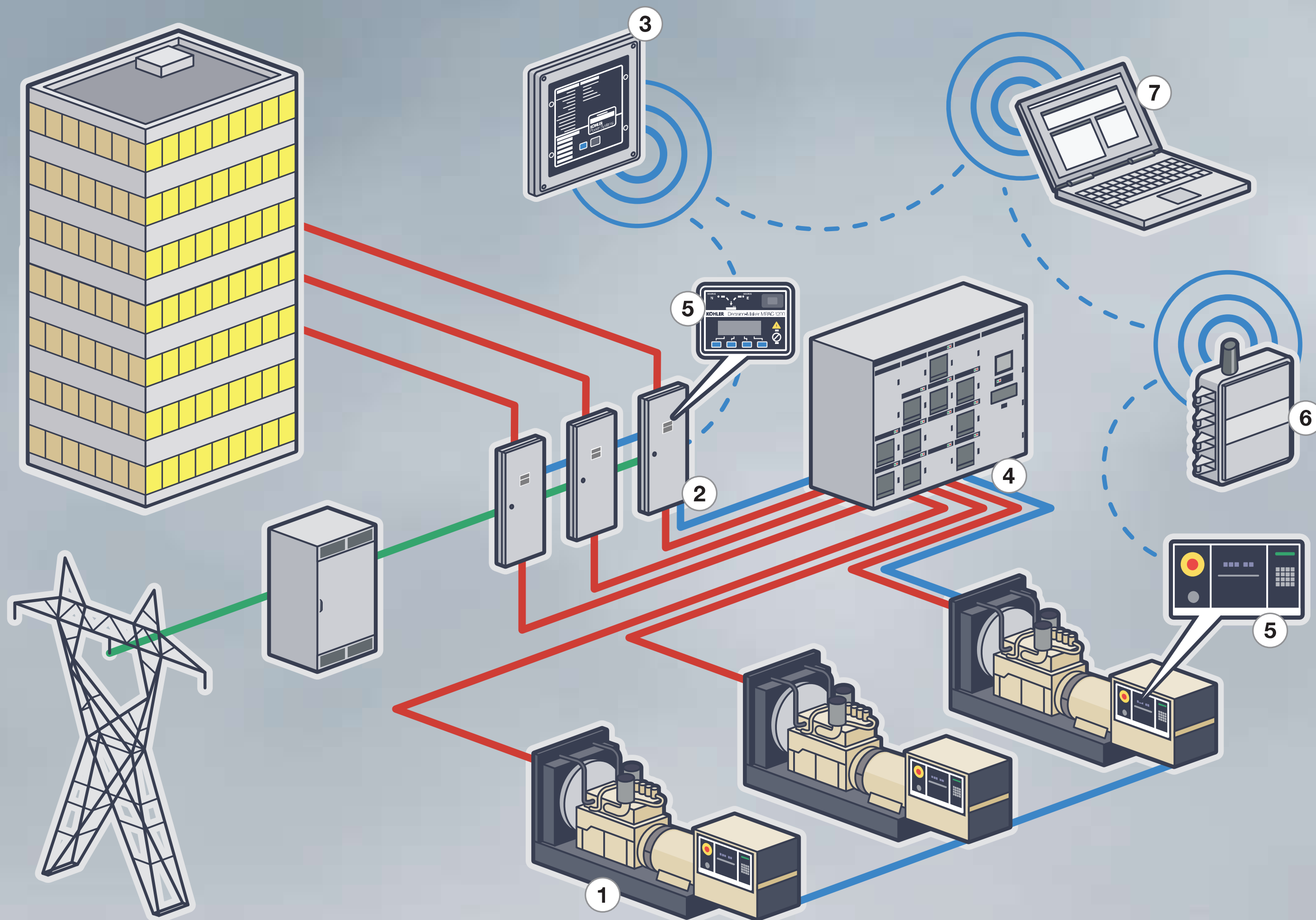

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4 **KOHLER PARALLELING SWITCHGEAR**
Low and medium voltage

5 **KOHLER DECISION-MAKER® CONTROLLER**
Control, monitor and system diagnostics

6 **KOHLER WIRELESS MONITOR**
Performance monitoring around the clock

7 **KOHLER MONITORING SOFTWARE**
Monitors generators and transfer switches from a PC

SERVICE AND SUPPORT
THE HELP YOU NEED. ANY TIME, ANYWHERE.

You're never too far from Kohler. Across the world, more than 800 locations are ready to provide sales, installation and aftermarket support services. And each one offers expertise in power specifications, equipment and integration. There's no question they can't answer. We should know, we trained them ourselves.

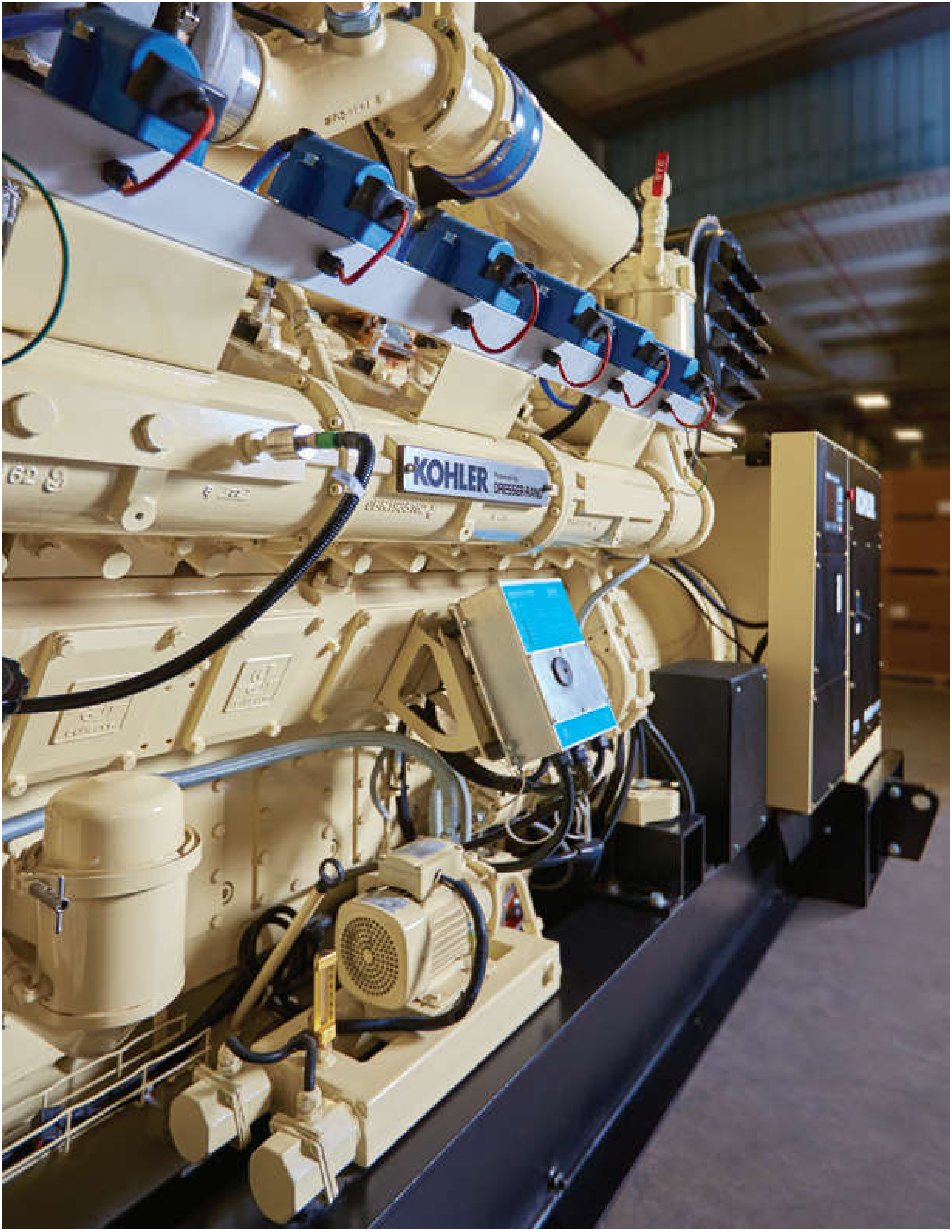
Plus, if you ever need assistance in the middle of the night, we'll take care of you. KOHLER Power professionals are available to offer troubleshooting, advice, service and support.

KOHLER POWER SYSTEMS

1 Headquarters and Manufacturing – Kohler, Wisconsin
2 Headquarters EMEA
3 Headquarters Asia-Pacific and Manufacturing – Singapore
4 Manufacturing Facility – India
5 Manufacturing Facility – China
Sales Offices, Dealers and Distributors

SDMO (Kohler-Owned)

6 Headquarters and Three Manufacturing Facilities – France
7 Manufacturing Facility – Brazil
Sales Offices, Dealers and Distributors


KOHLER

POWER SOLUTIONS CENTER

SIZING AND SPECIFYING HAVE NEVER BEEN EASIER.

Power Solutions Center is Kohler's all new, easy-to-use specifying and sizing software with exclusive drag-and-drop load management. It's so simple and intuitive – if you can drag a mouse, you can size a generator. Download it free at KohlerPower.com.

STANDARD FEATURES

QUICK DRAG-AND-DROP LOAD MANAGEMENT

- Build system with generators, transfer switches and transformers
- Duplicate or delete loads with a click of the mouse
- Automatically calculate harmonic load analysis

AUTOMATIC ONE-LINE DIAGRAM AND STEPS REPORT

- Instantly display and print easy-to-read diagrams
- See parameters that fall outside specified limits

PRE-POPULATED ENGINEERING TOOLS

- Get tools for exhaust, fuel line and room sizing in seconds
- Add lighting, air conditioning, elevators and other equipment

OPTIMUM GENERATOR SET RESULTS

- Review a selection of generator set options
- Display generator performance details

SUMMARIES, REPORTS AND TECHNICAL DOCUMENTS

- Display or print diagrams and detailed sizing reports
- Download spec sheets, diagrams and BIM models instantly

QUICK, HASSLE-FREE ESTIMATES AND INFO

- Click to connect with your KOHLER distributor

SECURE FILE STORAGE

- Store files on your local computer
- Share files online or by email
- Works whether you're online or offline

GAS GENERATORS

CUSTOM MADE TO MEET YOUR NEEDS.

25-400 kW

From light commercial use to heavy industrial applications, KOHLER® gas generators are customized to your specifications. Kohler was the first generator manufacturer to offer EPA factory-certified ratings in 180- to 400-kW generators. Now, every size from 25 to 400 kW is available EPA-certified, which saves you big dollars on site certification. Plus, these generators are capable of tying into your natural gas utility or LP supply – so you'll never have to think about fuel again.

STANDARD FEATURES

TESTED AND APPROVED
KOHLER generators meet tough industry testing and quality standards (UL, CSA, IBC, NFPA).

ONE-STEP FULL-LOAD ACCEPTANCE
Our gas generators accept full load to keep you up and running.

ULTIMATE PERFORMANCE
Our 1800-rpm engines run quietly, offer extended life and provide great fuel efficiency.

FACTORY-CERTIFIED GENERATORS
Every size KOHLER gas generator is available EPA-certified, ECM-controlled and designed to meet the latest spark-ignited emission requirements.

LOWER EMISSIONS
Compared to diesel-fueled generators, KOHLER gas generators significantly reduce carbon monoxide and particulate emissions.

1. **EMISSION-CERTIFIED**
   Three-way catalyst reduces nitrogen oxides, carbon monoxide and hydrocarbon emissions
2. **FUEL SYSTEMS**
   Available with natural gas, LP, single or dual fuel and liquid withdrawal systems
3. **HIGH-AMBIENT COOLING**
   Designed to meet extreme operating conditions
4. **KOHLER PMG ALTERNATORS**
   Provide advanced short-circuit capability and meet NEMA MG 1, IEEE and ANSI standards
5. **KOHLER DECISION-MAKER® CONTROLLERS**
   Available with basic, advanced and paralleling options
6. **OPTIONS AND ACCESSORIES**
   Improved motor-starting alternators, multiple circuit breakers, enclosures, block heaters and more

200REZXB

25REZG

200REZXB

125REZGB

MODEL	NG STANDBY 60 Hz (kW/kVA)	LP STANDBY 60 Hz (kW/kVA)	NG PRIME 60 Hz (kW/kVA)	LP PRIME	RPM	Emissions
25REZG	25/31	25/31			1800	EPA-certified
30REZG	30/38	30/38	27/33	27/33	1800	EPA-certified
40REZG	39/49	40/50			1800	EPA-certified
45REZG	42/53	45/56	37/46	41/51	1800	EPA-certified
50REZGB	53/66	55/69			1800	EPA-certified
60REZGB	60/75	64/80	54/67	56/70	1800	EPA-certified
80REZGD	80/100				1800	EPA-certified
100REZGD	100/125	100/125			1800	EPA-certified
125REZGC	128/160	106/133			1800	EPA-certified
150REZGC	150/188	139/174			1800	EPA-certified
180REZXB	190/238	130/163	164/205		1800	EPA-certified
180RZXB	190/238	130/163	164/205		1800	
200REZXB	200/250	130/163	175/219		1800	EPA-certified
200RZXB	200/250	130/163	174/219		1800	
250REZXB	260/325	170/213	235/294		1800	EPA-certified
250RZXB	260/325	175/219	235/294		1800	
300REZXB	300/375	210/263	270/338		1800	EPA-certified
300RZXB	300/375	210/263	270/338		1800	
350REZXB	355/444	240/300	300/375		1800	EPA-certified
350RZXB	355/444	240/300	300/375		1800	
400REZXB	400/500	260/325	360/450		1800	EPA-certified
400RZXB	400/500	260/325	360/450		1800	

Ratings based on 3-phase, 480 V
50 Hz non-emissions models and single-phase ratings are also available
For additional technical specifications, visit KohlerPower.com.

LARGE GAS GENERATORS

THE RIGHT POWER – AND THE RIGHT POWER RATING. **400-1300** kW

KOHLER® large gas generators are custom-designed and targeted to fit your specific requirements. Many "one size fits all" models are built for continuous power, which limits their power rating for standby and prime applications. In contrast, every KOHLER generator is designed to work specifically for standby, prime or continuous applications – whatever you need. That means greater power efficiency and cost savings.

To power these proven generators, each engine is specially tuned to the generator system for optimal power efficiency. Plus, we've simplified the installation process – every model* is available EPA-certified to meet operational requirements on pipeline natural gas. There's no need to certify or recertify.

*Except the 1300REZCK model, which is available EPA-compliant.

STANDARD FEATURES

PROVEN ENGINE
Engines are specially tuned to optimize system performance, accept a wide range of input fuels and are highly resistant to fuel contamination.

TESTED AND APPROVED
KOHLER generators meet tough industry testing and quality standards (UL, CSA, NFPA).

ULTIMATE PERFORMANCE
1800-rpm engines run quietly, offer extended life and provide cost-effective performance.

CLEAN RUNNING
KOHLER large gas generators run cleanly and need no after treatment to meet strict EPA emissions standards.

LOWER EMISSIONS
Compared to diesel-fueled generators, KOHLER gas generators significantly reduce nitrogen oxide and particulate emissions.

1. **EMISSION-CERTIFIED**
   Clean-running engines need no after treatment to meet EPA emissions standards

2. **FUEL SYSTEMS**
   Standard configuration for natural gas; capable of a wide range of non-pipeline fuels

3. **HIGH-AMBIENT COOLING**
   Designed to meet extreme operating conditions

4. **EFFICIENT PMG ALTERNATORS**
   Provide advanced short-circuit capability and meet NEMA MG 1, IEEE and ANSI standards

5. **KOHLER DECISION-MAKER® CONTROLLER**
   Large-screen controller for paralleling, load management and generator management

6. **OPTIONS AND ACCESSORIES**
   Improved motor-starting alternators, multiple circuit breakers, enclosures, block heaters and more

1000REZGB

MODEL	NG STANDBY 60 Hz (kW/kVA)	NG PRIME 60 Hz (kW/kVA)	NG CONTINUOUS 60 Hz (kW/kVA)	RPM	Emissions
500REZK	500/625	435/543		1800	EPA-certified
750REZK	750/937	630/787		1800	EPA-certified
1000REZK	1000/1250	880/1100		1800	EPA-certified
400REZCK			435	1800	EPA-certified
600REZCK			675	1800	EPA-certified
800REZCK			875	1800	EPA-certified
1000REZCK			1030	1800	EPA-certified
1300REZCK			1310	1800	EPA-compliant

Ratings based on 3-phase, 480 V. Continuous rating at power factor of 1.0
For additional technical specifications, visit KohlerPower.com

CONTINUOUS-POWER MODELS: BUILT FOR EFFICIENCY

- Available EPA-certified (model 1300REZCK is EPA-compliant-capable) and ECM-controlled and meet the latest spark-ignited emission requirements for emergency operation.
- Offer high electrical efficiencies.
- Built to run at up to a 100% load factor over the life of the generator.
- Factory cooling options allow for up to 40°C ambient operation.

PRIME-POWER MODELS: BUILT FOR LOAD ACCEPTANCE

- Available EPA-certified and ECM-controlled and meet the latest spark-ignited emission requirements for non-emergency operation.
- Built to run at up to a 90% load factor over the life of the generator; meet ISO-8528 G1 power quality standards even through a 53% load step.
- Capable of accepting rated load in one step.
- Factory cooling options allow for up to 50°C ambient operation.

EMERGENCY STANDBY MODELS: BUILT TO LAST

- Available EPA-certified and ECM-controlled and meet the latest spark-ignited emission requirements for emergency operation.
- Built to run at up to an 85% load factor over the life of the generator; meet ISO-8528 G1 power quality standards even through a 53% load step.
- Capable of accepting rated load in one step.
- Factory cooling options allow for up to 50°C ambient operation.

DIESEL GENERATORS

BRED FOR THE TOUGHEST JOBS ON EARTH.

10-3250 kW

These generators are tough as nails and made to power all of your applications (simple to complex), including healthcare, gas stations, data centers, airports and more. KOHLER® diesel generators come loaded with power and are available in a range of sizes up to 3250 kW.

Of course, the diesel generators we make are available EPA-certified. And you can customize them any way you like with a variety of accessories.

STANDARD FEATURES

TESTED AND APPROVED

KOHLER generators meet tough industry testing and quality standards (UL, CSA, IBC, NFPA).

RAPID RESPONSE

Our generators power up in 10 seconds or less and deliver quality power during voltage and frequency changes.

EASY INSTALLATION

Our quickest install ever – large stub-up areas; easy access to fuel, load and exhaust locations.

1. **EMISSION-CERTIFIED**
   EPA-certified, industrial-grade engines meet the latest emissions requirements
2. **HIGH-AMBIENT COOLING**
   Designed to meet your extreme operating conditions
3. **KOHLER PMG ALTERNATORS**
   Provide advanced short-circuit capability and meet NEMA MG 1, IEEE and ANSI standards
4. **KOHLER DECISION-MAKER® CONTROLS**
   Available with a variety of controls – basic, advanced and paralleling
5. **OPTIONS AND ACCESSORIES**
   Improved motor-starting alternators, heavy-duty air cleaners, enclosures, fuel tanks, block heaters, multiple circuit breakers and more

2000REOZMD

30REOZJC

500REOZJ

3250REOZD

MODEL	STANDBY 60 Hz (kW/kVA)	PRIME 60 Hz (kW/kVA)	RPM	Engine Manufacturer	EPA Emissions
10REOZDC	10/12.5	9/11.3	1800	Yanmar	Tier 4i
15REOZK	17/21.3	15/18.8	1800	Kohler	Tier 4i
20REOZK	24/30	21/26.3	1800	Kohler	Tier 4i
30REOZK	31/39	28/25	1800	Kohler	Tier 4i
30REOZK4	30/37.5	28/35	1800	Kohler	Tier 4
40REOZK	42/52	37/46	1800	Kohler	Tier 3
40REOZK4	40/50	36/45	1800	Kohler	Tier 4
48REOZK4	48/60	43/53	1800	Kohler	Tier 4
50REOZK	52/65	47/58	1800	Kohler	Tier 3
60REOZK	60/75	54/67	1800	Kohler	Tier 3
80REOZJF	83/104	76/95	1800	John Deere	Tier 3
100REOZJF	102/128	92/115	1800	John Deere	Tier 3
125REOZJG	128/160	116/145	1800	John Deere	Tier 3
125REOZJ4	130/163	117/146	1800	John Deere	Tier 4
150REOZJF	154/193	140/175	1800	John Deere	Tier 3
150REOZJ4	154/193	139/174	1800	John Deere	Tier 4
180REOZJG	180/225	165/206	1800	John Deere	Tier 3
200REOZJF	200/250	180/225	1800	John Deere	Tier 3
230REOZJE	230/288	205/256	1800	John Deere	Tier 3
250REOZJE	255/319	230/288	1800	John Deere	Tier 3
275REOZJE	280/350	255/319	1800	John Deere	Tier 3
300REOZJ	300/375		1800	John Deere	Tier 3
350REOZJB	360/450		1800	John Deere	Tier 3
400REOZJB	410/513		1800	John Deere	Tier 3
500REOZJB	510/638		1800	John Deere	Tier 2
500REOZVC	515/644	460/575	1800	Volvo	Tier 2
550REOZVB	550/688	500/625	1800	Volvo	Tier 2
600REOZVB	600/750	555/694	1800	Volvo	Tier 2

MODEL	STANDBY 60 Hz (kW/kVA)	PRIME 60 Hz (kW/kVA)	RPM	Engine Manufacturer	EPA Emissions
700REOZDE	700/785	630/788	1800	MTU	Tier 2
750REOZMD	760/950	690/863	1800	Mitsubishi	Tier 2
800REOZDE	800/1000	725/906	1800	MTU	Tier 2
800REOZMD	810/1013	730/913	1800	Mitsubishi	Tier 2
800ROZMC	810/1013	730/913	1800	Mitsubishi	
900REOZDE	910/1136	830/1038	1800	MTU	Tier 2
900REOZMD	970/1213	915/1144	1800	Mitsubishi	Tier 2
1000REOZDE	1000/1250	910/1138	1800	MTU	Tier 2
1000REOZMD	1020/1275	925/1156	1800	Mitsubishi	Tier 2
1000ROZMC	1020/1275	925/1156	1800	Mitsubishi	
1250REOZDD	1300/1625	1180/1475	1800	MTU	Tier 2
1250ROZMC	1280/1600	1160/1450	1800	Mitsubishi	
1250REOZMD	1280/1600	1160/1450	1800	Mitsubishi	Tier 2
1500REOZDD	1560/1950	1400/1750	1800	MTU	Tier 2
1600ROZMC	1600/2000	1450/1813	1800	Mitsubishi	
1600REOZMD	1600/2000	1450/1813	1800	Mitsubishi	Tier 2
1750REOZDC	1760/2200	1600/2000	1800	MTU	Tier 2
1750REOZMD	1780/2225	1620/2025	1800	Mitsubishi	Tier 2
2000REOZDD	2060/2575	1850/2313	1800	MTU	Tier 2
2000ROZMC	2000/2500	1820/2275	1800	Mitsubishi	
2000REOZMD	2000/2500	1820/2275	1800	Mitsubishi	Tier 2
2250REOZDD	2250/2813	2050/2563	1800	MTU	Tier 2
2500REOZDB	2500/3125	2270/2838	1800	MTU	Tier 2
2800REOZDB	2800/3500	2540/3175	1800	MTU	Tier 2
3000REOZD	3000/3500	2800/3500	1800	MTU	Tier 2
3250REOZD	3250/3500	2800/3500	1800	MTU	Tier 2

1) Stationary emergency ratings based on 3-phase, 480 V

2) 50 Hz non-emissions models are also available. Please contact the factory

3) Single-phase ratings also available

For additional technical specifications, visit KohlerPower.com

KOHLER® FAST-RESPONSE® ALTERNATORS

ALL THE BELLS AND WHISTLES. NO EXTRA CHARGE.

More than 90 years ago, Kohler unleashed its first alternator – and we've been raising the bar ever since. Today we're proud to manufacture KOHLER Fast-Response Permanent Magnet Generator (PMG) alternators – a breakthrough in speed technology. Built to perform, these revolutionary alternators offer fast response to load changes.

On some other gensets, PMG alternators come as a costly upgrade. Not so with Kohler. All of our 35- to 300-kW units are factory-equipped with our Fast-Response PMG alternators. Which means you get all the bells and whistles with no expensive upcharge.

STANDARD FEATURES

TRUSTED RELIABILITY
Greaseless bearing and Class H insulation provide extra thermal protection for lasting reliability.

ULTIMATE PERFORMANCE
High-power density design makes Kohler an industry leader in motor-starting capability.

TESTED AND APPROVED
Our alternators meet NEMA MG 1, IEEE and ANSI standards for temperature rise and motor-starting capability.

CLEAN POWER
Experience the rewards of clean power with precise voltage, current and frequency control.

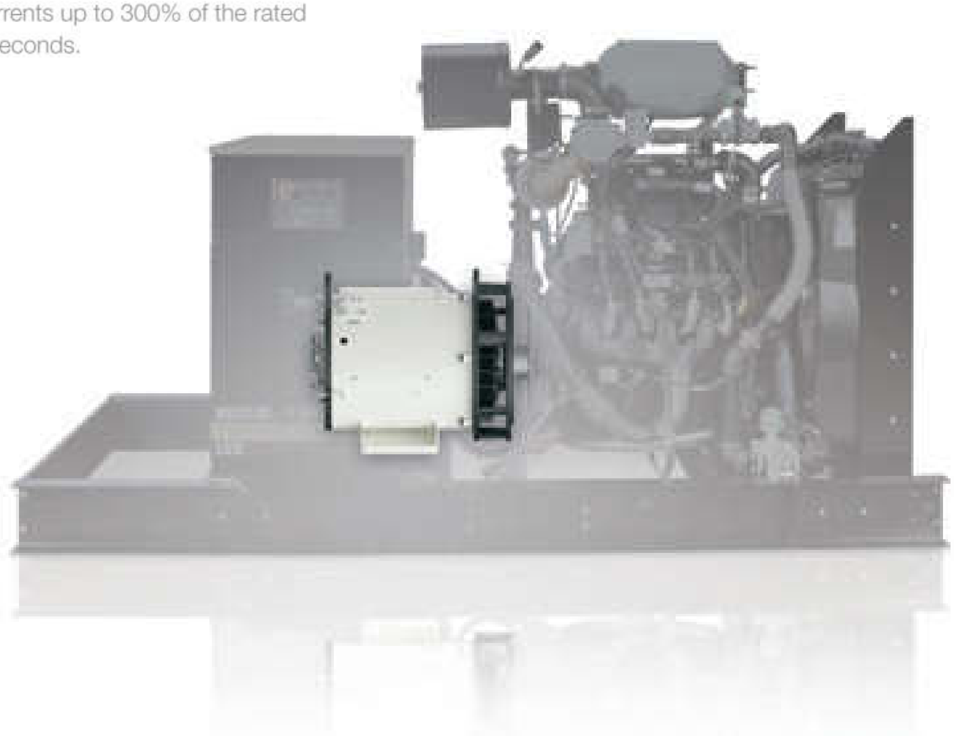
DURABLE SHORT-CIRCUIT RATINGS
The very definition of performance. Our alternators sustain short-circuit currents up to 300% of the rated current – for up to 10 seconds.

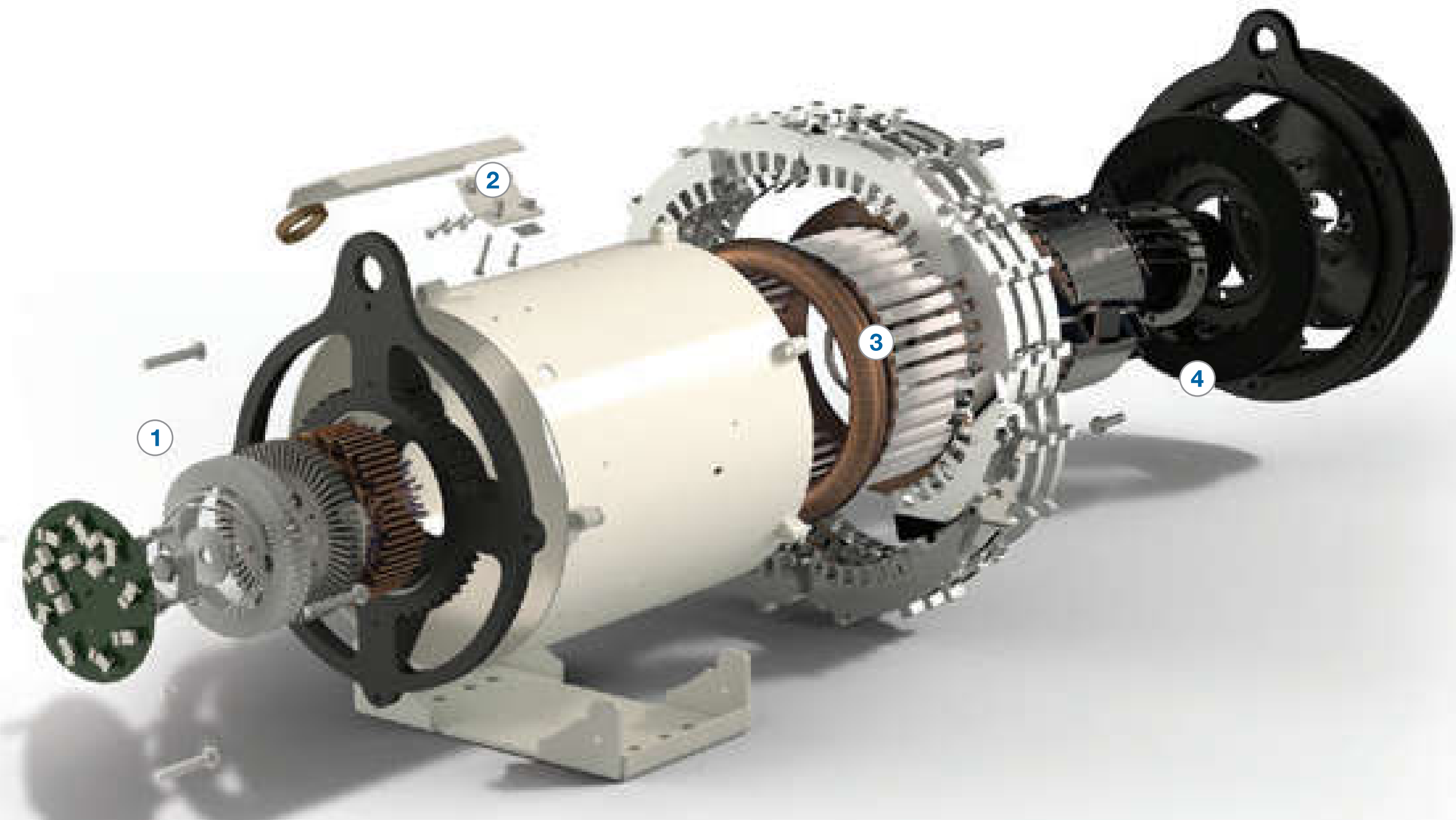
1. **PMG–BRUSHLESS ALTERNATOR**
   Features brushless permanent magnet exciter for fast load response

2. **RECONNECTABLE LEADS**
   Designed with 4-lead dedicated voltages and 12-lead optional voltage connections

3. **VACUUM-IMPREGNATED WINDINGS**
   Fungus-resistant epoxy varnish ensures reliability in tough environments

4. **ROTOR**
   Two-thirds pitch stator and skewed rotor deliver clean power and superior voltage waveform

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KOHLER® DECISION-MAKER® CONTROLS

TECHNOLOGY SO ADVANCED, IT'S EASY.

At Kohler, we don't do one size fits all. With our Decision-Maker controls, we design custom packages, tailored to your needs – from basic controls to multiple generator paralleling.

Plus, Kohler makes each controller easy to operate with user-friendly displays and keypad functions. And if that weren't enough, our complete line of Decision-Maker controllers features advanced network communications for remote monitoring as well as adjustable parameters to accommodate your specific application.

STANDARD FEATURES

TESTED AND APPROVED

Our controls meet NFPA, UL and CE standards.

INTEGRAL VOLTAGE REGULATOR

KOHLER controls deliver precise voltage regulation (.05%–0.25%) to protect your sensitive equipment from poor power quality.

SEAMLESS SYSTEM INTEGRATION

Every controller works with our automatic transfer switches and switchgear for complete system integration.

ALTERNATOR PROTECTION

This must-have technology protects the alternator from thermal overload.

REMOTE COMMUNICATIONS

MONITOR SOFTWARE

Monitors and controls generator sets and transfer switches from your personal computer.

POWERSCAN™

Provides system monitoring around the clock using wireless technology to send messages to your phone, fax and email.

REMOTE ANNUNCIATOR

Offers an economical solution for remote annunciation of faults and status conditions for NFPA-110 compliance.

1. **EMERGENCY STOP BUTTON**
   Turns off generator immediately
2. **CONTROL BUTTONS**
   Control synchronizing breakers and generator operation (Off/Auto/Run)
3. **STATUS INDICATORS**
   Display generator mode, breaker and synchronization status
4. **DIGITAL ALPHA/ NUMERIC DISPLAY**
   Displays faults, warnings, codes and metering
5. **KEY SWITCH**
   Secures your program settings
6. **PUSH-BUTTON KEYPAD**
   Sets custom parameters, displays menus, resets faults and more

REMOTE ANNUNCIATOR

DECISION-MAKER 6000

3000

550

6000

8000

Decision-Maker Model®	3000	550	6000	8000	3500
Integral voltage regulator	x	x	x		x
Engine diagnostics	x	x	x	x	x
Engine starting aid	x	x	x		x
Event and data logging	x	x	x	x	x
Programming access via laptop	x	x	x	x	x
Key switch		x	x		
USER INTERFACE					
Alphanumeric digital display	x	x	x		
Monochromatic graphical display					x
Color graphical display				x	
Emergency stop (local)				x	x
Emegency stop (remote)	x	x	x	x	x
Exercise function		x	x		x
COMMUNICATIONS					
Local and remote area network capability	x	x	x	x	x
Monitoring software	o	o	o	x	

Decision-Maker Model	3000	550	6000	8000	3500
PARALLELING					
Remote input for external paralleling controller		x		x	x
Dead bus paralleling			x	x	x
Dead field paralleling				x	
Synchronizer			x	x	x
Real and reactive load sharing			x	x	x
First-on logic			x	x	x
Circuit breaker control			x	x	x
Base load control			x	x	x
Var/power factor control			x	x	x
Load management			o	x	x
Generator management			o	x	x

KEY: **STANDARD** = x / **OPTION** = o

COMMON FEATURES

INPUTS AND OUTPUTS

All models include digital and analog input and output with option for additional inputs/outputs

ENGINE STATUS AND CONDITION INDICATORS

Oil pressure/temperature
Coolant temperature
Engine speed
Number of starts
Battery voltage

ALTERNATOR STATUS AND CONDITION

Voltage, L-L and L-N for all phases
Current/frequency for all phases
Total kW/kVA and KVAr
kWh
Power factor*
Per phase kW/kVA and KVAr*

ENGINE PROTECTION – SHUTDOWN/INDICATION

High engine coolant temperature
Low coolant level
Low oil pressure
Overcrank
High/low fuel level/pressure
Overspeed
Load shed output*

ALTERNATOR PROTECTION – SHUTDOWN/INDICATION

Over- and under-voltage/frequency
Overcurrent
Overpower
Locked rotor**
Reverse power/var*

*Except Decision-Maker 3000. **Except Decision-Maker 8000

DECISION-MAKER® PARALLELING SYSTEM

TOTAL INTEGRATION. FROM TOP TO BOTTOM

When it comes to paralleling systems, Kohler offers 100% integration. Our Decision-Maker Paralleling System (DPS) is designed, engineered and factory-tested as a complete system, not built from parts from multiple manufacturers like some competitive products.

Comprised of KOHLER® generators, controls and switchboards, DPS delivers dependable power across multiple applications.

STANDARD FEATURES

REDUNDANT BACKUP POWER
Total and complete protection. If one genset needs servicing, the DPS makes power available to your most critical loads.

EASY EXPANSION
Purchase a system that fits your budget today. And, in the future, we'll expand on your DPS instead of completely replacing it.

OPERATIONAL SAVINGS
Saving has never been easier. The DPS automatically turns off generators when your needs are low.

FAST LEAD TIMES
Our DPS is a standard product, no customization necessary. So you'll get it faster than custom paralleling systems.

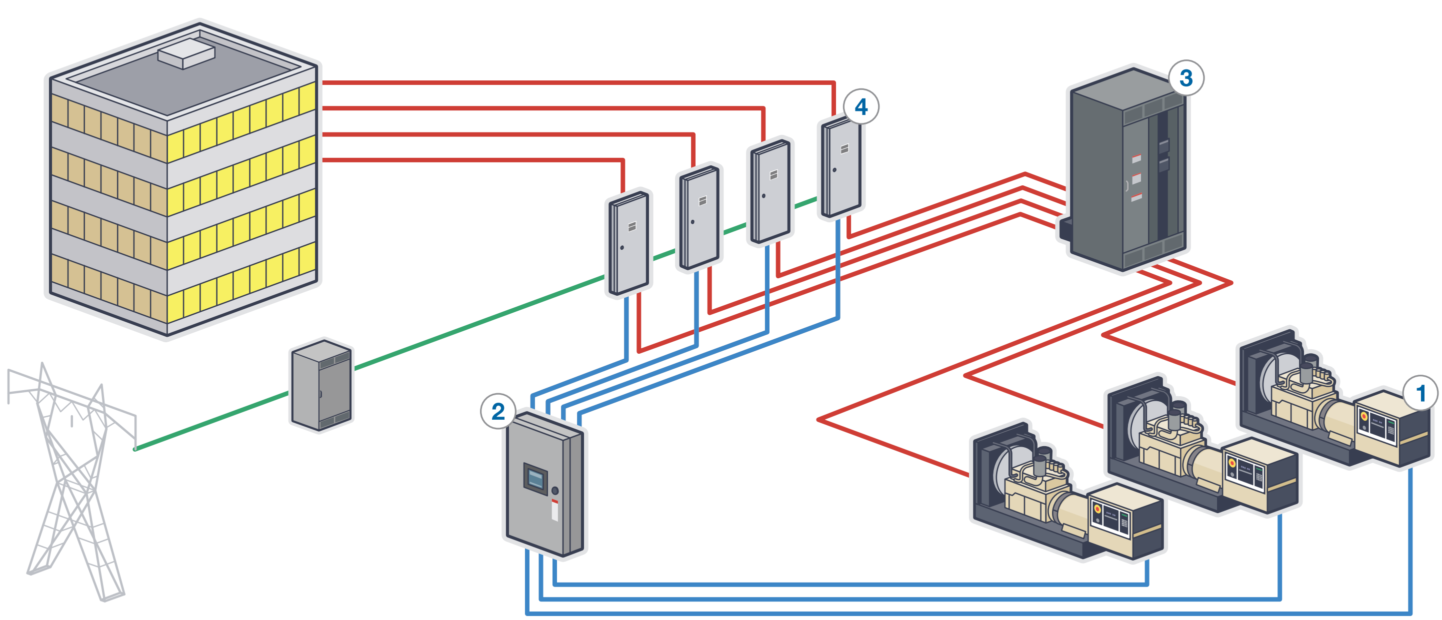
OPTIONAL FUEL TYPES
Mix and match any fuel you want. Available for use with diesel, natural gas and LP fuel types in the same system.

1. **KOHLER DECISION-MAKER 6000 CONTROLLER**
Enables load sharing and synchronization for up to eight generator sets in the KOHLER DPS

2. **MASTER CONTROL PANEL**
Handles load add/shed, number of gensets online, monitors event logging and alarms

3. **POWER DISTRIBUTION SWITCHBOARD**
Accommodates paralleling and distribution breakers

4. **AUTOMATIC TRANSFER SWITCH**
Intelligently selects the power source and transfers loads



SUB - BASE FUEL TANKS

BUILT TO MATCH YOUR ENVIRONMENTAL NEEDS.

If it's environmental protection you want, you're in the right place. KOHLER® tanks feature two containment walls to keep your fuel where it should be – inside. Plus, they're coated with Power Armor Plus™ (a textured epoxy-based, rubberized finish) for heavy-duty durability.

STANDARD FEATURES

ENVIRONMENTAL PROTECTION

Our tanks are UL-approved secondary containment tanks and can be configured to meet cUL, IBC and other required codes.

MULTIPLE RUNTIMES

Usable tank capacities provide 12 to 72 hours of operation.

CUSTOM OPTIONS

Choose from alarm panels, spill-fill containments, high-fuel switches, tank markings and more.

EXCELLENT PROTECTION

Our new Power Armor Plus – polyurea textured coating eliminates the need for exterior epoxy treatment and provides excellent abrasion resistance and corrosion protection.

1. **STATE TANK OPTIONS**
   Spill-fill containments, three-alarm panel, fuel basin switch and tank markings
2. **EMERGENCY PRESSURE RELIEF VENTS**
   Ensure proper venting of inner and outer tank during extreme conditions
3. **NORMAL VENT WITH CAP**
   Raised above the lockable fuel fill cap
4. **ELECTRICAL STUB-UP**
   Features large stub-up area for easy installation
5. **LEAK DETECTION SWITCH**
   Annunciates a contained primary tank fuel leak at generator control
6. **FUEL SWITCH**
   Interfaces with controller to provide fuel level indication

ENCLOSURES

REDUCE THE RACKET. AND PUT MOTHER NATURE IN HER PLACE.

If you want to keep the weather out and the noise in, there's really only one way to go. KOHLER® enclosures are bolstered by industrial steel or heavy-duty aluminum and acoustic insulation to protect your investment and keep the noise down. In addition, we coat every unit with Power Armor™ (a textured industrial finish) for heavy-duty durability in harsh conditions.

UL 2200 and IBC-certified packages are available.

STANDARD FEATURES

CUSTOM OPTIONS
Multiple weather/sound enclosure options are available on 10- to 3250-kW generators.

QUIET PERFORMANCE
Our enclosures offer acoustic insulation to meet your quiet applications.

CERTIFIED PACKAGES
Enclosures are UL2200-tested and approved, IBC-certified and meet 150-mph wind rating.

ADVANCED CORROSION PROTECTION
Power Armor is a textured automotive-grade finish that surpasses a 2,500 hour salt spray exposure test.

1 ADVANCED DOOR SYSTEM
Hinged doors, door handles and door holders provide security, protection and easy access for service

2 SERVICE ACCESS
Multiple personnel doors and removable panels offer easy access to generator control, fuel fill, fuel gauge, oil fill and battery

3 INTERNAL EXHAUST SYSTEM
Features insulated exhaust silencer for improved aesthetics, safety and noise reduction

4 OIL AND RADIATOR DRAINS
Provide an easier, quicker way to service your generator

5 AVAILABLE ACCESSORIES
Electrical packages, lighting, heaters, motorized louvers, stairs and more

400REOZJ

80REZGD

2000REOZMD

Sound Levels			
KW	**Engine Manufacturer**	**Weather Enclosure dBA**	**Sound Enclosure dBA**
10-20 kW	Yanmar	77	68
25-150 kW	GM	77-88	69-74
20-300 kW	John Deere	80-94	68-75
350-500 kW	John Deere	90-94	73-75
500-600 kW	Volvo	94-95	75
700-1000 kW	MTU	93-98	75
1250-3250 kW	MTU/Mitsubishi	95-101	75-85

Sound level full load dBA @ 23 feet.

AUTOMATIC TRANSFER SWITCHES

FORGET THE FORECAST. WE HAVE YOU COVERED.

Bridging the gap between loss of utility and standby power is no small task, which is why KOHLER® automatic transfer switches are essential to KOHLER power systems.

Kohler's latest generation of transfer switches – featuring MPAC® controllers – are loaded with technology to ensure transfer of power from the utility to the generator and back. When the grid fails, power is transferred to the standby system. And then it's back to business as usual.

STANDARD FEATURES

MULTIPLE APPLICATIONS

Find the perfect option. KOHLER transfer switches are available in standard, bypass-isolation and service-entrance configurations with open, closed and programmed transition operating modes, from 30 to 4000 amps.

SEAMLESS SYSTEM INTEGRATION

Everything works together. KOHLER transfer switches are designed to interface perfectly with KOHLER generators and switchgear.

ADVANCED COMMUNICATIONS

Every transfer switch comes fully loaded with the technology to do the job. Ethernet and Modbus communications capabilities are available.

CERTIFIED PACKAGES

Transfer switches are UL-listed and have CSA and IBC certifications available.

1. **CERTIFIED ENCLOSURES**
   Meet NEMA Type 1, 3R, 12, 4 and 4X enclosure standards
2. **BYPASS OPERATION**
   Eliminates interruption to the loads during maintenance
3. **MPAC DIGITAL CONTROLLER**
   Provides a full array of features including communications, I/O, load management and other advanced functionality
4. **HEAVY-DUTY CONTACTOR**
   Choose from any breaker, specific breaker and current limiting fuse-rated mechanisms
5. **AVAILABLE ACCESSORIES**
   Anti-condensation heater, voltage surge suppressor, line-to-neutral voltage monitoring, seismic certification and more

STANDARD ATS

SERVICE-ENTRANCE ATS

BYPASS ISOLATION ATS

KOHLER® PRODUCT SERIES	DECISION-MAKER® MPAC® 750	DECISION-MAKER MPAC 1200	DECISION-MAKER MPAC 1500
Comparison Features	**Basic**	**Advanced**	**Mission-Critical**
Amperage	Up to 1000 A	Up to 4000 A	Up to 4000 A
Phases	Single/Three	Single/Three	Single/Three
Poles	2, 3, 4	2, 3, 4	2, 3, 4
Voltage range	115-480 V	115-600 V	115-600 V
Product Type			
Standard open transition	Yes	Yes	Yes
Standard delayed transition		Yes	Yes
Standard closed transition		Yes	Yes
Bypass-isolation open transition			Yes
Bypass-isolation delayed transition			Yes
Bypass-isolation closed transition			Yes
Service entrance			Yes
Withstand and Close-On Ratings (WCR)			
WCR – Specific breaker	30-65 kA	30-65 kA	22-100 kA
WCR – Any breaker		10-100 kA	10-100 kA
WCR – Current-limiting fuses		100-200 kA	100-200 kA
Short-time withstand rating		36-65 kA	36-65 kA

PARALLELING SWITCHGEAR
LOAD IT UP. ANYWAY YOU WANT.

Whether your needs are for emergency, prime power, interruptible rate or peak shaving applications, Kohler has the switchgear to back them all up. When it's time to spec, our team will take care of you every step of the way – from concept to startup. And we will engineer custom switchgear to meet your needs.

Now when it comes to flexibility in generator paralleling, KOHLER® PD-Series paralleling switchgear is the way to go. If utility power ever fluctuates or fails, your KOHLER switchgear automatically reacts to the situation, engages the generators and connects them to your facility.

STANDARD FEATURES

CUSTOM DESIGN
Tailor-made from top to bottom. Our switchgear is engineered to specifically meet your unique application.

SEAMLESS SYSTEM INTEGRATION
It's simple really. Our switchgear works with the entire KOHLER power system – generators, automatic transfer switches and more.

CERTIFIED PACKAGES
All KOHLER switchgear is cUL-listed and IBC-certified.

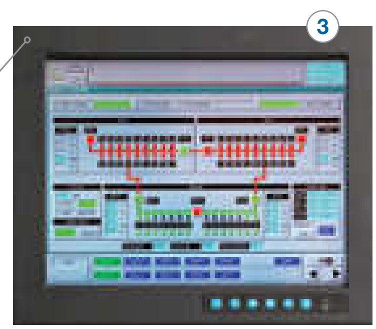
DESIGN SUPPORT
Need help? Our experts are ready to assist in switchgear design.

1 **CIRCUIT BREAKERS**
Choose from a variety of paralleling and distribution circuit breakers

2 **CUSTOM OPTIONS**
Choose from controls, meters, protective relays and more

3 **CONTROL CENTER**
Features color touch screen, USB port for downloading reports, Modbus communications, Web server and more

4 **LOW AND MEDIUM VOLTAGES**
Available up to 13.8 kV



PD-2000

Features	PD-2000	PD-3000	PD-4000
Low-voltage switchboard (UL/cUL 891)	x		
Low-voltage switchgear (UL/cUL 1558)		x	
Medium-voltage metal-clad switchgear (UL/cUL-listed)			x
NEMA 1	x	x	x
NEMA 3R	x	x	x
Short-circuit rating up to 200 kA		x	x
Short-circuit rating up to 150 kA	x		
Bus rating up to 10,000 A	x		
Bus rating up to 9200 A		x	
Bus rating up to 6000 A			x
Maximum voltage 600 V	x	x	
Maximum voltage 15 kV			x
60 Hz	x	x	x
50 Hz	x	x	x
Parallel up to 32 generators	x	x	x
15" color touch screen (optional touch screen sizes available)	x	x	x
Customizable controls, relays and metering	x	x	x

Modes of Operation			
Emergency standby	x	x	x
Prime power	x	x	x
Base load (peak shave)	x	x	x
Import (peak shave)	x	x	x
Isolate (interruptible rate)	x	x	x
Customizable sequence of operation	x	x	x

MOBILE GENERATORS

TAKE YOUR POWER ANYWHERE.

35-500 kW

Quiet, reliable KOHLER® mobile generators give you dependable power anywhere, from remote construction sites to public events to storm recovery. Tough to the core, they're built to withstand the elements and run for long hours in prime and standby applications. Upgrade your rental fleet with hard-working mobile units. They're loaded with features for power that works wherever you go.

STANDARD FEATURES

DIESEL MOBILE GENERATORS

EASY ON THE ENVIRONMENT

EPA-emission-certified for non-road use with 110% containment of fuel, oil and coolant. Tier 4 Final engines with lower operating costs* give you heavy-duty power for any demanding application.

ENGINES FOR THE FUTURE

KOHLER Diesel KDI engines have no DPF (diesel particulate filter) for a smaller overall footprint without DPF maintenance. Cooled EGR helps achieve the industry's toughest emissions standards. Ultra-efficient performance provides savings. John Deere engines have Integrated Emissions Control systems – cooled EGR, exhaust filter and SCR – that result in high power density, high torque and lower fuel consumption.

GASEOUS MOBILE GENERATORS

INNOVATIVE PROPANE TANK SYSTEM

LP gas is reliable, readily available, refills just like diesel and produces less smog-producing carbon monoxide. Easily switch to natural gas or external propane for extended power supply.

LOWER OPERATING COSTS

KOHLER mobile generators with propane engines offer a 15%-20% reduction in hourly fuel costs.**

GENERATOR PARALLELING BOX

The KOHLER Mobile Paralleling Box lets you parallel differently sized KOHLER mobile generators to meet job requirements. It eliminates the need to size circuit breakers to specific generator output or invest in motorized breakers on generators that may never be paralleled. Each box can parallel two generators with the Decision-Maker® 3500 controller.

*Available on 35/45REOZT4.

**Fuel cost savings compared to diesel fuel and based on December 2013 rates published by the U.S. Energy Information Administration.

1. **LIFTING EYE**
   Convenient single-point lifting eye
2. **KOHLER DECISION-MAKER 3500 CONTROLLER**
   User-friendly LCD display and advanced network communications
3. **REMOVABLE HOUSING**
   Patent-pending housing is easy to remove – just unscrew bolts from the base*
4. **ON-BOARD FUEL TANK**
   24-hour runtime tanks are standard on diesel models, optional on gaseous models
5. **RUGGED TRAILER**
   Tough commercial trailer with electric braking system
6. **TWO-WAY FUEL VALVE**
   Easily switches among onboard LP, external LP or natural gas fuel (gaseous model); switches between on-board and external fuel tank draw (optional on diesel models)*

*Available on Tier 4F and gaseous models only.

125REZGT

Model	Standby 60 Hz (kW/kVA)	Prime 60 Hz (kW/kVA)	Fuel	EPA Emissions
35REOZT4	30/37.5	28/35	Diesel	Tier 4F
45REOZT4	40/50	36/45	Diesel	Tier 4F
55REOZT4	48/60	43/53	Diesel	Tier 4F
60REOZT	65/81	59/74	Diesel	Tier 3
100REOZT	105/131	96/120	Diesel	Tier 3
145REOZT4	130/163	117/146	Diesel	Tier 4F
150REOZT	155/194	140/175	Diesel	Tier 3
175REOZT4	154/193	139/174	Diesel	Tier 4F
200REOZT	210/263	190/238	Diesel	Tier 3
500REOZT	510/638	460/575	Diesel	Tier 2
30REZGT	28/35	25/31	LP/NG	EPA-Certified
50REZGT	42/52	40/50	LP/NG	EPA-Certified
70REZGT	62/77	56/70	LP/NG	EPA-Certified
125REZGT	105/131	95/119	LP/NG	EPA-Certified

MOBILE PARALLELING BOX

SPEC YOUR JOB AT **KOHLERPOWER.COM**

For more information, call **800.544.2444**
or visit **KohlerPower.com/Industrial**

ISO 9001
KOHLER POWER SYSTEMS
NATIONALLY REGISTERED

KOHLER. Power Systems

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G12-18 8/16

The City of San Diego

PRIORITY DEVELOPMENT PROJECT (PDP) STORM WATER QUALITY MANAGEMENT PLAN (SWQMP) FOR

9775 Towne Centre Drive
PTS 527644

ENGINEER OF WORK:

Giovanni Posillico, PE | RCE 66332

PREPARED FOR:

BMR– APEX LP
17190 Bernardo Center Drive
San Diego, CA 92128
858.485.9840

PREPARED BY:

Latitude 33 Planning & Engineering
9968 Hibert Street Second Floor
San Diego, CA 92131
858.751.0633

DATE:

December 2016
Revised: May 2017
Revised: August 2017

Approved by: City of San Diego Date

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TABLE OF CONTENTS

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ACRONYMS

APN	Assessor's Parcel Number
ASBS	Area of Special Biological Significance
BMP	Best Management Practice
CEQA	California Environmental Quality Act
CGP	Construction General Permit
DCV	Design Capture Volume
DMA	Drainage Management Areas
ESA	Environmentally Sensitive Area
GLU	Geomorphic Landscape Unit
GW	Ground Water
HMP	Hydromodification Management Plan
HSG	Hydrologic Soil Group
HU	Harvest and Use
INF	Infiltration
LID	Low Impact Development
LUP	Linear Underground/Overhead Projects
MS4	Municipal Separate Storm Sewer System
N/A	Not Applicable
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
PDP	Priority Development Project
PE	Professional Engineer
POC	Pollutant of Concern
SC	Source Control
SD	Site Design
SDRWQCB	San Diego Regional Water Quality Control Board
SIC	Standard Industrial Classification
SWPPP	Stormwater Pollutant Protection Plan
SWQMP	Storm Water Quality Management Plan
TMDL	Total Maximum Daily Load
WMAA	Watershed Management Area Analysis
WPCP	Water Pollution Control Program
WQIP	Water Quality Improvement Plan

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CERTIFICATION PAGE

Project Name: 9775 Towne Centre Drive
Permit Application Number: 527644

I hereby declare that I am the Engineer in Responsible Charge of design of storm water BMPs for this project, and 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 the requirements of the Storm Water Standards, which is based on the requirements of SDRWQCB Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100 (MS4 Permit).

I have read and understand that the City Engineer has adopted minimum requirements for managing urban runoff, including storm water, from land development activities, as described in the Storm Water Standards. I certify that this PDP SWQMP has been completed to the best of my ability and accurately reflects the project being proposed and the applicable source control and site design BMPs proposed to minimize the potentially negative impacts of this project's land development activities on water quality. I understand and acknowledge that the plan check review of this PDP SWQMP by the City Engineer is confined to a review and does not relieve me, as the Engineer in Responsible Charge of design of storm water BMPs for this project, of my responsibilities for project design.

Engineer of Work's Signature, PE Number & Expiration Date

GIOVANNI POSILLICO

Print Name

LATITUDE 33, PLANNING & ENGINEERING

Company

Date

Engineer's Stamp

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SUBMITTAL RECORD

Use this Table to keep a record of submittals of this PDP SWQMP. Each time the PDP SWQMP is re-submitted, provide the date and status of the project. In last column indicate changes that have been made or indicate if response to plan check comments is included. When applicable, insert response to plan check comments.

Submittal Number	Date	Project Status	Changes
1	Dec. 2016	☒ Preliminary Design/Planning/CEQA ☐ Final Design	Initial Submittal
2	May 2017	☒ Preliminary Design/Planning/CEQA ☐ Final Design	Respond to City Comments (1st submittal)
3	Aug. 2017	☒ Preliminary Design/Planning/CEQA ☐ Final Design	Respond to City Comments (2nd submittal)
4		☐ Preliminary Design/Planning/CEQA ☐ Final Design	

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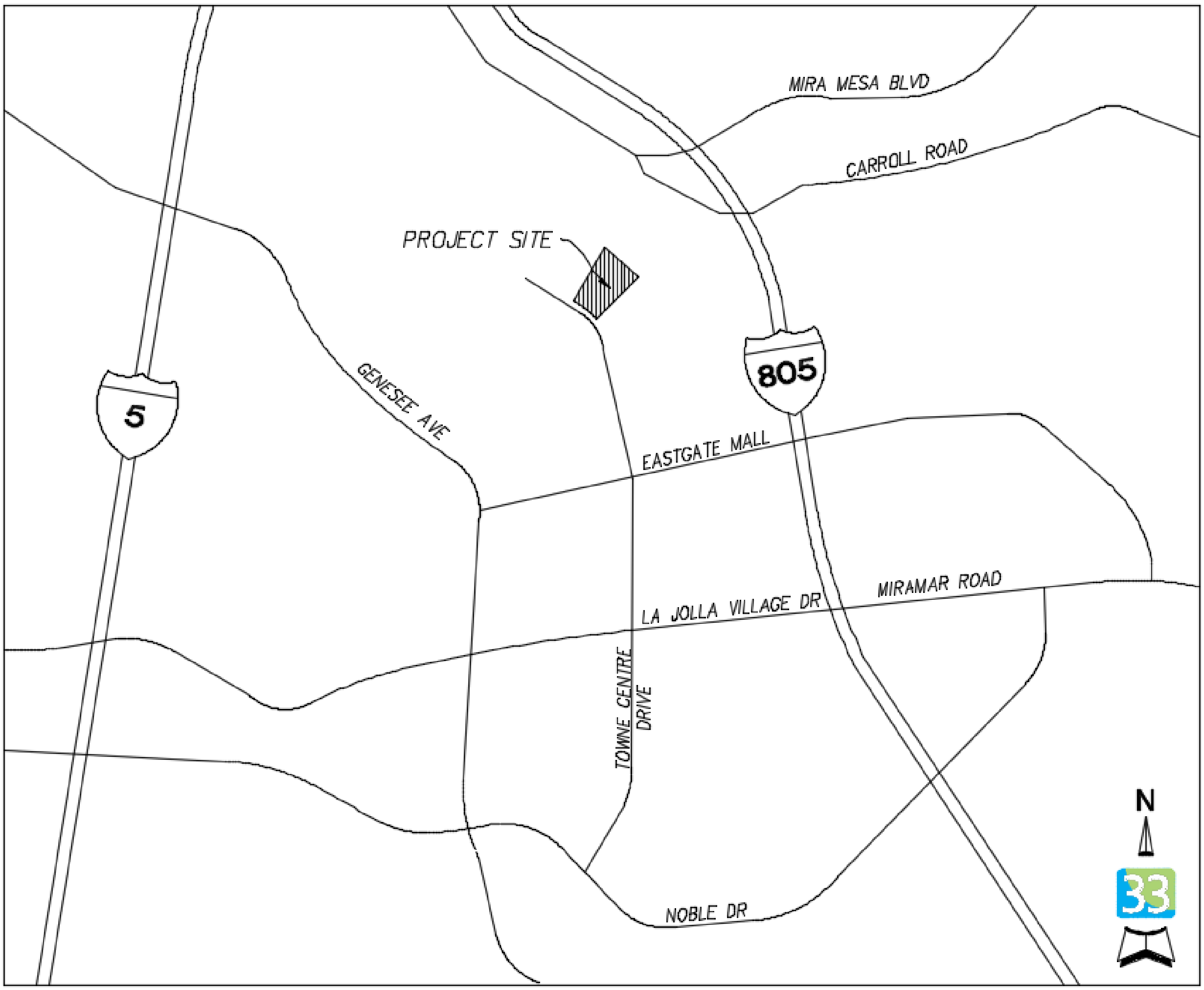
PROJECT VICINITY MAP

Project Name: 9775 Towne Centre Drive
Permit Application Number: 527644



VICINITY MAP
NO SCALE

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STORM WATER REQUIREMENTS APPLICABILITY CHECKLIST

Complete and attach DS-560 Form included in Appendix A.1

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The City of San Diego	City of San Diego **Development Services** 1222 First Ave., MS-302 San Diego, CA 92101 (619) 446-5000	**Storm Water Requirements Applicability Checklist**	**FORM** **DS-560** **February 2016**

Project Address: 9775 Towne Centre Drive	Project Number *(for City Use Only)*:

SECTION 1. Construction Storm Water BMP Requirements:

All construction sites are required to implement construction BMPs in accordance with the performance standards in the Storm Water Standards Manual. Some sites are additionally required to obtain coverage under the State Construction General Permit (CGP)[1] , which is administered by the State Water Resources Control Board.

For all project complete PART A: If project is required to submit a SWPPP or WPCP, continue to PART B.

PART A: Determine Construction Phase Storm Water Requirements.

1. Is the project subject to California's statewide General NPDES permit for Storm Water Discharges Associated with Construction Activities, also known as the State Construction General Permit (CGP)? (Typically projects with land disturbance greater than or equal to 1 acre.)

   ☒ Yes; SWPPP required, skip questions 2-4 ☐ No; next question

2. Does the project propose construction or demolition activity, including but not limited to, clearing, grading, grubbing, excavation, or any other activity that results in ground disturbance and contact with storm water runoff?

   ☐ Yes; WPCP required, skip 3-4 ☐ No; next question

3. Does the project propose routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility? (Projects such as pipeline/utility replacement)

   ☐ Yes; WPCP required, skip 4 ☐ No; next question

4. Does the project only include the following Permit types listed below?
   - Electrical Permit, Fire Alarm Permit, Fire Sprinkler Permit, Plumbing Permit, Sign Permit, Mechanical Permit, Spa Permit.
   - Individual Right of Way Permits that exclusively include only ONE of the following activities: water service, sewer lateral, or utility service.
   - Right of Way Permits with a project footprint less than 150 linear feet that exclusively include only ONE of the following activities: curb ramp, sidewalk and driveway apron replacement, pot holing, curb and gutter replacement, and retaining wall encroachments.

   ☐ Yes; no document required

   Check one of the boxes to the right, and continue to PART B:

   ☒ If you checked "Yes" for question 1, **a SWPPP is REQUIRED. Continue to PART B**

   ☐ If you checked "No" for question 1, and checked "Yes" for question 2 or 3, **a WPCP is REQUIRED.** If the project proposes less than 5,000 square feet of ground disturbance AND has less than a 5-foot elevation change over the entire project area, a Minor WPCP may be required instead. **Continue to PART B.**

   ☐ If you checked "No" for all questions 1-3, and checked "Yes" for question 4 PART B **does not apply and no document is required. Continue to Section 2.**

1. More information on the City's construction BMP requirements as well as CGP requirements can be found at: www.sandiego.gov/stormwater/regulations/index.shtml

PART B: Determine Construction Site Priorit

This prioritization must be completed within this form, noted on the plans, and included in the SWPPP or WPCP. The city reserves the right to adjust the priority of projects both before and after construction. Construction projects are assigned an inspection frequency based on if the project has a “high threat to water quality.” The City has aligned the local definition of “high threat to water quality” to the risk determination approach of the State Construction General Permit (CGP). The CGP determines risk level based on project specific sediment risk and receiving water risk. Additional inspection is required for projects within the Areas of Special Biological Significance (ASBS) watershed. **NOTE:** The construction priority does **NOT** change construction BMP requirements that apply to projects; rather, it determines the frequency of inspections that will be conducted by city staff.

Complete PART B and continued to Section 2

1. ☐ **ASBS**

a. Projects located in the ASBS watershed.

2. ☐ **High Priority**

a. Projects 1 acre or more determined to be Risk Level 2 or Risk Level 3 per the Construction General Permit and not located in the ASBS watershed.

b. Projects 1 acre or more determined to be LUP Type 2 or LUP Type 3 per the Construction General Permit and not located in the ASBS watershed.

3. ☒ **Medium Priority**

a. Projects 1 acre or more but not subject to an ASBS or high priority designation.

b. Projects determined to be Risk Level 1 or LUP Type 1 per the Construction General Permit and not located in the ASBS watershed.

4. ☐ **Low Priority**

a. Projects requiring a Water Pollution Control Plan but not subject to ASBS, high, or medium priority designation.

SECTION 2. Permanent Storm Water BMP Requirements.

Additional information for determining the requirements is found in the Storm Water Standards Manual.

PART C: Determine if Not Subject to Permanent Storm Water Requirements.

Projects that are considered maintenance, or otherwise not categorized as “new development projects” or “redevelopment projects” according to the Storm Water Standards Manual are not subject to Permanent Storm Water BMPs.

If “yes” is checked for any number in Part C, proceed to Part F and check “Not Subject to Permanent Storm Water BMP Requirements”.

If “no” is checked for all of the numbers in Part C continue to Part D.

1.	Does the project only include interior remodels and/or is the project entirely within an existing enclosed structure and does not have the potential to contact storm water?	☐ Yes ☒ No
2.	Does the project only include the construction of overhead or underground utilities without creating new impervious surfaces?	☐ Yes ☒ No
3.	Does the project fall under routine maintenance? Examples include, but are not limited to: roof or exterior structure surface replacement, resurfacing or reconfiguring surface parking lots or existing roadways without expanding the impervious footprint, and routine replacement of damaged pavement (grinding, overlay, and pothole repair).	☐ Yes ☒ No

PART D: PDP Exempt Requirements.

PDP Exempt projects are required to implement site design and source control BMPs.

If "yes" was checked for any questions in Part D, continue to Part F and check the box labeled "PDP Exempt."

If "no" was checked for all questions in Part D, continue to Part E.

1. Does the project ONLY include new or retrofit sidewalks, bicycle lanes, or trails that:
   - Are designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas? Or;
   - Are designed and constructed to be hydraulically disconnected from paved streets and roads? Or;
   - Are designed and constructed with permeable pavements or surfaces in accordance with the Green Streets guidance in the City's Storm Water Standards manual?

   ☐ Yes; PDP exempt requirements apply ☒ No; next question

2. Does the project ONLY include retrofitting or redeveloping existing paved alleys, streets or roads designed and constructed in accordance with the Green Streets guidance in the City's Storm Water Standards Manual?

   ☐ Yes; PDP exempt requirements apply ☒ No; project not exempt. PDP requirements apply

PART E: Determine if Project is a Priority Development Project (PDP).
Projects that match one of the definitions below are subject to additional requirements including preparation of a Storm Water Quality Management Plan (SWQMP).

If "yes" is checked for any number in PART E, continue to PART F.

If "no" is checked for every number in PART E, continue to PART F and check the box labeled "Standard Development Project".

1.	**New Development that creates 10,000 square feet or more of impervious surfaces collectively over the project site.** This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.	☐ Yes ☒ No
2.	**Redevelopment project that creates and/or replaces 5,000 square feet or more of impervious surfaces on an existing site of 10,000 square feet or more of impervious surfaces**. This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.	☒ Yes ☐ No
3.	**New development or redevelopment of a restaurant.** Facilities that sell prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC 5812), and where the land development creates and/or replace 5,000 square feet or more of impervious surface.	☐ Yes ☒ No
4.	**New development or redevelopment on a hillside.** The project creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site) and where the development will grade on any natural slope that is twenty-five percent or greater.	☐ Yes ☒ No
5.	**New development or redevelopment of a parking lot that creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site).**	☒ Yes ☐ No
6.	**New development or redevelopment of streets, roads, highways, freeways, and driveways.** The project creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site).	☐ Yes ☒ No

7. **New development or redevelopment discharging directly to an Environmentally Sensitive Area.** The project creates and/or replaces 2,500 square feet of impervious surface (collectively over project site), and discharges directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands). ☐ Yes ☒ No

8. **New development or redevelopment projects of a retail gasoline outlet (RGO) that create and/or replaces 5,000 square feet of impervious surface.** The development project meets the following criteria: (a) 5,000 square feet or more or (b) has a projected Average Daily Traffic (ADT) of 100 or more vehicles per day. ☐ Yes ☒ No

9. **New development or redevelopment projects of an automotive repair shops that creates and/or replaces 5,000 square feet or more of impervious surfaces.** Development projects categorized in any one of Standard Industrial Classification (SIC) codes 5013, 5014, 5541, 7532-7534, or 7536-7539. ☐ Yes ☒ No

10. **Other Pollutant Generating Project.** The project is not covered in the categories above, results in the disturbance of one or more acres of land and is expected to generate pollutants post construction, such as fertilizers and pesticides. This does not include projects creating less than 5,000 sf of impervious surface and where added landscaping does not require regular use of pesticides and fertilizers, such as slope stabilization using native plants. Calculation of the square footage of impervious surface need not include linear pathways that are for infrequent vehicle use, such as emergency maintenance access or bicycle pedestrian use, if they are built with pervious surfaces of if they sheet flow to surrounding pervious surfaces. ☐ Yes ☒ No

PART F: Select the appropriate category based on the outcomes of PART C through PART E.

1. The project is **NOT SUBJECT TO STORM WATER REQUIREMENTS**. ☐
2. The project is a **STANDARD DEVELOPMENT PROJECT**. Site design and source control BMP requirements apply. See the Storm Water Standards Manual for guidance. ☐
3. The project is **PDP EXEMPT**. Site design and source control BMP requirements apply. See the Storm Water Standards Manual for guidance. ☐
4. The project is a **PRIORITY DEVELOPMENT PROJECT**. Site design, source control, and structural pollutant control BMP requirements apply. See the Storm Water Standards Manual for guidance on determining if project requires a hydromodification plan management ☒

Name of Owner or Agent *(Please Print)*: Title:

Signature: Date:

<table>
<tr><td colspan="2">Applicability of Permanent, Post-Construction Storm Water BMP Requirements</td><td>**Form I-1**</td></tr>
<tr><td colspan="3">Project Identification</td></tr>
<tr><td colspan="3">Project Name: 9775 Towne Centre Drive</td></tr>
<tr><td colspan="2">Permit Application Number: 527644</td><td>Date: December 2016</td></tr>
<tr><td colspan="3">Determination of Requirements</td></tr>
<tr><td colspan="3">The purpose of this form is to identify permanent, post-construction requirements that apply to the project. This form serves as a short summary of applicable requirements, in some cases referencing separate forms that will serve as the backup for the determination of requirements.

Answer each step below, starting with Step 1 and progressing through each step until reaching "Stop".
Refer to Part 1 of Storm Water Standards sections and/or separate forms referenced in each step below.</td></tr>
<tr><td>Step</td><td>Answer</td><td>Progression</td></tr>
<tr><td rowspan="2">Step 1: Is the project a "development project"?
See Section 1.3 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.</td><td>☒ Yes</td><td>Go to Step 2.</td></tr>
<tr><td>☐ No</td><td>Stop.
Permanent BMP requirements do not apply. No SWQMP will be required. Provide discussion below.</td></tr>
<tr><td colspan="3">Discussion / justification if the project is not a "development project" (e.g., the project includes only interior remodels within an existing building):</td></tr>
<tr><td rowspan="3">Step 2: Is the project a Standard Project, Priority Development Project (PDP), or exception to PDP definitions?
To answer this item, see Section 1.4 of the BMP Design Manual (Part 1 of Storm Water Standards) in its entirety for guidance, AND complete Storm Water Requirements Applicability Checklist.</td><td>☐ Standard Project</td><td>Stop.
Standard Project requirements apply.</td></tr>
<tr><td>☒ PDP</td><td>PDP requirements apply, including PDP SWQMP.
Go to Step 3.</td></tr>
<tr><td>☐ PDP Exempt</td><td>Stop.
Standard Project requirements apply. Provide discussion and list any additional requirements below.</td></tr>
<tr><td colspan="3">Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:</td></tr>
</table>

<table>
<tr><th colspan="3">Form I-1 Page 2</th></tr>
<tr><th>Step</th><th>Answer</th><th>Progression</th></tr>
<tr><td rowspan="2">Step 3. Is the project subject to earlier PDP requirements due to a prior lawful approval?
See Section 1.10 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.</td><td>☐ Yes</td><td>Consult the City Engineer to determine requirements.
Provide discussion and identify requirements below.
Go to Step 4.</td></tr>
<tr><td>☒ No</td><td>BMP Design Manual PDP requirements apply.
Go to Step 4.</td></tr>
<tr><td colspan="3">Discussion / justification of prior lawful approval, and identify requirements (<u>not required if prior lawful approval does not apply</u>):</td></tr>
<tr><td rowspan="2">Step 4. Do hydromodification control requirements apply?
See Section 1.6 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.</td><td>☒ Yes</td><td>PDP structural BMPs required for pollutant control (Chapter 5) and hydromodification control (Chapter 6).
Go to Step 5.</td></tr>
<tr><td>☐ No</td><td>Stop.
PDP structural BMPs required for pollutant control (Chapter 5) only.
Provide brief discussion of exemption to hydromodification control below.</td></tr>
<tr><td colspan="3">Discussion / justification if hydromodification control requirements do <u>not</u> apply:</td></tr>
<tr><td rowspan="2">Step 5. Does protection of critical coarse sediment yield areas apply?
See Section 6.2 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.</td><td>☐ Yes</td><td>Management measures required for protection of critical coarse sediment yield areas (Chapter 6.2).
Stop.</td></tr>
<tr><td>☒ No</td><td>Management measures not required for protection of critical coarse sediment yield areas.
Provide brief discussion below.
Stop.</td></tr>
<tr><td colspan="3">Discussion / justification if protection of critical coarse sediment yield areas does <u>not</u> apply:

Please see the CCSYA Exhibit as Attachment 2b within this report for nearest critical coarse sediment areas.</td></tr>
</table>

Site Information Checklist For PDPs	Form I-3B
Project Summary Information	
Project Name	9775 Towne Centre Drive
Project Address	9775 Towne Centre Drive San Diego, CA 92121
Assessor's Parcel Number(s) (APN(s))	343-121-1400
Permit Application Number	527644
Project Watershed	Select One: ☐ San Dieguito River ☒ Penasquitos ☐ Mission Bay ☐ San Diego River ☐ San Diego Bay ☐ Tijuana River
Hydrologic subarea name with Numeric Identifier up to two decimal places (9XX.XX)	906.3
Project Area (total area of Assessor's Parcel(s) associated with the project or total area of the right-of-way)	12.108 Acres (427,500 Square Feet)
Area to be disturbed by the project (Project Footprint)	4.74 Acres (206,635 Square Feet)
Project Proposed Impervious Area (subset of Project Footprint)	2.98 Acres (129,904 Square Feet)
Project Proposed Pervious Area (subset of Project Footprint)	1.76 Acres (76,731 Square Feet)
Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Project Area.	
The proposed increase or decrease in impervious area in the proposed condition as compared to the pre-project condition.	Decrease 15.55%

Form I-3B Page 2 of 11
Description of Existing Site Condition and Drainage Patterns
Current Status of the Site (select all that apply): ☒ Existing development ☐ Previously graded but not built out ☐ Agricultural or other non-impervious use ☐ Vacant, undeveloped/natural Description / Additional Information: The existing conditions of the project consist of a ~44,500sf office building with ~117,000sf sidewalk and parking lot with ~44,560sf of landscaping.
Existing Land Cover Includes (select all that apply): ☒ Vegetative Cover ☐ Non-Vegetated Pervious Areas ☒ Impervious Areas Description / Additional Information:
Underlying Soil belongs to Hydrologic Soil Group (select all that apply): ☐ NRCS Type A ☐ NRCS Type B ☐ NRCS Type C ☒ NRCS Type D
Approximate Depth to Groundwater (GW): ☐ GW Depth < 5 feet ☐ 5 feet < GW Depth < 10 feet ☐ 10 feet < GW Depth < 20 feet ☐ GW Depth > 20 feet
Existing Natural Hydrologic Features (select all that apply): ☐ Watercourses ☐ Seeps ☐ Springs ☐ Wetlands ☒ None Description / Additional Information:

Form I-3B Page 3 of 11
Description of Existing Site Topography and Drainage:
How is storm water runoff conveyed from the site? At a minimum, this description should answer: 1. Whether existing drainage conveyance is natural or urban; 2. If runoff from offsite is conveyed through the site? If yes, quantification of all offsite drainage areas, design flows, and locations where offsite flows enter the project site and summarize how such flows are conveyed through the site; 3. Provide details regarding existing project site drainage conveyance network, including storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, and natural and constructed channels; 4. Identify all discharge locations from the existing project along with a summary of the conveyance system size and capacity for each of the discharge locations. Provide summary of the pre-project drainage areas and design flows to each of the existing runoff discharge locations.
Description / Additional Information:
1. The existing drainage conveyance is urban consisting of sheetflow over parking lots and private storm drain systems before discharging into the existing storm drain system within Towne Centre Drive. 2. All runoff is contained within the project limits, no runoff is discharged or conveyed from neighboring projects. 3. Existing project site drainage conveyance consists of curb and gutters that route surface runoff to private storm drain inlets before discharging off-site. 4. There are two discharge locations on the existing project site. There is some sheet flow from the existing driveway that discharges into the curb and gutter within Towne Centre Drive. All private drainage and runoff is discharged into the 24” RCP storm drain within Towne Centre Drive.

Form I-3B Page 4 of 11
Description of Proposed Site Development and Drainage Patterns
Project Description / Proposed Land Use and/or Activities: BMR-Apex, LP seeks to construct a 165,000sf office building with an underground parking facility with 318 parking spaces along with 177 surface parking spaces. Site preparations include the demolition of the existing office building and adjoining parking lot.
List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features): The proposed impervious features on-site consist of a two-story 165,000sf office building with surface parking and pedestrian walkways.
List/describe proposed pervious features of the project (e.g., landscape areas): The proposed pervious features on-site consist of biofiltration basins with drought tolerant plans, as well as other landscaped areas.
Does the project include grading and changes to site topography? ☒ Yes ☐ No Description / Additional Information: Grading activities include bringing the site to final design elevations as well as excavation for the underground parking structure, retaining walls, biofiltration facilities and underground utilities.

Form I-3B Page 5 of 11

Does the project include changes to site drainage (e.g., installation of new storm water conveyance systems)?
☒ Yes
☐ No

If yes, provide details regarding the proposed project site drainage conveyance network, including storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural and constructed channels, and the method for conveying offsite flows through or around the proposed project site. Identify all discharge locations from the proposed project site along with a summary of the conveyance system size and capacity for each of the discharge locations. Provide a summary of pre and post-project drainage areas and design flows to each of the runoff discharge locations. Reference the drainage study for detailed calculations.

Description / Additional Information:

Post development conditions will maintain existing drainage patterns. On-site runoff will be collected via private storm drain systems before being treated and detained within biofiltration facilities and underground storage vaults. Runoff is then pumped from the storage vaults before being discharged into the existing 24" RCP storm drain system within Towne Centre Drive. The implementation of the proposed biofiltration basins and storage vaults are discussed in detail further in this report.

Form I-3B Page 6 of 11
Identify whether any of the following features, activities, and/or pollutant source areas will be present (select all that apply): ☒ On-site storm drain inlets ☒ Interior floor drains and elevator shaft sump pumps ☒ Interior parking garages ☐ Need for future indoor & structural pest control ☒ Landscape/Outdoor Pesticide Use ☐ Pools, spas, ponds, decorative fountains, and other water features ☐ Food service ☐ Refuse areas ☐ Industrial processes ☐ Outdoor storage of equipment or materials ☐ Vehicle and Equipment Cleaning ☐ Vehicle/Equipment Repair and Maintenance ☐ Fuel Dispensing Areas ☒ Loading Docks ☒ Fire Sprinkler Test Water ☒ Miscellaneous Drain or Wash Water ☒ Plazas, sidewalks, and parking lots ☐ Large Trash Generating Facilities ☐ Animal Facilities ☐ Plant Nurseries and Garden Centers ☐ Automotive-related Uses Description / Additional Information:

Form I-3B Page 7 of 11
Identification and Narrative of Receiving Water
Narrative describing flow path from discharge location(s), through urban storm conveyance system, to receiving creeks, rivers, and lagoons and ultimate discharge location to Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable) The runoff generated from this project (pre and post conditions) is gathered within private storm drain system before discharging into the existing 24" RCP storm drain within Towne Centre Drive. The storm drain system then discharges into Soledad Canyon approximately 3,000 feet to the north-west of the project site where runoff then is discharged into Los Penasquitos Creek before entering Los Penasquitos Lagoon and then ultimately the Pacific Ocean.
Provide a summary of all beneficial uses of receiving waters downstream of the project discharge locations. The beneficial uses for Downstream Inland Surfaces (RWQCB, 1998) are AGR, PROC, REC-1, REC-2, WARM, COLD, WILD, & RARE. The beneficial uses for Downstream Coastal Water (RWQCB, 1998) are PROC, NAV, REC-1, REC-2, COMM, BIOL, EST, WILD, RARE, MAR, MIGR, AQUA, SHELL & SPWN.
Identify all ASBS (areas of special biological significance) receiving waters downstream of the project discharge locations. There are no existing Areas of Special Biological Significances within the receiving waters downstream of this project.
Provide distance from project outfall location to impaired or sensitive receiving waters. This project outfall location is 0.68 miles away from Soledad Canyon, which is listed as a 303(d) impaired/sensitive receiving waters.
Summarize information regarding the proximity of the permanent, post-construction storm water BMPs to the City's Multi-Habitat Planning Area and environmentally sensitive lands There is a dedicated MHPA that overlaps the existing development and along with a dedicated open space easement and environmentally sensitive lands. See Attachments 1a and 2a for exact location.

Form I-3B Page 8 of 11		
Identification of Receiving Water Pollutants of Concern		
List any 303(d) impaired water bodies within the path of storm water from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable), identify the pollutant(s)/stressor(s) causing impairment, and identify any TMDLs and/or Highest Priority Pollutants from the WQIP for the impaired water bodies:		
303(d) Impaired Water Body	Pollutant(s)/Stressor(s)	TMDLs/ WQIP Highest Priority Pollutant
Los Penasquitos Lagoon	Sediment/Siltation	N/A
Los Penasquitos Creek	Phosphate and TDS	N/A

Identification of Project Site Pollutants*			
*Identification of project site pollutants is only required if flow-thru treatment BMPs are implemented onsite in lieu of retention or biofiltration BMPs (note the project must also participate in an alternative compliance program unless prior lawful approval to meet earlier PDP requirements is demonstrated) Identify pollutants anticipated from the project site based on all proposed use(s) of the site (see BMP Design Manual (Part 1 of Storm Water Standards) Appendix B.6):			
Pollutant	Not Applicable to the Project Site	Anticipated from the Project Site	Also a Receiving Water Pollutant of Concern
Sediment			
Nutrients			
Heavy Metals			
Organic Compounds			
Trash & Debris			
Oxygen Demanding Substances			
Oil & Grease			
Bacteria & Viruses			
Pesticides			

The subject project proposed biofiltration BMPs. No flow-thru treatment BMPs are proposed for this project.

Form I-3B Page 9 of 11
Hydromodification Management Requirements
Do hydromodification management requirements apply (see Section 1.6 of the BMP Design Manual)? ☒ Yes, hydromodification management flow control structural BMPs required. ☐ No, the project will discharge runoff directly to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. ☐ No, the project will discharge runoff directly to conveyance channels whose bed and bank are concrete-lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. ☐ No, the project will discharge runoff directly to an area identified as appropriate for an exemption by the WMAA for the watershed in which the project resides. Description / Additional Information (to be provided if a 'No' answer has been selected above):
Critical Coarse Sediment Yield Areas* *This Section only required if hydromodification management requirements apply
Based on Section 6.2 and Appendix H does CCSYA exist on the project footprint or in the upstream area draining through the project footprint? ☐ Yes ☒ No Discussion / Additional Information: See the exhibit attached, Attachment 2b, for the nearest CCSYAs to the project site.

Form I-3B Page 10 of 11
Flow Control for Post-Project Runoff* *This Section only required if hydromodification management requirements apply
List and describe point(s) of compliance (POCs) for flow control for hydromodification management (see Section 6.3.1). For each POC, provide a POC identification name or number correlating to the project's HMP Exhibit and a receiving channel identification name or number correlating to the project's HMP Exhibit. This project consists of two points of compliances that mimic existing conditions and are described as follows: • POC#1 is the surface runoff from the proposed driveway as it enters the curb and gutter within Towne Centre Drive. • POC#2 is the existing Type 'A' Cleanout with Towne Center Drive that the underground storage vaults will discharge to, see Attachment 1a and 2a for exact locations.
Has a geomorphic assessment been performed for the receiving channel(s)? ☒ No, the low flow threshold is 0.1Q2 (default low flow threshold) ☐ Yes, the result is the low flow threshold is 0.1Q2 ☐ Yes, the result is the low flow threshold is 0.3Q2 ☐ Yes, the result is the low flow threshold is 0.5Q2 If a geomorphic assessment has been performed, provide title, date, and preparer:
Discussion / Additional Information: (optional)

Form I-3B Page 11 of 11
Other Site Requirements and Constraints
When applicable, list other site requirements or constraints that will influence storm water management design, such as zoning requirements including setbacks and open space, or local codes governing minimum street width, sidewalk construction, allowable pavement types, and drainage requirements. N/A
Optional Additional Information or Continuation of Previous Sections As Needed
This space provided for additional information or continuation of information from previous sections as needed.

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Source Control BMP Checklist for All Development Projects			Form I-4
Source Control BMPs			
All development projects must implement source control BMPs SC-1 through SC-6 where applicable and feasible. See Chapter 4 and Appendix E of the BMP Design Manual (Part 1 of the Storm Water Standards) for information to implement source control BMPs shown in this checklist. Answer each category below pursuant to the following. • "Yes" means the project will implement the source control BMP as described in Chapter 4 and/or Appendix E of the BMP Design Manual. Discussion / justification is not required. • "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided. • "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification may be provided.			
Source Control Requirement	Applied?		
SC-1 Prevention of Illicit Discharges into the MS4	☒ Yes	☐ No	☐ N/A
Discussion / justification if SC-1 not implemented:			
SC-2 Storm Drain Stenciling or Signage	☒ Yes	☐ No	☐ N/A
Discussion / justification if SC-2 not implemented:			
SC-3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☒ Yes	☐ No	☐ N/A
Discussion / justification if SC-3 not implemented:			
SC-4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☒ Yes	☐ No	☐ N/A
Discussion / justification if SC-4 not implemented:			
SC-5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☒ Yes	☐ No	☐ N/A
Discussion / justification if SC-5 not implemented:			

Form I-4 Page 2 of 2			
Source Control Requirement	Applied?		
SC-6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below)			
On-site storm drain inlets	☒ Yes	☐ No	☐ N/A
Interior floor drains and elevator shaft sump pumps	☒ Yes	☐ No	☐ N/A
Interior parking garages	☒ Yes	☐ No	☐ N/A
Need for future indoor & structural pest control	☐ Yes	☐ No	☒ N/A
Landscape/Outdoor Pesticide Use	☒ Yes	☐ No	☐ N/A
Pools, spas, ponds, decorative fountains, and other water features	☐ Yes	☐ No	☒ N/A
Food service	☐ Yes	☐ No	☒ N/A
Refuse areas	☒ Yes	☐ No	☐ N/A
Industrial processes	☐ Yes	☐ No	☒ N/A
Outdoor storage of equipment or materials	☒ Yes	☐ No	☐ N/A
Vehicle/Equipment Repair and Maintenance	☐ Yes	☐ No	☒ N/A
Fuel Dispensing Areas	☐ Yes	☐ No	☒ N/A
Loading Docks	☒ Yes	☐ No	☐ N/A
Fire Sprinkler Test Water	☐ Yes	☐ No	☒ N/A
Miscellaneous Drain or Wash Water	☐ Yes	☐ No	☒ N/A
Plazas, sidewalks, and parking lots	☒ Yes	☐ No	☐ N/A
SC-6A: Large Trash Generating Facilities	☐ Yes	☐ No	☒ N/A
SC-6B: Animal Facilities	☐ Yes	☐ No	☒ N/A
SC-6C: Plant Nurseries and Garden Centers	☐ Yes	☐ No	☒ N/A
SC-6D: Automotive-related Uses	☐ Yes	☐ No	☒ N/A
Discussion / justification if SC-6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for <u>all</u> "No" answers shown above.			

Source Control BMP Checklist for All Development Projects	Form I-5

Site Design BMPs

All development projects must implement site design BMPs SD-1 through SD-8 where applicable and feasible. See Chapter 4 and Appendix E of the BMP Design Manual (Part 1 of Storm Water Standards) for information to implement site design BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the site design BMP as described in Chapter 4 and/or Appendix E of the BMP Design Manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification may be provided.

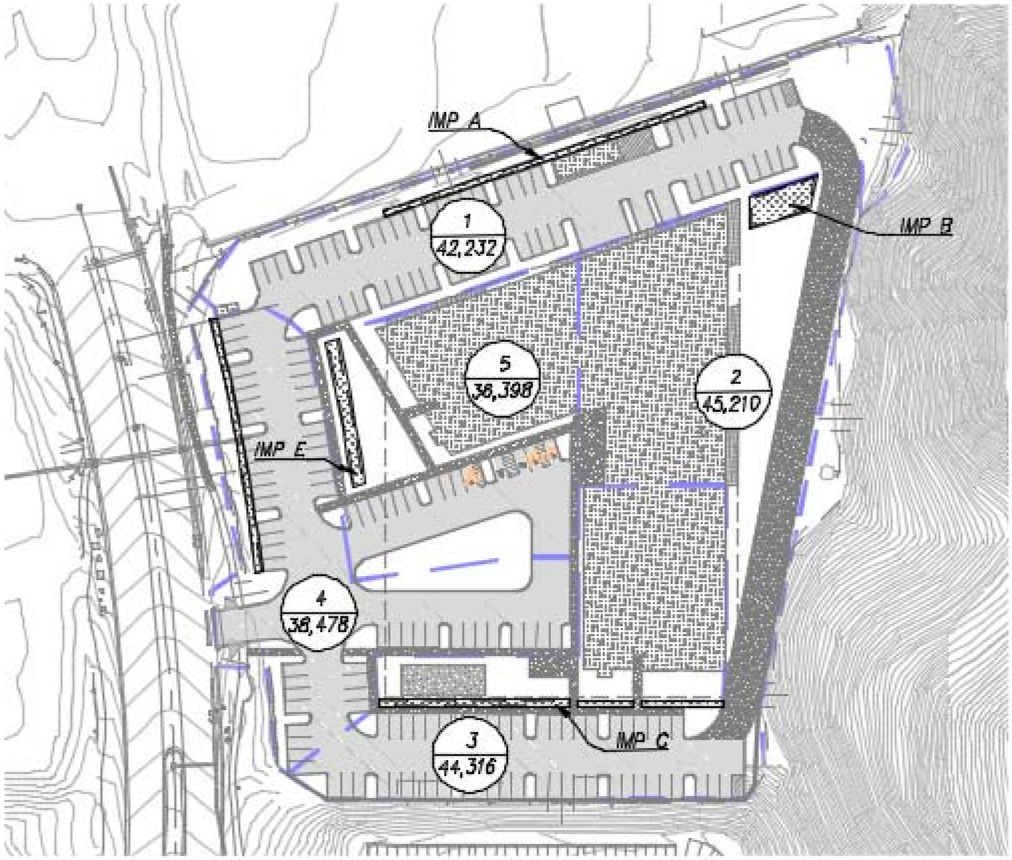
A site map with implemented site design BMPs must be included at the end of this checklist.

Site Design Requirement	Applied?		
SD-1 Maintain Natural Drainage Pathways and Hydrologic Features	☐ Yes	☐ No	☒ N/A
Discussion / justification if SD-1 not implemented: There are no existing natural drainage pathways or hydrologic features to maintain on this project.			
1-1 Are existing natural drainage pathways and hydrologic features mapped on the site map?	☒ Yes	☐ No	☐ N/A
1-2 Are trees implemented? If yes, are they shown on the site map?	☐ Yes	☐ No	☒ N/A
1-3 Implemented trees meet the design criteria in SD-1 Fact Sheet (e.g. soil volume, maximum credit, etc.)?	☐ Yes	☐ No	☒ N/A
1-4 Is tree credit volume calculated using Appendix B.2.2.1 and SD-1 Fact Sheet in Appendix E?	☐ Yes	☐ No	☒ N/A
SD-2 Have natural areas, soils and vegetation been conserved?	☒ Yes	☐ No	☐ N/A
Discussion / justification if SD-2 not implemented:			

Site Design Requirement	Applied?		
SD-3 Minimize Impervious Area	☒ Yes	☐ No	☐ N/A
Discussion / justification if SD-3 not implemented:			
SD-4 Minimize Soil Compaction	☒ Yes	☐ No	☐ N/A
Discussion / justification if SD-4 not implemented:			
SD-5 Impervious Area Dispersion	☒ Yes	☐ No	☐ N/A
Discussion / justification if SD-5 not implemented:			
5-1 Is the pervious area receiving runon from impervious area identified on the site map?	☐ Yes	☐ No	☒ N/A
5-2 Does the pervious area satisfy the design criteria in SD-5 Fact Sheet in Appendix E (e.g. maximum slope, minimum length, etc.)	☒ Yes	☐ No	☐ N/A
5-3 Is impervious area dispersion credit volume calculated using Appendix B.2.1.1 and SD-5 Fact Sheet in Appendix E?	☐ Yes	☐ No	☒ N/A

Form I-5 Page 3 of 4			
Site Design Requirement	Applied?		
SD-6 Runoff Collection	☒ Yes	☐ No	☐ N/A
Discussion / justification if SD-6 not implemented:			
6a-1 Are green roofs implemented in accordance with design criteria in SD-6A Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☒ No	
6a-2 Is green roof credit volume calculated using Appendix B.2.1.2 and SD-6A Fact Sheet in Appendix E?	☐ Yes	☒ No	
6b-1 Are permeable pavements implemented in accordance with design criteria in SD-6B Fact Sheet? If yes, are they shown on the site	☐ Yes	☒ No	
6b-2 Is permeable pavement credit volume calculated using Appendix B.2.1.3 and SD-6B Fact Sheet in Appendix E?	☐ Yes	☒ No	
SD-7 Landscaping with Native or Drought Tolerant Species	☒ Yes	☐ No	☐ N/A
Discussion / justification if SD-7 not implemented:			
SD-8 Harvesting and Using Precipitation	☐ Yes	☒ No	☐ N/A
Discussion / justification if SD-8 not implemented: Due to not meeting the requirements as laid out in Attachment 1c – Form I-7, this project does not propose Harvest and Use.			
8-1 Are rain barrels implemented in accordance with design criteria in SD-8 Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☒ No	
8-2 Is rain barrel credit volume calculated using Appendix B.2.2.2 and SD-8 Fact Sheet in Appendix E?	☐ Yes	☒ No	

Insert Site Map with all site design BMPs identified:



**Please see Attachment 1a for exact BMP locations.*

Summary of PDP Structural BMPs	Form I-6
PDP Structural BMPs	

All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the BMP Design Manual, Part 1 of Storm Water Standards). Selection of PDP structural BMPs for storm water pollutant control must be based on the selection process described in Chapter 5. PDPs subject to hydromodification management requirements must also implement structural BMPs for flow control for hydromodification management (see Chapter 6 of the BMP Design Manual). Both storm water pollutant control and flow control for hydromodification management can be achieved within the same structural BMP(s).

PDP structural BMPs must be verified by the City at the completion of construction. This includes requiring the project owner or project owner's representative to certify construction of the structural BMPs (complete Form DS-563). PDP structural BMPs must be maintained into perpetuity (see Chapter 7 of the BMP Design Manual).

Use this form to provide narrative description of the general strategy for structural BMP implementation at the project site in the box below. Then complete the PDP structural BMP summary information sheet (page 3 of this form) for each structural BMP within the project (copy the BMP summary information page as many times as needed to provide summary information for each individual structural BMP).

Describe the general strategy for structural BMP implementation at the site. This information must describe how the steps for selecting and designing storm water pollutant control BMPs presented in Section 5.1 of the BMP Design Manual were followed, and the results (type of BMPs selected). For projects requiring hydromodification flow control BMPs, indicate whether pollutant control and flow control BMPs are integrated or separate.

Step 1 – This project contains one self-retaining area on-site as delineated on Attachments 1a and 2a.

Step 2 – Per the included Harvest and Use feasibility screening, Form I-7, the proposed project is considered to be infeasible for harvest and use.

Step 3 – Per the included Form I-8, Categorization of Infiltration Feasibility Condition, there is no chance for infiltration on-site as shown by the percolation tests within the geotechnical investigation performed by Geocon. Please reference Attachemnt 6 for further details. Biofiltration basins have been sized for treatment and storage vaults have been implemented for hydromodification purposes.

Step 4 – Biofiltration basins have been sized and placed accordingly to treat the required runoff generated per the proposed development.

Step 5 – Flow-thru treatment is not proposed on this project as we were able to treat the required DCV onsite with the proposed basins and vaults.

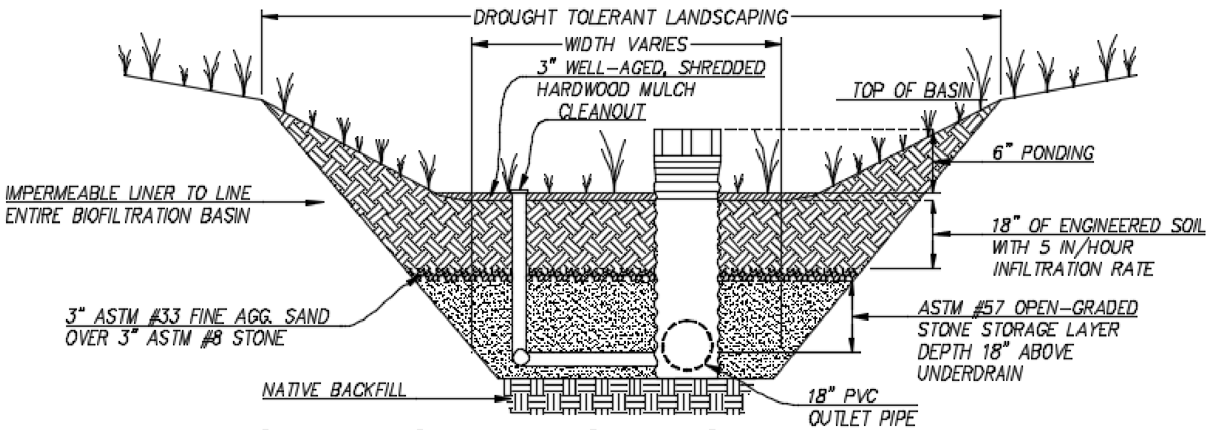
Form I-6 Page 2 of 5
(Page reserved for continuation of description of general strategy for structural BMP implementation at the site)
(Continued from page 1)

Form I-6 Page 3 of 5	
Structural BMP Summary Information	
Structural BMP ID No. A - E	
Construction Plan Sheet No. CPA Grading and Utility Plan	
Type of structural BMP: ☐ Retention by harvest and use (HU-1) ☐ Retention by infiltration basin (INF-1) ☐ Retention by bioretention (INF-2) ☐ Retention by permeable pavement (INF-3) ☐ Partial retention by biofiltration with partial retention (PR-1) ☒ Biofiltration (BF-1) ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (Provide BMP type / Description in discussion section below ☐ Flow-thru treatment control included as pre-treatment / forebay for an onsite retention or biofiltration BMP (provide BMP type / description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-thru treatment control with alternative compliance (provide BMP type / description in discussion section below ☒ Detention pond or vault for hydromodification management ☐ Other (describe in discussion section below)	
Purpose: ☐ Pollutant control only ☐ Hydromodification control only ☒ Combined pollutant control and hydromodification control ☐ Pre-treatment / forebay for another structural BMP ☐ Other (describe in discussion section below	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification form DS-563	Giovanni Posillico | RCE 66332 Latitude 33 – 858.751.0633 9968 Hibert Street, Second Floor San Diego, CA 92131
Who will be the final owner of this BMP?	BMR - Apex, LP, or subsequent property owner
Who will maintain this BMP into perpetuity?	BMR - Apex, LP, or subsequent property owner
What is the funding mechanism for maintenance?	SWMA with BMR - Apex, LP, or subsequent property owner

Structural BMP ID No. B and E

Construction Plan Sheet No. CPA Grading and Util. Sheet

Discussion (as needed):

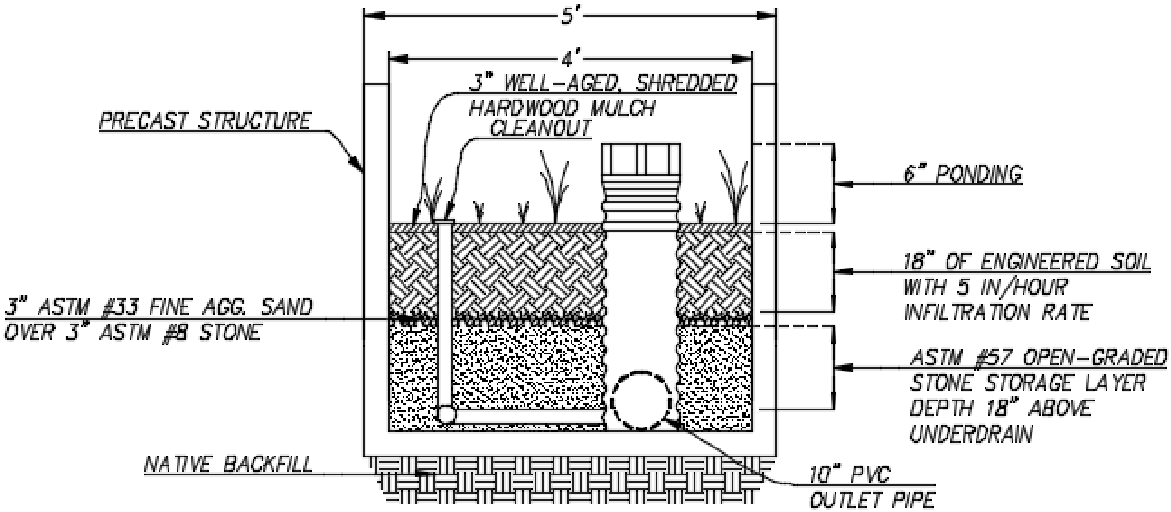


1. "ENGINEERED SOIL" LAYER SHALL BE "SANDY LOAM" SOIL MIX WITH NO MORE THAN 5% CLAY CONTENT. THE MIX SHALL CONTAIN 50-60% SAND, 20-30% COMPOST OR HARDWOOD MULCH, AND 20-30% TOPSOIL, FREE OF STONES, STUMPS, ROOTS, OR SIMILAR OBJECTS, AND ALSO FREE OF NOXIOUS WEEDS.

PVT. BIOFILTRATION BASIN - IMP 'B' AND 'E'

NTS

Structural BMP ID No. A, C and D
Construction Plan Sheet No. CPA Grading and Util. Sheet
Discussion (as needed):



1. "ENGINEERED SOIL" LAYER SHALL BE "SANDY LOAM" SOIL MIX WITH NO MORE THAN 5% CLAY CONTENT. THE MIX SHALL CONTAIN 50-60% SAND, 20-30% COMPOST OR HARDWOOD MULCH, AND 20-30% TOPSOIL, FREE OF STONES, STUMPS, ROOTS, OR SIMILAR OBJECTS, AND ALSO FREE OF NOXIOUS WEEDS.

PVT. BIOFILTRATION BASIN - IMP 'A', 'C' AND 'D'

NTS

THE CITY OF SAN DIEGO	City of San Diego **Development Services** 1222 First Ave., MD-302 San Diego, CA 92101 (619) 446-5000	**Permanent BMP Construction** **Self Certification Form**	FORM DS-563 January 2016

Date Prepared:	Project No.:
Project Applicant:	Phone:
Project Address:	
Project Engineer:	Phone:

The purpose of this form is to verify that the site improvements for the project, identified above, have been constructed in conformance with the approved Storm Water Quality Management Plan (SWQMP) documents and drawings.

This form must be completed by the engineer and submitted prior to final inspection of the construction permit. Completion and submittal of this form is required for all new development and redevelopment projects in order to comply with the City's Storm Water ordinances and NDPES Permit Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100. Final inspection for occupancy and/or release of grading or public improvement bonds may be delayed if this form is not submitted and approved by the City of San Diego.

CERTIFICATION:
As the professional in responsible charge for the design of the above project, I certify that I have inspected all constructed Low Impact Development (LID) site design, source control and structural BMP's required per the approved SWQMP and Construction Permit No.________________________; and that said BMP's have been constructed in compliance with the approved plans and all applicable specifications, permits, ordinances and Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100 of the San Diego Regional Water Quality Control Board.

I understand that this BMP certification statement does not constitute an operation and maintenance verification.

Signature: ______________________________

Date of Signature: ______________________________

Printed Name: ______________________________

Title: ______________________________

Phone No. ______________________________

Engineer's Stamp

DS-563 (01-16)

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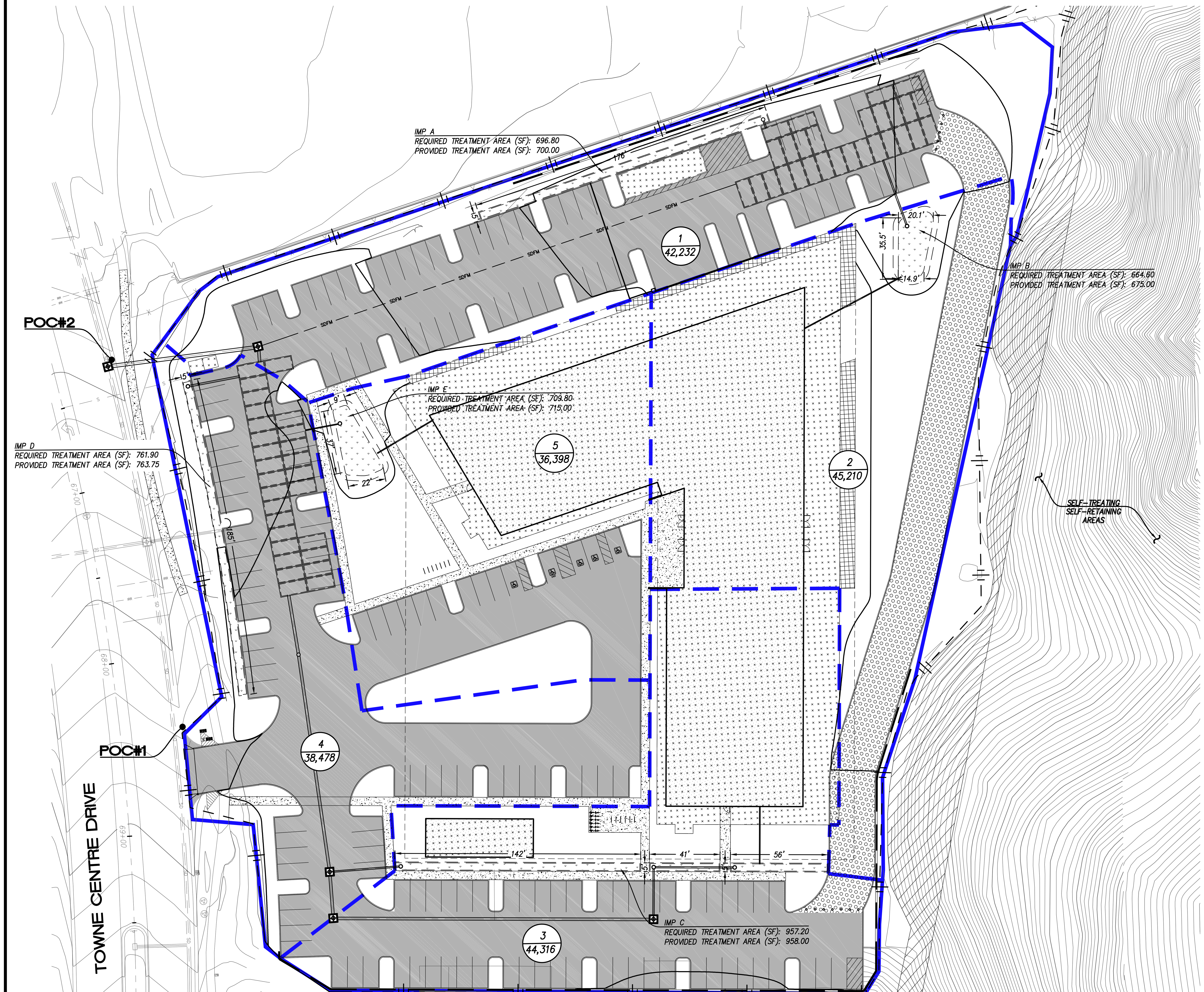


EXISTING SITE INFORMATION

HYDROLOGIC SOIL GROUP: SOIL CLASS TYPE "D"

GROUNDWATER: GROUNDWATER NOT ENCOUNTERED WITHIN 70.5 FEET IN BORINGS PER REPORT BY GEOCON, INC. ENTITLED "GEOTECHNICAL INVESTIGATION – 9775 TOWNE CENTRE DRIVE SAN DIEGO, CA" DATED DECEMBER 16, 2016. GROUNDWATER DEPTH IS ASSUMED TO BE GREATER THAN 100 FEET.

EXISTING NATURAL HYDROLOGIC FEATURES: NO NATURAL HYDROLOGIC FEATURES EXIST ONSITE.

CRITICAL COARSE SEDIMENT YIELD AREAS: NO CRITICAL COARSE SEDIMENT YIELD AREAS (CCSYAS) EXIST ONSITE. NO PROTECTION OF CCSYAS REQUIRED.

EXISTING TOPOGRAPHY AND IMPERVIOUS AREA: EXISTING TOPOGRAPHY SHOWN HEREON. SEE AREA SUMMARY TABLE FOR EXISTING IMPERVIOUS AREA.

EXISTING DRAINAGE: ALL EXISTING DRAINAGE IS CONTAINED WITHIN THE PROJECT SITE AND IS CONVEYED VIA PRIVATE STORM DRAINS AND DISCHARGE INTO THE EXISTING 24" RCP STORM DRAIN WITHIN TOWNE CENTRE DRIVE.

PROPOSED SITE INFORMATION

PROPOSED DRAINAGE: PROPOSED DRAINAGE MIMICS EXISTING CONDITIONS AND ALL DRAINAGE IS KEPT ONSITE AND CONVEYED VIA PRIVATE STORM DRAIN SYSTEMS BEFORE DISCHARGING INTO THE EXISTING STORM DRAIN SYSTEM WITH TOWNE CENTRE DRIVE.

PROPOSED GRADING: SHOWN HEREON.

PROPOSED IMPERVIOUS FEATURES: SHOWN HEREON.

PROPOSED DRAINAGE: SHOWN HEREON.

PROPOSED DESIGN FEATURES: SITE DESIGN REQUIREMENTS SHOWN HEREON. SEE FORM I-4 FOR EXPLANATION.

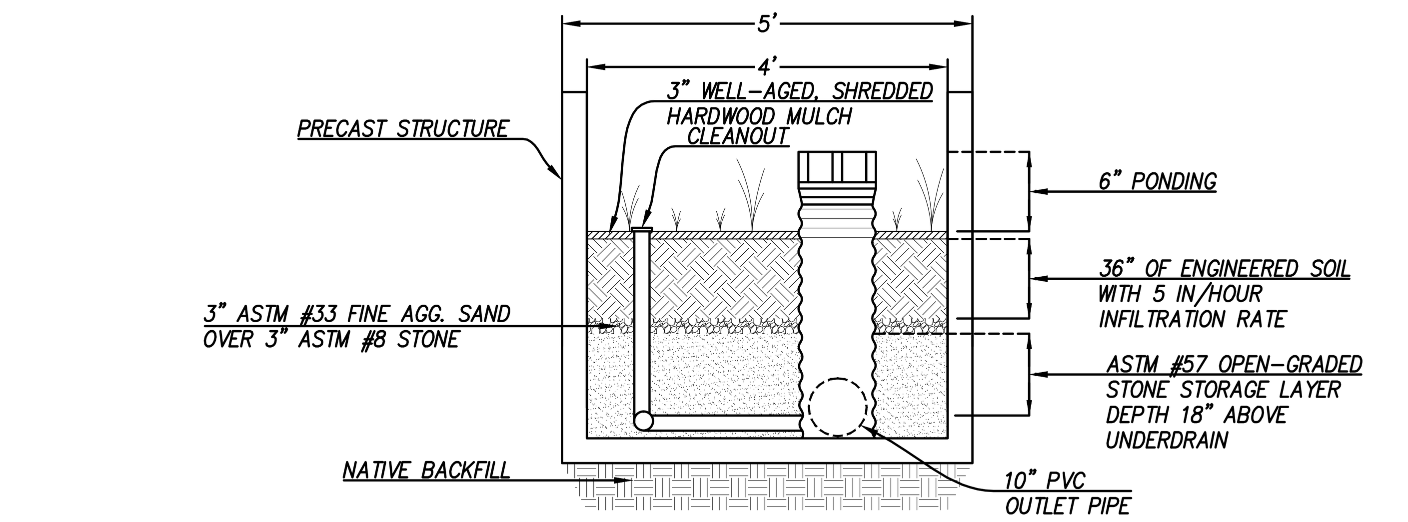
DRAINAGE MANAGEMENT AREAS: SHOWN HEREON. SEE DMA SUMMARY TABLE.

POTENTIAL POLLUTANT SOURCE AREAS AND SOURCE CONTROL: SHOWN HEREON. SEE FORMS 1-3B AND 1-4 FOR EXPLANATION.

STRUCTURAL BMPS: BF-1 BIOFILTRATION SHOWN HEREON. SEE DETAILS.

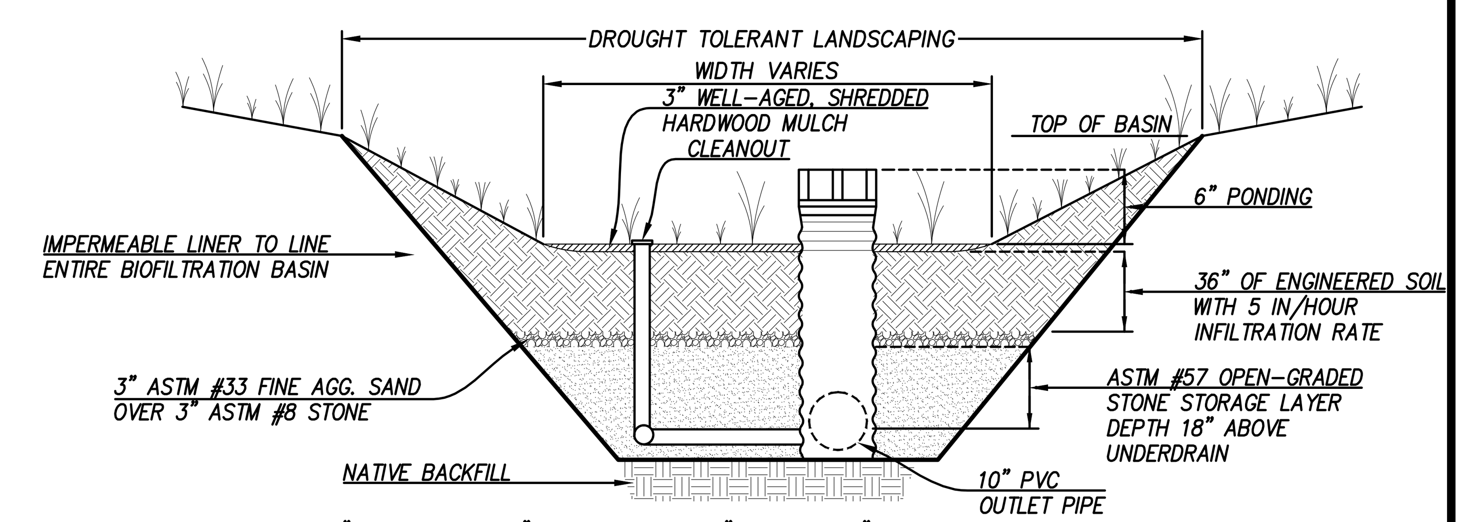
LEGEND

- BUILDING
- ASPHALT
- CONCRETE
- TERRACE
- LANDSCAPE
- BMP AREA
- GRASSCRETE
- DMA / AREA (1 / 3,000)
- DMA BOUNDARY



1. "ENGINEERED SOIL" LAYER SHALL BE "SANDY LOAM" SOIL MIX WITH NO MORE THAN 5% CLAY CONTENT. THE MIX SHALL CONTAIN 50-60% SAND, 20-30% COMPOST OR HARDWOOD MULCH, AND 20-30% TOPSOIL, FREE OF STONES, STUMPS, ROOTS, OR SIMILAR OBJECTS, AND ALSO FREE OF NOXIOUS WEEDS.

PVT. BIOFILTRATION BASIN – IMP 'A', 'C' AND 'D'
NTS



1. "ENGINEERED SOIL" LAYER SHALL BE "SANDY LOAM" SOIL MIX WITH NO MORE THAN 5% CLAY CONTENT. THE MIX SHALL CONTAIN 50-60% SAND, 20-30% COMPOST OR HARDWOOD MULCH, AND 20-30% TOPSOIL, FREE OF STONES, STUMPS, ROOTS, OR SIMILAR OBJECTS, AND ALSO FREE OF NOXIOUS WEEDS.

PVT. BIOFILTRATION BASIN – IMP 'B' AND 'E'
NTS

0 15 30 60 90
(IN FEET)
1 inch = 30 ft.

DMA AREA TABLE

DMA NO.	PROPOSED IMPERVIOUS AREA	PROPOSED PERVIOUS AREA	IMPERVIOUS AREA (%)	TREATMENT BMP
1	23,535 SF	18,698 SF	55.7%	IMP A
2	22,184 SF	23,026 SF	49.1%	IMP B
3	34,537 SF	9,779 SF	77.9%	IMP C
4	26,926 SF	11,552 SF	70.0%	IMP D
5	24,929 SF	11,470 SF	68.5%	IMP E

AREA TABLE

	EXISTING CONDITION	PROPOSED CONDITION	DIFFERENCE
IMPERVIOUS AREA	162,076 SF (3.72 AC) 78.5%	132,111 SF (4.03 AC) 63.9%	-29,965 SF
PERVIOUS AREA	44,559 SF (1.02 AC) 21.5%	74,523 SF (0.71 AC) 36.1%	+29,965 SF
TOTAL AREA	206,635 SF (4.74 AC)	206,635 SF (4.74 AC)	---

latitude 33
PLANNING & ENGINEERING
9968 Hibert Street 2nd Floor, San Diego, CA 92131
Tel 858.751.0633

DMA MAP

9775 TOWNE CENTRE DRIVE
ATTACHMENT 1A

Harvest and Use Feasibility Screening	Form I-7

1. Is there a demand for harvested water (check all that apply) at the project site that is reliably present during the wet season?

☒ Toilet and urinal flushing
☐ Landscape Irrigation
☐ Other: ___________

2. If there is a demand; estimate the anticipated average wet season demand over a period of 36 hours. Guidance for planning level demand calculations for toilet/urinal flushing and landscape irrigation is provided in Section B.3.2.

Per Table B.3-1, OFFICE: (165,000sf x 1per/150sf = 1,100 per)

Toilet flushes per day amounts to 9/3.45 = 2.61 fl/day. This is a new development which will employ the use of low-flow toilets. So, 2.61 fl/day x 1.6 gal/fl = 4.18 gal/per x 2,200per x 1.1 v.f. = 5,060 gal/day
5,060 gal/day x 36hours/24hours per day = **7,590 gallons per 36hr demand**

Urinal flushes per day amounts to 2.27/1.6 = 1.42 fl/day. This is a new development which will employ the use of low-flow urinals. So, 1.42 fl/day x 1gal/fl = 1.42 gal/per x 2,200per x 1.1 v.f. = 1,720 gal/day
1,720 gal/day x 36 hours/24hours per day = **2,580 gallons per 36hr demand**

Total: 10,170 gallons or 1,340 cubic feet

3. Calculate the DCV using worksheet B-2.1.

IMP A: 1,319.25 cubic feet - IMP B: 1,133.18 cubic feet - IMP C: 1,233.64 cubic feet

IMP D: 1,100.17 cubic feet - IMP E: 929.30 cubic feet

TOTAL: 5,715.54 cubic feet

3a. Is the 36-hour demand greater than or equal to the DCV? Yes / No	3b. Is the 36-hour demand greater than 0.25 DCV but less than the full DCV? Yes / No	3c. Is the 36-hour demand less than 0.25DCV? Yes
Harvest and use appears to be feasible. Conduct more detailed evaluation and sizing calculations to confirm that DCV can be used at an adequate rate to meet drawdown criteria.	Harvest and use may be feasible. Conduct more detailed evaluation and sizing calculations to determine feasibility. Harvest and use may only be able to be used for a portion of the site, or (optionally) the storage may need to be upsized to meet long term capture targets while draining in longer than 36 hours.	Harvest and use is considered to be infeasible.

Is harvest and use feasible based on further evaluation?

☐ Yes, refer to appendix E to select and size harvest and use BMPs
☒ No, select alternate BMPs

Categorization of Infiltration Feasibility Condition			Form I-8
Part 1 - Full Infiltration Feasibility Screening Criteria **Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?**			
Criteria	Screening Question	Yes	No
1	**Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		X
Provide basis: We performed 4 infiltration tests in the very old terrace deposits. The results of the infiltration rates are the following: I-1: 0.004 in/hr; I-3: 0.001 in/hr I-2: 0.003 in/hr I-4: 0.001 in/hr This shows the soil does not have an estimated reliable infiltration rate greater than 0.5 inches per hour.			
2	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		X
Provide basis: The site in underlain by very old terrace deposits. Based on the comprehensive study presented in the geotechnical report, infiltration could not be incorporated without increasing the risk of lateral water migration to adjacent properties and streets.			

Form I-8 Page 2 of 4			
Criteria	Screening Question	**Yes**	**No**
3	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis: Based on information obtained during our study, groundwater is at a depth of at least 70 feet below the existing ground surface.			
4	**Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis: Infiltration is not anticipated to have a negative impact on nearby water balance or discharge of contaminated groundwater to surface waters.			
Part 1 Result*	If all answers to rows 1 - 4 are "**Yes**" a full infiltration design is potentially feasible. The feasibility screening category is **Full Infiltration** If any answer from row 1-4 is "**No**", infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design. Proceed to Part 2		Full Infiltration is not feasible

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by the City to substantiate findings.

Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria

Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?

Criteria	Screening Question	Yes	No
5	**Do soil and geologic conditions allow for infiltration in any appreciable rate or volume?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		X

Provide basis:

The unfactored infiltration rates are:

I-1: 0.004 in/hr
I-2: 0.003 in/hr
I-3: 0.001 in/hr
I-4: 0.001 in/hr

The infiltration rates are less than 0.01. Therefore, the site is not feasible for infiltration.

Criteria	Screening Question	Yes	No
6	**Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level**? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		X

Provide basis:

The site in underlain by very old terrace deposits. Based on the comprehensive study presented in the geotechnical report, infiltration could not be incorporated without increasing the risk of lateral water migration to adjacent properties and streets.

<table>
<tr><th colspan="4">Form I-8 Page 4 of 4</th></tr>
<tr><th>Criteria</th><th>Screening Question</th><th>Yes</th><th>No</th></tr>
<tr><td>7</td><td>Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.</td><td>X</td><td></td></tr>
<tr><td colspan="4">Provide basis:

Based on information obtained from our geotechnical investigation, groundwater is at a depth of at least 70 feet below the existing ground surface.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.</td></tr>
<tr><td>8</td><td>Can infiltration be allowed without violating downstream water rights? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.</td><td>X</td><td></td></tr>
<tr><td colspan="4">Provide basis:

We are unaware of any downstream water rights that could be impacted from infiltration. The project civil engineer should confirm.</td></tr>
<tr><td>Part 2 Result*</td><td colspan="2">If all answers from row 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is Partial Infiltration.

If any answer from row 5-8 is no, then infiltration of any volume is considered to be infeasible within the drainage area. The feasibility screening category is No Infiltration.</td><td>Partial Infiltration is not feasible</td></tr>
</table>

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by the City to substantiate findings.

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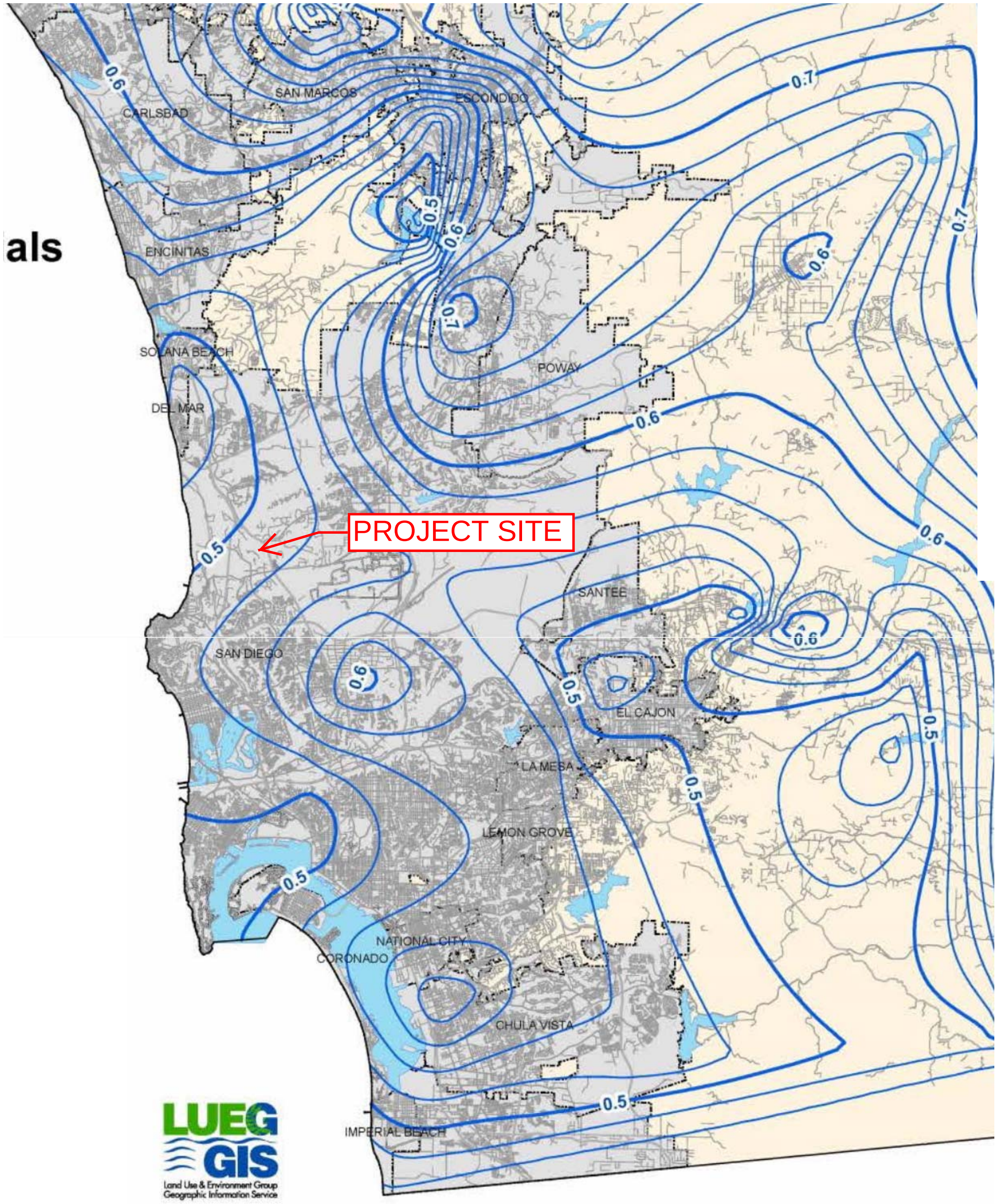
CARLSBAD
SAN MARCOS
ESCONDIDO
ENCINITAS
SOLANA BEACH
DEL MAR
POWAY
PROJECT SITE
SANTEE
SAN DIEGO
EL CAJON
LA MESA
LEMON GROVE
NATIONAL CITY
CORONADO
CHULA VISTA
IMPERIAL BEACH
0.5
0.6
0.7
LUEG
GIS
Land Use & Environment Group
Geographic Information Service

Area Weighted Runoff Factor (BMP A)			
Surface	**Runoff Factor**	**Area (sq. ft)**	**Weighted Area**
Roof	0.9	881	793
Concrete or Asphalt	0.9	22,653	20,388
Unit Pavers (Grouted)	0.9	-	-
Decomposed Granite	0.3	-	-
Cobbles or Crushed Aggregate	0.3	-	-
Ammended, Mulched soils or Landscape	0.1	18,698	1,870
CompactedSoils (Unpaved Parking)	0.3	-	-
Natural (A Soil)	0.1	-	-
Natural (B Soil)	0.14	-	-
Natural (C Soil)	0.23	-	-
Natural (D Soil)	0.3	-	-
Total		42,232	23,050
Composite C	**0.55**		

Worksheet B.2-1 DCV (BMP A)				
Design Capture Volume		**Worksheet B.2-1**		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.51	inches
2	Area tributary to BMP (s)	A=	0.97	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.55	unitless
4	Trees Credit Volume	TCV=		cubic-feet
5	Rain barrels Credit Volume	RCV=		cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=	980	cubic-feet

Worksheet B.5-1: Simple Sizing Method for Biofiltration BMPs (BMP A)

	Simple Sizing Method for Biofiltration BMPs	Worksheet B.5-1 (Page 1 of 2)	
1	Remaining DCV after implementing retention BMPs	980	cubic- feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36	hours
4	Depth of runoff that can be infiltrated [Line 2 x Line 3]	0	inches
5	Aggregate pore space	0.40	in/in
6	Required depth of gravel below the underdrain [Line 4/ Line 5]	0.00	inches
7	Assumed surface area of the biofiltration BMP	486	sq-ft
8	Media retained pore storage	0.1	in/in
9	Volume retained by BMP [[Line 4 + (Line 12 x Line 8)]/12] x Line 7	145.8	cubic- feet
10	DCV that requires biofiltration [Line 1 – Line 9]	834.2	cubic- feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	6	inches
12	Media Thickness [18 inches minimum], also add mulch layer thickness to this line for sizing calculations	36	inches
13	Aggregate Storage above underdrain invert (12 inches typical) – use 0 inches for sizing if the aggregate is not over the entire bottom surface area	18	inches
14	Freely drained pore storage	0.2	in/in
15	Media filtration rate to be used for sizing (5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate which will be less than 5 in/hr.)	5.0	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6	hours
17	Depth filtered during storm [Line 15 x Line 16]	30	inches
18	Depth of Detention Storage [Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5)]	17	inches
19	Total Depth Treated [Line 17 + Line 18]	47	inches

Note: Line 7 is used to estimate the amount of volume retained by the BMP. Update assumed surface area in Line 7 until its equivalent to the required biofiltration footprint (either Line 21 or Line 23)

Worksheet B.5-1: Simple Sizing Method for Biofiltration BMPs (BMP A) (continued)

Simple Sizing Method for Biofiltration BMPs			Worksheet B.5-1 (Page 2 of 2)
Option 1 – Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]	1251.3	cubic-feet
21	Required Footprint [Line 20/ Line 19] x 12	297.9	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume [0.75 x Line 10]	680.3	cubic-feet
23	Required Footprint [Line 22/ Line 18] x 12	485.9	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	42232	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.55	
26	BMP Footprint Sizing Factor (Default 0.03 or an alternative minimum footprint sizing factor from Worksheet B.5-2, Line 11)	0.03	
27	Minimum BMP Footprint [Line 24 x Line 25 x Line 26]	696.8	sq-ft
28	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 27)	696.8	sq-ft
Check for Volume Reduction [Not applicable for No Infiltration Condition]			
29	Calculate the fraction of DCV retained in the BMP [Line 9/Line 1]	0.07438776	unitless
30	Minimum required fraction of DCV retained for partial infiltration condition	0.375	unitless
31	Is the retained DCV ≥ 0.375? If the answer is no increase the footprint sizing factor in Line 26 until the answer is yes for this criterion.	Yes	No

Note:

1. Line 7 is used to estimate the amount of volume retained by the BMP. Update assumed surface area in Line 7 until its equivalent to the required biofiltration footprint (either Line 21 or Line 23)
2. The DCV fraction of 0.375 is based on a 40% average annual percent capture and a 36-hour drawdown time.
3. The increase in footprint for volume reduction can be optimized using the approach presented in Appendix B.5.2. The optimized footprint cannot be smaller than the alternative minimum footprint sizing factor from Worksheet B.5-2.

4. If the proposed biofiltration BMP footprint is smaller than the alternative minimum footprint sizing factor from Worksheet B.5-2, but satisfies Option 1 or Option 2 sizing, it is considered a compact biofiltration BMP and may be allowed at the discretion of the City Engineer, if it meets the requirements in Appendix F.

Area Weighted Runoff Factor (BMP B)			
Surface	**Runoff Factor**	**Area (sq. ft)**	**Weighted Area**
Roof	0.9	19,032	17,129
Concrete or Asphalt	0.9	3,152	2,837
Unit Pavers (Grouted)	0.9	-	-
Decomposed Granite	0.3	-	-
Cobbles or Crushed Aggregate	0.3	-	-
Ammended, Mulched soils or Landscape	0.1	23,026	2,303
CompactedSoils (Unpaved Parking)	0.3	-	-
Natural (A Soil)	0.1	-	-
Natural (B Soil)	0.14	-	-
Natural (C Soil)	0.23	-	-
Natural (D Soil)	0.3	-	-
Total		45,210	22,268
Composite C	**0.49**		

Worksheet B.2-1 DCV (BMP B)				
Design Capture Volume		**Worksheet B.2-1**		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.51	inches
2	Area tributary to BMP (s)	A=	1.04	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.49	unitless
4	Trees Credit Volume	TCV=		cubic-feet
5	Rain barrels Credit Volume	RCV=		cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=	946	cubic-feet

Worksheet B.5-1: Simple Sizing Method for Biofiltration BMPs (BMP B)

Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1 (Page 1 of 2)	
1	Remaining DCV after implementing retention BMPs	946	cubic- feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36	hours
4	Depth of runoff that can be infiltrated [Line 2 x Line 3]	0	inches
5	Aggregate pore space	0.40	in/in
6	Required depth of gravel below the underdrain [Line 4/ Line 5]	0.00	inches
7	Assumed surface area of the biofiltration BMP	469.1	sq-ft
8	Media retained pore storage	0.1	in/in
9	Volume retained by BMP [[Line 4 + (Line 12 x Line 8)]/12] x Line 7	140.7	cubic- feet
10	DCV that requires biofiltration [Line 1 – Line 9]	805.3	cubic- feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	6	inches
12	Media Thickness [18 inches minimum], also add mulch layer thickness to this line for sizing calculations	36	inches
13	Aggregate Storage above underdrain invert (12 inches typical) – use 0 inches for sizing if the aggregate is not over the entire bottom surface area	18	inches
14	Freely drained pore storage	0.2	in/in
15	Media filtration rate to be used for sizing (5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate which will be less than 5 in/hr.)	5.0	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6	hours
17	Depth filtered during storm [Line 15 x Line 16]	30	inches
18	Depth of Detention Storage [Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5)]	20	inches
19	Total Depth Treated [Line 17 + Line 18]	50	inches

Note: Line 7 is used to estimate the amount of volume retained by the BMP. Update assumed surface area in Line 7 until its equivalent to the required biofiltration footprint (either Line 21 or Line 23)

Worksheet B.5-1: Simple Sizing Method for Biofiltration BMPs (BMP B) (continued)

Simple Sizing Method for Biofiltration BMPs			Worksheet B.5-1 (Page 2 of 2)
Option 1 – Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]	1207.9	cubic-feet
21	Required Footprint [Line 20/ Line 19] x 12	287.6	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume [0.75 x Line 10]	604.0	cubic-feet
23	Required Footprint [Line 22/ Line 18] x 12	355.3	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	45210	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.49	
26	BMP Footprint Sizing Factor (Default 0.03 or an alternative minimum footprint sizing factor from Worksheet B.5-2, Line 11)	0.03	
27	Minimum BMP Footprint [Line 24 x Line 25 x Line 26]	664.6	sq-ft
28	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 27)	664.6	sq-ft
Check for Volume Reduction [Not applicable for No Infiltration Condition]			
29	Calculate the fraction of DCV retained in the BMP [Line 9/Line 1]	0.14876321	unitless
30	Minimum required fraction of DCV retained for partial infiltration condition	0.375	unitless
31	Is the retained DCV ≥ 0.375? If the answer is no increase the footprint sizing factor in Line 26 until the answer is yes for this criterion.	Yes	No

Note:

1. Line 7 is used to estimate the amount of volume retained by the BMP. Update assumed surface area in Line 7 until its equivalent to the required biofiltration footprint (either Line 21 or Line 23)
2. The DCV fraction of 0.375 is based on a 40% average annual percent capture and a 36-hour drawdown time.
3. The increase in footprint for volume reduction can be optimized using the approach presented in Appendix B.5.2. The optimized footprint cannot be smaller than the alternative minimum footprint sizing factor from Worksheet B.5-2.

4. If the proposed biofiltration BMP footprint is smaller than the alternative minimum footprint sizing factor from Worksheet B.5-2, but satisfies Option 1 or Option 2 sizing, it is considered a compact biofiltration BMP and may be allowed at the discretion of the City Engineer, if it meets the requirements in Appendix F.

Area Weighted Runoff Factor (BMP C)			
Surface	Runoff Factor	Area (sq. ft)	Weighted Area
Roof	0.9	15,712	14,141
Concrete or Asphalt	0.9	18,824	16,942
Unit Pavers (Grouted)	0.9	-	-
Decomposed Granite	0.3	-	-
Cobbles or Crushed Aggregate	0.3	-	-
Ammended, Mulched soils or Landscape	0.1	9,780	978
CompactedSoils (Unpaved Parking)	0.3	-	-
Natural (A Soil)	0.1	-	-
Natural (B Soil)	0.14	-	-
Natural (C Soil)	0.23	-	-
Natural (D Soil)	0.3	-	-
Total		44,316	32,060
Composite C	**0.72**		

Worksheet B.2-1 DCV (BMP C)				
Design Capture Volume		**Worksheet B.2-1**		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.51	inches
2	Area tributary to BMP (s)	A=	1.02	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.72	unitless
4	Trees Credit Volume	TCV=		cubic-feet
5	Rain barrels Credit Volume	RCV=		cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=	1363	cubic-feet

Worksheet B.5-1: Simple Sizing Method for Biofiltration BMPs (BMP C)

Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1 (Page 1 of 2)	
1	Remaining DCV after implementing retention BMPs	1363	cubic- feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36	hours
4	Depth of runoff that can be infiltrated [Line 2 x Line 3]	0	inches
5	Aggregate pore space	0.40	in/in
6	Required depth of gravel below the underdrain [Line 4/ Line 5]	0.00	inches
7	Assumed surface area of the biofiltration BMP	675.9	sq-ft
8	Media retained pore storage	0.1	in/in
9	Volume retained by BMP [[Line 4 + (Line 12 x Line 8)]/12] x Line 7	202.8	cubic- feet
10	DCV that requires biofiltration [Line 1 – Line 9]	1160.2	cubic- feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	6	inches
12	Media Thickness [18 inches minimum], also add mulch layer thickness to this line for sizing calculations	36	inches
13	Aggregate Storage above underdrain invert (12 inches typical) – use 0 inches for sizing if the aggregate is not over the entire bottom surface area	18	inches
14	Freely drained pore storage	0.2	in/in
15	Media filtration rate to be used for sizing (5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate which will be less than 5 in/hr.)	5.0	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6	hours
17	Depth filtered during storm [Line 15 x Line 16]	30	inches
18	Depth of Detention Storage [Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5)]	20	inches
19	Total Depth Treated [Line 17 + Line 18]	50	inches

Note: Line 7 is used to estimate the amount of volume retained by the BMP. Update assumed surface area in Line 7 until its equivalent to the required biofiltration footprint (either Line 21 or Line 23)

Worksheet B.5-1: Simple Sizing Method for Biofiltration BMPs (BMP C) (continued)

Simple Sizing Method for Biofiltration BMPs			Worksheet B.5-1 (Page 2 of 2)
Option 1 – Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]	1740.3	cubic-feet
21	Required Footprint [Line 20/ Line 19] x 12	414.4	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume [0.75 x Line 10]	870.2	cubic-feet
23	Required Footprint [Line 22/ Line 18] x 12	511.9	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	44316	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.72	
26	BMP Footprint Sizing Factor (Default 0.03 or an alternative minimum footprint sizing factor from Worksheet B.5-2, Line 11)	0.03	
27	Minimum BMP Footprint [Line 24 x Line 25 x Line 26]	957.2	sq-ft
28	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 27)	957.2	sq-ft
Check for Volume Reduction [Not applicable for No Infiltration Condition]			
29	Calculate the fraction of DCV retained in the BMP [Line 9/Line 1]	0.14876742	unitless
30	Minimum required fraction of DCV retained for partial infiltration condition	0.375	unitless
31	Is the retained DCV ≥ 0.375? If the answer is no increase the footprint sizing factor in Line 26 until the answer is yes for this criterion.	Yes	No

Note:

1. Line 7 is used to estimate the amount of volume retained by the BMP. Update assumed surface area in Line 7 until its equivalent to the required biofiltration footprint (either Line 21 or Line 23)
2. The DCV fraction of 0.375 is based on a 40% average annual percent capture and a 36-hour drawdown time.
3. The increase in footprint for volume reduction can be optimized using the approach presented in Appendix B.5.2. The optimized footprint cannot be smaller than the alternative minimum footprint sizing factor from Worksheet B.5-2.

4. If the proposed biofiltration BMP footprint is smaller than the alternative minimum footprint sizing factor from Worksheet B.5-2, but satisfies Option 1 or Option 2 sizing, it is considered a compact biofiltration BMP and may be allowed at the discretion of the City Engineer, if it meets the requirements in Appendix F.

Area Weighted Runoff Factor (BMP D)			
Surface	**Runoff Factor**	**Area (sq. ft)**	**Weighted Area**
Roof	0.9	-	-
Concrete or Asphalt	0.9	26,926	24,233
Unit Pavers (Grouted)	0.9	-	-
Decomposed Granite	0.3	-	-
Cobbles or Crushed Aggregate	0.3	-	-
Ammended, Mulched soils or Landscape	0.1	11,552	1,155
CompactedSoils (Unpaved Parking)	0.3	-	-
Natural (A Soil)	0.1	-	-
Natural (B Soil)	0.14	-	-
Natural (C Soil)	0.23	-	-
Natural (D Soil)	0.3	-	-
Total		38,478	25,389
Composite C	**0.66**		

Worksheet B.2-1 DCV (BMP D)				
Design Capture Volume		**Worksheet B.2-1**		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.51	inches
2	Area tributary to BMP (s)	A=	0.88	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.66	unitless
4	Trees Credit Volume	TCV=		cubic-feet
5	Rain barrels Credit Volume	RCV=		cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=	1079	cubic-feet

Worksheet B.5-1: Simple Sizing Method for Biofiltration BMPs (BMP D)

Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1 (Page 1 of 2)	
1	Remaining DCV after implementing retention BMPs	1079	cubic- feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36	hours
4	Depth of runoff that can be infiltrated [Line 2 x Line 3]	0	inches
5	Aggregate pore space	0.40	in/in
6	Required depth of gravel below the underdrain [Line 4/ Line 5]	0.00	inches
7	Assumed surface area of the biofiltration BMP	535	sq-ft
8	Media retained pore storage	0.1	in/in
9	Volume retained by BMP [[Line 4 + (Line 12 x Line 8)]/12] x Line 7	160.5	cubic- feet
10	DCV that requires biofiltration [Line 1 – Line 9]	918.5	cubic- feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	6	inches
12	Media Thickness [18 inches minimum], also add mulch layer thickness to this line for sizing calculations	36	inches
13	Aggregate Storage above underdrain invert (12 inches typical) – use 0 inches for sizing if the aggregate is not over the entire bottom surface area	18	inches
14	Freely drained pore storage	0.2	in/in
15	Media filtration rate to be used for sizing (5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate which will be less than 5 in/hr.)	5.0	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6	hours
17	Depth filtered during storm [Line 15 x Line 16]	30	inches
18	Depth of Detention Storage [Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5)]	20	inches
19	Total Depth Treated [Line 17 + Line 18]	50	inches

Note: Line 7 is used to estimate the amount of volume retained by the BMP. Update assumed surface area in Line 7 until its equivalent to the required biofiltration footprint (either Line 21 or Line 23)

Worksheet B.5-1: Simple Sizing Method for Biofiltration BMPs (BMP D) (continued)

Simple Sizing Method for Biofiltration BMPs			Worksheet B.5-1 (Page 2 of 2)
Option 1 – Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]	1377.8	cubic-feet
21	Required Footprint [Line 20/ Line 19] x 12	328.0	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume [0.75 x Line 10]	688.9	cubic-feet
23	Required Footprint [Line 22/ Line 18] x 12	405.2	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	38478	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.66	
26	BMP Footprint Sizing Factor (Default 0.03 or an alternative minimum footprint sizing factor from Worksheet B.5-2, Line 11)	0.03	
27	Minimum BMP Footprint [Line 24 x Line 25 x Line 26]	761.9	sq-ft
28	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 27)	761.9	sq-ft
Check for Volume Reduction [Not applicable for No Infiltration Condition]			
29	Calculate the fraction of DCV retained in the BMP [Line 9/Line 1]	0.14874884	unitless
30	Minimum required fraction of DCV retained for partial infiltration condition	0.375	unitless
31	Is the retained DCV ≥ 0.375? If the answer is no increase the footprint sizing factor in Line 26 until the answer is yes for this criterion.	Yes	No

Note:

1. Line 7 is used to estimate the amount of volume retained by the BMP. Update assumed surface area in Line 7 until its equivalent to the required biofiltration footprint (either Line 21 or Line 23)

2. The DCV fraction of 0.375 is based on a 40% average annual percent capture and a 36-hour drawdown time.

3. The increase in footprint for volume reduction can be optimized using the approach presented in Appendix B.5.2. The optimized footprint cannot be smaller than the alternative minimum footprint sizing factor from Worksheet B.5-2.

4. If the proposed biofiltration BMP footprint is smaller than the alternative minimum footprint sizing factor from Worksheet B.5-2, but satisfies Option 1 or Option 2 sizing, it is considered a compact biofiltration BMP and may be allowed at the discretion of the City Engineer, if it meets the requirements in Appendix F.

Area Weighted Runoff Factor (BMP E)			
Surface	**Runoff Factor**	**Area (sq. ft)**	**Weighted Area**
Roof	0.9	13,512	12,161
Concrete or Asphalt	0.9	11,416	10,274
Unit Pavers (Grouted)	0.9	-	-
Decomposed Granite	0.3	-	-
Cobbles or Crushed Aggregate	0.3	-	-
Ammended, Mulched soils or Landscape	0.1	11,470	1,147
CompactedSoils (Unpaved Parking)	0.3	-	-
Natural (A Soil)	0.1	-	-
Natural (B Soil)	0.14	-	-
Natural (C Soil)	0.23	-	-
Natural (D Soil)	0.3	-	-
Total		36,398	23,582
Composite C	**0.65**		

Worksheet B.2-1 DCV (BMP E)				
Design Capture Volume		**Worksheet B.2-1**		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.51	inches
2	Area tributary to BMP (s)	A=	0.84	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.65	unitless
4	Trees Credit Volume	TCV=		cubic-feet
5	Rain barrels Credit Volume	RCV=		cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=	1002	cubic-feet

Worksheet B.5-1: Simple Sizing Method for Biofiltration BMPs (BMP E)

Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1 (Page 1 of 2)	
1	Remaining DCV after implementing retention BMPs	1002	cubic- feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36	hours
4	Depth of runoff that can be infiltrated [Line 2 x Line 3]	0	inches
5	Aggregate pore space	0.40	in/in
6	Required depth of gravel below the underdrain [Line 4/ Line 5]	0.00	inches
7	Assumed surface area of the biofiltration BMP	496.9	sq-ft
8	Media retained pore storage	0.1	in/in
9	Volume retained by BMP [[Line 4 + (Line 12 x Line 8)]/12] x Line 7	149.1	cubic- feet
10	DCV that requires biofiltration [Line 1 – Line 9]	852.9	cubic- feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	6	inches
12	Media Thickness [18 inches minimum], also add mulch layer thickness to this line for sizing calculations	36	inches
13	Aggregate Storage above underdrain invert (12 inches typical) – use 0 inches for sizing if the aggregate is not over the entire bottom surface area	18	inches
14	Freely drained pore storage	0.2	in/in
15	Media filtration rate to be used for sizing (5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate which will be less than 5 in/hr.)	5.0	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6	hours
17	Depth filtered during storm [Line 15 x Line 16]	30	inches
18	Depth of Detention Storage [Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5)]	20	inches
19	Total Depth Treated [Line 17 + Line 18]	50	inches

Note: Line 7 is used to estimate the amount of volume retained by the BMP. Update assumed surface area in Line 7 until its equivalent to the required biofiltration footprint (either Line 21 or Line 23)

Worksheet B.5-1: Simple Sizing Method for Biofiltration BMPs (BMP E) (continued)

Simple Sizing Method for Biofiltration BMPs			Worksheet B.5-1 (Page 2 of 2)
Option 1 – Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]	1279.4	cubic-feet
21	Required Footprint [Line 20/ Line 19] x 12	304.6	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume [0.75 x Line 10]	639.7	cubic-feet
23	Required Footprint [Line 22/ Line 18] x 12	376.3	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	36398	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.65	
26	BMP Footprint Sizing Factor (Default 0.03 or an alternative minimum footprint sizing factor from Worksheet B.5-2, Line 11)	0.03	
27	Minimum BMP Footprint [Line 24 x Line 25 x Line 26]	709.8	sq-ft
28	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 27)	709.8	sq-ft
Check for Volume Reduction [Not applicable for No Infiltration Condition]			
29	Calculate the fraction of DCV retained in the BMP [Line 9/Line 1]	0.14877246	unitless
30	Minimum required fraction of DCV retained for partial infiltration condition	0.375	unitless
31	Is the retained DCV ≥ 0.375? If the answer is no increase the footprint sizing factor in Line 26 until the answer is yes for this criterion.	Yes	No

Note:

1. Line 7 is used to estimate the amount of volume retained by the BMP. Update assumed surface area in Line 7 until its equivalent to the required biofiltration footprint (either Line 21 or Line 23)
2. The DCV fraction of 0.375 is based on a 40% average annual percent capture and a 36-hour drawdown time.
3. The increase in footprint for volume reduction can be optimized using the approach presented in Appendix B.5.2. The optimized footprint cannot be smaller than the alternative minimum footprint sizing factor from Worksheet B.5-2.

4. If the proposed biofiltration BMP footprint is smaller than the alternative minimum footprint sizing factor from Worksheet B.5-2, but satisfies Option 1 or Option 2 sizing, it is considered a compact biofiltration BMP and may be allowed at the discretion of the City Engineer, if it meets the requirements in Appendix F.

ATTACHMENT 2
BACKUP FOR PDP HYDROMODIFICATION CONTROL MEASURES

This is the cover sheet for Attachment 2.

☐ Mark this box if this attachment is empty because the project is exempt from PDP hydromodification management requirements.

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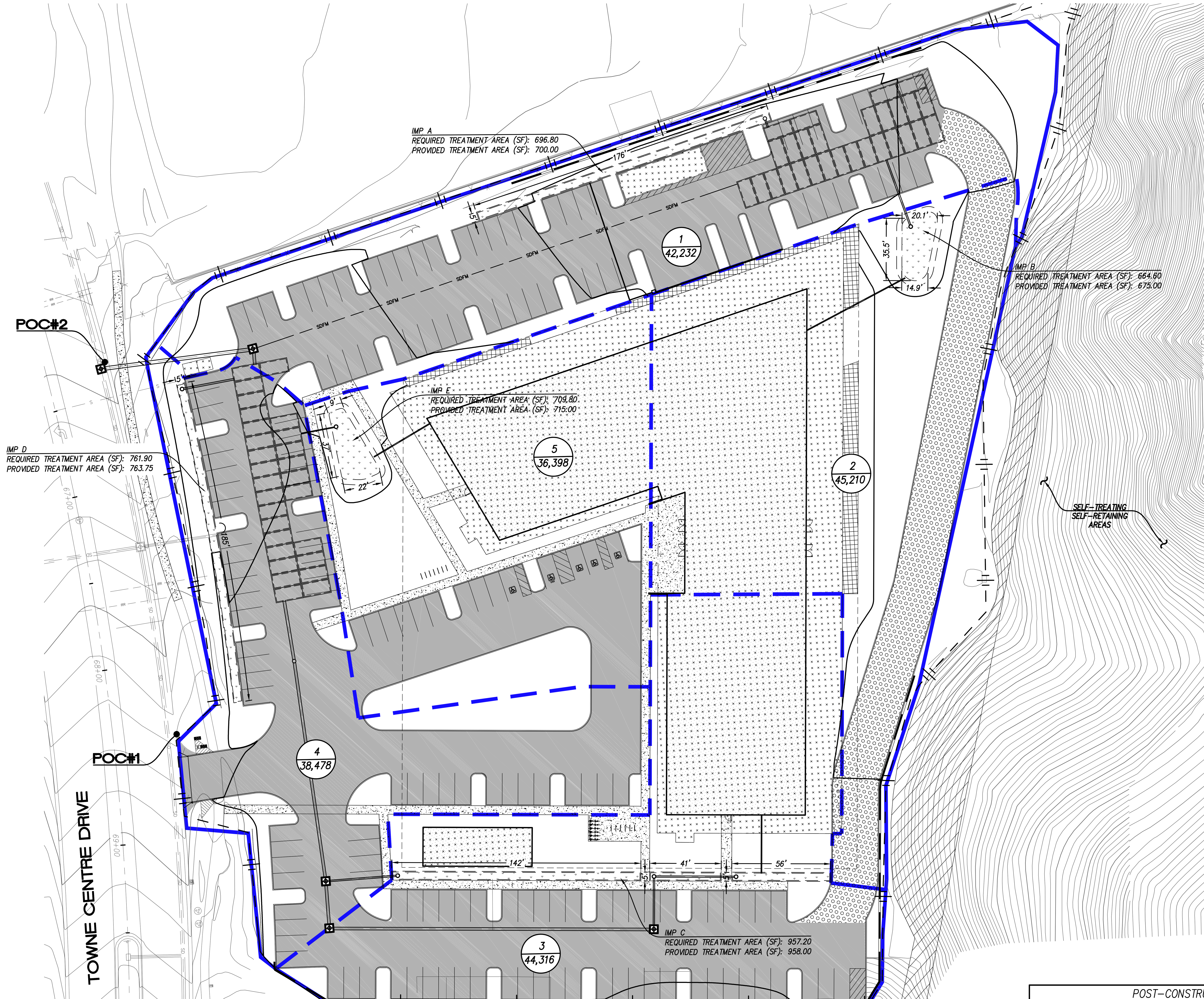
Indicate which Items are Included:

Attachment Sequence	Contents	Checklist
Attachment 2a	Hydromodification Management Exhibit (Required)	☐ Included See Hydromodification Management Exhibit Checklist
Attachment 2b	Management of Critical Coarse Sediment Yield Areas (WMAA Exhibit is required, additional analyses are optional) See Section 6.2 of the BMP Design Manual.	☒ Exhibit showing project drainage boundaries marked on WMAA Critical Coarse Sediment Yield Area Map (Required) Optional analyses for Critical Coarse Sediment Yield Area Determination ☐ 6.2.1 Verification of Geomorphic Landscape Units Onsite ☐ 6.2.2 Downstream Systems Sensitivity to Coarse Sediment ☐ 6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite
Attachment 2c	Geomorphic Assessment of Receiving Channels (Optional) See Section 6.3.4 of the BMP Design Manual.	☒ Not Performed ☐ Included ☐ Submitted as separate stand-alone document
Attachment 2d	Flow Control Facility Design and Structural BMP Drawdown Calculations (Required) Overflow Design Summary for each structural BMP See Chapter 6 and Appendix G of the BMP Design Manual	☒ Included ☐ Submitted as separate stand-alone document
Attachment 2e	Vector Control Plan (Required when structural BMPs will not drain in 96 hours)	☐ Included ☒ Not required because BMPs will drain in less than 96 hours

Use this checklist to ensure the required information has been included on the Hydromodification Management Exhibit:

The Hydromodification Management Exhibit must identify:

☒ Underlying hydrologic soil group
☒ Approximate depth to groundwater
☒ Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
☒ Critical coarse sediment yield areas to be protected
☒ Existing topography
☒ Existing and proposed site drainage network and connections to drainage offsite
☒ Proposed grading
☒ Proposed impervious features
☒ Proposed design features and surface treatments used to minimize imperviousness
☒ Point(s) of Compliance (POC) for Hydromodification Management
☒ Existing and proposed drainage boundary and drainage area to each POC (when necessary, create separate exhibits for pre-development and post-project conditions)
☒ Structural BMPs for hydromodification management (identify location, type of BMP, and size/detail)



EXISTING SITE INFORMATION

HYDROLOGIC SOIL GROUP: SOIL CLASS TYPE "D"

GROUNDWATER: GROUNDWATER NOT ENCOUNTERED WITHIN 70.5 FEET IN BORINGS PER REPORT BY GEOCON, INC. ENTITLED "GEOTECHNICAL INVESTIGATION – 9775 TOWNE CENTRE DRIVE SAN DIEGO, CA" DATED DECEMBER 16, 2016. GROUNDWATER DEPTH IS ASSUMED TO BE GREATER THAN 100 FEET.

EXISTING NATURAL HYDROLOGIC FEATURES: NO NATURAL HYDROLOGIC FEATURES EXIST ONSITE.

CRITICAL COARSE SEDIMENT YIELD AREAS: NO CRITICAL COARSE SEDIMENT YIELD AREAS (CCSYAS) EXIST ONSITE. NO PROTECTION OF CCSYAS REQUIRED.

EXISTING TOPOGRAPHY AND IMPERVIOUS AREA: EXISTING TOPOGRAPHY SHOWN HEREON. SEE AREA SUMMARY TABLE FOR EXISTING IMPERVIOUS AREA.

EXISTING DRAINAGE: ALL EXISTING DRAINAGE IS CONTAINED WITHIN THE PROJECT SITE AND IS CONVEYED VIA PRIVATE STORM DRAINS AND DISCHARGE INTO THE EXISTING 24" RCP STORM DRAIN WITHIN TOWNE CENTRE DRIVE.

PROPOSED SITE INFORMATION

PROPOSED DRAINAGE: PROPOSED DRAINAGE MIMICS EXISTING CONDITIONS AND ALL DRAINAGE IS KEPT ONSITE AND CONVEYED VIA PRIVATE STORM DRAIN SYSTEMS BEFORE DISCHARGING INTO THE EXISTING STORM DRAIN SYSTEM WITH TOWNE CENTRE DRIVE.

PROPOSED GRADING: SHOWN HEREON.

PROPOSED IMPERVIOUS FEATURES: SHOWN HEREON.

PROPOSED DRAINAGE: SHOWN HEREON.

PROPOSED DESIGN FEATURES: SITE DESIGN REQUIREMENTS SHOWN HEREON. SEE FORM I–4 FOR EXPLANATION.

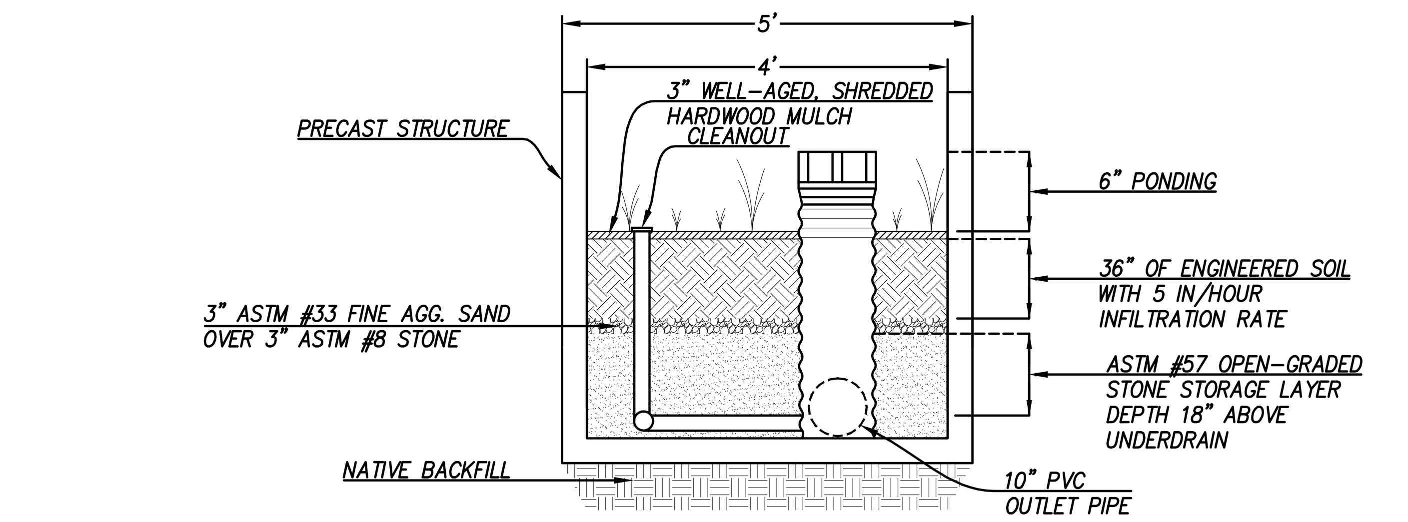
DRAINAGE MANAGEMENT AREAS: SHOWN HEREON. SEE DMA SUMMARY TABLE.

POTENTIAL POLLUTANT SOURCE AREAS AND SOURCE CONTROL: SHOWN HEREON. SEE FORMS 1–3B AND 1–4 FOR EXPLANATION.

STRUCTURAL BMPS: BF–1 BIOFILTRATION SHOWN HEREON. SEE DETAILS.

LEGEND

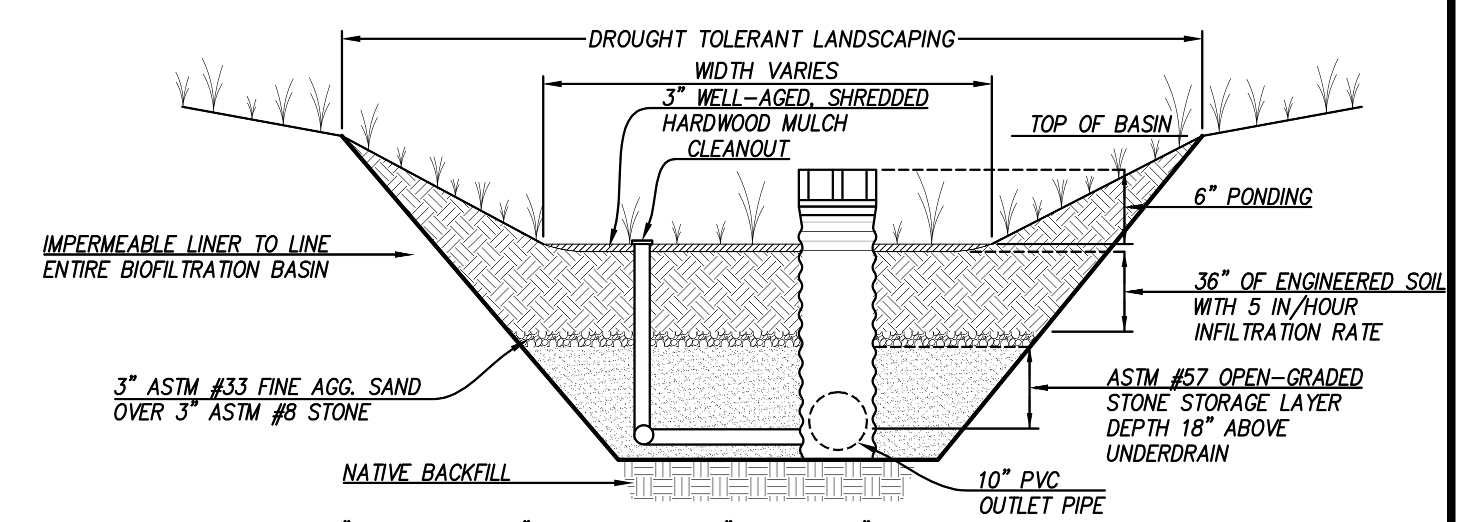
- BUILDING
- ASPHALT
- CONCRETE
- TERRACE
- LANDSCAPE
- BMP AREA
- GRASSCRETE
- DMA AREA (1 / 3,000)
- DMA BOUNDARY



1. "ENGINEERED SOIL" LAYER SHALL BE "SANDY LOAM" SOIL MIX WITH NO MORE THAN 5% CLAY CONTENT. THE MIX SHALL CONTAIN 50-60% SAND, 20-30% COMPOST OR HARDWOOD MULCH, AND 20-30% TOPSOIL, FREE OF STONES, STUMPS, ROOTS, OR SIMILAR OBJECTS, AND ALSO FREE OF NOXIOUS WEEDS.

PVT. BIOFILTRATION BASIN – IMP 'A', 'C' AND 'D'

NTS



1. "ENGINEERED SOIL" LAYER SHALL BE "SANDY LOAM" SOIL MIX WITH NO MORE THAN 5% CLAY CONTENT. THE MIX SHALL CONTAIN 50-60% SAND, 20-30% COMPOST OR HARDWOOD MULCH, AND 20-30% TOPSOIL, FREE OF STONES, STUMPS, ROOTS, OR SIMILAR OBJECTS, AND ALSO FREE OF NOXIOUS WEEDS.

PVT. BIOFILTRATION BASIN – IMP 'B' AND 'E'

NTS

POST–CONSTRUCTION PERMANENT BMP
OPERATION & MAINTENANCE PROCEDURE DETAILS

STORM WATER MANAGEMENT AND DISCHARGE CONTROL MAINTENANCE AGREEMENT APPROVAL NO.: 1644549

O&M RESPONSIBLE PARTY DESIGNEE: (PROPERTY OWNER) / HOA / CITY / OTHER

BMP DESCRIPTION	INSPECTION FREQUENCY	MAINTENANCE FREQUENCY	MAINTENANCE METHOD	QUANTITY	SHEET NUMBER(S)
BIOFILTRATION BASIN	YEARLY	AS–NEEDED	REMOVE ACCUMULATING MATERIALS (IE TRASH AND DEBRIS)	5	CPA GRAD & UTIL
HMP FACILITY					
UNDERGROUND STORAGE VAULT	YEARLY	AS–NEEDED	REMOVE ACCUMULATING MATERIALS (IE TRASH AND DEBRIS)	2	CPA GRAD & UTIL

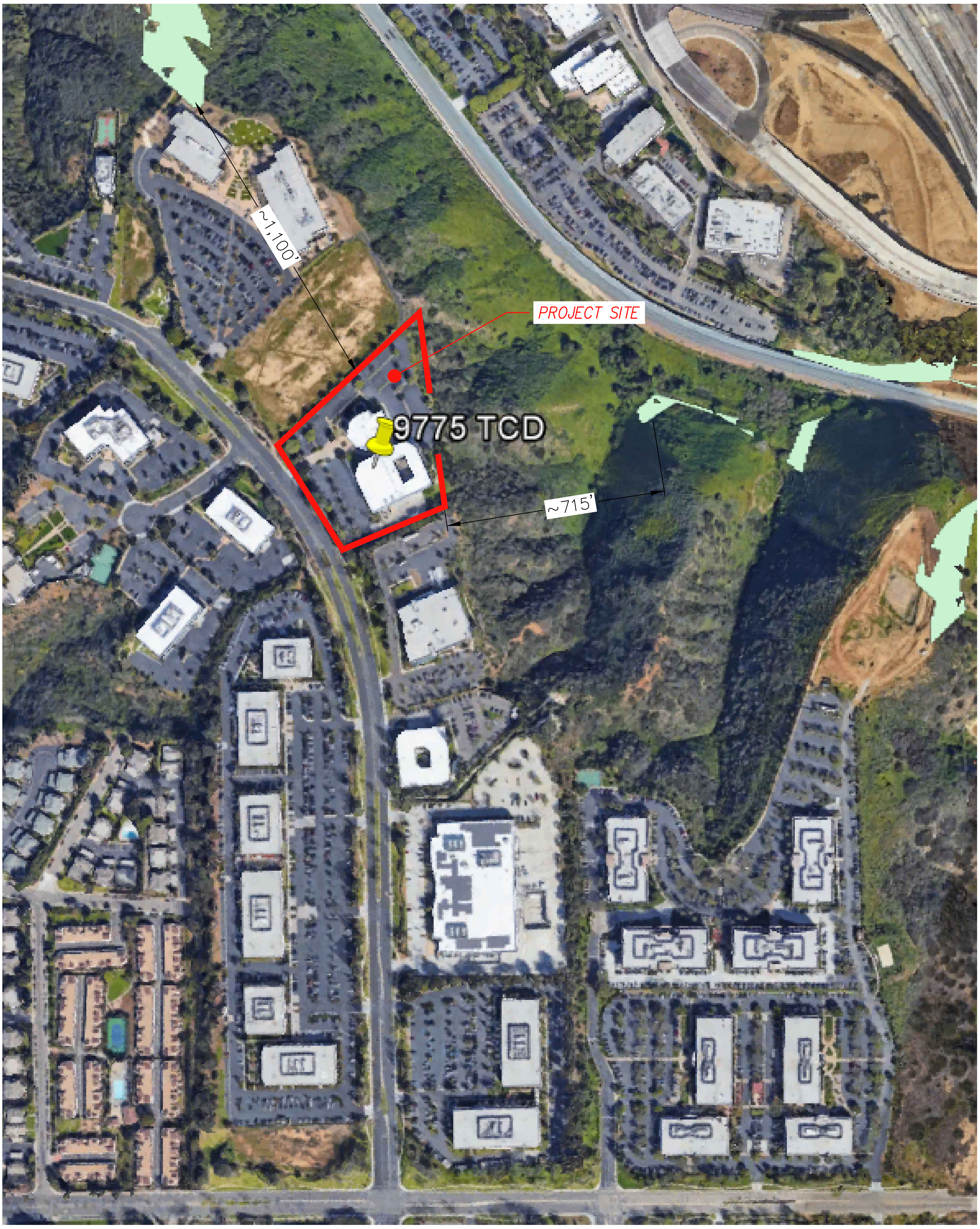
0 15 30 60 90
(IN FEET)
1 inch = 30 ft.

latitude 33
PLANNING & ENGINEERING
9968 Hibert Street 2nd Floor, San Diego, CA 92131
Tel 858.751.0633

HMP EXHIBIT

9775 TOWNE CENTRE DRIVE
ATTACHMENT 2A

WMAA CRITICAL COURSE SEDIMENT YIELD AREA MAP



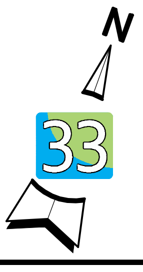


EXHIBIT 2b

SCALE:	N.T.S.	JOB NO.:	1517.0
DATE:	12.15.2016	SHEET:	1 OF 1

latitude 33
PLANNING & ENGINEERING
9968 Hibert Street 2nd Floor, San Diego, CA 92131
Tel 858.751.0633

BMP Sizing Spreadsheet V2.0			
Project Name:	9775 Towne Centre Drive	Hydrologic Unit:	906.3
Project Applicant:	Latitude 33	Rain Gauge:	Oceanside
Jurisdiction:	City of San Diego	Total Project Area:	206,635
Parcel (APN):	343-12-114	Low Flow Threshold:	0.1Q2
BMP Name:	Basin 1	BMP Type:	Cistern
BMP Native Soil Type:		BMP Infiltration Rate (in/hr):	N/A

Areas Draining to BMP						HMP Sizing Factors			Minimum BMP Size		
DMA Name	Area (sf)	Soil Type	Pre-project Slope	Post Project Surface Type	Runoff Factor (Table G.2-1)[1]	N/A	Cistern Volume	N/A	N/A	Cistern Volume (cf)	N/A
A thru E	31,772	D	Flat	ROOF	1.0	N/A	0.2	N/A	N/A	6354	N/A
A thru E	15,171	D	Flat	DECKING	1.0	N/A	0.2	N/A	N/A	3034	N/A
A thru E	9,717	D	Flat	SIDEWALK	1.0	N/A	0.2	N/A	N/A	1943	N/A
A thru E	88,475	D	Flat	PAVEMENT	1.0	N/A	0.2	N/A	N/A	17695	N/A
A thru E	97,818	D	Flat	LANDSCAPING	0.1	N/A	0.2	N/A	N/A	1956	N/A
Total BMP Area	242,953										
								Minimum BMP Size		30983	
								Proposed BMP Size*	N/A	N/A	N/A

Minimum Cistern Depth	N/A	in
Maximum Cistern Depth	N/A	in
Selected Cistern Depth	96.00	in
Selected Cistern Volume	31080	cubic feet

Notes:

1. Runoff factors which are used for hydromodification management flow control (Table G.2-1) are different from the runoff factors used for pollutant control BMP sizing (Table B.1-1). Table references are taken from the San Diego Region Model BMP Design Manu

Describe the BMP's in sufficient detail in your PDP SWQMP to demonstrate the area, volume, and other criteria can be met within the constraints of the site.

BMP's must be adapted and applied to the conditions specific to the development project such as unstable slopes or the lack of available head.
Designated Staff have final review and approval authority over the project design.

This BMP Sizing Spreadsheet has been updated in conformance with the San Diego Region Model BMP Design Manual, February 2016. For questions or concerns please contact the jurisdiction in which your project is located.

BMP Sizing Spreadsheet V2.0			
Project Name:	9775 Towne Centre Driv	Hydrologic Unit:	906.3
Project Applicant:	Latitude 33	Rain Gauge:	Oceanside
Jurisdiction:	City of San Diego	Total Project Area:	206,635
Parcel (APN):	343-12-114	Low Flow Threshold:	0.1Q2
BMP Name	Basin 1	BMP Type:	Cistern

DMA Name	Rain Gauge	Pre-developed Condition			Q_2 Sizing Factor	DMA Area (ac)	Orifice Flow - $\%Q_2$	Orifice Area
		Soil Type	Cover	Slope	(cfs/ac)		(cfs)	(in^2)
A thru E	Oceanside	D	Scrub	Flat	0.175	0.729	0.013	**0.14**
A thru E	Oceanside	D	Scrub	Flat	0.175	0.348	0.006	**0.07**
A thru E	Oceanside	D	Scrub	Flat	0.175	0.223	0.004	**0.04**
A thru E	Oceanside	D	Scrub	Flat	0.175	2.031	0.036	**0.40**
A thru E	Oceanside	D	Scrub	Flat	0.175	2.246	0.039	**0.44**
			Scrub					
			Scrub					
			Scrub					
			Scrub					
			Scrub					
			Scrub					
			Scrub					
			Scrub					
			Scrub					
			Scrub					

0.098	**1.10**	**1.19**
Tot. Allowable Orifice Flow (cfs)	**Tot. Allowable Orifice Area (in^2)**	**Max Orifice Diameter (in)**
0.098	**1.04**	**1.15**
Actual Orifice Flow (cfs)	Actual Orifice Area (in^2)	Selected Orifice Diameter (in)
	Drawdown (Hrs)	provide hand calculation

ATTACHMENT 3
STRUCTURAL BMP MAINTENANCE INFORMATION

This is the cover sheet for Attachment 3.

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Indicate which Items are Included:

Attachment Sequence	Contents	Checklist
Attachment 3a	Structural BMP Maintenance Thresholds and Actions (Required)	☒ Included See Structural BMP Maintenance Information Checklist.
Attachment 3b	Maintenance Agreement (Form DS-3247) (when applicable)	☐ Included ☒ Not Applicable

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Use this checklist to ensure the required information has been included in the Structural BMP Maintenance Information Attachment:

Preliminary Design / Planning / CEQA level submittal:

- Attachment 3a must identify:
  - ☒ Typical maintenance indicators and actions for proposed structural BMP(s) based on Section 7.7 of the BMP Design Manual
- Attachment 3b is not required for preliminary design / planning / CEQA level submittal.

Final Design level submittal:

Attachment 3a must identify:

- ☐ Specific maintenance indicators and actions for proposed structural BMP(s). This shall be based on Section 7.7 of the BMP Design Manual and enhanced to reflect actual proposed components of the structural BMP(s)
- ☐ How to access the structural BMP(s) to inspect and perform maintenance
- ☐ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
- ☐ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
- ☐ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
- ☐ When applicable, frequency of bioretention soil media replacement.
- ☐ Recommended equipment to perform maintenance
- ☐ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management

Attachment 3b: For private entity operation and maintenance, Attachment 3b must include a Storm Water Management and Discharge Control Maintenance Agreement (Form DS-3247). The following information must be included in the exhibits attached to the maintenance agreement:

- ☐ Vicinity map
- ☐ Site design BMPs for which DCV reduction is claimed for meeting the pollutant control obligations.
- ☐ BMP and HMP location and dimensions
- ☐ BMP and HMP specifications/cross section/model
- ☐ Maintenance recommendations and frequency
- ☐ LID features such as (permeable paver and LS location, dim, SF).

Structural BMP Maintenance Information

BF-1 | Biofiltration

Typical Maintenance Indicator(s) for Proprietary Biofiltration Units	Maintenance Actions
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials, without damage to the vegetation.
Poor vegetation establishment	Re-seed, re-plant, or re-establish vegetation per original plans.
Overgrown vegetation	Mow or trim as appropriate, but not less than the design height of the vegetation per original plans when applicable (e.g. a vegetated swale may require a minimum vegetation height).
Erosion due to concentrated irrigation flow	Repair/re-seed/re-plant eroded areas and adjust the irrigation system.
Erosion due to concentrated storm water runoff flow	Repair/re-seed/re-plant eroded areas, and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, the City Engineer shall be contacted prior to any additional repairs or reconstruction.
Standing water in vegetated swales	Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, loosening or replacing top soil to allow for better infiltration, or minor re-grading for proper drainage. If the issue is not corrected by restoring the BMP to the original plan and grade, the City Engineer shall be contacted prior to any additional repairs or reconstruction.
Standing water in bioretention, biofiltration with partial retention, or biofiltration areas, or flow-through planter boxes for longer than 96 hours following a storm event*	Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, clearing underdrains (where applicable), or repairing/replacing clogged or compacted soils.
Obstructed inlet or outlet structure	Clear obstructions.
Damage to structural components such as weirs, inlet or outlet structures	Repair or replace as applicable.
Clogged Biofiltration Media Mix	Remove and properly dispose media and replace with fresh media.
*These BMPs typically include a surface ponding layer as part of their function which may take 96 hours to drain following a storm event.	

E.13. BF-1 Biofiltration

Location: 43rd Street and Logan Avenue, San Diego, California

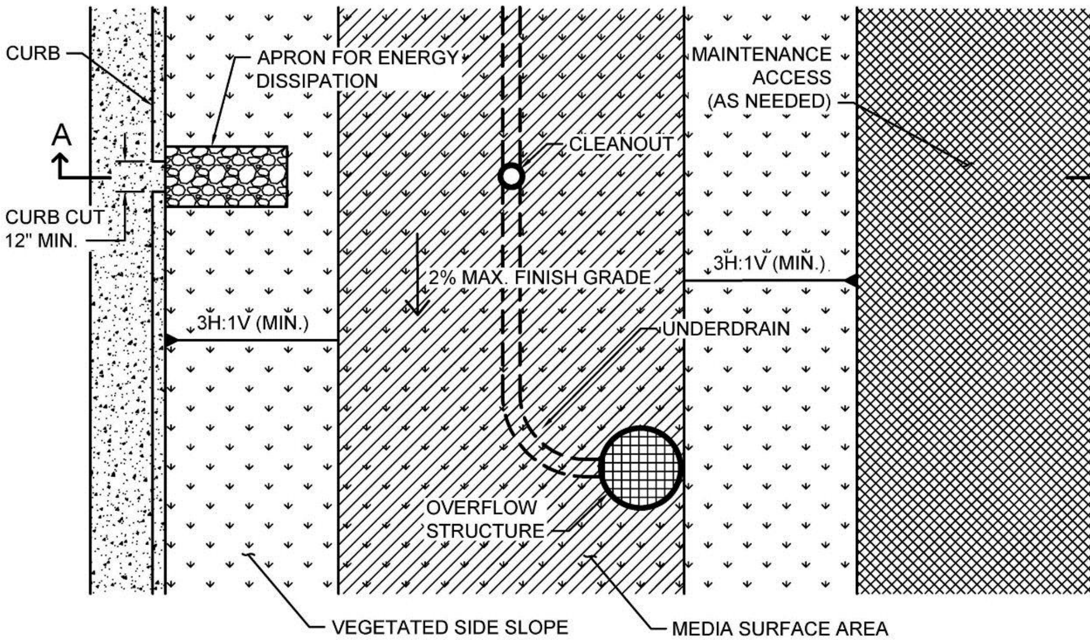
MS4 Permit Category
Biofiltration
Manual Category
Biofiltration
Applicable Performance Standard
Pollutant Control Flow Control
Primary Benefits
Treatment Volume Reduction (Incidental) Peak Flow Attenuation (Optional)

Description

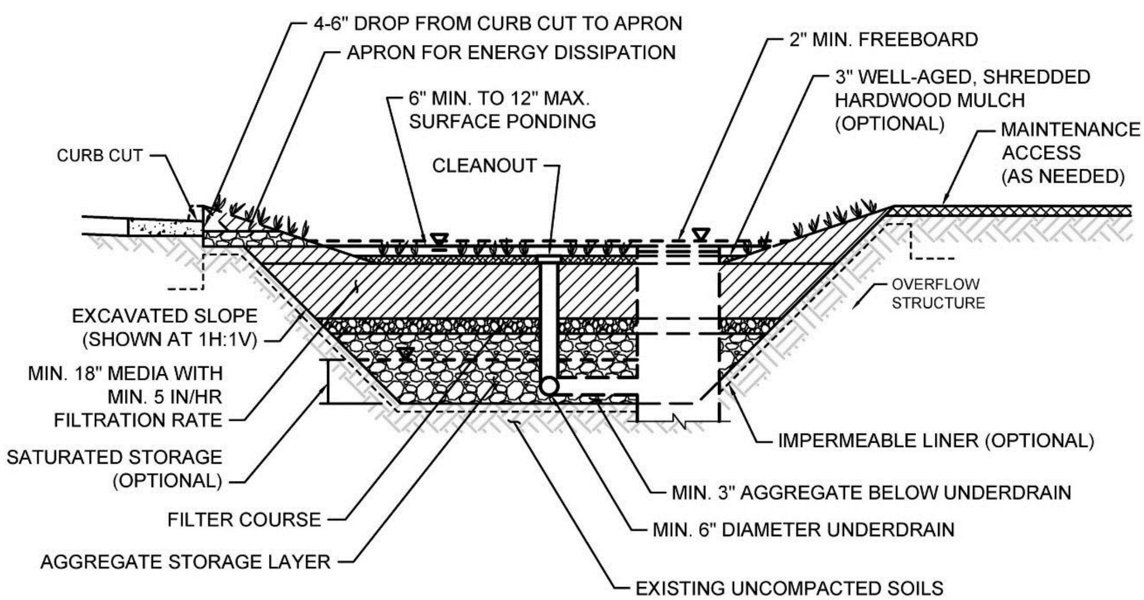
Biofiltration (Bioretention with underdrain) facilities are vegetated surface water systems that filter water through vegetation, and soil or engineered media prior to discharge via underdrain or overflow to the downstream conveyance system. Bioretention with underdrain facilities are commonly incorporated into the site within parking lot landscaping, along roadsides, and in open spaces. Because these types of facilities have limited or no infiltration, they are typically designed to provide enough hydraulic head to move flows through the underdrain connection to the storm drain system. Treatment is achieved through filtration, sedimentation, sorption, biochemical processes and plant uptake.

Typical bioretention with underdrain components include:

- Inflow distribution mechanisms (e.g, perimeter flow spreader or filter strips)
- Energy dissipation mechanism for concentrated inflows (e.g., splash blocks or riprap)
- Shallow surface ponding for captured flows
- Side slope and basin bottom vegetation selected based on expected climate and ponding depth
- Non-floating mulch layer
- Media layer (planting mix or engineered media) capable of supporting vegetation growth
- Filter course layer (aka choking layer) consisting of aggregate to prevent the migration of fines into uncompacted native soils or the aggregate storage layer
- Aggregate storage layer with underdrain(s)
- Impermeable liner or uncompacted native soils at the bottom of the facility
- Overflow structure



PLAN
NOT TO SCALE



SECTION A-A'
NOT TO SCALE

Figure E.13-E.13-1: Typical plan and Section view of a Biofiltration BMP

Design Adaptations for Project Goals

Biofiltration Treatment BMP for storm water pollutant control. The system is lined or un-lined to provide incidental infiltration, and an underdrain is provided at the bottom to carry away filtered runoff. This configuration is considered to provide biofiltration treatment via flow through the media layer. Storage provided above the underdrain within surface ponding, media, and aggregate storage is considered included in the biofiltration treatment volume. Saturated storage within the aggregate storage layer can be added to this design by raising the underdrain above the bottom of the aggregate storage layer or via an internal weir structure designed to maintain a specific water level elevation.

Integrated storm water flow control and pollutant control configuration. The system can be designed to provide flow rate and duration control by primarily providing increased surface ponding and/or having a deeper aggregate storage layer above the underdrain. This will allow for significant detention storage, which can be controlled via inclusion of an outlet structure at the downstream end of the underdrain.

Design Criteria and Considerations

Bioretention with underdrain must meet the following design criteria. Deviations from the below criteria may be approved at the discretion of the City Engineer if it is determined to be appropriate:

	Siting and Design	Intent/Rationale
□	Placement observes geotechnical recommendations regarding potential hazards (e.g., slope stability, landslides, liquefaction zones) and setbacks (e.g., slopes, foundations, utilities).	Must not negatively impact existing site geotechnical concerns.
□	An impermeable liner or other hydraulic restriction layer is included if site constraints indicate that infiltration or lateral flows should not be allowed.	Lining prevents storm water from impacting groundwater and/or sensitive environmental or geotechnical features. Incidental infiltration, when allowable, can aid in pollutant removal and groundwater recharge.
□	Contributing tributary area shall be ≤ 5 acres (≤ 1 acre preferred).	Bigger BMPs require additional design features for proper performance. Contributing tributary area greater than 5 acres may be allowed at the discretion of the City Engineer if the following conditions are met: 1) incorporate design features (e.g. flow spreaders) to minimizing short circuiting of flows in the BMP and 2) incorporate additional design features requested by the City Engineer for proper performance of the regional BMP.
□	Finish grade of the facility is ≤ 2%.	Flatter surfaces reduce erosion and channelization within the facility.
Surface Ponding		

	Siting and Design	Intent/Rationale
☐	Surface ponding is limited to a 24-hour drawdown time.	Surface ponding limited to 24 hour for plant health. Surface ponding drawdown time greater than 24-hours but less than 96 hours may be allowed at the discretion of the City Engineer if certified by a landscape architect or agronomist.
☐	Surface ponding depth is ≥ 6 and ≤ 12 inches.	Surface ponding capacity lowers subsurface storage requirements. Deep surface ponding raises safety concerns. Surface ponding depth greater than 12 inches (for additional pollutant control or surface outlet structures or flow-control orifices) may be allowed at the discretion of the City Engineer if the following conditions are met: 1) surface ponding depth drawdown time is less than 24 hours; and 2) safety issues and fencing requirements are considered (typically ponding greater than 18" will require a fence and/or flatter side slopes) and 3) potential for elevated clogging risk is considered.
☐	A minimum of 2 inches of freeboard is provided.	Freeboard provides room for head over overflow structures and minimizes risk of uncontrolled surface discharge.
☐	Side slopes are stabilized with vegetation and are = 3H:1V or shallower.	Gentler side slopes are safer, less prone to erosion, able to establish vegetation more quickly and easier to maintain.
Vegetation		
☐	Plantings are suitable for the climate and expected ponding depth. A plant list to aid in selection can be found in Appendix E.20.	Plants suited to the climate and ponding depth are more likely to survive.
☐	An irrigation system with a connection to water supply should be provided as needed.	Seasonal irrigation might be needed to keep plants healthy.
Mulch (Mandatory)		
☐	A minimum of 3 inches of well-aged, shredded hardwood mulch that has been stockpiled or stored for at least 12 months is provided.	Mulch will suppress weeds and maintain moisture for plant growth. Aging mulch kills pathogens and weed seeds and allows the beneficial microbes to multiply.
Media Layer		

	Siting and Design	Intent/Rationale
☐	Media maintains a minimum filtration rate of 5 in/hr over lifetime of facility. Additional Criteria for media hydraulic conductivity described in the bioretention soil media model specification (Appendix F.4)	A filtration rate of at least 5 inches per hour allows soil to drain between events. The initial rate should be higher than long term target rate to account for clogging over time. However an excessively high initial rate can have a negative impact on treatment performance, therefore an upper limit is needed.
☐	Media is a minimum 18 inches deep, meeting the following media specifications: Model biorention soil media specification provided in Appendix F.4 <u>or</u> County of San Diego Low Impact Development Handbook: Appendix G - Bioretention Soil Specification (June 2014, unless superseded by more recent edition). Alternatively, for proprietary designs and custom media mixes not meeting the media specifications, the media meets the pollutant treatment performance criteria in Section F.1.	A deep media layer provides additional filtration and supports plants with deeper roots. Standard specifications shall be followed. For non-standard or proprietary designs, compliance with Appendix F.1 ensures that adequate treatment performance will be provided.
☐	Media surface area is 3% of contributing area times adjusted runoff factor or greater. Unless demonstrated that the BMP surface area can be smaller than 3%.	Greater surface area to tributary area ratios: a) maximizes volume retention as required by the MS4 Permit and b) decrease loading rates per square foot and therefore increase longevity. Adjusted runoff factor is to account for site design BMPs implemented upstream of the BMP (such as rain barrels, impervious area dispersion, etc.). Refer to Appendix B.2 guidance. Use Worksheet B.5-1 Line 26 to estimate the minimum surface area required per this criteria.
☐	Where receiving waters are impaired or have a TMDL for nutrients, the system is designed with nutrient sensitive media design (see fact sheet BF-2).	Potential for pollutant export is partly a function of media composition; media design must minimize potential for export of nutrients, particularly where receiving waters are impaired for nutrients.
Filter Course Layer		
☐	A filter course is used to prevent migration of fines through layers of the facility. Filter fabric is not used.	Migration of media can cause clogging of the aggregate storage layer void spaces or subgrade and can result in poor water quality performance for turbidity and suspended solids. Filter fabric is more likely to clog.

	Siting and Design	Intent/Rationale
☐	Filter course is washed and free of fines.	Washing aggregate will help eliminate fines that could clog the facility and impede infiltration.
☐	To reduce clogging potential, a two-layer filter course (aka choking stone system) is used consisting of one 3" layer of clean and washed ASTM 33 Fine Aggregate Sand overlying a 3" layer of ASTM No 8 Stone (Appendix F.5).	This specification has been developed to maintain permeability while limiting the migration of media material into the stone reservoir and underdrain system.
Aggregate Storage Layer		
☐	ASTM #57 open graded stone is used for the storage layer and a two layer filter course (detailed above) is used above this layer	This layer provides additional storage capacity. ASTM #8 stone provides an acceptable choking/bridging interface with the particles in ASTM #57 stone.
☐	The depth of aggregate provided (12-inch typical) and storage layer configuration is adequate for providing conveyance for underdrain flows to the outlet structure.	Proper storage layer configuration and underdrain placement will minimize facility drawdown time.
Inflow, Underdrain, and Outflow Structures		
☐	Inflow, underdrains and outflow structures are accessible for inspection and maintenance.	Maintenance will prevent clogging and ensure proper operation of the flow control structures.
☐	Inflow velocities are limited to 3 ft/s or less or use energy dissipation methods. (e.g., riprap, level spreader) for concentrated inflows.	High inflow velocities can cause erosion, scour and/or channeling.
☐	Curb cut inlets are at least 12 inches wide, have a 4-6 inch reveal (drop) and an apron and energy dissipation as needed.	Inlets must not restrict flow and apron prevents blockage from vegetation as it grows in. Energy dissipation prevents erosion.
☐	Underdrain outlet elevation should be a minimum of 3 inches above the bottom elevation of the aggregate storage layer.	A minimal separation from subgrade or the liner lessens the risk of fines entering the underdrain and can improve hydraulic performance by allowing perforations to remain unblocked.
☐	Minimum underdrain diameter is 8 inches.	Smaller diameter underdrains are prone to clogging.
☐	Underdrains should be affixed with an upturned elbow to an elevation at least 9 to 12 inches above the invert of the underdrain.	An upturned elbow reduces velocity in the underdrain pipe and can help reduce mobilization of sediments from the underdrain and media bed.

	Siting and Design	Intent/Rationale
☐	Underdrains are made of slotted, PVC pipe conforming to ASTM D 3034 or equivalent or corrugated, HDPE pipe conforming to AASHTO 252M or equivalent.	Slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.
☐	An underdrain cleanout with a minimum 8-inch diameter and lockable cap is placed every 50 feet as required based on underdrain length.	Properly spaced cleanouts will facilitate underdrain maintenance.
☐	Overflow is safely conveyed to a downstream storm drain system or discharge point Size overflow structure to pass 100-year peak flow for on-line infiltration basins and water quality peak flow for off-line basins.	Planning for overflow lessens the risk of property damage due to flooding.

Conceptual Design and Sizing Approach for Storm Water Pollutant Control Only

To design bioretention with underdrain for storm water pollutant control only (no flow control required), the following steps should be taken:

1. Verify that siting and design criteria have been met, including placement requirements, contributing tributary area, maximum side and finish grade slopes, and the recommended media surface area tributary ratio.
2. Calculate the DCV per Appendix B based on expected site design runoff for tributary areas.
3. Use the sizing worksheet presented in Appendix B.5 to size biofiltration BMPs.

Conceptual Design and Sizing Approach when Storm Water Flow Control is Applicable

Control of flow rates and/or durations will typically require significant surface ponding and/or aggregate storage volumes, and therefore the following steps should be taken prior to determination of storm water pollutant control design. Pre-development and allowable post-project flow rates and durations should be determined as discussed in Chapter 6 of the manual.

1. Verify that siting and design criteria have been met, including placement requirements, contributing tributary area, maximum side and finish grade slopes, and the recommended media surface area tributary ratio.
2. Iteratively determine the facility footprint area, surface ponding and/or aggregate storage layer depth required to provide detention storage to reduce flow rates and durations to allowable limits. Flow rates and durations can be controlled from detention storage by altering outlet structure orifice size(s) and/or water control levels. Multi-level orifices can be used within an outlet structure to control the full range of flows.
3. If bioretention with underdrain cannot fully provide the flow rate and duration control required by this manual, an upstream or downstream structure with significant storage volume such as an underground vault can be used to provide remaining controls.
4. After bioretention with underdrain has been designed to meet flow control requirements, calculations must be completed to verify if storm water pollutant control requirements to treat the DCV have been met.

1	**Biofiltration BMPs shall be allowed to be used only as described in the BMP selection process based on a documented feasibility analysis.** Intent: This manual defines a specific prioritization of pollutant treatment BMPs, where BMPs that retain water (retained includes evapotranspired, infiltrated, and/or harvested and used) must be used before considering BMPs that have a biofiltered discharge to the MS4 or surface waters. Use of a biofiltration BMP in a manner in conflict with this prioritization (i.e., without a feasibility analysis justifying its use) is not permitted, regardless of the adequacy of the sizing and design of the system.	
☐	The project applicant has demonstrated that it is not technically feasible to retain the full DCV onsite.	Document feasibility analysis and findings in SWQMP per Appendix C.
2	**Biofiltration BMPs must be sized using acceptable sizing methods.** Intent: The MS4 Permit and this manual defines specific sizing methods that must be used to size biofiltration BMPs. Sizing of biofiltration BMPs is a fundamental factor in the amount of storm water that can be treated and also influences volume and pollutant retention processes.	
☐	The project applicant has demonstrated that biofiltration BMPs are sized to meet one of the biofiltration sizing options available (Appendix B.5).	Submit sizing worksheets (Appendix B.5) or other equivalent documentation with the SWQMP.
3	**Biofiltration BMPs must be sited and designed to achieve maximum feasible infiltration and evapotranspiration.** Intent: Various decisions about BMP placement and design influence how much water is retained via infiltration and evapotranspiration. The MS4 Permit requires that biofiltration BMPs achieve maximum feasible retention (evapotranspiration and infiltration) of storm water volume.	
☐	The biofiltration BMP is sited to allow for maximum infiltration of runoff volume based on the feasibility factors considered in site planning efforts. It is also designed to maximize evapotranspiration through the use of amended media and plants (biofiltration designs without amended media and plants may be permissible; see Item 5).	Document site planning and feasibility analyses in SWQMP per Section 5.4.
☐	For biofiltration BMPs categorized as "Partial Infiltration Condition," the infiltration storage depth in the biofiltration design has been selected to drain in 36 hours (+/-25%) or an alternative value shown to maximize infiltration on the site.	Included documentation of estimated infiltration rate per Appendix D; provide calculations using Appendix B.4 and B.5 to show that the infiltration storage depth meets this criterion. Note, depths that are too shallow or too deep may not be acceptable.

☐	For biofiltration BMP locations categorized as "Partial Infiltration Condition," the infiltration storage is over the entire bottom of the biofiltration BMP footprint.	Document on plans that the infiltration storage covers the entire bottom of the BMP (i.e., not just underdrain trenches); or an equivalent footprint elsewhere on the site.
☐	For biofiltration BMP locations categorized as "Partial Infiltration Condition," the sizing factor used for the infiltration storage area is not less than the minimum biofiltration BMP sizing factors calculated using Worksheet B.5.1.	Provide a table that compares the minimum sizing factor per Worksheet B.5.1 to the provided sizing factor. Note: The infiltration storage area could be a separate storage feature located downstream of the biofiltration BMP, not necessarily within the same footprint.
☐	An impermeable liner or other hydraulic restriction layer is only used when needed to avoid geotechnical and/or subsurface contamination issues in locations identified as "No Infiltration Condition."	If using an impermeable liner or hydraulic restriction layer, provide documentation of feasibility findings per Appendix C that recommend the use of this feature.
☐	The use of "compact" biofiltration BMP design[8] is permitted only in conditions identified as "No Infiltration Condition" and where site-specific documentation demonstrates that the use of larger footprint biofiltration BMPs would be infeasible.	Provide documentation of feasibility findings that recommend no infiltration is feasible. Provide site-specific information to demonstrate that a larger footprint biofiltration BMP would not be feasible.
4	**Biofiltration BMPs must be designed with a hydraulic loading rate to maximize pollutant retention, preserve pollutant control processes, and minimize potential for pollutant washout.** Intent: Various decisions about biofiltration BMP design influence the degree to which pollutants are retained. The MS4 Permit requires that biofiltration BMPs achieve maximum feasible retention of storm water pollutants.	

[8]Compact biofiltration BMPs are defined as features with infiltration storage footprint less than the minimum sizing factors required to achieve 40% volume retention. Note that if a biofiltration BMP is accompanied by an infiltrating area downstream that has a footprint equal to at least the minimum sizing factors calculated using Worksheet B.5.1 assuming a partial infiltration condition, then it is not considered to be a compact biofiltration BMP for the purpose of Item 4 of the checklist. For potential configurations with a higher rate biofiltration BMP upstream of an larger footprint infiltration area, the BMP would still need to comply with Item 5 of this checklist for pollutant treatment effectiveness.

☐	Media selected for the biofiltration BMP meets minimum quality and material specifications per Appendix F.4 or County LID Manual, including the maximum allowable design filtration rate and minimum thickness of media. OR	Provide documentation that media meets the specifications in Appendix F.4 or County LID Manual.
☐	Alternatively, for proprietary designs and custom media mixes not meeting the media specifications contained in Appendix F.4 or County LID Manual, field scale testing data are provided to demonstrate that proposed media meets the pollutant treatment performance criteria in Section F.1 below.	Provide documentation of performance information as described in Section F.1.
☐	To the extent practicable, filtration rates are outlet controlled (e.g., via an underdrain and orifice/weir) instead of controlled by the infiltration rate of the media.	Include outlet control in designs or provide documentation of why outlet control is not practicable.
☐	The water surface drains to at least 12 inches below the media surface within 24 hours from the end of storm event flow to preserve plant health and promote healthy soil structure.	Include calculations to demonstrate that drawdown rate is adequate. Surface ponding drawdown time greater than 24-hours but less than 96 hours may be allowed at the discretion of the City Engineer if certified by a landscape architect or agronomist.
☐	If nutrients are a pollutant of concern, design of the biofiltration BMP follows nutrient-sensitive design criteria.	Follow specifications for nutrient sensitive design in Fact Sheet BF-2. Or provide alternative documentation that nutrient treatment is addressed and potential for nutrient release is minimized.
☐	Media gradation calculations demonstrate that migration of media between layers will be prevented and permeability will be preserved.	Follow specification for choking layer in Fact Sheet PR-1 or BF-1. Or include calculations to demonstrate that choking layer is appropriately specified.
5	**Biofiltration BMPs must be designed to promote appropriate biological activity to support and maintain treatment processes.** Intent: Biological processes are an important element of biofiltration performance and longevity.	

☐	Plants have been selected to be tolerant of project climate, design ponding depths and the treatment media composition.	Provide documentation justifying plant selection. Refer to the plant list in Appendix E.20.
☐	Plants have been selected to minimize irrigation requirements.	Provide documentation describing irrigation requirements for establishment and long term operation.
☐	Plant location and growth will not impede expected long-term media filtration rates and will enhance long term infiltration rates to the extent possible.	Provide documentation justifying plant selection. Refer to the plant list in Appendix E.20.
☐	If plants are not part of the biofiltration design, other biological processes are supported as needed to sustain treatment processes (e.g., biofilm in a subsurface flow wetland).	For biofiltration designs without plants, describe the biological processes that will support effective treatment and how they will be sustained. Refer to Appendix F.3
6	**Biofiltration BMPs must be designed with a hydraulic loading rate to prevent erosion, scour, and channeling within the BMP.** Intent: Erosion, scour, and/or channeling can disrupt treatment processes and reduce biofiltration effectiveness.	
☐	Scour protection has been provided for both sheet flow and pipe inflows to the BMP, where needed.	Provide documentation of scour protection as described in Fact Sheets PR-1 or BF-1 or approved equivalent.
☐	Where scour protection has not been provided, flows into and within the BMP are kept to non-erosive velocities.	Provide documentation of design checks for erosive velocities as described in Fact Sheets PR-1 or BF-1 or approved equivalent.
☐	For proprietary BMPs, the BMP is used in a manner consistent with manufacturer guidelines and conditions of its third-party certification[9] (i.e., maximum tributary area, maximum inflow velocities, etc., as applicable).	Provide copy of manufacturer recommendations and conditions of third-party certification.

[9]Certifications or verifications issued by the Washington Technology Acceptance Protocol-Ecology program and the New Jersey Corporation for Advanced Technology programs are typically accompanied by a set of guidelines regarding appropriate design and maintenance conditions that would be consistent with the certification/verification

7	**Biofiltration BMP must include operations and maintenance design features and planning considerations for continued effectiveness of pollutant and flow control functions.** Intent: Biofiltration BMPs require regular maintenance in order provide ongoing function as intended. Additionally, it is not possible to foresee and avoid potential issues as part of design; therefore plans must be in place to correct issues if they arise.	
☐	The biofiltration BMP O&M plan describes specific inspection activities, regular/periodic maintenance activities and specific corrective actions relating to scour, erosion, channeling, media clogging, vegetation health, and inflow and outflow structures.	Include O&M plan with project submittal as described in Chapter 7.
☐	Adequate site area and features have been provided for BMP inspection and maintenance access.	Illustrate maintenance access routes, setbacks, maintenance features as needed on project water quality plans.
☐	For proprietary biofiltration BMPs, the BMP maintenance plan is consistent with manufacturer guidelines and conditions of its third-party certification (i.e., maintenance activities, frequencies).	Provide copy of manufacturer recommendations and conditions of third-party certification.

ATTACHMENT 4
COPY OF PLAN SHEETS SHOWING PERMANENT STORM WATER BMPS

This is the cover sheet for Attachment 4.

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Use this checklist to ensure the required information has been included on the plans:

The plans must identify:

☒ Structural BMP(s) with ID numbers matching Form I-6 Summary of PDP Structural BMPs
☒ The grading and drainage design shown on the plans must be consistent with the delineation of DMAs shown on the DMA exhibit
☒ Details and specifications for construction of structural BMP(s)
☒ Signage indicating the location and boundary of structural BMP(s) as required by the City Engineer
☒ How to access the structural BMP(s) to inspect and perform maintenance
☒ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
☒ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
☒ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
☒ Recommended equipment to perform maintenance
☒ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management
☒ Include landscaping plan sheets showing vegetation requirements for vegetated structural BMP(s)
☒ All BMPs must be fully dimensioned on the plans
☒ When proprietary BMPs are used, site specific cross section with outflow, inflow and model number shall be provided. Boucher photocopies are not allowed.

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ATTACHMENT 4
COPY OF PLAN SHEETS SHOWING PERMANENT STORM WATER BMPS

This is the cover sheet for Attachment 4.

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Use this checklist to ensure the required information has been included on the plans:

The plans must identify:

☒ Structural BMP(s) with ID numbers matching Form I-6 Summary of PDP Structural BMPs
☒ The grading and drainage design shown on the plans must be consistent with the delineation of DMAs shown on the DMA exhibit
☒ Details and specifications for construction of structural BMP(s)
☒ Signage indicating the location and boundary of structural BMP(s) as required by the City Engineer
☒ How to access the structural BMP(s) to inspect and perform maintenance
☒ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
☒ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
☒ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
☒ Recommended equipment to perform maintenance
☒ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management
☒ Include landscaping plan sheets showing vegetation requirements for vegetated structural BMP(s)
☒ All BMPs must be fully dimensioned on the plans
☒ When proprietary BMPs are used, site specific cross section with outflow, inflow and model number shall be provided. Boucher photocopies are not allowed.

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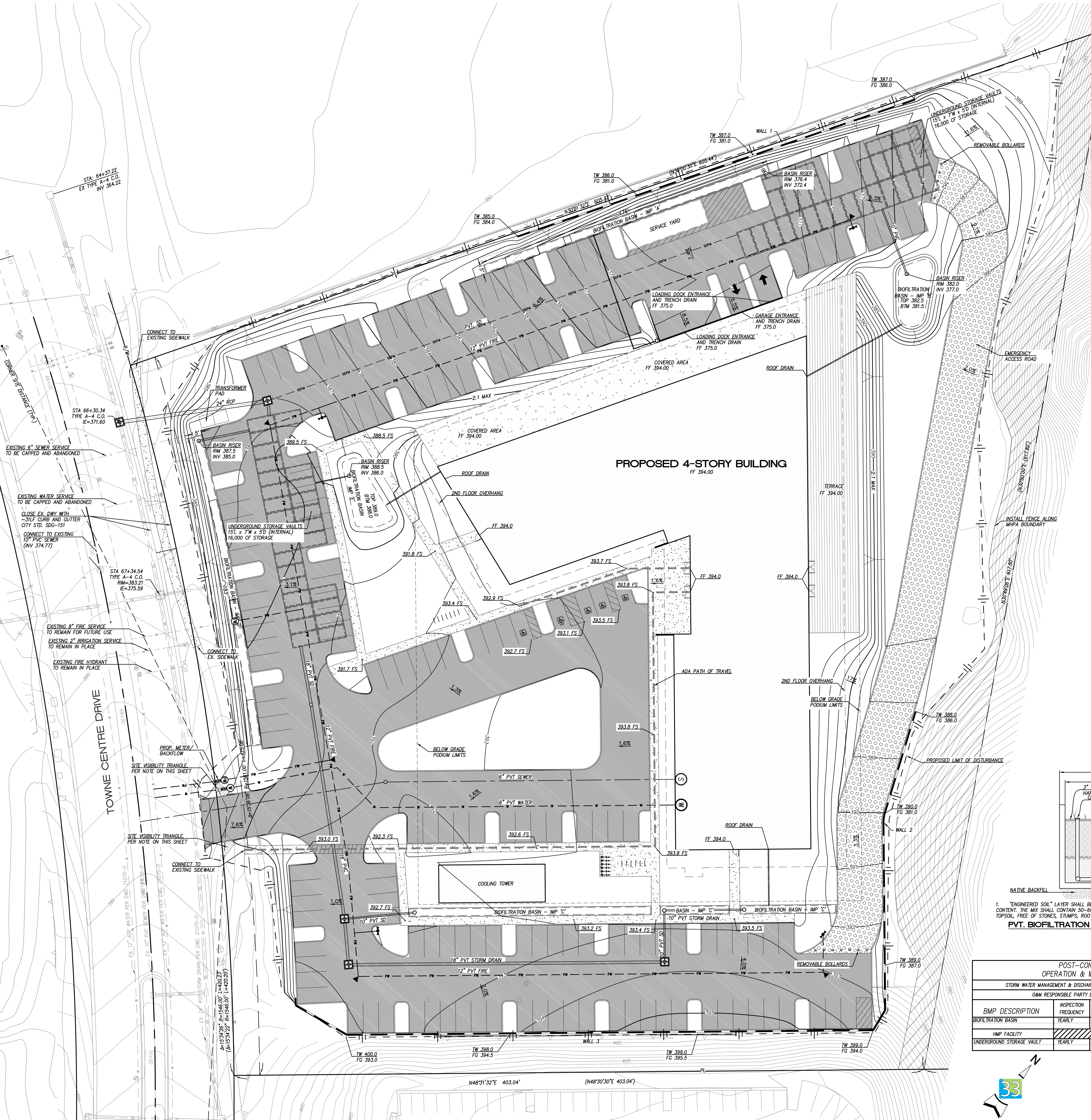


LEGEND

- PROPERTY LINE
- PROPOSED BUILDING FOOTPRINT
- PROPOSED RETAINING WALL
- EXISTING CONTOUR
- PROPOSED CONTOUR
- LIMITS OF 2ND STORY OVERHANG
- LIMITS OF UNDERGROUND PODIUM
- LIMITS OF DISTURBANCE
- PROPOSED CONCRETE SIDEWALK
- PROPOSED GRASSCRETE FIRE ACCESS LANE
- PROPOSED DECK
- PROPOSED ASPHALT
- COVENANT OF EASEMENT AREA/CORRECTED MHPA
- PROPOSED STORM DRAIN
- PROPOSED STORM DRAIN FORCE MAIN
- PROPOSED TRENCH DRAIN
- PROPOSED SEWER
- PROPOSED CURB
- ACCESSIBLE PATH OF TRAVEL

DRAINAGE NOTES

1. THE PROJECT PROPOSES A SYSTEM OF PRIVATE STORM DRAIN PIPES, STRUCTURES, AND BIOFILTRAION BASINS FOR DRAINAGE AND WATER QUALITY. THE PROJECT MIMICS EXISTING CONDITIONS AND ALL WATER RUNOFF IS CAPTURED ON SITE IN PRIVATE STORM DRAIN SYSTEMS BEFORE DISCHARGING INTO THE EXISTING 36" RCP STORM DRAIN WITHIN TOWNE CENTRE DRIVE.

UTILITY NOTES

1. ALL ONSITE WATER, SEWER, AND STORM DRAIN FACILITIES WILL BE PRIVATE UNLESS NOTED OTHERWISE. PUBLIC EASEMENTS SHALL BE PROVIDED FOR ALL PUBLIC UTILITIES, INCLUDING WATER METERS ON PRIVATE PROPERTY. BACKFLOW DEVICES SHALL BE OUTSIDE OF PUBLIC EASEMENTS & R/W. PRIVATE WATER AND SEWER FACILITIES SHALL BE DESIGNED TO MEET THE REQUIREMENTS OF THE CALIFORNIA UNIFORM PLUMBING CODE AND SHALL BE REVIEWED AS PART OF THE BUILDING PERMIT PLAN CHECK.
2. IF A 3" OR LARGER METER IS REQUIRED FOR THIS PROJECT, THE OWNER/PERMITTEE SHALL CONSTRUCT THE NEW METER AND PRIVATE BACKFLOW DEVICE ON SITE, ABOVE GROUND, IN A MANNER SATISFACTORY TO THE PUBLIC UTILITIES DIRECTOR AND THE CITY ENGINEER.
3. NO TREES OR SHRUBS EXCEEDING 3' IN HEIGHT AT MATURITY SHALL BE INSTALLED WITHIN 10' OF ANY SEWER FACILITIES AND 5' OF ANY WATER FACILITIES.
4. ALL PROPOSED PEDESTRIAN ACCESS POINTS ALONG TOWNE CENTRE DRIVE SHALL BE ADA COMPLIANT. ADA ACCESS SHALL BE PROVIDED TO ALL AREAS OF THE SITE.
5. ALL PRIVATE STORMWATER RUNOFF WILL BE TREATED VIA ONSITE BIOFILTRATION BASINS WITH HMP VOLUME PROVIDED VIA UNDERGROUND VAULTS.

STORM WATER NOTES

1. PRIOR TO THE ISSUANCE OF ANY CONSTRUCTION PERMIT, THE OWNER/PERMITTEE SHALL ENTER INTO A MAINTENANCE AGREEMENT FOR THE ONGOING PERMANENT BMP MAINTENANCE, SATISFACTORY TO THE CITY ENGINEER
2. PRIOR TO THE ISSUANCE OF ANY CONSTRUCTION PERMIT, THE OWNER/PERMITTEE SHALL INCORPORATE ANY CONSTRUCTION BEST MANAGEMENT PRACTICES NECESSARY TO COMPLY WITH CHAPTER 14, ARTICLE 2, DIVISION 1 (GRADING REGULATIONS) OF THE SAN DIEGO MUNICIPAL CODE, INTO THE CONSTRUCTION PLANS OR SPECIFICATIONS.
3. PRIOR TO THE ISSUANCE OF ANY CONSTRUCTION PERMIT, THE APPLICANT SHALL SUBMIT A TECHNICAL REPORT THAT WILL BE SUBJECT TO FINAL REVIEW AND APPROVAL BY THE CITY ENGINEER, BASED ON THE STORM WATER STANDARDS IN EFFECT AT THE TIME OF THE CONSTRUCTION PERMIT ISSUANCE.
4. DEVELOPMENT OF THIS PROJECT SHALL COMPLY WITH ALL STORM WATER CONSTRUCTION REQUIREMENTS OF THE STATE CONSTRUCTION GENERAL PERMIT, ORDER NO. 2009-0009DWQ, OR SUBSEQUENT ORDER, AND THE MUNICIPAL STORM WATER PERMIT, ORDER NO. R9-2013-0001, OR SUBSEQUENT ORDER. IN ACCORDANCE WITH ORDER NO. 2009-0009DWQ, OR SUBSEQUENT ORDER, A RISK LEVEL DETERMINATION SHALL BE CALCULATED FOR THE SITE AND A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) SHALL BE IMPLEMENTED CONCURRENTLY WITH THE COMMENCEMENT OF GRADING ACTIVITIES.
5. PRIOR TO ISSUANCE OF A GRADING OR A CONSTRUCTION PERMIT, A COPY OF THE NOTICE OF INTENT (NOI) WITH A VALID WASTE DISCHARGE ID NUMBER (WDID#) SHALL BE SUBMITTED TO THE CITY OF SAN DIEGO AS A PROOF OF ENROLLMENT UNDER THE CONSTRUCTION GENERAL PERMIT. WHEN OWNERSHIP OF THE ENTIRE SITE OR PORTIONS OF THE SITE CHANGES PRIOR TO FILING OF THE NOTICE OF TERMINATION (NOT), A REVISED NOI SHALL BE SUBMITTED ELECTRONICALLY TO THE STATE WATER RESOURCES BOARD IN ACCORDANCE WITH THE PROVISIONS AS SET FORTH IN SECTION II.C OF ORDER NO. 2009-0009-DWQ AND A COPY SHALL BE SUBMITTED TO THE CITY.

WALL TABLE

WALL NO.	HEIGHT	LENGTH
1	6'	245'
2	9'	150'
3	5'	370'

GRADING TABULATIONS

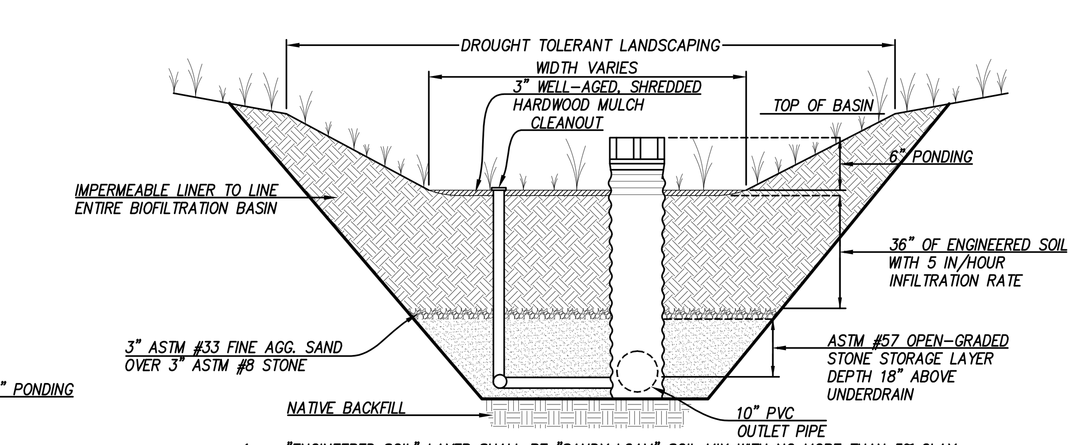
TOTAL GRADED AREA	206,635 SF
PERCENT OF TOTAL SITE	38.7 %
AMOUNT OF CUT	70,000 CY
MAXIMUM DEPTH OF CUT	25 FT
MAX HEIGHT OF CUT SLOPE	N/A
AMOUNT OF FILL	29,000 CY
MAX DEPTH OF FILL	4 FT
MAX HEIGHT OF FILL SLOPE	13 FT
MAX CUT/FILL RATIO	2:1
AMOUNT OF EXPORT	41,000 CY
RETAINING WALL LENGTH	765 FT
MAX RETAINING WALL HEIGHT	9 FT

SITE VISIBILITY TRIANGLES

PER SAN DIEGO MUNICIPAL CODE DIAGRAM 113-02SS: NO OBSTRUCTIONS, INCLUDING SOLID WALLS, IN THE VISIBILITY TRIANGLE SHALL EXCEED 3 FEET IN HEIGHT. PLANT MATERIAL, OTHER THAN TREES, WITHIN THE PUBLIC RIGHT OF WAY THAT IS LOCATED WITH VISIBILITY AREAS SHALL NOT EXCEED 24 INCHES IN HEIGHT, MEASURED FROM THE TOP OF THE ADJACENT CURB.

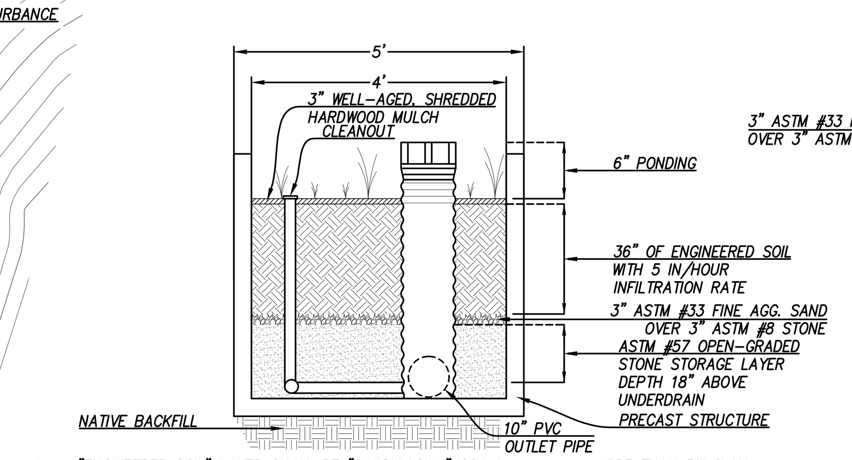
EMRA NOTE

THE OWNER/PERMITTEE SHALL OBTAIN AN ENCROACHMENT MAINTENANCE REMOVAL AGREEMENT FROM THE CITY ENGINEER FOR THE PRIVATE STORM DRAIN CONNECTION INTO THE PUBLIC STORM DRAIN SYSTEM WITHIN TOWNE CENTRE DRIVE.



1. "ENGINEERED SOIL" LAYER SHALL BE "SANDY LOAM" SOIL MIX WITH NO MORE THAN 5% CLAY CONTENT. THE MIX SHALL CONTAIN 50-60% SAND, 20-30% COMPOST OR HARDWOOD MULCH, AND 20-30% TOPSOIL, FREE OF STONES, STUMPS, ROOTS, OR SIMILAR OBJECTS, AND ALSO FREE OF NOXIOUS WEEDS.

PVT. BIOFILTRATION BASIN - IMP 'B' AND 'E'
NTS



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PVT. BIOFILTRATION BASIN - IMP 'A', 'C' AND 'D'
NTS

DEVELOPER: BMR-APEX LP
17190 BERNARDO CENTER DRIVE
SAN DIEGO, CA 92128
(858) 485-9840

PLANNING: LATITUDE 33 PLANNING & ENGINEERING
9968 HIBERT STREET, SECOND FLOOR
SAN DIEGO, CA 92131
(858) 751-0633 FAX(858) 751-0634

LANDSCAPE ARCHITECT: OFFICE OF JAMES BURNETT
550 LOMAS SANTA FE DRIVE, SUITE A
SOLANA BEACH, CA 92075
(858) 793-6970 FAX(858) 793-6905

CIVIL ENGINEER: LATITUDE 33 PLANNING & ENGINEERING
9968 HIBERT STREET, SECOND FLOOR
SAN DIEGO, CA 92131
(858) 751-0633 FAX(858) 751-0634

ARCHITECT: PERKINS+WILL
1301 FIFTH AVENUE, SUITE 2300
SEATTLE, WA 98101
(206) 381-6000 FAX(206) 441-4981

POST-CONSTRUCTION PERMANENT BMP OPERATION & MAINTENANCE PROCEDURE DETAILS

STORM WATER MANAGEMENT & DISCHARGE CONTROL MAINTENANCE AGREEMENT APPROVAL NO.: 1644549

O&M RESPONSIBLE PARTY DESIGNEE: PROPERTY OWNER / HOA / CITY / OTHER

BMP DESCRIPTION	INSPECTION FREQUENCY	MAINTENANCE FREQUENCY	MAINTENANCE METHOD	QUANTITY
BIOFILTRATION BASIN	YEARLY	AS-NEEDED	REMOVE ACCUMULATING MATERIALS (IE TRASH AND DEBRIS)	5
HMP FACILITY				
UNDERGROUND STORAGE VAULT	YEARLY	AS-NEEDED	REMOVE ACCUMULATING MATERIALS (IE TRASH AND DEBRIS)	2

0 10 20 40 60
(IN FEET)
1 inch = 20 ft.

latitude 33
PLANNING & ENGINEERING
9968 Hibert Street 2nd Floor, San Diego, CA 92131
Tel 858.751.0633

REGISTERED PROFESSIONAL ENGINEER
BRADLEY D. SAGER
No. C054564
CIVIL
STATE OF CALIFORNIA

BRADLEY D. SAGER
R.C.E C054564

DATE

PREPARED BY:

NAME: LATITUDE 33 PLANNING & ENGINEERING
ADDRESS: 9968 Hibert Street, 2nd Floor
SAN DIEGO, CA 92131
PHONE #: (858) 751-0633
FAX #: (858) 751-0634

PROJECT ADDRESS:
9775 TOWNE CENTRE DRIVE

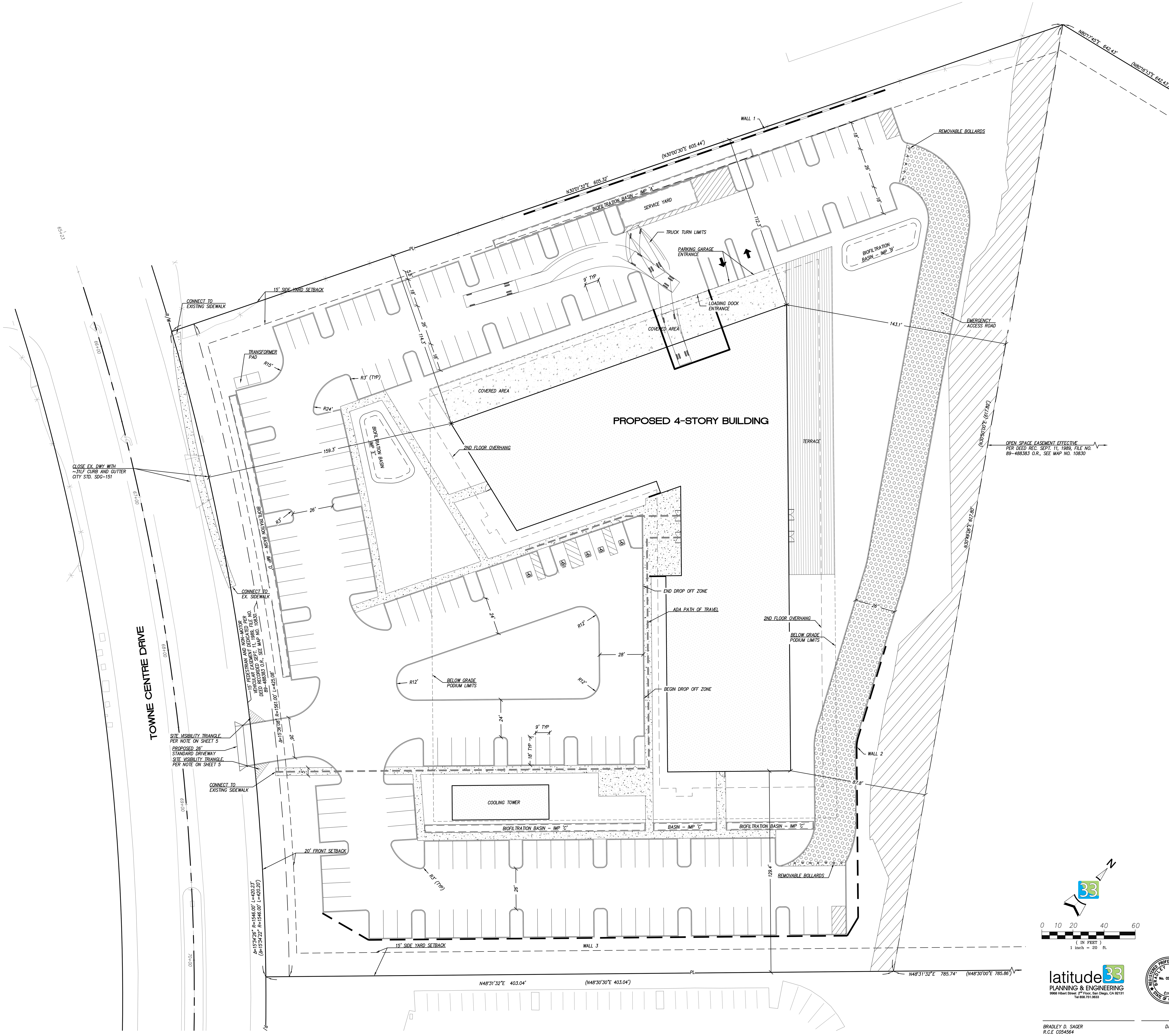
PROJECT NAME:
9775 TOWNE CENTRE DRIVE

SHEET TITLE:
GRADING AND UTILITIES PLAN

REVISION 14:
REVISION 13:
REVISION 12:
REVISION 11:
REVISION 10:
REVISION 9:
REVISION 8:
REVISION 7:
REVISION 6:
REVISION 5:
REVISION 4:
REVISION 3:
REVISION 2: 08-09-17 3RD SUBMITTAL
REVISION 1: 05-16-17 2ND SUBMITTAL

ORIGINAL DATE: 12-12-16

DEPT NO.



LEGEND

- PROPERTY LINE
- PROPOSED BUILDING FOOTPRINT
- PROPOSED RETAINING WALL
- EXISTING CONTOUR — 400
- PROPOSED CONTOUR — 400
- LIMITS OF 2ND STORY OVERHANG
- LIMITS OF UNDERGROUND PODIUM
- PROPOSED CONCRETE SIDEWALK
- PROPOSED GRASSCRETE FIRE ACCESS LANE
- PROPOSED DECK
- PROPOSED ASPHALT
- COVENANT OF EASEMENT AREA
- PROPOSED STORM DRAIN
- PROPOSED STORM DRAIN FORCE MAIN — SDFM — SDFM
- PROPOSED TRENCH DRAIN
- PROPOSED SEWER
- PROPOSED CURB
- ACCESSIBLE PATH OF TRAVEL

NOTE

ENVIRONMENTALLY SENSITIVE LANDS NOT ALREADY WITHIN AN OPEN SPACE EASEMENT SHALL BE PLACED WITHIN A COVENANT OF EASEMENT AS PART OF THIS APPLICATION. TOTAL AREA TO BE INCLUDED WITHIN THIS COVENANT OF EASEMENT IS 0.33 ACRES.

DEVELOPER: BMR-APEX LP
17190 BERNARDO CENTER DRIVE
SAN DIEGO, CA 92128
(858) 485-9840

PLANNING: LATITUDE 33 PLANNING & ENGINEERING
9968 HIBERT STREET, SECOND FLOOR
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550 LOMAS SANTA FE DRIVE, SUITE A
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9968 HIBERT STREET, SECOND FLOOR
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(858) 751-0633 FAX(858) 751-0634

ARCHITECT: PERKINS+WILL
1301 FIFTH AVENUE, SUITE 2300
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PREPARED BY:
NAME: LATITUDE 33 PLANNING & ENGINEERING
ADDRESS: 9968 Hibert Street, 2nd Floor
SAN DIEGO, CA 92131
PHONE #: (858) 751-0633
FAX #: (858) 751-0634

PROJECT ADDRESS: 9775 TOWNE CENTRE DRIVE

PROJECT NAME: 9775 TOWNE CENTRE DRIVE

SHEET TITLE: SITE PLAN

REVISION 14:	
REVISION 13:	
REVISION 12:	
REVISION 11:	
REVISION 10:	
REVISION 9:	
REVISION 8:	
REVISION 7:	
REVISION 6:	
REVISION 5:	
REVISION 4:	
REVISION 3:	
REVISION 2:	
REVISION 1:	05-16-17 2ND SUBMITTAL

ORIGINAL DATE: 12-12-16

SHEET 6 OF 23

DEPT NO.

latitude 33
PLANNING & ENGINEERING
9968 Hibert Street 2nd Floor, San Diego, CA 92131
Tel 858.751.0633

REGISTERED PROFESSIONAL ENGINEER BRADLEY D. SAGER No. C054564 CIVIL STATE OF CALIFORNIA

BRADLEY D. SAGER
R.C.E. C054564

DATE

H:\1500\1517.00 – BioMed Realty – 9775 Towne Center Drive\Engineering\Plans\CPA\1517.0 – 07 Site Plan.dwg

ATTACHMENT 5
DRAINAGE REPORT

Attach project's drainage report. Refer to Drainage Design Manual to determine the reporting requirements.

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2017

DRAINAGE STUDY

9775 TOWNE CENTRE DRIVE

AUGUST 2017

PREPARED BY: latitude 33 PLANNING & ENGINEERING

PREPARED FOR: BMR-APEX

JOB NUMBER:1517.0

DRAINAGE STUDY FOR

9775 TOWNE CENTRE DRIVE

CITY OF SAN DIEGO, CALIFORNIA

PTS No. 527644

January 2017
Revised: August 2017

Prepared for:
BMR-APEX LP
17190 BERNARDO CENTER DRIVE
SAN DIEGO, CA 92128

Prepared by:
LATITUDE 33 PLANNING AND ENGINEERING
9968 Hibert Street, 2nd Floor
San Diego, California 92131
(858) 751-0633

____
Giovanni Posillico, PE | RCE 66332

Prepared by: AB

TABLE OF CONTENTS

I. PROJECT DESCRIPTION

The project site is located within the City of San Diego, State of California, at 9775 Towne Centre Drive, San Diego CA 92121. See figure 1 below for a vicinity map.

FIGURE 1 – VICINITY MAP

The total project site is 5.58 acres, of which approximately 4.75 acres is disturbed. The total drainage area is 6.28 acres including portions of the site to the south. The site is bounded to the north and south by existing commercial developments.

The project includes the demolition of the existing onsite building and surface improvements and the construction of a new building and surface improvements. Refer to the proposed site plan included in Appendix C.

This report has been prepared in support of Latitude 33's preliminary design for the 9775 Towne Centre Drive Project. This report provides hydrologic and hydraulic analyses of the proposed condition 100-year flow rates as well as drainage facility sizing.

FIGURE 2 – EXISTING AERIAL

II. EXISTING DRAINAGE CONDITION

In its existing condition, the site is divided into seven drainage basins, including three main discharge points. All site runoff eventually enters the existing storm drain system or is discharged to the canyon to the east. The basins are described as below:

BASIN E.1

This basin is comprised of concrete sidewalk, landscaping and asphalt roadway, primarily sheet flows and gutter flows to the north-west. Drainage from basin E.1 discharges at POC 1, which continues to drain along Towne Centre Drive.

BASIN E.2

This basin is comprised of an existing building, concrete sidewalk, landscape and asphalt parking lot, which primarily sheet flows and gutter flows to the north-west towards the edge of the parking lot. Drainage from basin E.2 flows into an inlet at the west end of the parking lot, which joins with basin E.1 at POC 1.

BASIN E.3, E.4, E.5, E.6

These basins contain the existing building, concrete sidewalk and asphalt parking lot to the west, east and south of the building. Basins E.3, E.4, E.5 and E.6 each sheet flow to their own respective inlets, which join together to discharge at POC 2.

BASIN E.7

This basin contains the existing open space slopes to the east of the building and some minor surface improvement areas to the east of the building. It includes some minor concrete sidewalk and mainly landscape areas, draining towards the east to the open space, shown as POC 3.

III. DEVELOPED DRAINAGE CONDITION

In post construction conditions, the site will be divided into seven drainage basins. Please refer to the Proposed Hydrology exhibit included in Appendix C for POC locations.

BASIN P.1

This basin is comprised of concrete sidewalk, landscape and a portion of asphalt roadway, primarily sheet flowing and gutter flowing to the north-west. Drainage from basin E.1 discharges at POC 1, which continues to drain along Towne Centre Drive.

BASIN P.2. P.3, P.4, P.5, P.6

Drainage from Basin P.2 mainly sheet flows through the parking lot northwest of the building to a low point on the north side of the parking lot. Basin P.2 is ultimately pumped up to POC 2. Basin P.3 will contain some runoff from the proposed building and also some sheet flow from the west side of the proposed building, collected in a bioretention basin. Basin P.4 will consist of parking lot sheet flow from the southwest side of the building. Basin P.5 will consist of a portion of the proposed building runoff, a portion of existing slope runoff, and the parking lot to the southeast of the proposed building. Basin P.6 will contain a portion of the proposed building, landscape area runoff and the proposed grasscrete fire access road, collected in a bioretention basin. Basins P.2, P.3, P.4, P.5 and P.6 all ultimately discharge at POC 2.

BASIN P.7

This basin contains the undisturbed open space to the east of the building and sheet flows easterly towards the open space, shown as POC 3.

IV. HYDROLOGIC METHODOLOGY

The proposed development was analyzed in conformance with the City of San Diego Drainage Design Manual, dated April 1984. In the hydrology study, all basins analyzed are less than one square mile. The Rational Method module within the Autodesk Storm and Sanitary Analysis (SSA) software was utilized to calculate storm runoff for a 100-year frequency storm. The criteria used for this analysis are described as follows:

- For existing and proposed conditions, runoff coefficients of 0.45 and 0.90 were assumed for landscape and paved areas respectively. For areas containing both open space and commercial/retail area, a composite C value was determined using the equation provided on table 2 of the Drainage Design Manual.

- Initial travel time values were computed using the Overland Time of Flow Nomograph, as shown on Page 86 in the City of San Diego Drainage Design Manual.

- "Gutter and Roadway Discharge - Velocity Chart" and Manning's Equation were used to determine the flow velocity for concentrated flows in curb and gutters, drainage channels and conduits. Travel times were then determined by dividing the flow distance by the velocity of flow.

- Final times of concentration values for each basin were calculated by adding the initial and final travel times, with a minimum time of 5 minutes.

- The rainfall intensity was obtained from the "Intensity-Duration-Frequency Curves" from the City of San Diego Drainage Manual, included in Appendix A.

- Drainage Area: The existing condition drainage basins were delineated from the base topographic map as shown on the Existing Hydrology Exhibit provided in Appendix B. The proposed condition drainage basins were delineated using the proposed grading plan as show on the Proposed Hydrology Exhibit provided in Appendix C.

The existing and proposed condition rational method results are included in Appendix A and summarized in Table 1 and Table 2 respectively.

Table 1 - Summary of Existing Condition Flows

Drainage Basin	Drainage Area (AC)	100-year Peak Flow (CFS)
POC 1		
E.1	1.02	3.23
E.2	1.49	5.47
Total	**2.51**	**8.70**
POC 2		
E.3	0.13	0.41
E.4	0.73	2.87
E.5	1.22	3.98
E.6	0.82	2.63
Total	**2.90**	**9.58***
POC 3		
E.7	0.87	1.80
Total	**0.87**	**1.80**
OVERALL	**6.28**	**20.08***

***Value accounts for flood routing and is not a summation of the peak flows from the tributary areas.**

Table 2 - Summary of Developed Condition Flows

Drainage Basin	Drainage Area (AC)	100-year Peak Flow (CFS)
POC 1		
P.1	1.04	2.46
Total	**1.04**	**2.46**
POC 2		
P.2	1.13	3.27
P.3	0.75	2.18
P.4	0.68	2.68
P.5	1.08	3.78
P.6	1.20	1.38
Total	**4.84**	**10.62***
POC 3		
P.7	0.41	0.66
Total	**0.41**	**0.66**
OVERALL	**6.28**	**13.74***

*** Value accounts for flood routing and is not a summation of the peak flows from the tributary areas.**

V. CONCLUSION

The hydrologic and hydraulic analysis confirms the proposed development and associated storm drain system effectively conveys the 100-year storm event in open channel flow with no instances of pressure flow. In the existing condition, the project site releases a peak flow of 20.08 CFS of runoff. In the proposed condition, the site releases a peak flow 13.74 CFS of runoff, resulting in a 6.74 CFS decrease in peak flow. Additionally, the site does not require permitting associated with Sections 401 or 404 of the Federal Clean Water Act due to the lack of wetlands, streams, or other protected water bodies.

APPENDIX A: REFERENCES

TABLE 2

RUNOFF COEFFICIENTS (RATIONAL METHOD)

DEVELOPED AREAS (URBAN)

Land Use	Coefficient, C Soil Type (1)
Residential:	D
Single Family	.55
Multi-Units	.70
Mobile Homes	.65
Rural (lots greater than 1/2 acre)	.45
Commercial (2) 80% Impervious	.85
Industrial (2) 90% Impervious	.95

NOTES:

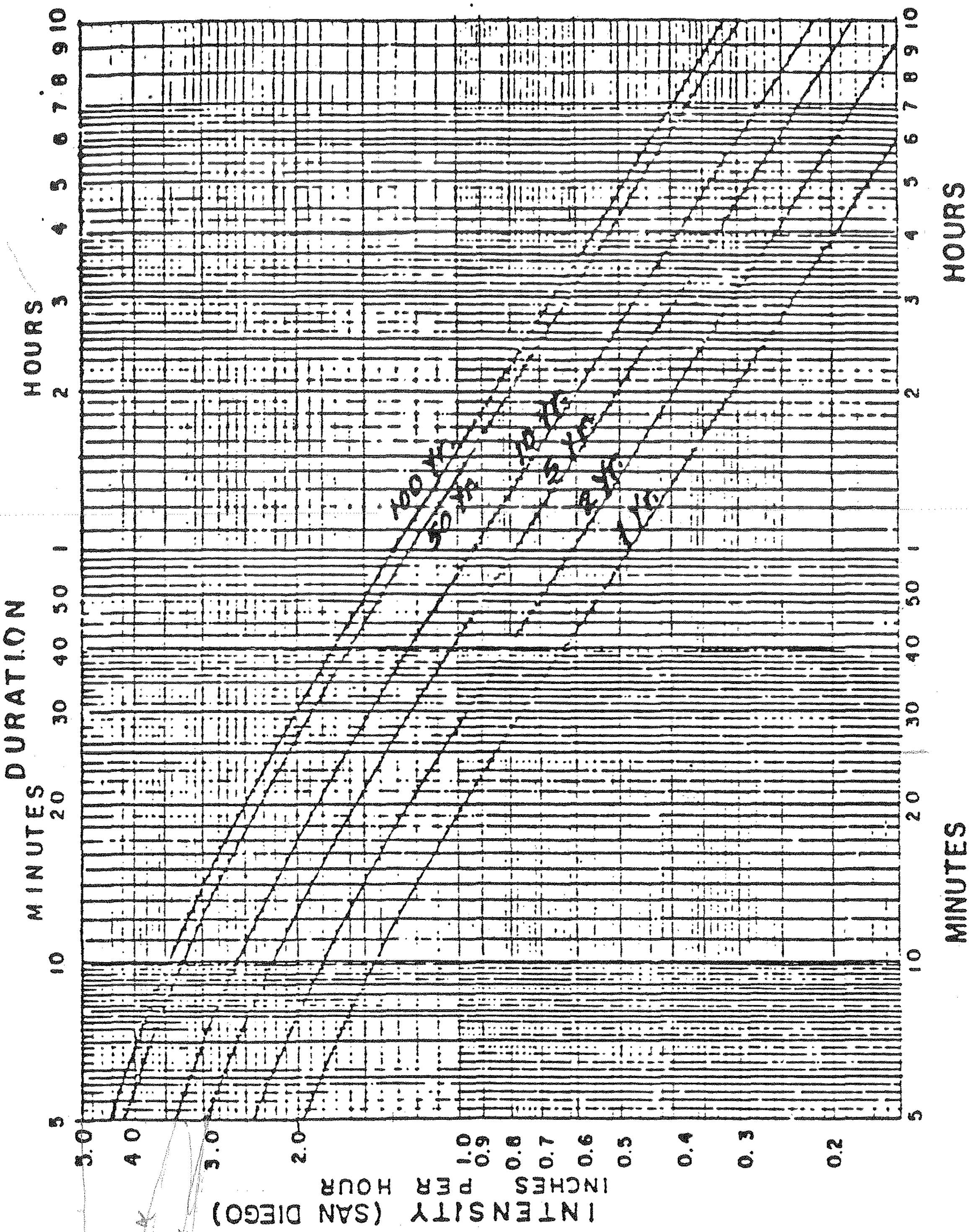
(1) Type D soil to be used for all areas.

(2) Where actual conditions deviate significantly from the tabulated imperviousness values of 80% or 90%, the values given for coefficient C, may be revised by multiplying 80% or 90% by the ratio of actual imperviousness to the tabulated imperviousness. However, in no case shall the final coefficient be less than 0.50. For example: Consider commercial property on D soil.

Actual imperviousness = 50%

Tabulated imperviousness = 80%

Revised C = $\frac{50}{80} \times 0.85 = 0.53$



ELEV.	FACTOR
0-1500	1.00
1500-3000	1.25
3000-4000	1.42
4000-5000	1.60
5000-6000	1.70
DESERT	1.25

To obtain correct intensity, multiply intensity on chart by factor for design elevation.

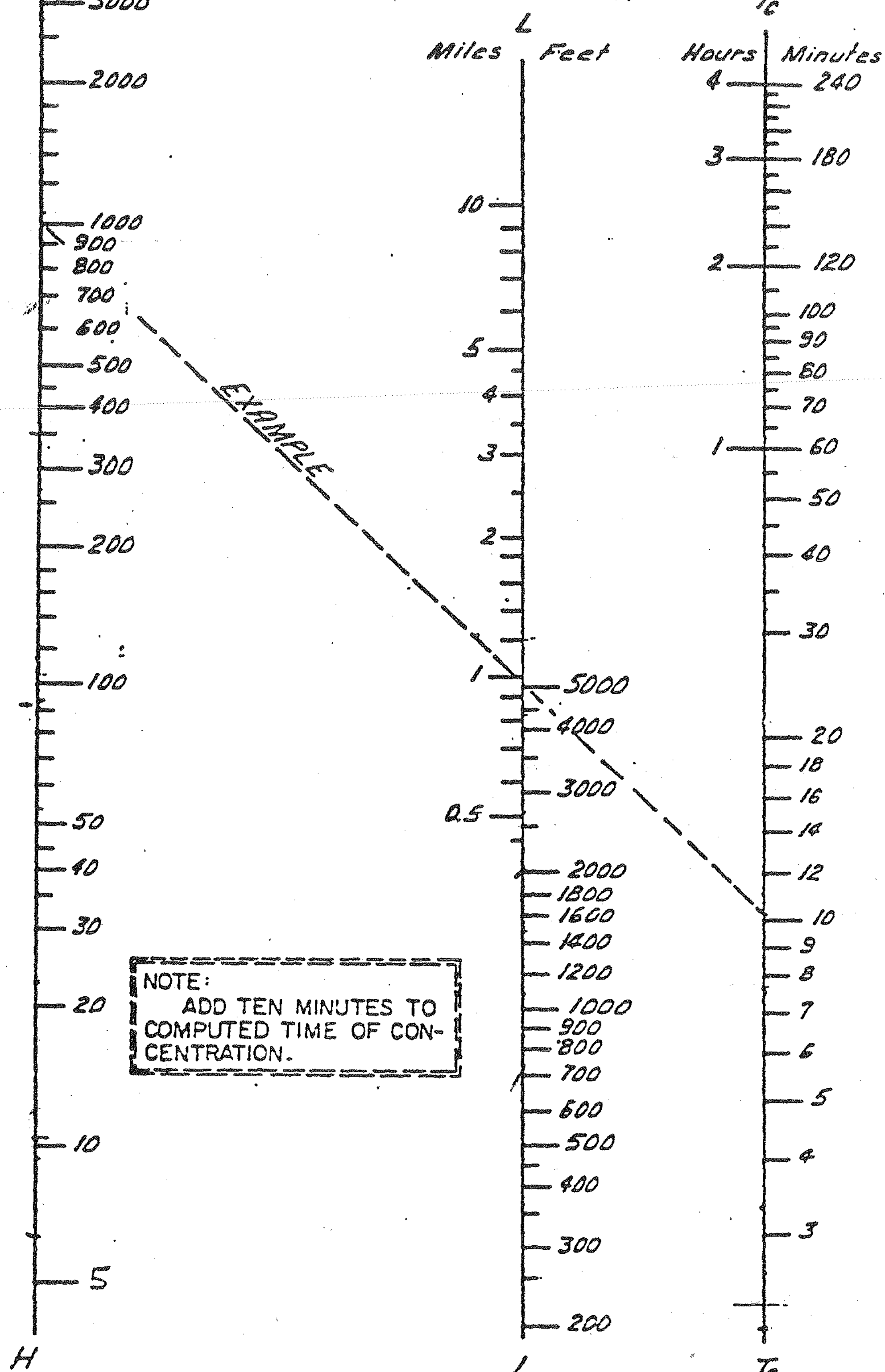
RAINFALL INTENSITY - DURATION - FREQUENC CURVES for COUNTY OF SAN DIEGO

APPENDIX I

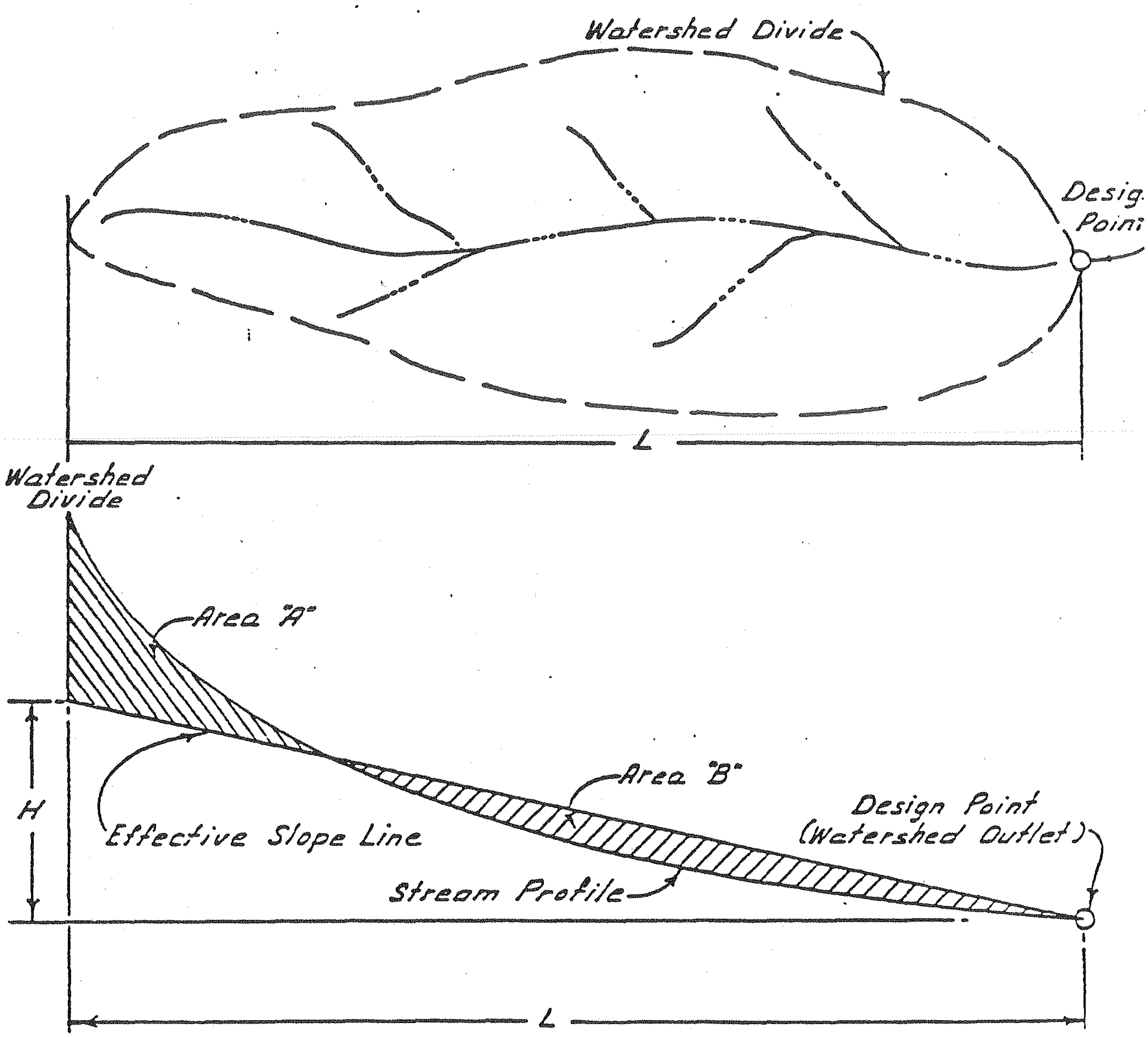
EQUATION

$$T_c = \left(\frac{11.9L^3}{H}\right)^{.385}$$

T_c = Time of concentration (in hours)
L = Length of watershed (in miles)
H = Difference in elevation along (in feet) effective slope line (See Appendix X-B)



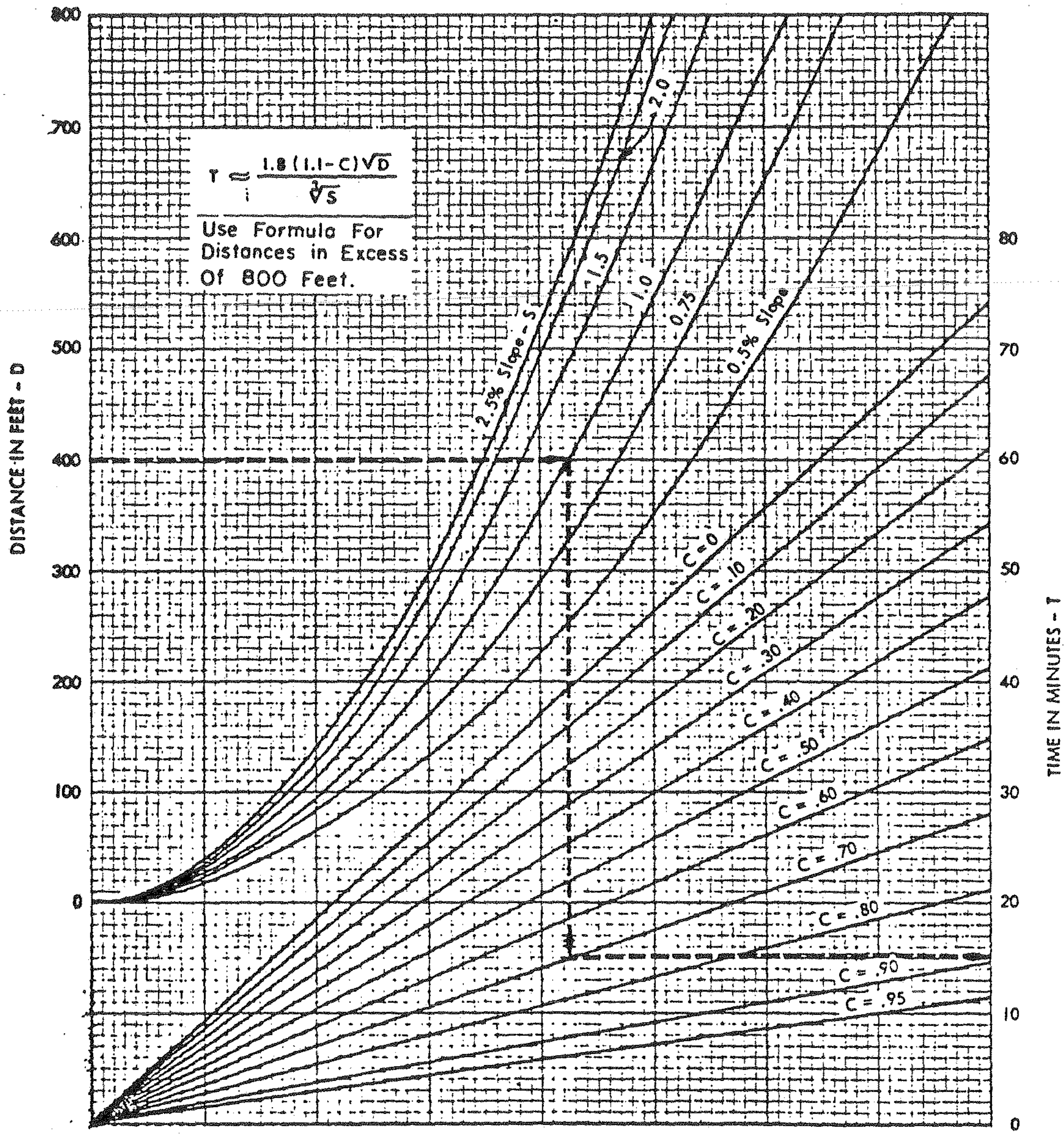
SAN DIEGO COUNTY DEPARTMENT OF SPECIAL DISTRICT SERVICES DESIGN MANUAL	NOMOGRAPH FOR DETERMINATION OF TIME OF CONCENTRATION (Tc) FOR NATURAL WATERSHEDS	
APPROVED [illegible signature]	DATE ______	APPENDIX



Area "A" = Area "B"

SAN DIEGO COUNTY DEPARTMENT OF SPECIAL DISTRICT SERVICES DESIGN MANUAL APPROVED [signature]	COMPUTATION OF EFFECTIVE SLOPE FOR NATURAL WATERSHEDS	
	DATE [illegible]	APPENDIX

URBAN AREAS OVERLAND TIME OF FLOW CURVES



Surface Flow Time Curves

EXAMPLE:

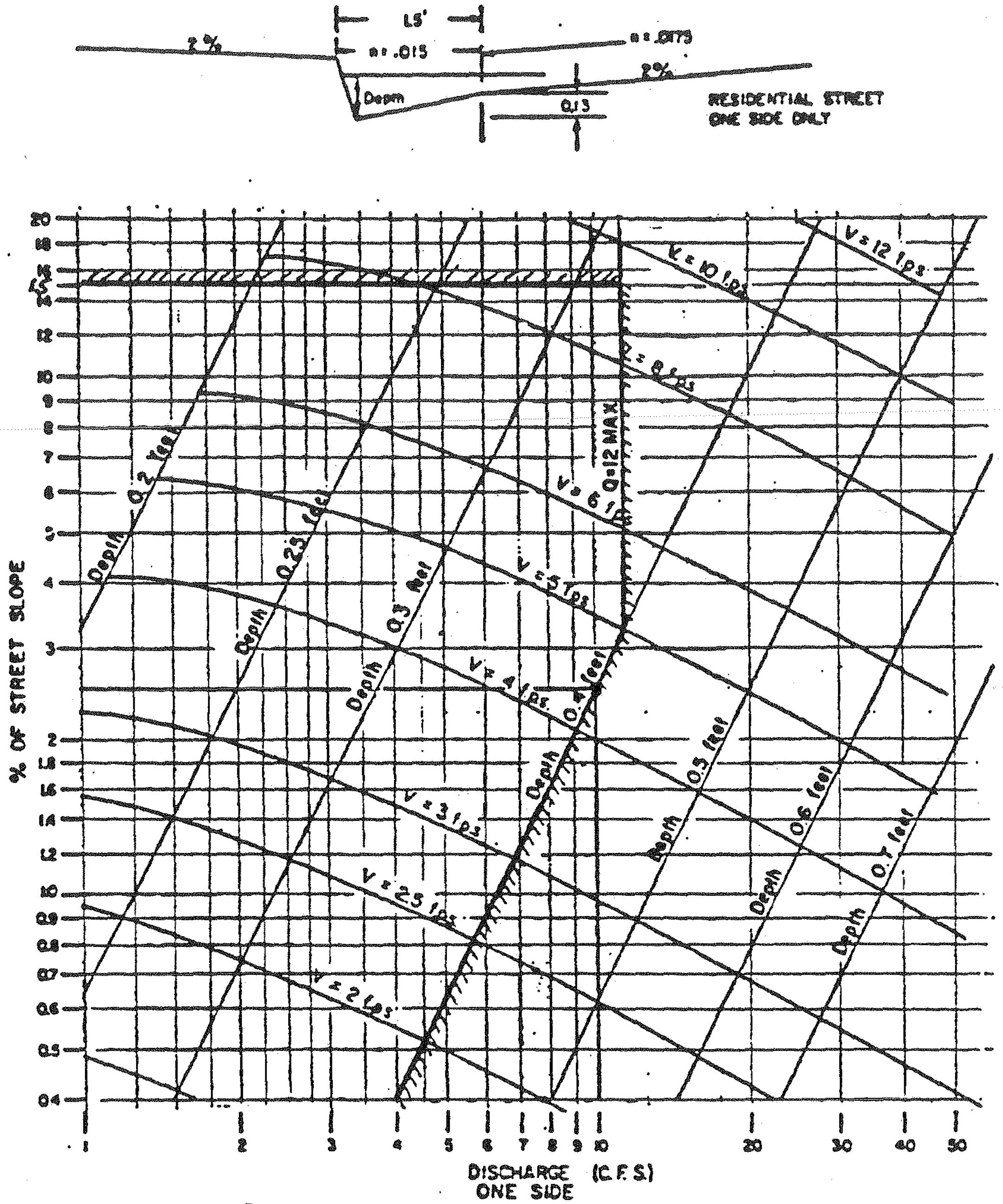
GIVEN: LENGTH OF FLOW = 400 FT.

SLOPE = 1.0 %

COEFFICIENT OF RUNOFF C = .70

READ: OVERLAND FLOWTIME = 15 MINUTES

CHART I-104.12



EXAMPLE:

Given: Q = 10 S = 2.5%
Chart gives: Depth = 0.4, Velocity = 4.4 f.p.s.

REV.		CITY OF SAN DIEGO - DESIGN GUIDE	SHT. NO.
		GUTTER AND ROADWAY DISCHARGE-VELOCITY CHART	

APPENDIX B: EXISTING HYDROLOGIC CALCULATIONS

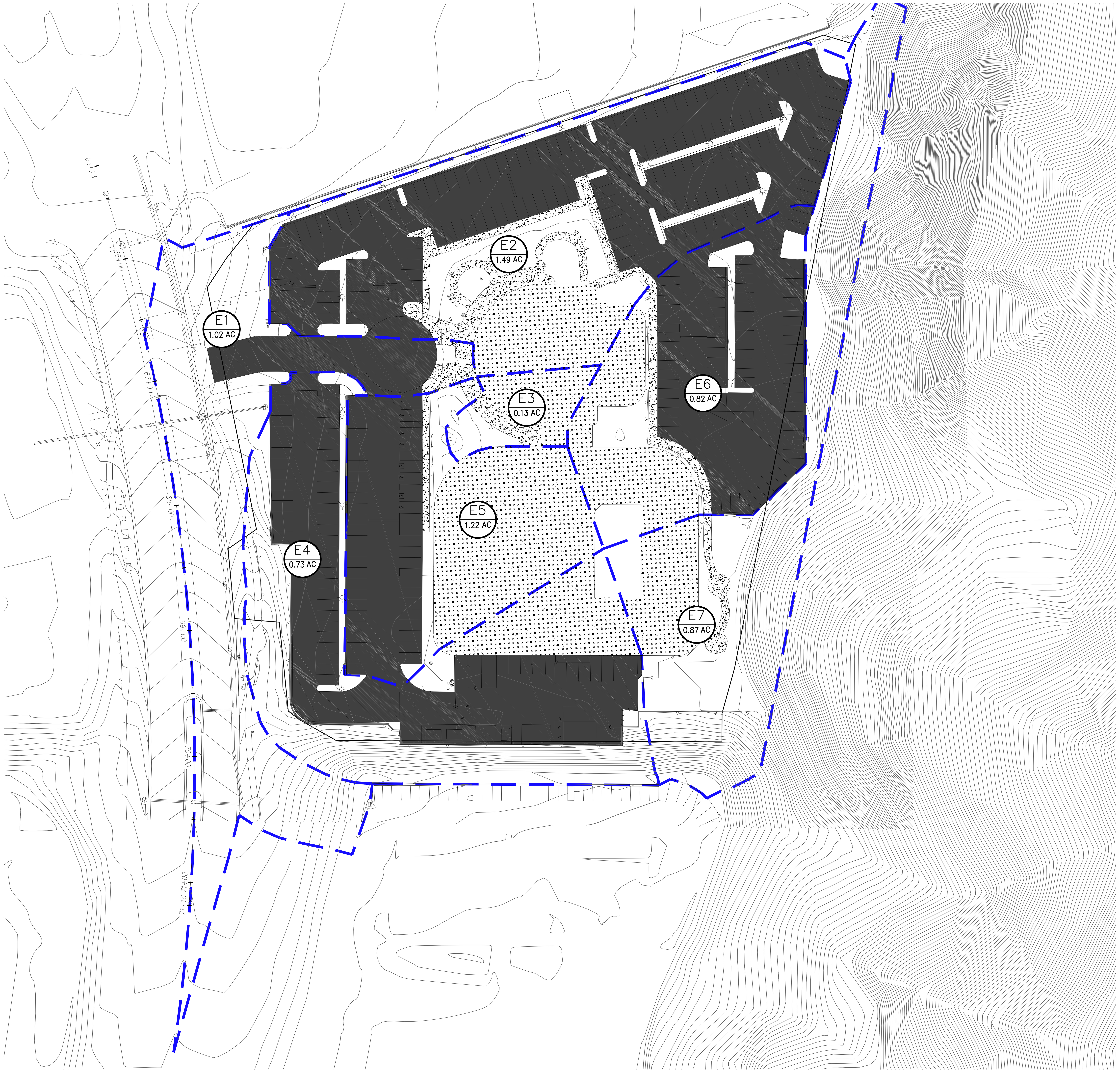
latitude 33
PLANNING & ENGINEERING
9968 Hibert Street 2nd Floor, San Diego, CA 92131
Tel 858.751.0633

EXISTING HYDROLOGY

SCALE: 1"=40'

DATE: 1/11/2017

PREPARED BY: AAB



LEGEND

- BUILDING
- ASPHALT
- CONCRETE
- LANDSCAPE
- DMA 1
- AREA 1.0 AC
- DMA BOUNDARY

EXISTING DMA TABLE

DMA NO.	TOTAL AREA	WEIGHTED C	HARDSCAPE (AC)	LANDSCAPE (AC)
1	1.02 AC	0.72	0.61	0.41
2	1.49 AC	0.84	1.28	0.21
3	0.13 AC	0.73	0.08	0.05
4	0.73 AC	0.90	0.73	0.00
5	1.22 AC	0.76	0.84	0.38
6	0.82 AC	0.75	0.55	0.27
7	0.87 AC	0.59	0.27	0.60

N

0 15 30 60 90

(IN FEET)
1 inch = 30 ft.

latitude 33
PLANNING & ENGINEERING
9968 Hibert Street 2nd Floor, San Diego, CA 92131
Tel 858.751.0633

PROPOSED DMA MAP

9775 TOWNE CENTRE DRIVE
ATTACHMENT 1A

H:\1500\1517.00 - BioMed Realty - 9775 Towne Center Drive\Engineering\Reports\Drainage\DMA AREAS EX.dwg

Project Description

File Name	EX SSA Model.SPF
Description	H:\1500\1517.00 - BioMed Realty - 9775 Towne Centre Drive\Engineering\Reports\Drainage\SSA\EX Parcels.dwg

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	Rational
Time of Concentration (TOC) Method	SCS TR-55
Link Routing Method	Hydrodynamic
Enable Overflow Ponding at Nodes	YES
Skip Steady State Analysis Time Periods	YES

Analysis Options

Start Analysis On	Jan 12, 2017	00:00:00
End Analysis On	Jan 13, 2017	00:00:00
Start Reporting On	Jan 12, 2017	00:00:00
Antecedent Dry Days	0	days
Runoff (Dry Weather) Time Step	0 01:00:00	days hh:mm:ss
Runoff (Wet Weather) Time Step	0 00:05:00	days hh:mm:ss
Reporting Time Step	0 00:05:00	days hh:mm:ss
Routing Time Step	30	seconds

Number of Elements

	Qty
Rain Gages	0
Subbasins	7
Nodes	6
Junctions	3
Outfalls	3
Flow Diversions	0
Inlets	0
Storage Nodes	0
Links	3
Channels	0
Pipes	3
Pumps	0
Orifices	0
Weirs	0
Outlets	0
Pollutants	0
Land Uses	0

Rainfall Details

Return Period	100 year(s)

Subbasin Summary

SN	Subbasin ID	Area (ac)	Weighted Runoff Coefficient	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	{Site 1}._E1	1.02	0.7200	0.37	0.26	0.27	3.23	0 00:05:00
2	{Site 1}._E2	1.49	0.8400	0.37	0.31	0.46	5.47	0 00:05:00
3	{Site 1}._E3	0.13	0.7300	0.37	0.27	0.03	0.41	0 00:05:00
4	{Site 1}._E4	0.73	0.9000	0.37	0.33	0.24	2.87	0 00:05:00
5	{Site 1}._E5	1.22	0.7600	0.40	0.31	0.38	3.98	0 00:05:44
6	{Site 1}._E6	0.82	0.7500	0.39	0.30	0.24	2.63	0 00:05:34
7	{Site 1}._E7	0.87	0.5900	0.58	0.34	0.30	1.80	0 00:09:51

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft²)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	Jun-02	Junction	380.10	381.00	0.00	0.00	0.00	0.41	380.29	0.00	1.31	0 00:00	0.00	0.00
2	Jun-03	Junction	378.40	385.90	0.00	0.00	0.00	3.25	378.92	0.00	6.98	0 00:00	0.00	0.00
3	Jun-04	Junction	376.80	383.50	0.00	0.00	0.00	6.98	377.54	0.00	5.96	0 00:00	0.00	0.00
4	OUT_1	Outfall	0.00					8.70	0.00					
5	OUT_2	Outfall	373.00					9.58	373.66					
6	OUT_3	Outfall	0.00					1.80	0.00					

Subbasin Hydrology

Subbasin : {Site 1}._E1

Input Data

Area (ac) 1.02
Weighted Runoff Coefficient 0.7200

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
hardscape	0.61	-	0.90
landscape	0.41	-	0.45
Composite Area & Weighted Runoff Coeff.	1.02		0.72

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

Where :

Tc = Time of Concentration (hr)
n = Manning's roughness
Lf = Flow Length (ft)
P = 2 yr, 24 hr Rainfall (inches)
Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (Sf^0.5) (unpaved surface)
V = 20.3282 * (Sf^0.5) (paved surface)
V = 15.0 * (Sf^0.5) (grassed waterway surface)
V = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
V = 9.0 * (Sf^0.5) (cultivated straight rows surface)
V = 7.0 * (Sf^0.5) (short grass pasture surface)
V = 5.0 * (Sf^0.5) (woodland surface)
V = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)

Channel Flow Equation :

V = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
R = Aq / Wp
Tc = (Lf / V) / (3600 sec/hr)

Where :

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
R = Hydraulic Radius (ft)
Aq = Flow Area (ft^2)
Wp = Wetted Perimeter (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)
n = Manning's roughness

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.013	0.00	0.00
Flow Length (ft) :	195	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.75	0.00	0.00
Velocity (ft/sec) :	1.02	0.00	0.00
Computed Flow Time (min) :	3.20	0.00	0.00

Channel Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.013	0.00	0.00
Flow Length (ft) :	460	0.00	0.00
Channel Slope (%) :	2	0.00	0.00
Cross Section Area (ft^2) :	.2	0.00	0.00
Wetted Perimeter (ft) :	1.5	0.00	0.00
Velocity (ft/sec) :	4.23	0.00	0.00
Computed Flow Time (min) :	1.81	0.00	0.00

Total TOC (min) 5.01

Subbasin Runoff Results

Total Rainfall (in) 0.37
Total Runoff (in) 0.26
Peak Runoff (cfs) 3.23
Rainfall Intensity 4.379
Weighted Runoff Coefficient 0.7200
Time of Concentration (days hh:mm:ss) 0 00:05:01

Subbasin : {Site 1}._E2

Input Data

Area (ac) 1.49
Weighted Runoff Coefficient 0.8400

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
hardscape	1.28	-	0.90
landscape	0.21	-	0.45
Composite Area & Weighted Runoff Coeff.	1.49		0.84

Time of Concentration

Channel Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.013	0.00	0.00
Flow Length (ft) :	476	0.00	0.00
Channel Slope (%) :	1	0.00	0.00
Cross Section Area (ft²) :	.2	0.00	0.00
Wetted Perimeter (ft) :	1.5	0.00	0.00
Velocity (ft/sec) :	2.99	0.00	0.00
Computed Flow Time (min) :	2.65	0.00	0.00

Total TOC (min) 2.65

Subbasin Runoff Results

Total Rainfall (in) 0.37
Total Runoff (in) 0.31
Peak Runoff (cfs) 5.47
Rainfall Intensity 4.380
Weighted Runoff Coefficient 0.8400
Time of Concentration (days hh:mm:ss) 0 00:02:39

Subbasin : {Site 1}._E3

Input Data

Area (ac) 0.13
Weighted Runoff Coefficient 0.7300

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
hardscape	0.08	-	0.90
landscape	0.05	-	0.45
Composite Area & Weighted Runoff Coeff.	0.13		0.73

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.013	0.00	0.00
Flow Length (ft) :	133	0.00	0.00
Slope (%) :	1	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.75	0.00	0.00
Velocity (ft/sec) :	0.71	0.00	0.00
Computed Flow Time (min) :	3.10	0.00	0.00

Total TOC (min) 3.10

Subbasin Runoff Results

Total Rainfall (in) 0.37
Total Runoff (in) 0.27
Peak Runoff (cfs) 0.41
Rainfall Intensity 4.380
Weighted Runoff Coefficient 0.7300
Time of Concentration (days hh:mm:ss) 0 00:03:06

Subbasin : {Site 1}._E4

Input Data

Area (ac) 0.73
Weighted Runoff Coefficient 0.9000

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
hardscape	0.73	-	0.90
Composite Area & Weighted Runoff Coeff.	0.73		0.90

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.013	0.00	0.00
Flow Length (ft) :	206	0.00	0.00
Slope (%) :	1	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.75	0.00	0.00
Velocity (ft/sec) :	0.78	0.00	0.00
Computed Flow Time (min) :	4.41	0.00	0.00

Channel Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.013	0.00	0.00
Flow Length (ft) :	70	0.00	0.00
Channel Slope (%) :	1	0.00	0.00
Cross Section Area (ft²) :	.2	0.00	0.00
Wetted Perimeter (ft) :	1.5	0.00	0.00
Velocity (ft/sec) :	2.99	0.00	0.00
Computed Flow Time (min) :	0.39	0.00	0.00

Total TOC (min) 4.80

Subbasin Runoff Results

Total Rainfall (in) 0.37
Total Runoff (in) 0.33
Peak Runoff (cfs) 2.87
Rainfall Intensity 4.380
Weighted Runoff Coefficient 0.9000
Time of Concentration (days hh:mm:ss) 0 00:04:48

Subbasin : {Site 1}._E5

Input Data

Area (ac) 1.22
Weighted Runoff Coefficient 0.7600

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
hardscape	0.84	-	0.90
landscape	0.38	-	0.45
Composite Area & Weighted Runoff Coeff.	1.22		0.76

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.013	0.00	0.00
Flow Length (ft) :	150	0.00	0.00
Slope (%) :	1	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.75	0.00	0.00
Velocity (ft/sec) :	0.73	0.00	0.00
Computed Flow Time (min) :	3.42	0.00	0.00

Channel Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.013	0.00	0.00
Flow Length (ft) :	417	0.00	0.00
Channel Slope (%) :	1	0.00	0.00
Cross Section Area (ft²) :	.2	0.00	0.00
Wetted Perimeter (ft) :	1.5	0.00	0.00
Velocity (ft/sec) :	2.99	0.00	0.00
Computed Flow Time (min) :	2.32	0.00	0.00

Total TOC (min) 5.74

Subbasin Runoff Results

Total Rainfall (in) 0.40
Total Runoff (in) 0.31
Peak Runoff (cfs) 3.98
Rainfall Intensity 4.281
Weighted Runoff Coefficient 0.7600
Time of Concentration (days hh:mm:ss) 0 00:05:44

Subbasin : {Site 1}._E6

Input Data

Area (ac) 0.82
Weighted Runoff Coefficient 0.7500

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
hardscape	0.55	-	0.90
landscape	0.27	-	0.45
Composite Area & Weighted Runoff Coeff.	0.82		0.75

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.013	0.00	0.00
Flow Length (ft) :	315	0.00	0.00
Slope (%) :	1.3	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.75	0.00	0.00
Velocity (ft/sec) :	0.94	0.00	0.00
Computed Flow Time (min) :	5.57	0.00	0.00

Total TOC (min) 5.57

Subbasin Runoff Results

Total Rainfall (in) 0.39
Total Runoff (in) 0.30
Peak Runoff (cfs) 2.63
Rainfall Intensity 4.303
Weighted Runoff Coefficient 0.7500
Time of Concentration (days hh:mm:ss) 0 00:05:34

Subbasin : {Site 1}._E7

Input Data

Area (ac) 0.87
Weighted Runoff Coefficient 0.5900

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
hardscape	0.27	-	0.90
landscape	0.60	-	0.45
Composite Area & Weighted Runoff Coeff.	0.87		0.59

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.2	0.00	0.00
Flow Length (ft) :	172	0.00	0.00
Slope (%) :	22	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.75	0.00	0.00
Velocity (ft/sec) :	0.29	0.00	0.00
Computed Flow Time (min) :	9.86	0.00	0.00

Total TOC (min) 9.86

Subbasin Runoff Results

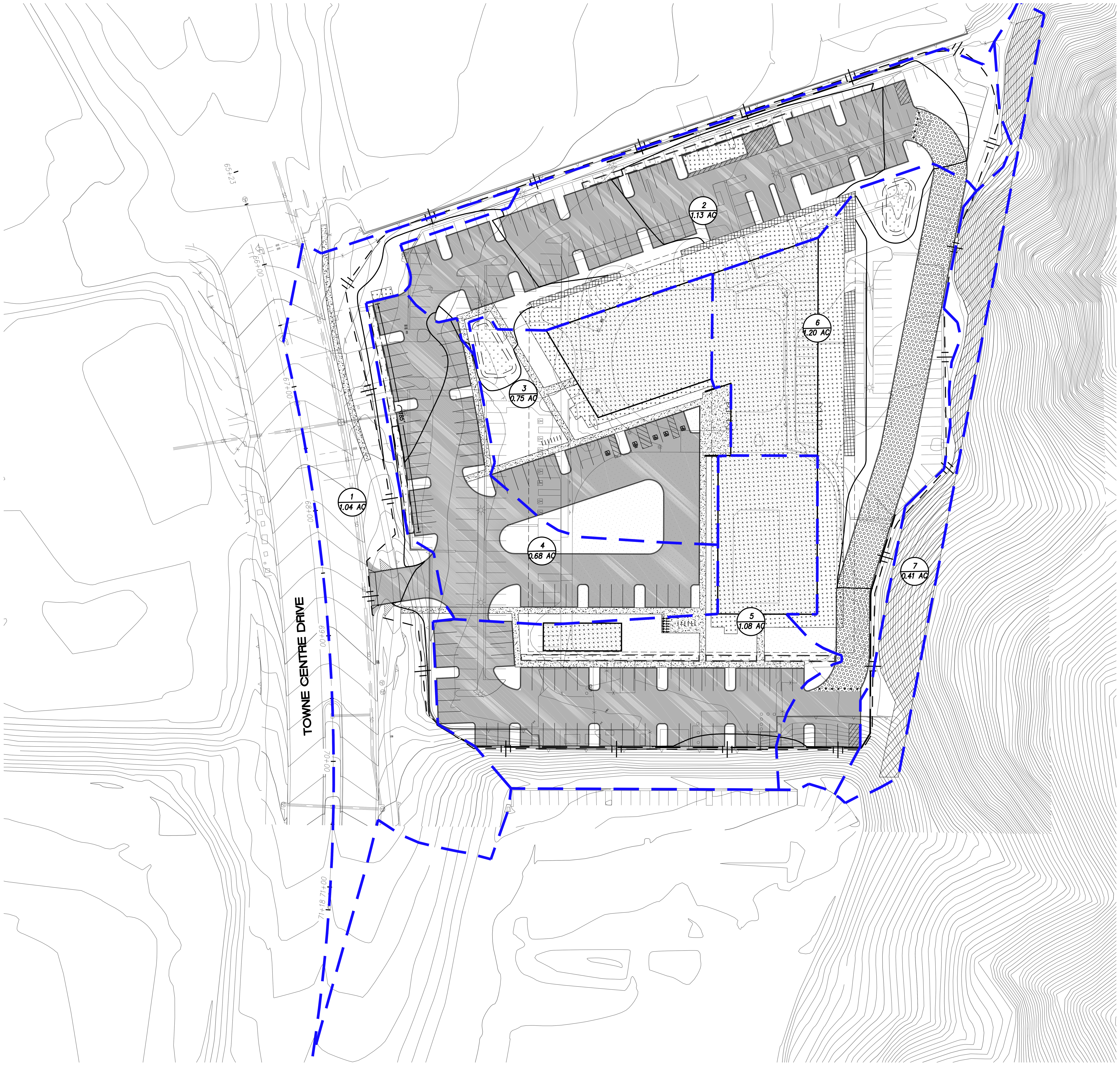
Total Rainfall (in) 0.58
Total Runoff (in) 0.34
Peak Runoff (cfs) 1.80
Rainfall Intensity 3.513
Weighted Runoff Coefficient 0.5900
Time of Concentration (days hh:mm:ss) 0 00:09:52

APPENDIX C: PROPOSED HYDROLOGIC CALCULATIONS

latitude 33
PLANNING & ENGINEERING
9968 Hibert Street 2nd Floor, San Diego, CA 92131
Tel 858.751.0633

PROPOSED HYDROLOGY

SCALE: 1"=40'
DATE: 1/11/2017
PREPARED BY: AAB



LEGEND

- BUILDING
- ASPHALT
- CONCRETE
- TERRACE
- LANDSCAPE
- BMP AREA
- GRASSCRETE
- DMA
- AREA
- DMA BOUNDARY

PROPOSED DMA TABLE					
DMA NO.	TOTAL AREA	WEIGHTED C	HARDSCAPE (AC)	LANDSCAPE (AC)	GRASSCRETE (AC)
1	1.04 AC	0.54	0.20	0.84	0.00
2	1.13 AC	0.66	0.51	0.59	0.03
3	0.75 AC	0.82	0.62	0.13	0.00
4	0.68 AC	0.90	0.68	0.00	0.00
5	1.08 AC	0.81	0.86	0.22	0.00
6	1.20 AC	0.27	0.36	0.60	0.25
7	0.41 AC	0.45	0.00	0.41	0.00

latitude 33
PLANNING & ENGINEERING
9968 Hibert Street 2nd Floor, San Diego, CA 92131
Tel 858.751.0633

DMA MAP

9775 TOWNE CENTRE DRIVE
ATTACHMENT 1A

Project Description

File Name	PR SSA Model.SPF
Description	
	H:\1500\1517.00 - BioMed Realty - 9775 Towne Centre Drive\Engineering\Reports\Drainage\SSA\PR Parcels.dwg

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	Rational
Time of Concentration (TOC) Method	SCS TR-55
Link Routing Method	Hydrodynamic
Enable Overflow Ponding at Nodes	YES
Skip Steady State Analysis Time Periods	YES

Analysis Options

Start Analysis On	Jan 13, 2017	00:00:00
End Analysis On	Jan 14, 2017	00:00:00
Start Reporting On	Jan 13, 2017	00:00:00
Antecedent Dry Days	0	days
Runoff (Dry Weather) Time Step	0 01:00:00	days hh:mm:ss
Runoff (Wet Weather) Time Step	0 00:05:00	days hh:mm:ss
Reporting Time Step	0 00:05:00	days hh:mm:ss
Routing Time Step	30	seconds

Number of Elements

	Qty
Rain Gages	0
Subbasins	7
Nodes	12
Junctions	9
Outfalls	3
Flow Diversions	0
Inlets	0
Storage Nodes	0
Links	9
Channels	0
Pipes	9
Pumps	0
Orifices	0
Weirs	0
Outlets	0
Pollutants	0
Land Uses	0

Rainfall Details

Return Period	100 year(s)

Subbasin Summary

SN	Subbasin ID	Area (ac)	Weighted Runoff Coefficient	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	{Site 1}._P1	1.04	0.5400	0.37	0.20	0.20	2.46	0 00:05:00
2	{Site 1}._P2	1.13	0.6600	0.37	0.24	0.27	3.27	0 00:05:00
3	{Site 1}._P3	0.75	0.8200	0.56	0.46	0.35	2.18	0 00:09:34
4	{Site 1}._P4	0.68	0.9000	0.37	0.33	0.22	2.68	0 00:05:00
5	{Site 1}._P5	1.08	0.8100	0.40	0.32	0.35	3.78	0 00:05:26
6	{Site 1}._P6	1.20	0.2700	0.43	0.12	0.14	1.38	0 00:06:00
7	{Site 1}._P7	0.41	0.4500	0.53	0.24	0.10	0.66	0 00:08:51

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft²)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	Jun-01	Junction	388.00	390.50	0.00	0.00	0.00	2.18	388.20	0.00	2.30	0 00:00	0.00	0.00
2	Jun-03	Junction	373.00	388.00	0.00	0.00	0.00	12.34	374.78	0.00	13.22	0 00:00	0.00	0.00
3	Jun-04	Junction	377.00	378.00	0.00	0.00	0.00	3.26	378.00	0.00	0.00	0 00:05	0.00	0.00
4	Jun-05	Junction	376.00	377.00	0.00	6.00	0.00	4.31	376.32	0.00	1.18	0 00:00	0.00	0.00
5	Jun-06	Junction	374.00	388.50	0.00	0.00	0.00	7.09	375.02	0.00	13.48	0 00:00	0.00	0.00
6	Jun-07	Junction	375.00	378.00	0.00	0.00	0.00	2.68	375.46	0.00	2.54	0 00:00	0.00	0.00
7	Jun-08	Junction	380.00	393.00	0.00	0.00	0.00	3.71	380.53	0.00	12.47	0 00:00	0.00	0.00
8	Jun-09	Junction	383.00	394.00	0.00	0.00	0.00	3.78	383.63	0.00	10.37	0 00:00	0.00	0.00
9	Jun-10	Junction	377.00	381.00	0.00	0.00	0.00	1.38	377.48	0.00	3.52	0 00:00	0.00	0.00
10	OUT_1	Outfall	0.00					2.46	0.00					
11	OUT_2	Outfall	371.60					10.62	372.72					
12	OUT_3	Outfall	0.00					0.66	0.00					

Subbasin Hydrology

Subbasin : {Site 1}._P1

Input Data

Area (ac) 1.04
Weighted Runoff Coefficient 0.5400

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
LANDSCAPE	0.84	-	0.45
HARDSCAPE	0.20	-	0.90
Composite Area & Weighted Runoff Coeff.	1.04		0.54

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

Where :

Tc = Time of Concentration (hr)
n = Manning's roughness
Lf = Flow Length (ft)
P = 2 yr, 24 hr Rainfall (inches)
Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (Sf^0.5) (unpaved surface)
V = 20.3282 * (Sf^0.5) (paved surface)
V = 15.0 * (Sf^0.5) (grassed waterway surface)
V = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
V = 9.0 * (Sf^0.5) (cultivated straight rows surface)
V = 7.0 * (Sf^0.5) (short grass pasture surface)
V = 5.0 * (Sf^0.5) (woodland surface)
V = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)

Channel Flow Equation :

V = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
R = Aq / Wp
Tc = (Lf / V) / (3600 sec/hr)

Where :

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
R = Hydraulic Radius (ft)
Aq = Flow Area (ft²)
Wp = Wetted Perimeter (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)
n = Manning's roughness

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.013	0.00	0.00
Flow Length (ft) :	195	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.75	0.00	0.00
Velocity (ft/sec) :	1.02	0.00	0.00
Computed Flow Time (min) :	3.20	0.00	0.00

Channel Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.013	0.00	0.00
Flow Length (ft) :	460	0.00	0.00
Channel Slope (%) :	2	0.00	0.00
Cross Section Area (ft^2) :	.2	0.00	0.00
Wetted Perimeter (ft) :	1.5	0.00	0.00
Velocity (ft/sec) :	4.23	0.00	0.00
Computed Flow Time (min) :	1.81	0.00	0.00

Total TOC (min) 5.01

Subbasin Runoff Results

Total Rainfall (in) 0.37
Total Runoff (in) 0.20
Peak Runoff (cfs) 2.46
Rainfall Intensity 4.379
Weighted Runoff Coefficient 0.5400
Time of Concentration (days hh:mm:ss) 0 00:05:01

Subbasin : {Site 1}._P2

Input Data

Area (ac) 1.13
Weighted Runoff Coefficient 0.6600

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
GRASSCRETE	0.03	-	0.70
LANDSCAPE	0.59	-	0.45
HARDSCAPE	0.51	-	0.90
Composite Area & Weighted Runoff Coeff.	1.13		0.66

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.013	0.00	0.00
Flow Length (ft) :	252	0.00	0.00
Slope (%) :	6.4	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.75	0.00	0.00
Velocity (ft/sec) :	1.70	0.00	0.00
Computed Flow Time (min) :	2.46	0.00	0.00

Total TOC (min) 2.46

Subbasin Runoff Results

Total Rainfall (in) 0.37
Total Runoff (in) 0.24
Peak Runoff (cfs) 3.27
Rainfall Intensity 4.380
Weighted Runoff Coefficient 0.6600
Time of Concentration (days hh:mm:ss) 0 00:02:28

Subbasin : {Site 1}._P3

Input Data

Area (ac) 0.75
Weighted Runoff Coefficient 0.8200

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
HARDSCAPE	0.62	-	0.90
LANDSCAPE	0.13	-	0.45
Composite Area & Weighted Runoff Coeff.	0.75		0.82

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.4	0.00	0.00
Flow Length (ft) :	50	0.00	0.00
Slope (%) :	8	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.75	0.00	0.00
Velocity (ft/sec) :	0.09	0.00	0.00
Computed Flow Time (min) :	9.58	0.00	0.00

Total TOC (min) 9.58

Subbasin Runoff Results

Total Rainfall (in) 0.56
Total Runoff (in) 0.46
Peak Runoff (cfs) 2.18
Rainfall Intensity 3.540
Weighted Runoff Coefficient 0.8200
Time of Concentration (days hh:mm:ss) 0 00:09:35

Subbasin : {Site 1}._P4

Input Data

Area (ac) 0.68
Weighted Runoff Coefficient 0.9000

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
HARDSCAPE	0.68	-	0.90
Composite Area & Weighted Runoff Coeff.	0.68		0.90

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.013	0.00	0.00
Flow Length (ft) :	240	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.75	0.00	0.00
Velocity (ft/sec) :	1.06	0.00	0.00
Computed Flow Time (min) :	3.77	0.00	0.00

Total TOC (min) 3.77

Subbasin Runoff Results

Total Rainfall (in) 0.37
Total Runoff (in) 0.33
Peak Runoff (cfs) 2.68
Rainfall Intensity 4.380
Weighted Runoff Coefficient 0.9000
Time of Concentration (days hh:mm:ss) 0 00:03:46

Subbasin : {Site 1}._P5

Input Data

Area (ac) 1.08
Weighted Runoff Coefficient 0.8100

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
HARDSCAPE	0.86	-	0.90
LANDSCAPE	0.22	-	0.45
Composite Area & Weighted Runoff Coeff.	1.08		0.81

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.4	.013	0.00
Flow Length (ft) :	34	94	0.00
Slope (%) :	41	2	0.00
2 yr, 24 hr Rainfall (in) :	1.75	1.75	0.00
Velocity (ft/sec) :	0.15	0.88	0.00
Computed Flow Time (min) :	3.66	1.78	0.00

Total TOC (min) 5.44

Subbasin Runoff Results

Total Rainfall (in) 0.40
Total Runoff (in) 0.32
Peak Runoff (cfs) 3.78
Rainfall Intensity 4.319
Weighted Runoff Coefficient 0.8100
Time of Concentration (days hh:mm:ss) 0 00:05:26

Subbasin : {Site 1}._P6

Input Data

Area (ac) 1.20
Weighted Runoff Coefficient 0.2700

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
HARDSCAPE	0.36	-	0.90
GRASSCRETE	0.25	-	0.00
LANDSCAPE	0.60	-	0.00
Composite Area & Weighted Runoff Coeff.	1.21		0.27

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.4	.013	0.00
Flow Length (ft) :	33	72	0.00
Slope (%) :	42	7	0.00
2 yr, 24 hr Rainfall (in) :	1.75	1.75	0.00
Velocity (ft/sec) :	0.16	1.38	0.00
Computed Flow Time (min) :	3.54	0.87	0.00

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	336	0.00	0.00
Slope (%) :	3	0.00	0.00
Surface Type :	Paved	Unpaved	Unpaved
Velocity (ft/sec) :	3.52	0.00	0.00
Computed Flow Time (min) :	1.59	0.00	0.00

Total TOC (min) 6.00

Subbasin Runoff Results

Total Rainfall (in) 0.43
Total Runoff (in) 0.12
Peak Runoff (cfs) 1.38
Rainfall Intensity 4.250
Weighted Runoff Coefficient 0.2700
Time of Concentration (days hh:mm:ss) 0 00:06:00

Subbasin : {Site 1}._P7

Input Data

Area (ac) 0.41
Weighted Runoff Coefficient 0.4500

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
LANDSCAPE	0.41	-	0.45
Composite Area & Weighted Runoff Coeff.	0.41		0.45

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	.4	0.00	0.00
Flow Length (ft) :	92	0.00	0.00
Slope (%) :	33	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.75	0.00	0.00
Velocity (ft/sec) :	0.17	0.00	0.00
Computed Flow Time (min) :	8.85	0.00	0.00

Total TOC (min) 8.85

Subbasin Runoff Results

Total Rainfall (in) 0.53
Total Runoff (in) 0.24
Peak Runoff (cfs) 0.66
Rainfall Intensity 3.621
Weighted Runoff Coefficient 0.4500
Time of Concentration (days hh:mm:ss) 0 00:08:51

ATTACHMENT 6
GEOTECHNICAL AND GROUNDWATER INVESTIGATION REPORT

Attach project's geotechnical and groundwater investigation report. Refer to Appendix C.4 to determine the reporting requirements.

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GEOTECHNICAL INVESTIGATION

9775 TOWNE CENTRE DRIVE
SAN DIEGO, CALIFORNIA

GEOCON
INCORPORATED

GEOTECHNICAL
ENVIRONMENTAL
MATERIALS

PREPARED FOR

BMR-APEX LP
SAN DIEGO, CALIFORNIA

DECEMBER 16, 2016
PROJECT NO. G2059-42-01

GEOCON
INCORPORATED
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS

Project No. G2059-42-01
December 16, 2016

BMR-APEX LP
17190 Bernardo Center Drive
San Diego, California 92128

Attention: Mr. Federico Mina

Subject: GEOTECHNICAL INVESTIGATION
9775 TOWNE CENTRE DRIVE
SAN DIEGO, CALIFORNIA

Dear Mr. Mina:

In accordance with your request and authorization of our proposal (LG-16427, dated October 28, 2016), we herein submit the results of our geotechnical investigation for the subject project. We performed our investigation to evaluate the underlying soil and geologic conditions and potential geologic hazards and to assist in the design of the proposed building and associated improvements and provide storm water management recommendations.

The accompanying report presents the results of our study and conclusions and recommendations pertaining to the geotechnical aspects of the proposed project. The site is suitable for the proposed building and improvements provided the recommendations of this report are incorporated into the design and construction of the planned project.

Should you have questions regarding this report, or if we may be of further service, please contact the undersigned at your convenience.

Very truly yours,

GEOCON INCORPORATED

Noel G. Borja
Senior Staff Engineer

Rodney C. Mikesell
GE 2533

Garry W. Cannon
CEG 2201
RCE 56468

REGISTERED PROFESSIONAL ENGINEER
RODNEY C. MIKESELL
No.2533
GEOTECHNICAL
STATE OF CALIFORNIA

PROFESSIONAL GEOLOGIST
GARRY WELLS CANNON
NO. 2201
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
GARRY WELLS CANNON
No. C 056468
CIVIL
STATE OF CALIFORNIA

NGB:RCM:GWC:dmc

(1) Addressee
(3del) Latitude 33
Attention: Mr. Jon Arenez

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GEOTECHNICAL INVESTIGATION

1. PURPOSE AND SCOPE

This report presents the results of our geotechnical investigation for the proposed new office building located at 9775 Towne Centre Drive in San Diego, California (see Vicinity Map, Figure 1). The purpose of this geotechnical investigation is to evaluate the surface and subsurface soil conditions; general site geology; and to identify geotechnical constraints that may impact the planned improvements to the property. This report also provides 2016 CBC seismic design criteria; grading recommendations; shoring, tie-back, and soil nail wall recommendations; building foundation and concrete slab-on-grade recommendations; concrete flatwork, preliminary pavement recommendations; and retaining wall and lateral load recommendations.

The field investigation consisted of drilling five, small-diameter borings to evaluate the underlying geologic conditions within the area of planned improvements. We also performed infiltration testing at four locations using a Soil Moisture Corp Aardvark Permeameter.

The locations of the small-diameter borings and infiltration tests are shown the *Geologic Map*, Figure 2, and on the *Geologic Cross-Sections,* Figure 3. The base map used for Figure 2 is an electoric CAD file provided Latitude 33. Logs of the exploratory borings and a detailed discussion of the field investigation are presented in Appendix A.

We performed laboratory tests on selected soil samples obtained during the field investigation to evaluate pertinent physical properties for engineering analyses and to assist in providing recommendations for site grading and foundation design criteria. Details of the laboratory testing and a summary of test results are presented in Appendix B.

The conclusions and recommendations presented herein are based on analyses of the data obtained from the field investigation, laboratory tests, and our experience with similar soil and geologic conditions.

2. SITE AND PROJECT DESCRIPTION

The site is located at 9775 Towne Centre Drive, east of Towne Centre Court (see Site Vicinity Map, Figure 1). An existing building occupies the central portion of the site surrounded by asphalt concrete and concrete pavement aeras. The property is bordered by existing multi-story buildings to the northwest and southeast, by Towne Centre Drive on the southwest, and by an approximately 200-foot-high, native decending hillside to the east.

Based on our discussions with you and review of the referenced project plan, proposed development will consist of demolishing the existing structure and grading the site to construct a 4-story building with a multi-level, subterranean, parking garage. We understand the depth of the proposed parking structure will be approximately 30 feet below surface grade, with a small turn-around area that will be 40 feet below surface grade.

The above locations, site descriptions, and proposed development are based on our site reconnaissance, review of published geologic literature, field investigations, and discussions with the project civil engineer. If development plans differ from those described herein, Geocon Incorporated should be contacted for review of the plans and possible revisions to this report.

3. GENERAL GEOLOGY AND GEOLOGIC SETTING

The project site is located within the Peninsular Ranges Geomorphic Province. The region is characterized by northwest-trending structural blocks and intervening fault zones. The rock types in the Peninsular Ranges include igneous rocks, associated with the Cretaceous-age Southern California Batholith, intruded into older metamorphic rock. In the western part of the county and along the coastal areas the basement rock is overlain by a thick sequence of Cretaceous to Tertiary-age sedimentary deposits, which are the result of transgressive and regressive cycles of the sea. These deposits in turn are partially covered by several Quaternary-age terrace deposits.

The site is located atop a ridge with canyon drainages bordering the site along the northeast to east. These drainages flow northward toward Sorrento Creek, which flows northwest to the ocean.

4. SOIL AND GEOLOGIC CONDITIONS

During our field investigation, we encountered two surficial units consisting of undocumented fill and very old terrace deposits and one geologic unit consisting of the Ardath Formation. The surficial and geologic units are discussed herein. The approcimate occurrence and thickness of the units encountered, including descriptions, are shown on the Geologic Map (Figure 2), Geologic Cross Sections (Figure 3), and on the exploratory boring logs in Appendix A. We prepared the geologic cross-sections using interpolation between exploratory borings; therefore, actual geologic conditions between the borings may vary from those illustrated and should be considered approximate.

4.1 Undocumented Fill (Qudf)

We encountered minor fill less than 2 feet thick in borings B-1, B-2, B-4, and B-5. The fill consists of silty to clayey sand and sandy to silty clay. The fill is likely associated with original grading of the parking lots. We expect all of the undocumented fill within the building pad will be removed to achieve the subterranean pad grade. Fill outside of the building pad in pavement and hardscape areas should be removed to expose the undelying terrace deposits or Ardath Formation and replaced as compacted fill.

4.2 Very Old Terrace Deposits (Qt)

We encountered early to middle Pleistocene-age terrace deposits mapped by Kennedy and Tan (2008) as very old paralic deposits at grade or below the undocumented fill in our exploratory borings. The terrace depoists had a thicknesses up to approximately 16 feet at the boring locations. This unit consists of dense to very dense, damp to moist, silty sand. This unit can be interlayered with gravel, cobble, and cemented layers. Difficult excavation and localized cementation may occur within this unit. The very old terrace deposits are suitable for support of properly compacted fill and structural loading.

4.3 Ardath Formation (Ta)

We encountered the Ardath Formation underlying the very old terrace deposits in our exploratory borings. The Ardath Formation consists of dense to very dense, stiff to hard, mottled yellowish brown and gray to olive brown, interbedded sandstoneand siltstone. We expect the foundation system for the proposed new building will bear on the Ardath Formation. The Ardath Formation is suitable for support of structural loading in its present condition.

5. GROUNDWATER

We did not encounter groundwater or seepage during the site investigation. We do not expect groundwater or seepage to be encountered during construction of the proposed development; however, it is not uncommon for seepage conditions to exist within the near surface elevations or develop where none previously existed. Seepage is dependent on seasonal precipitation, irrigation, land use, among other factors, and varies as a result. Proper surface drainage will be important to future performance of the project.

6. GEOLOGIC HAZARDS

6.1 Geologic Hazard Category

The City of San Diego (2008), Sheet 34 defines the site as Hazard Category 51: *Level mesas – underlain by terrace deposits and bedrock, nominal risk* and as a Hazard Category 53: *Level or sloping terrain, unfavorable geologic structure, low to moderate risk*. The natieve hillside east of the site is defiend as Category 25: *Ardath: neutral or favorable geologic structure.*

6.2 Faulting

An active fault is defined by the California Geological Survey (CGS) as a fault showing evidence for activity within the last 11,000 years. The site is not located within a State of California Earthquake

Fault Zone. The nearest active fault is the Newport-Inglewood/Rose Canyon Fault Zone, which is located approximately 4 miles west of the site.

The City of San Diego (2008) Map Sheet 34 maps a fault traversing the descending slope located northeast and east of the site and labels the fault as *potentially active, inactive, presumed inactive, or activity unknown*. Kennedy and Tan (2008) show unfaulted very old terrace deposits over the fault; therefore, the faulting is older than 11,000 years. A review of the *USGS Quaternary Fault and Fold Database of the United States* (http://geohazards.usgs.gov) indicates that the fault mapped by the City of San Diego Seismic Safety Study (2008) and Kennedy and Tan (2008) is not a Quaternary-aged fault.

6.3 Seismicity

According to the computer program *EZ-FRISK* (Version 7.65), seven known active faults are located within a search radius of 50 miles from the property. We used the 2008 USGS fault database that provides several models and combinations of fault data to evaluate the fault information. The nearest known active faults are the Newport-Inglewood/Rose Canyon Fault system, located approximately 4 miles west of the site and is the dominant source of potential ground motion. Earthquakes that might occur on the Newport-Inglewood/Rose Canyon Fault Zone or other faults within the southern California and northern Baja California area are potential generators of significant ground motion at the site. The estimated deterinistic maximum earthquake magnitude and peak ground acceleration for the Newport-Inglewood Fault are 7.5 and 0.45g, respectively. Table 6.3.1 lists the estimated maximum earthquake magnitude and peak ground acceleration for these and other faults in relationship to the site location. We used acceleration attenuation relationships developed by Boore-Atkinson (2008) NGA USGS2008, Campbell-Bozorgnia (2008) NGA USGS, and Chiou-Youngs (2007) NGA USGS 2008 acceleration-attenuation relationships in our analysis.

TABLE 6.3.1
DETERMINISTIC SITE PARAMETERS

Fault Name	Distance from Site (miles)	Maximum Earthquake Magnitude (Mw)	Peak Ground Acceleration		
			Boore-Atkinson 2008 (g)	Campbell-Bozorgnia 2008 (g)	Chiou-Youngs 2007 (g)
Newport-Inglewood	4	7.5	0.36	0.36	0.45
Rose Canyon	4	6.9	0.31	0.35	0.38
Coronado Bank	17	7.4	0.17	0.13	0.16
Palos Verdes Connected	17	7.7	0.19	0.14	0.18
Elsinore	34	7.85	0.13	0.09	0.11
Earthquake Valley	41	6.8	0.06	0.05	0.04
Palos Verdes	49	7.3	0.07	0.05	0.05

It is our opinion the site could be subjected to moderate to severe ground shaking in the event of an earthquake along any of the faults listed on Table 6.3.1 or other faults in the southern California/ northern Baja California region. We do not consider the site to possess a greater risk than that of the surrounding developments.

We used the computer program *EZ-FRISK* to perform a probabilistic seismic hazard analysis. The computer program *EZ-FRISK* operates under the assumption that the occurrence rate of earthquakes on each mapped Quaternary fault is proportional to the faults slip rate. The program accounts for earthquake magnitude as a function of fault rupture length, and site acceleration estimates are made using the earthquake magnitude and distance from the site to the rupture zone. The program also accounts for uncertainty in each of following: (1) earthquake magnitude, (2) rupture length for a given magnitude, (3) location of the rupture zone, (4) maximum possible magnitude of a given earthquake, and (5) acceleration at the site from a given earthquake along each fault. By calculating the expected accelerations from considered earthquake sources, the program calculates the total average annual expected number of occurrences of site acceleration greater than a specified value. We utilized acceleration-attenuation relationships suggested by Boore-Atkinson (2008) NGA USGS 2008, Campbell-Bozorgnia (2008) NGA USGS 2008, and Chiou-Youngs (2007) NGA USGS 2008 in the analysis. Table 6.3.2 presents the site-specific probabilistic seismic hazard parameters including acceleration-attenuation relationships and the probability of exceedence.

TABLE 6.3.2
PROBABILISTIC SEISMIC HAZARD PARAMETERS

Probability of Exceedence	Peak Ground Acceleration		
	Boore-Atkinson 2008 (g)	Campbell-Bozorgnia 2008 (g)	Chiou-Youngs 2007 (g)
2% in a 50 Year Period	0.45	0.47	0.53
5% in a 50 Year Period	0.30	0.31	0.34
10% in a 50 Year Period	0.21	0.21	0.22

While listing peak accelerations is useful for comparison of potential effects of fault activity in a region, other considerations are important in seismic design, including the frequency and duration of motion and the soil conditions underlying the site. Seismic design of the structures should be evaluated in accordance with the 2016 California Building Code (CBC) guidelines or guidelines currently adopted by the City of San Diego.

6.4 Ground Rupture

The risk associated with ground rupture hazard is low due to the absence of faults traversing the subject site.

6.5 Seiches and Tsunamis

The property is located at an elevation of about 390 feet above MSL and is about 2½ miles from the Pacific Ocean; therefore, the risk of inundation hazard due to tsunamis is low.

The site is not located near or downstream of any large body of water; therefore, the risk associated with inundation due to seiche is low.

6.6 Liquefaction and Seismically Induced Settlement

Due to the absence of a near surface groundwater elevation and the dense to very dense nature of the on-site soils, the risk associated with ground failure or settlement due to liquefaction is low.

6.7 Landslides

We did not observe indications of landsliding or landslide deposits during this investigation. The City of San Diego (2008) maps an area approximately 400 feet east of the site within the native hillside slope as *Landslides: confirmed, known, or highly suspected.* It is our opinion landslides are not present within the subject property or in an area that could affect the project. The risk associated with landslide hazard is low.

7. CONCLUSIONS AND RECOMMENDATIONS

7.1 General

7.1.1 From a geotechnical engineering standpoint, it is our opinion that the site is suitable for development of the proposed project provided the recommendations presented herein are implemented in design and construction of the project.

7.1.2 Our field investigation indicates the site is underlain by minor undocumented fill overlying very old terrace deposits and the Ardath Formation.

7.1.3 The site is located approximately 4 miles from the nearest active fault, the Newport-Inglewood/Rose Canyon Fault Zone. It is our opinion that active or potentially active faults do not cross the site.

7.1.4 The risk associated with geologic hazards due to ground rupture, liquefaction, and landslides are low.

7.1.5 We did not encounter groundwater or seepage during our field investigation. We do not expect groundwater or seepage to be encountered during construction of the proposed development.

7.1.6 Excavation of the undocumented fill should generally be possible with moderate to heavy effort using conventional, heavy-duty equipment during grading and trenching operations. We expect excavations for the subterranean parking garage will extend into the very old terrace deposits and the Ardath Formaiton. Excavations into these units may require very heavy effort and possible rock breaking if cemented zones are encountered.

7.1.7 Excavation for the subterranean parking garage will likely remove all undocumented fill within the building pad. We anticipate that the foundation for the building will bear entirely on the Ardath Formation. In structural improvement aeas outside of the building pad, the undocumented fill should be removed and replaced as compacted fill. Where highly expansive clays are encountered, we recommend the expansive soils be part of the export operation and not be reused as compacted fill in structural improvement areas. The very old terrace deposits and Ardath Formaiton are suitable for the support of compacted fill and settlement-sensitive structures.

7.1.8 Surface settlement monuments will not be required on the project; however, monitoring of temporary shoring, as discussed herein, should be performed.

7.1.9 Subsurface conditions observed may be extrapolated to reflect general soil and geologic conditions; however, variations in subsurface conditions between exploratory borings should be expected.

7.1.10 With the exception of retaining wall drains, we do not expect other subdrains are required for this project.

7.1.11 Final grading or foundation plans have not been provided for our review. Geocon Incorporated should review the plans prior to the submittal to regulatory agencies for approval. Additional analyses may be required once the plans have been provided.

7.2 Excavation and Soil Characteristics

7.2.1 Excavation of the undocumented fill should generally be possible with moderate to heavy effort using conventional, heavy-duty equipment. We expect very heavy effort will be required in the very old terrace deposits and Ardath Formation. Excavatins in the very old terrace deposits and Ardath Formation may encountered cemented zone that require rock breaking to facilite removal. Oversize material from the excavations will require special handling.

7.2.2 The soil encountered in our field investigation is considred to be both “non-expansive” (Expansion Index [EI] of 20 or less) and “expansive” (EI greater than 20) as defined by 2016 California Building Code (CBC) Section 1803.5.3. Table 7.2 presents soil classifications based on the expansion index.

TABLE 7.2
EXPANSION CLASSIFICATION BASED ON EXPANSION INDEX

Expansion Index (EI)	Expansion Classification	2016 CBC Expansion Classification
0 – 20	Very Low	Non-Expansive
21 – 50	Low	Expansive
51 – 90	Medium	
91 – 130	High	
Greater Than 130	Very High	

7.2.3 We performed laboratory tests on samples of the site materials to evaluate the percentage of water-soluble sulfate content. Appendix B presents the results from the laboratory water-soluble sulfate content tests. The test results indicate that on-site materials at the locations tested possess “Not Applicable” and “S0” sulfate exposure to concrete structures, as defined by 2016 CBC Section 1904 and ACI 318-14 Chapter 19. The presence of water-soluble sulfates is not a visually discernible characteristic. Therefore, other soil samples from the site could yield different concentrations. Additionally, over time landscaping activities (i.e. addition of fertilizers and other soil nutrients) may affect the concentration.

7.2.4 Geocon Incorporated does not practice in the field of corrosion engineering. Therefore, if improvements that could be susceptible to corrosion are planned, further evaluation by a corrosion engineer may be needed.

7.3 Slope Stability

7.3.1 Slope stability analyses were performed utilizing average drained direct shear strength parameters from the laboratory shear test results. These analyses indicate that the existing native hillslide slope east of the site has a calculated factors of safety of at least 1.5 under static conditions for both deep-seated failure and shallow sloughing conditions. Slope stability calculations for both deep-seated and surficial slope stability are presented on Figures 4 and 5, respectively.

7.4 Grading

7.4.1 Grading should be performed in accordance with the *Recommended Grading Specifications* in Appendix D. Where the recommendations of this report conflict with Appendix D, the recommendations of this section take precedence.

7.4.2 A pre-construction conference with the city inspector, owner, general contractor, civil engineer, and soil engineer in attendance should be held at the site prior to the beginning of grading operations. Special soil handling requirements can be discussed at that time.

7.4.3 Earthwork should be observed and compacted fill tested by representatives of Geocon Incorporated.

7.4.4 Grading of the site should commence with the demolition of existing structures, pavement, removal of existing improvements, vegetation, and deleterious debris. Deleterious debris should be exported from the site and should not be mixed with the fill. Existing underground improvements within the proposed structure area should be removed and relocated. The resulting depressions should be properly backfilled in accordance with the procedures described herein.

7.4.5 Based on discussions with you and the results of our field investigation, we expect excavations to achieve eleveations for the subterranean parking garage will expose very old terrace deposits and the Ardath Formation. Remedial grading will not be required below finish subgrade elevations for the subterranean parking garage.

7.4.6 In areas of surface improvments (pavement, hardscape, etc.) outside of the building pad, undocumented fill should be removed and replaced as compacted fill. Where expansive soils are encountered (EI greater than 90), the expasnive soils should not be resued in structural improvement areas and should be exported from the site or used in non-structural areas. Where very old terrace deposts are encountered at subgrade elevaitons, no additional removals are requied.

7.4.7 Prior to placing fill, the base of excvations should be scarified to a depth of 12 inches, moisture conditioned as necessary, and compacted to a dry density of at least 90 percent of the laboratory maximum dry density near to slightly above optimum moisture content as determined by ASTM Test Method D 1557. Excavated soil that is generally free of deleterious debris and contamination can be placed as fill and compacted in layers to the design finish-grade elevations. Fill and backfill materials should be placed in loose thicknesses of 6 to 8 inches and compacted to a dry density of at least 90 percent of the relative compaction near to slightly above optimum moisture content.

7.4.8 Import fill (if necessary) should consist of granular materials with a “very low” to “low” expansion potential (EI of 50 or less) free of deleterious material or stones larger than 3 inches and should be compacted as recommended herein. Geocon Incorporated should be notified of the import source and should perform laboratory testing of import soil prior to its arrival at the site to evaluate its suitability as fill material.

7.5 Seismic Design Criteria

7.5.1 We used the computer program *U.S. Seismic Design Maps*, provided by the USGS. Table 7.5.1 summarizes site-specific design criteria obtained from the 2016 California Building Code (CBC; Based on the 2015 International Building Code [IBC] and ASCE 7-10), Chapter 16 Structural Design, Section 1613 Earthquake Loads. The short spectral response uses a period of 0.2 second. The building structure and improvements should be designed using a Site Class C. We evaluated the Site Class in accordance with Section 1613.3.2 of the 2016 CBC and Table 20.3-1 of ASCE 7-10 based on our experience with the site subsurface soils and exploratory boring information. The values presented in Table 7.5.1 are for the risk-targeted maximum considered earthquake (MCE_R).

TABLE 7.5.1
2016 CBC SEISMIC DESIGN PARAMETERS

Parameter	Value	2013 CBC Reference
Site Class	C	Table 1613.3.2
MCE_R Ground Motion Spectral Response Acceleration – Class B (short), S_S	1.093g	Figure 1613..3.1(1)
MCE_R Ground Motion Spectral Response Acceleration – Class B (1 sec), S_1	0.421g	Figure 1613.3.1(2)
Site Coefficient, F_A	1.000	Table 1613.3.3(1)
Site Coefficient, F_V	1.379	Table 1613.3.3(2)
Site Class Modified MCE_R Spectral Response Acceleration (short), S_{MS}	1.093g	Section 1613.3.3 (Eqn 16-37)
Site Class Modified MCE_R Spectral Response Acceleration – (1 sec), S_{M1}	0.580g	Section 1613.3.3 (Eqn 16-38)
5% Damped Design Spectral Response Acceleration (short), S_{DS}	0.729g	Section 1613.3.4 (Eqn 16-39)
5% Damped Design Spectral Response Acceleration (1 sec), S_{D1}	0.387g	Section 1613.3.4 (Eqn 16-40)

7.5.2 Table 7.5.2 presents additional seismic design parameters for projects located in Seismic Design Categories of D through F in accordance with ASCE 7-10 for the mapped maximum considered geometric mean (MCE_G).

TABLE 7.5.2
2016 CBC SITE ACCELERATION DESIGN PARAMETERS

Parameter	Value	ASCE 7-10 Reference
Mapped MCE_G Peak Ground Acceleration, PGA	0.460g	Figure 22-7
Site Coefficient, F_{PGA}	1.000	Table 11.8-1
Site Class Modified MCE_G Peak Ground Acceleration, PGA_M	0.460g	Section 11.8.3 (Eqn 11.8-1)

7.5.3 Conformance to the criteria in Tables 7.5.1 and 7.5.2 for seismic design does not constitute any kind of guarantee or assurance that significant structural damage or ground failure will not occur if a maximum level earthquake occurs. The primary goal of seismic design is to protect life and not to avoid all damage, since such design may be economically prohibitive.

7.6 Excavation Slopes, Shoring, and Tiebacks

7.6.1 Excavations to achieve basement level grade will likely require vertical shoring due to the excavation depth and proximity of adjacent improvements. Deflection of the shoring system should be limited so as to not impact adjacent structures and improvements.

7.6.2 The recommendations herein are provided for stable excavations and are submitted to the shoring and structural engineers to design a shoring system for the proposed excavations. The contractor should construct the temporary shoring system as designed by the project shoring engineer. The stability of the excavations is dependent on the design and construction of the shoring system. It is the responsibility of the contractor to provide a safe excavation during the construction of the proposed project. Geocon Incorporated cannot be responsible for site safety and the stability of the proposed excavations.

7.6.3 Temporary slopes should be made in conformance with OSHA requirements. The old terrace deposit and Ardath Formation can be considered Type A soil (Type B soil if seepage, groundwater, or cohesionless soil is encountered) in accordance with OSHA requirements. In general, no special shoring requirements will be necessary if temporary excavations will be less than 4 feet in height. Temporary excavations greater than 4 feet in height, however, should be sloped at an appropriate inclination. These excavations should not be allowed to become saturated or to dry appreciably. Surcharge loads should not be permitted to a distance equal to the height of the excavation from the top of the excavation. The top of the excavation should be a minimum of 15 feet from the edge of existing improvements. Excavations steeper than those recommended or closer than 15 feet from an existing buildings and surface improvement should be shored in accordance with applicable OSHA codes and regulations.

7.6.4 The design of temporary shoring is governed by soil and groundwater conditions and by the depth and width of the excavated area. Continuous support of the excavation face can be provided by a system of soldier piles and wood lagging. Excavations exceeding 15 feet may require tie back anchors or internal bracing to provide additional wall restraint.

7.6.5 In general, ground conditions are moderately suited to soldier pile and tieback anchor construction techniques. However, localized gravel, cobble, and cemented material will likely be encountered that could be difficult to drill. Additionally, relatively clean sands may be encountered within the excavation that may result in some raveling of the unsupported excavation.

7.6.6 For level backfill conditions behind the shoring system, temporary shoring should be designed using a lateral pressure envelope acting on the back of the shoring and applying a pressure equal to 26H, 17H, or 21H, for a triangular, rectangular, or trapezoidal distribution, respectively, where H is the height, in feet, of the shoring (resulting pressure in pounds per square foot) as shown in Figure 6. These values are based on estimated maximum wall height up to 40 feet. Triangular distribution should be used for cantilevered shoring and the trapezoidal and rectangular distribution should be used for multi-braced systems such as tieback anchors and rakers. The project shoring engineer should determine the applicable soil distribution for the design of the temporary shoring system. Additional lateral earth pressure due to the surcharging effects of adjacent structures, soil, or traffic loads should be considered, where appropriate, during design of the shoring system.

7.6.7 Passive soil pressure resistance for embedded portions of soldier piles can be based upon an equivalent passive soil fluid weight of 500 + 375D, where D is the depth of embedment (resulting in pounds per square foot), as shown on Figure 7. The passive resistance can be assumed to act over a width of three pile diameters. Typically, soldier piles are embedded a minimum of 0.5 times the maximum height of the excavation (this depth is to include footing excavations) if tieback anchors are not employed. The project structural engineer should determine the actual embedment depth.

7.6.8 Drilled shafts for the soldier piles should be observed by Geocon Incorporated prior to the placement of steel reinforcement to check that the exposed soil conditions are similar to those expected and that footing excavations have been extended to the appropriate bearing strata, and design depths. If unexpected soil conditions are encountered, foundation modifications may be required.

7.6.9 Lateral movement of shoring is associated with vertical ground settlement outside of the excavation. Therefore, it is essential that the soldier pile and tieback system allow very limited amounts of lateral displacement. Earth pressures acting on a lagging wall can cause movement of the shoring toward the excavation and result in ground subsidence outside of the excavation. Consequently, horizontal movements of the shoring wall should be accurately monitored and recorded during excavation and anchor construction.

7.6.10 Survey points should be established at the top of the pile on at least 20 percent of the soldier piles. An additional point located at an intermediate point between the top of the pile and the base of the excavation should be monitored on at least 20 percent of the piles if tieback anchors will be used. These points should be monitored on a weekly basis during excavation work and on a monthly basis thereafter until the permanent support system is constructed.

7.6.11 The project civil engineer should provide the approximate location, depth, and pipe type of the underground utilities adjacent to the site to the shoring engineer to help select the appropriate shoring type and design. The shoring system should be designed to limit horizontal and vertical soldier pile movement to a maximum of 1 inch and ½ inch, respectively. The amount of horizontal deflection can be assumed to be essentially zero along the Active Zone and Effective Zone boundary. The magnitude of movement for intermediate depths and distances from the shoring wall can be linearly interpolated. We understand the City of San Diego may require the developer to prepare a hold harmless agreement for the planned construction and development regarding potential damage to the existing utilities and improvements.

7.6.12 Tieback anchors employed in shoring should be designed such that anchors fully penetrate the Active Zone behind the shoring. The Active Zone can be considered the wedge of soil from the face of the shoring to a plane extending upward from the base of the excavation at a 30-degree angle from vertical, as shown on Figure 8. Normally, tieback anchors are contractor-designed and installed, and there are numerous anchor construction methods available. Non-shrinkage grout should be used for the construction of the tieback anchors.

7.6.13 The recommendations contained herein including the lateral earth pressures assume a temporary wall condition. Geocon Incorporated should be consulted to provide additional recommendations if the shoring wall will be a permanent structure.

7.6.14 Experience has shown that the use of pressure grouting during formation of the bonded portion of the anchor will increase the soil-grout bond stress. A pressure grouting tube should be installed during the construction of the tieback. Post grouting should be performed if adequate capacity cannot be obtained by other construction methods.

7.6.15 Anchor capacity is a function of construction method, depth of anchor, batter, diameter of the bonded section, and the length of the bonded section. Anchor capacity should be evaluated using the strength parameters shown in Table 7.6.

TABLE 7.6
SOIL STRENGTH PARAMETERS FOR TEMPORARY SHORING

Description	Cohesion (psf)	Friction Angle (Degrees)
Very Old Terrace Deposits	485	26
Ardath Formation	425	36

7.6.16 Grout should only be placed in the tieback anchor's bonded section prior to testing. Tieback anchors should be proof-tested to at least 130 percent of the anchor's design working load. Following a successful proof test, the tieback anchors should be locked off at 80 percent of the allowable working load. Tieback anchor test failure criteria should be established in project plans and specifications. The tieback anchor test failure criteria should be based upon a maximum allowable displacement at 130 percent of the anchor's working load (anchor creep) and a maximum residual displacement within the anchor following stressing. Tieback anchor stressing should only be conducted after sufficient hydration has occurred within the grout. Tieback anchors that fail to meet project specified test criteria should be replaced or additional anchors should be constructed.

7.6.17 Lagging should keep pace with excavation and tieback anchor construction. The excavation should not be advanced deeper than three feet below the bottom of lagging at any time. These unlagged gaps of up to three feet should only be allowed to stand for short periods of time in order to decrease the probability of soil instability and should never be unsupported overnight. Backfilling should be conducted when necessary between the back of lagging and excavation sidewalls to reduce sloughing in this zone and all voids should be filled by the end of each day. Further, the excavation should not be advanced further than four feet below a row of tiebacks prior to those tiebacks being proof tested and locked off.

7.6.18 If tieback anchors are employed, an accurate survey of existing utilities and other underground structures adjacent to the shoring wall should be conducted. The survey should include both locations and depths of existing utilities. Locations of anchors should be adjusted as necessary during the design and construction process to accommodate the existing and proposed utilities.

7.6.19 The condition of existing buildings, streets, sidewalks, and other structures/ improvements around the perimeter of the planned excavation should be documented prior to the start of shoring and excavation work. Special attention should be given to documenting existing cracks or other indications of differential settlement within these adjacent structures, pavements and other improvements. Underground utilities sensitive to settlement should be videotaped prior to construction to check the integrity of pipes. In addition, monitoring points should be established indicating location and elevation around the excavation and on existing buildings. These points should be monitored on a weekly basis during excavation work and on a monthly basis thereafter. Inclinometers should be installed and monitored behind any shoring sections that will be excavated deeper than 30 feet below the existing ground surface.

7.6.20 Tieback anchors within the City right-of-way should be removed in conformance with City of San Diego requirements. Geocon Incorporated should observe and document the removal of the anchors.

7.7 Conventional Shallow Foundations

7.7.1 The following shallow foundation recommendations assume all structural footings will be founded directly on the old terrace deposit or Ardath Formation. Foundations can consist of continuous strip footings and/or isolated spread footings. Continuous footings should be at least 18 inches wide and extend at least 24 inches below lowest adjacent pad grade. Isolated spread footings should have a minimum width and depth of 2 feet. Concrete reinforcement for continuous footings should consist of at least four, No. 5 steel, reinforcing bars placed horizontally in the footings; two near the top and two near the bottom. The project structural engineer should design the concrete reinforcement for the spread footings. A typical wall/column footing dimension detail is presented on Figure 9.

7.7.2 Concrete reinforcement for continuous footings should consist of at least four No. 5 steel, reinforcing bars placed horizontally in the footings; two near the top and two near the bottom. Steel reinforcement for the spread footings should be designed by the project structural engineer.

7.7.3 The minimum reinforcement recommended herein is based on soil characteristics only (EI of 90 or less) and is not intended to replace reinforcement required for structural considerations.

7.7.4 The recommended allowable bearing pressure for foundations with minimum dimensions described herein is 6,000 psf for footings bearing in undisturbed very old terrace deposits and 8,000 psf for footings bearing in undisturbed Ardath Formation. The allowable soil bearing pressure may be increased by an additional 500 psf for each additional foot of depth and 300 psf for each additional foot of width, to a maximum allowable bearing capacity of 8,000 psf for the very old terrace deposit and 10,000 psf for the Ardath Formation. The values presented herein are for dead plus live loads and may be increased by one-third when considering transient loads due to wind or seismic forces. These values are based on an excavation depth of approximately 20 to 40 feet.

7.7.5 We estimate the total and differential settlements under the imposed allowable loads to be ½ inch using an 8-foot square foundation. We estimate the total and differential settlements under the imposed allowable loads to be 1-inch using a 15-foot-square foundation. We should be contacted to provide additional settlement calculations for larger foundations.

7.7.6 Where buildings or other improvements are planned near the top of a slope steeper than 3:1 (horizontal to vertical), special foundations and/or design considerations are recommended due to the tendency for lateral soil movement to occur. Building and retaining wall footings should be deepened such that the bottom outside edge of the footing is at least 7 feet horizontally from the face of the slope.

7.7.7 Foundation excavations should be observed by the geotechnical engineer (a representative of Geocon Incorporated) prior to the placement of reinforcing steel to check that the exposed soil conditions are similar to those expected and that they have been extended to the appropriate bearing strata. Foundation modifications may be required if unexpected soil conditions are encountered.

7.8 Concrete Slabs-on-Grade

7.8.1 The concrete slab-on-grade for the structure should be at least 5 inches thick. As a minimum, reinforcement for slabs-on-grade should consist of No. 4 steel, reinforcing bars placed at 18 inches on center in both directions.

7.8.2 The concrete slab-on-grade recommendations are based on soil support characteristics only. The project structural engineer should evaluate the structural requirements of the concrete slabs for supporting equipment and storage loads.

7.8.3 A vapor retarder should underlie slabs that may receive moisture-sensitive floor coverings or may be used to store moisture-sensitive materials. The vapor-retarder design should be consistent with the guidelines presented in the American Concrete Institute's (ACI) *Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials* (ACI 302.2R-06). The project architect or developer should specify the type of vapor retarder used based on the type of floor covering that will be installed and if the structure will possess a humidity-controlled environment.

7.8.4 The bedding sand or crushed aggregate thickness (if needed) should be determined by the project foundation engineer, architect, and/or developer. However, we should be contacted to provide recommendations if the bedding sand is thicker than 6 inches. It is common to see 3 to 4 inches of sand or crushed aggregate

7.8.5 The foundation design engineer should provide appropriate concrete mix design criteria and curing measures to assure proper curing of the slab by reducing the potential for rapid moisture loss and subsequent cracking and/or slab curl. We suggest that the foundation design engineer present the concrete mix design and proper curing methods on the foundation plans. It is critical that the foundation contractor understands and follows the recommendations presented on the foundation plans.

7.8.6 Exterior concrete flatwork not subject to vehicular traffic should be a minimum of 4 inches thick and, when in excess of 8 feet square, should be reinforced with 6 x 6 - W2.9/W2.9 (6 x 6 - 6/6) welded wire mesh or No. 3 steel, reinforcing bars at 24 inches on center in both directions to reduce the potential for cracking.

7.8.7 Concrete slabs should be provided with crack control joints to reduce and/or control shrinkage cracking. Crack control spacing should be determined by the project structural engineer based upon the slab thickness and intended usage. Criteria of the American Concrete Institute (ACI) should be taken into consideration when establishing crack control spacing.

7.8.8 Special subgrade presaturation is not deemed necessary prior to placing concrete; however, the exposed foundation and slab subgrade soil should be moisturized to maintain a moist condition as would be expected in any such concrete placement.

7.8.9 Where exterior flatwork abuts the structure at entrant or exit areas, the exterior slab should be dowelled into the structure's foundation stemwall. This recommendation is intended to reduce the potential for differential elevations that could result from differential settlement or minor heave of the flatwork. Dowelling details should be designed by the project structural engineer.

7.8.10 Geocon Incorporated should be consulted to provide additional design parameters as required by the structural engineer.

7.8.11 The recommendations presented herein are intended to reduce the potential for cracking of slabs and foundations as a result of differential movement. However, even with the incorporation of the recommendations presented herein, foundations and slabs-on-grade will still crack. The occurrence of concrete shrinkage cracks is independent of the soil supporting characteristics. Their occurrence may be reduced and/or controlled by: limiting the slump of the concrete; the use of crack control joints; and proper concrete placement and curing. Literature provided by the Portland Concrete Association (PCA) and American Concrete Institute (ACI) present recommendations for proper concrete mix, construction, and curing practices, and should be incorporated into project construction.

7.9 Retaining Walls

7.9.1 Retaining walls that are allowed to rotate more than 0.001H (where H equals the height of the retaining portion of the wall) at the top of the wall and having a level backfill surface should be designed for an active soil pressure equivalent to the pressure exerted by a fluid density of 35 pcf. Where the backfill will be inclined at 2:1 (horizontal:vertical), an active soil pressure of 52 pcf is recommended. These active pressures assume low expansive soil (Expansion Index less than 50) will be used as retaining wall backfill.

7.9.2 Where walls are restrained from movement at the top, an additional uniform pressure of 8H psf should be added to the active soil pressure where the wall possesses a height of 8 feet or less and 13H where the wall is greater than 8 feet.

7.9.3 Retaining walls subject to vehicular loads within a horizontal distance equal to two-thirds the wall height, a surcharge equivalent to 2 feet of fill soil should be added.

7.9.4 Soil contemplated for use as retaining wall backfill, including import materials, should identified prior to backfill. At that time Geocon Incorporated should obtain samples for laboratory testing to evaluate its suitability. Modified lateral earth pressures may be necessary if the backfill soil does not meet the required expansion index or shear strength. City or regional standard wall designs, if used, are based on a specific active lateral earth pressure and/or soil friction angle. In this regard, on-site soil to be used as backfill may or may not meet the values for standard wall designs. Geocon Incorporated should be consulted to assess the suitability of the on-site soil for use as wall backfill if standard wall designs will be used.

7.9.5 Unrestrained walls will move laterally when backfilled and loading is applied. The amount of lateral deflection is dependent on the wall height, the type of soil used for backfill, and loads acting on the wall. The wall designer should provide appropriate lateral deflection quantities for planned retaining walls structures, if applicable. These lateral values should be considered when planning types of improvements above retaining wall structures.

7.9.6 Retaining walls should be provided with a drainage system adequate to prevent the buildup of hydrostatic forces and should be waterproofed as required by the project architect. The use of drainage openings through the base of the wall (weep holes) is not recommended where the seepage could be a nuisance or otherwise adversely affect the property adjacent to the base of the wall. The above recommendations assume a properly compacted granular (EI of less than 50) free-draining backfill material with no hydrostatic forces or imposed surcharge load. :Figure 10 presents a typical retaining wall drainage detail. Figure 11 presents a soldier pile wall drainage detail. If conditions different than those described are expected, Geocon Incorporated should be contacted for additional recommendations.

7.9.7 The structural engineer should determine the seismic design category for the project in accordance with Section 1613 of the 2016 CBC. If the project possesses a seismic design category of D, E, or F, retaining walls that support more than 6 feet of backfill should be designed with seismic lateral pressure in accordance with Section 18.3.5.12 of the 2016 CBC. The seismic load is dependent on the retained height where H is the height of the wall, in feet, and the calculated loads result in pounds per square foot (psf) exerted at the base of the wall and zero at the top of the wall. A seismic load of 21H should be used for design. We used the peak ground acceleration adjusted for Site Class effects, PGA_M, of 0.460g calculated from ASCE 7-10 Section 11.8.3 and applied a pseudo-static coefficient of 0.33.

7.9.8 Foundation excavations should be observed by the geotechnical engineer (a representative of Geocon Incorporated) prior to the placement of reinforcing steel and concrete to observe that the exposed soil conditions are consistent with those anticipated and that they have been extended to the appropriate bearing strata. If unanticipated soil conditions are encountered, foundation modifications may be required.

7.10 Lateral Loading

7.10.1 To resist lateral loads, a passive pressure exerted by an equivalent fluid weight of 350 pounds per cubic foot (pcf) should be used for design of footings or shear keys poured neat against compacted fill. The allowable passive pressure assumes a horizontal surface extending at least 5 feet or three times the height of the surface generating the passive pressure, whichever is greater. The upper 12 inches of material not protected by floor slabs or pavement should not be included in the design for lateral resistance. Where walls are planned adjacent to and/or on descending slopes, a passive pressure of 150 pcf should be used in design.

7.10.2 If friction is to be used to resist lateral loads, an allowable coefficient of friction between soil and concrete of 0.35 should be used for design for footings founded in compacted fill or formational materials. The recommended passive pressure may be used concurrently with frictional resistance and may be increased by one-third for transient wind or seismic loading.

7.11 Preliminary Flexible and Rigid Pavement Recommendations

7.11.1 We calculated the flexible pavement sections for varying traffic indices (TIs) in general conformance with the *Caltrans Method of Flexible Pavement Design* (Highway Design Manual, Section 608.4). The project civil engineer or traffic engineer should provide the actual TI that is appropriate for the project based on anticipated traffic loading and volumes. Final pavement sections should be based on the R-Value of the subgrade soil encountered at final subgrade elevation. For preliminary design, we used an R-Value of 5 for the subgrade soil and 78 for the base materials. Table 7.11.1 presents the preliminary flexible pavement sections.

TABLE 7.11.1
PRELIMINARY ASPHALT CONCRETE PAVEMENT SECTIONS

Traffic Index	Asphalt Concrete (inches)	Class 2 Aggregate Base (inches)
4.5	3	8
5	3	10
5.5	3	12
6	4	9.5
6.5	4	13.5
7	4	15.5
7.5	4.5	14.5

7.11.2 Prior to placing base materials, the upper 12 inches of the subgrade soil should be scarified, moisture conditioned as necessary, and recompacted to a dry density of at least 95 percent of the laboratory maximum dry density near to slightly above optimum moisture content as determined by ASTM D 1557. Similarly, the base material should be compacted to a dry density of at least 95 percent of the laboratory maximum dry density near to slightly above optimum moisture content. Asphalt concrete should be compacted to a density of at least 95 percent of the laboratory Hveem density in accordance with ASTM D 2726.

7.11.3 Base materials should conform to Section 26-1.02B of the *Standard Specifications for The State of California Department of Transportation (Caltrans)* with a ¾-inch maximum size aggregate. The asphalt concrete should conform to Section 203-6 of the *Standard Specifications for Public Works Construction (Greenbook)*.

7.11.4 A rigid Portland cement concrete (PCC) pavement section should be placed in driveway entrance aprons, trash bin loading/storage areas and loading dock areas. The concrete pad for trash truck areas should be large enough such that the truck wheels will be positioned on the concrete during loading. We calculated the rigid pavement section in general conformance with the procedure recommended by the American Concrete Institute report ACI 330R-08 *Guide for Design and Construction of Concrete Parking Lots* using the parameters presented in Table 7.11.2.

TABLE 7.11.2
RIGID PAVEMENT DESIGN PARAMETERS

Design Parameter	Design Value
Modulus of subgrade reaction, k	100 pci
Modulus of rupture for concrete, M_R	500 psi
Traffic Category, TC	A and C
Average daily truck traffic, ADTT	10 and 100

7.11.5 Based on the criteria presented herein, the PCC pavement sections should have a minimum thickness as presented in Table 7.11.3.

TABLE 7.11.3
RIGID PAVEMENT RECOMMENDATIONS

Location	Portland Cement Concrete (inches)
Automobile Parking Areas (TC=A)	5.5
Heavy Truck and Fire Lane Areas (TC=C)	7.0

7.11.6 The PCC pavement should be placed over subgrade soil that is compacted to a dry density of at least 95 percent of the laboratory maximum dry density near to slightly above optimum moisture content. This pavement section is based on a minimum concrete compressive strength of approximately 3,250 psi (pounds per square inch). Base materials will not be required below concrete improvements.

7.11.7 A thickened edge or integral curb should be constructed on the outside of concrete slabs subjected to wheel loads. The thickened edge should be 1.2 times the slab thickness or a minimum thickness of 2 inches, whichever results in a thicker edge, and taper back to the recommended slab thickness 4 feet behind the face of the slab (e.g., a 7-inch-thick slab would have a 9-inch-thick edge). Reinforcing steel will not be necessary within the concrete for geotechnical purposes with the possible exception of dowels at construction joints as discussed herein.

7.11.8 To control the location and spread of concrete shrinkage cracks, crack-control joints (weakened plane joints) should be included in the design of the concrete pavement slab. Crack-control joints should not exceed 30 times the slab thickness with a maximum spacing of 12.5 feet and 15 feet for the 5.5 and 7-inch-thick slabs, respectively, and should be sealed with an appropriate sealant to prevent the migration of water through the control joint to the subgrade materials. The depth of the crack-control joints should be determined by the referenced ACI report.

7.11.9 To provide load transfer between adjacent pavement slab sections, a butt-type construction joint should be constructed. The butt-type joint should be thickened by at least 20 percent at the edge and taper back at least 4 feet from the face of the slab. As an alternative to the butt-type construction joint, dowelling can be used between construction joints for pavements of 7 inches or thicker. As discussed in the referenced ACI guide, dowels should consist of smooth, 1-inch-diameter reinforcing steel 14 inches long embedded a minimum of 6 inches into the slab on either side of the construction joint. Dowels should be located at the midpoint of the slab, spaced at 12 inches on center and lubricated to allow joint movement while still transferring loads. In addition, tie bars should be installed at the as recommended in Section 3.8.3 of the referenced ACI guide. The structural engineer should provide other alternative recommendations for load transfer.

7.12 Storm Water Management

7.12.1 If storm water management devices are not properly designed and constructed, there is a risk for distress to improvements and properties located hydrologically down gradient or adjacent to these devices. Factors such as the amount of water being detained, its residence time, and soil permeability have an important effect on seepage transmission and the potential adverse impacts that may occur if the storm water management features are not properly designed and constructed. We have not performed a hydrogeological study at the site. If infiltration of storm water runoff into the subsurface occurs, downstream improvements may be subjected to seeps, springs, slope instability, raised groundwater, movement of foundations and slabs, or other undesirable impacts as a result of water infiltration.

7.12.2 A summary of our study and storm water management recommendations are provided in Appendix C.

7.13 Site Drainage and Moisture Protection

7.13.1 Adequate site drainage is critical to reduce the potential for differential soil movement, erosion and subsurface seepage. Under no circumstances should water be allowed to pond adjacent to footings and improvements. The site should be graded and maintained such that surface drainage is directed away from structures in accordance with 2016 CBC 1804.4 or other applicable standards. In addition, surface drainage should be directed away from the top of slopes into swales or other controlled drainage devices. Roof and pavement drainage should be directed into conduits that carry runoff away from the proposed structure.

7.13.2 In the case of basement walls or building walls retaining landscaping areas, a water-proofing system should be used on the wall and joints and a Miradrain drainage panel (or equivalent) should be placed over the waterproofing. The project architect or civil engineer should provide detailed specifications on the plans for all waterproofing and drainage.

7.13.3 Underground utilities should be leak free. Utility and irrigation lines should be checked periodically for leaks, and detected leaks should be repaired promptly. Detrimental soil movement could occur if water is allowed to infiltrate the soil for prolonged periods of time.

7.13.4 Landscaping planters adjacent to paved areas are not recommended due to the potential for surface or irrigation water to infiltrate the pavement's subgrade and base course. We recommend that area drains to collect excess irrigation water and transmit it to drainage structures or impervious above-grade planter boxes be used. In addition, where landscaping is planned adjacent to the pavement, we recommend construction of a cutoff wall along the edge of the pavement that extends at least 6 inches below the bottom of the base materials.

7.14 Slope Maintenance

7.14.1 Slopes that are steeper than 3:1 (horizontal:vertical) may, under conditions that are both difficult to prevent and predict, be susceptible to near-surface (surficial) slope instability. The instability is typically limited to the outer 3 feet of a portion of the slope and usually does not directly impact the improvements on the pad areas above or below the slope. The occurrence of surficial instability is more prevalent on fill slopes and is generally preceded by a period of heavy rainfall, excessive irrigation, or the migration of subsurface seepage. The disturbance and/or loosening of the surficial soils, as might result from root growth, soil expansion, or excavation for irrigation lines and slope planting, may also be a significant contributing factor to surficial instability. It is therefore recommended that, to the maximum extent practical: (a) disturbed/loosened surficial soils be either removed or properly recompacted, (b) irrigation systems be periodically inspected and maintained to eliminate leaks and excessive irrigation, and (c) surface drains on and adjacent to slopes be periodically maintained to preclude ponding or erosion. Although the incorporation of the above recommendations should reduce the potential for surficial slope instability, it will not eliminate the possibility and, therefore, it may be necessary to rebuild or repair a portion of the project's slopes in the future.

7.15 Grading and Foundation Plan Review

7.15.1 The geotechnical engineer and engineering geologist should review the grading and foundation plans prior to final submittal to check their compliance with the recommendations of this report and to determine the need for additional comments, recommendations and/or analysis.

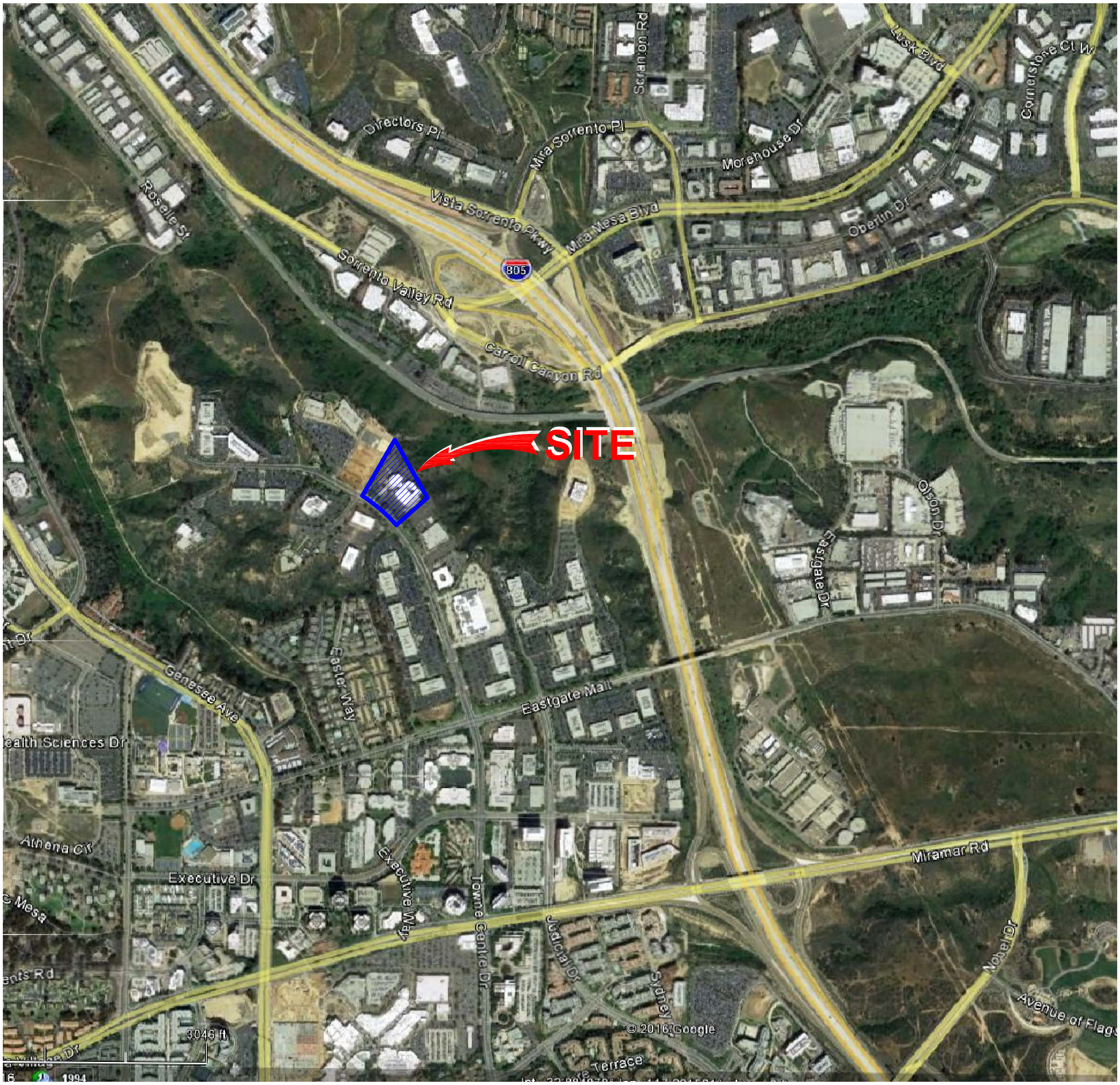
LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. The firm that performed the geotechnical investigation for the project should be retained to provide testing and observation services during construction to provide continuity of geotechnical interpretation and to check that the recommendations presented for geotechnical aspects of site development are incorporated during site grading, construction of improvements, and excavation of foundations. If another geotechnical firm is selected to perform the testing and observation services during construction operations, that firm should prepare a letter indicating their intent to assume the responsibilities of project geotechnical engineer of record. A copy of the letter should be provided to the regulatory agency for their records. In addition, that firm should provide revised recommendations concerning the geotechnical aspects of the proposed development, or a written acknowledgement of their concurrence with the recommendations presented in our report. They should also perform additional analyses deemed necessary to assume the role of Geotechnical Engineer of Record.

2. The recommendations of this report pertain only to the site investigated and are based upon the assumption that the soil conditions do not deviate from those disclosed in the investigation. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that anticipated herein, Geocon Incorporated should be notified so that supplemental recommendations can be given. The evaluation or identification of the potential presence of hazardous or corrosive materials was not part of the scope of services provided by Geocon Incorporated.

3. This report is issued with the understanding that it is the responsibility of the owner or his representative to ensure that the information and recommendations contained herein are brought to the attention of the architect and engineer for the project and incorporated into the plans, and the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.

4. The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they be due to natural processes or the works of man on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of three years.



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N

NO SCALE

VICINITY MAP

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9775 TOWNE CENTRE DRIVE
SAN DIEGO, CALIFORNIA

RM / AML		DSK/GTYPD	DATE 12 - 16 - 2016	PROJECT NO. G2059 - 42 - 01	FIG. 1

Plotted:12/15/2016 3:54PM | By:ALVIN LADRILLONO | File Location:Y:\PROJECTS\G2059-42-01 (9775 Towne Centre Dr)\DETAILS\G2059-42-01 Vic Map.dwg

GEOCON LEGEND

Qudf ........UNDOCUMENTED FILL

Qt ....VERY OLD TERRACE DEPOSITS (Dotted Where Buried)

Ta ....ARDATH SHALE (Dotted Where Buried)

........APPROX. LOCATION OF GEOLOGIC CONTACT (Queried Where Uncertain)

B-5 ....APPROX. LOCATION OF BORING

I-4 ....APPROX. LOCATION OF INFILTRATIION TEST

B B' ....APPROX. LOCATION OF GEOLOGIC CROSS SECTION

GEOLOGIC MAP

9775 TOWNE CENTRE DRIVE
SAN DIEGO, CALIFORNIA

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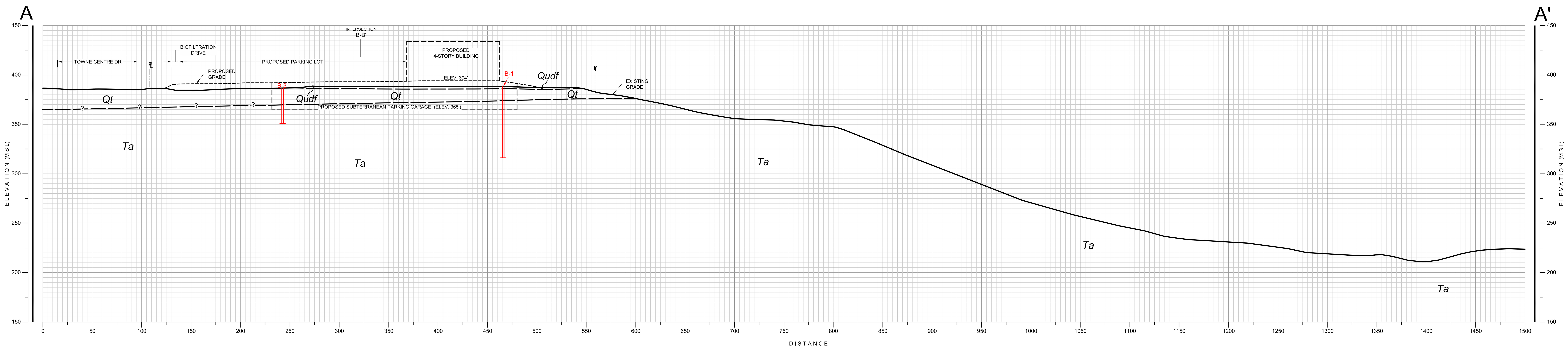
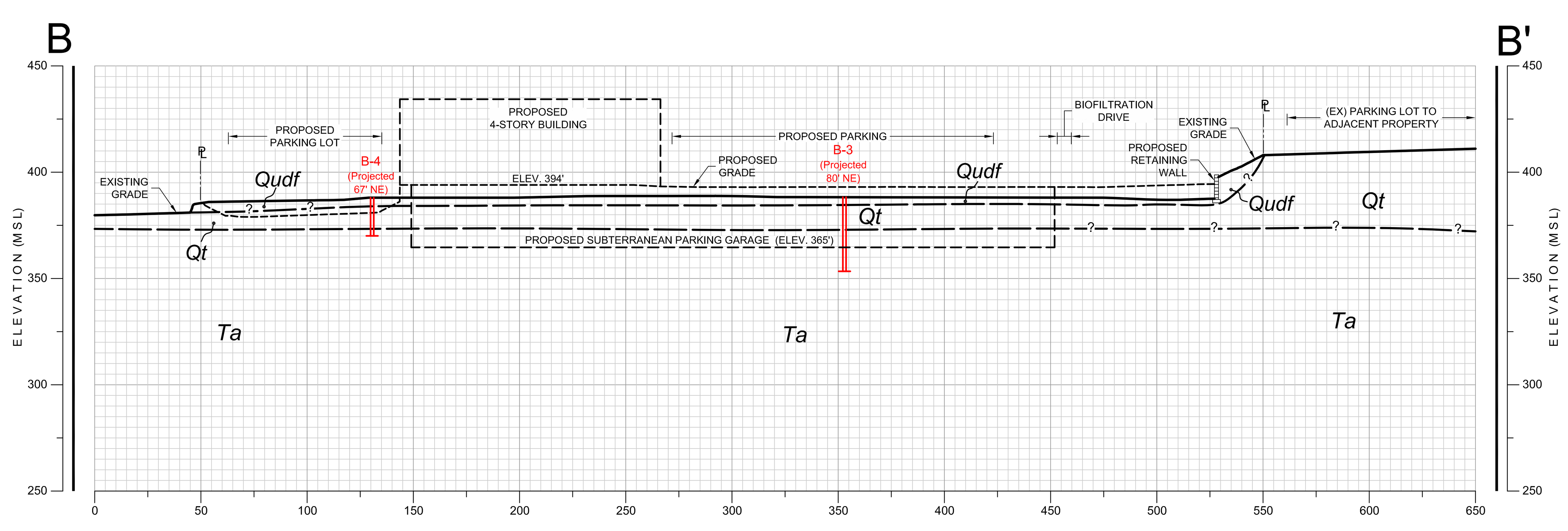
SCALE	1" = 50'
DATE	12 - 16 - 2016
PROJECT NO.	G2059 - 42 - 01
SHEET	1 OF 1
FIGURE	2

Plotted:12/16/2016 10:42AM | By:ALVIN LADRILLONO | File Location:Y:\PROJECTS\G2059-42-01 (9775 Towne Centre Dr)\SHEETS\G2059-42-01 Site Plan.dwg



GEOLOGIC CROSS-SECTION A-A'

SCALE: 1" = 50' (Vert. = Horiz.)



GEOLOGIC CROSS-SECTION B-B'

SCALE: 1" = 50' (Vert. = Horiz.)

GEOCON LEGEND

- *Qudf* ........UNDOCUMENTED FILL
- *Qt* ....VERY OLD TERRACE DEPOSITS
- *Ta* ....ARDATH SHALE
- ....APPROX. LOCATION OF GEOLOGIC CONTACT (Queried Where Uncertain)
- B-4 ....APPROX. LOCATION OF BORING

GEOLOGIC CROSS SECTION

9775 TOWNE CENTRE DRIVE
SAN DIEGO, CALIFORNIA

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SCALE	1" = 50'
DATE	12 - 16 - 2016
PROJECT NO.	G2059 - 42 - 01
FIGURE	3
SHEET	1 OF 1

Plotted:12/16/2016 10:40AM | By:ALVIN LADRILLONO | File Location:Y:\PROJECTS\G2059-42-01 (9775 Towne Centre Dr)\SHEETS\G2059-42-01 XSections.dwg

9775 Towne Centre Drive
Project No. G2059-42-01
Cross-Section A-A'
Name: AA'-1.gsz
Date: 12/16/2016 Time: 1:20:24 PM
Analysis: Proposed Upper Slope (Static)

MATERIAL DESCRIPTION:
Name: Qt - Very Old Terrace Deposits (2); Unit Weight: 130 pcf; Cohesion: 485 psf; Phi: 26 °
Name: Ta - Ardath Shale; Unit Weight: 130 pcf; Cohesion: 425 psf; Phi: 36 °

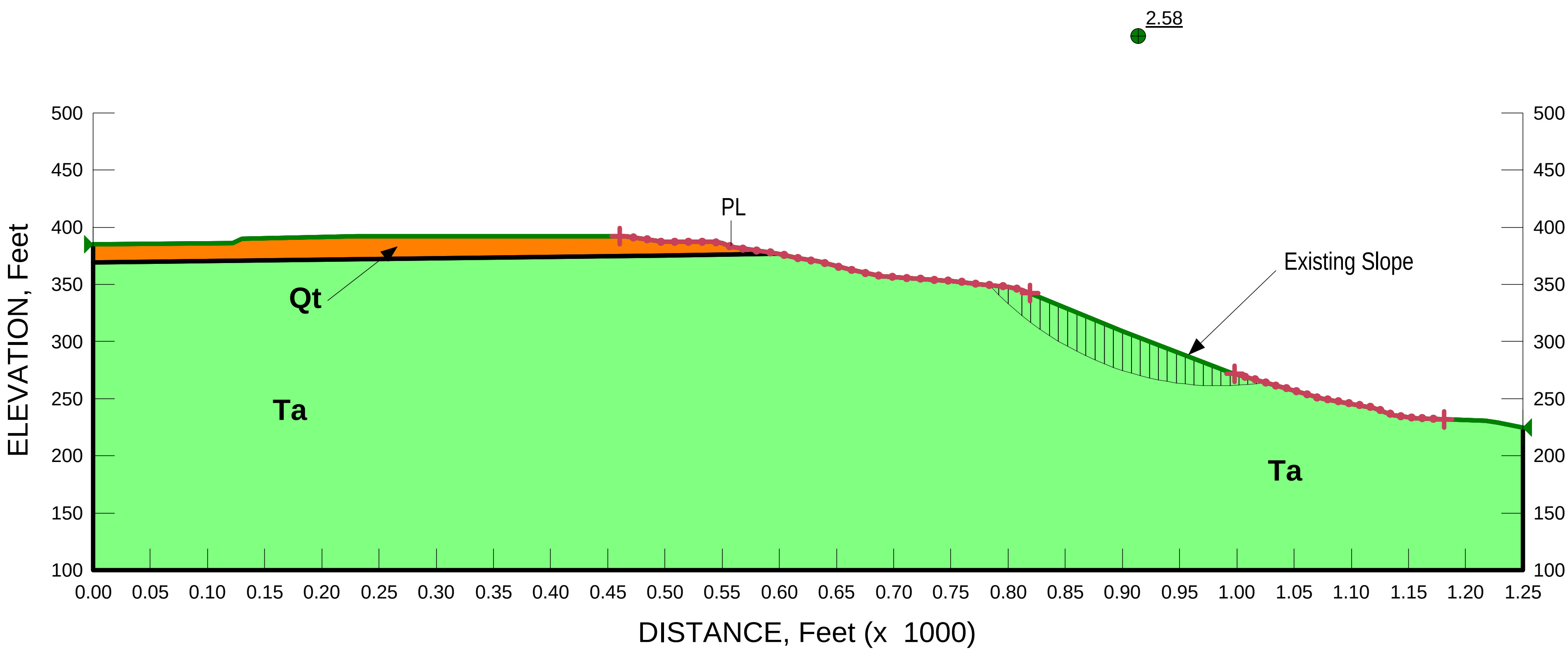

FIGURE 4

ASSUMED CONDITIONS :

SLOPE HEIGHT	H	= Infinite
DEPTH OF SATURATION	Z	= 3 feet
SLOPE INCLINATION	2 : 1	(Horizontal : Vertical)
SLOPE ANGLE	i	= 26.6 degrees
UNIT WEIGHT OF WATER	γ_w	= 62.4 pounds per cubic foot
TOTAL UNIT WEIGHT OF SOIL	γ_t	= 130 pounds per cubic foot
ANGLE OF INTERNAL FRICTION	ϕ	= 36 degrees
APPARENT COHESION	C	= 425 pounds per square foot

SLOPE SATURATED TO VERTICAL DEPTH Z BELOW SLOPE FACE

SEEPAGE FORCES PARALLEL TO SLOPE FACE

ANALYSIS :

$$FS = \frac{C + (\gamma_t - \gamma_w)\ Z \cos^2 i \tan \phi}{\gamma_t\ Z \sin i \cos i} = 3.5$$

REFERENCES :

1......Haefeli, R. *The Stability of Slopes Acted Upon by Parallel Seepage*, Proc. Second International Conference, SMFE, Rotterdam, 1948, 1, 57-62

2......Skempton, A. W., and F.A. Delory, *Stability of Natural Slopes in London Clay*, Proc. Fourth International Conference, SMFE, London, 1957, 2, 378-81

SURFICIAL SLOPE STABILITY ANALYSIS

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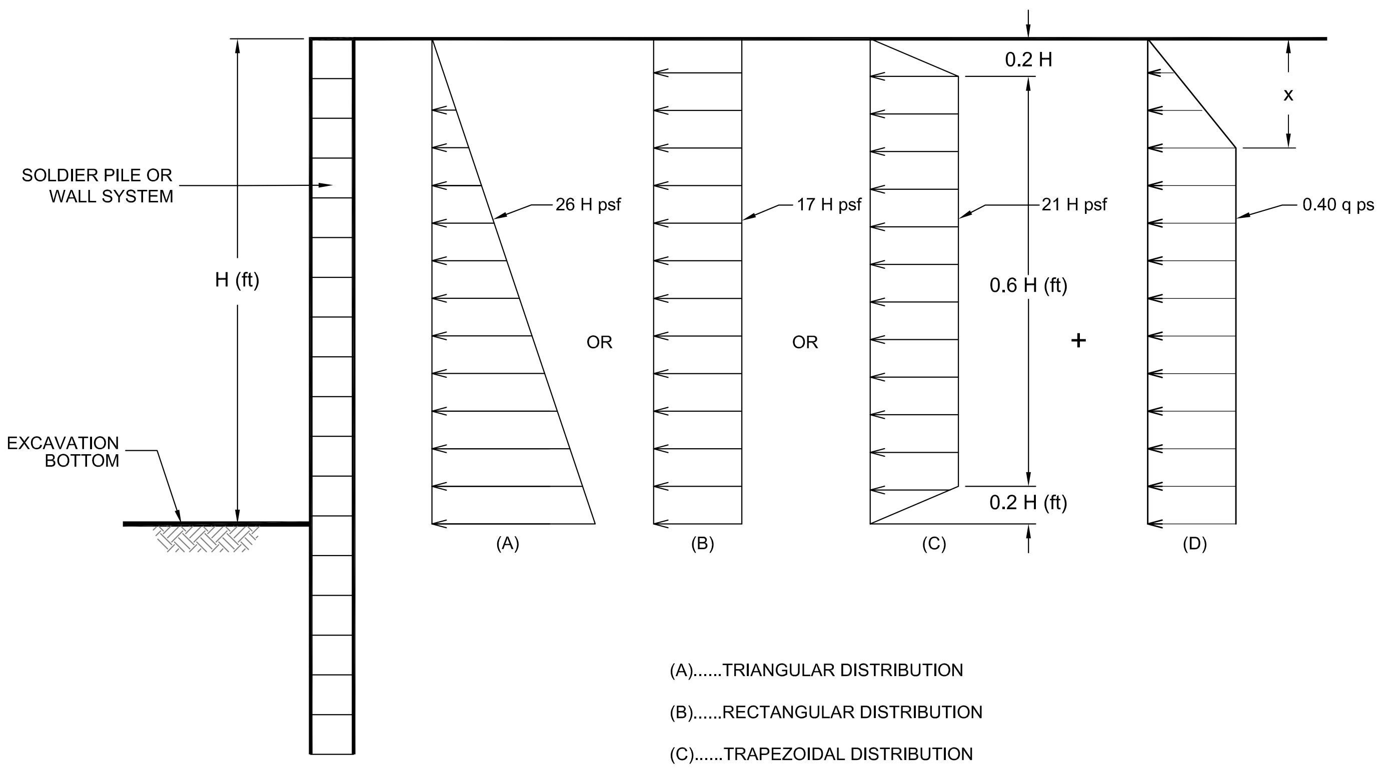
RM / AML		DSK/GTYPD	DATE 12 - 16 - 2016	PROJECT NO. G2059 - 42 - 01	FIG. 5



(A)......TRIANGULAR DISTRIBUTION

(B)......RECTANGULAR DISTRIBUTION

(C)......TRAPEZOIDAL DISTRIBUTION

(D)......SURCHARGE DISTRIBUTION

NO SCALE

LATERAL ACTIVE PRESSURES FOR VERTICAL EXCATIONS

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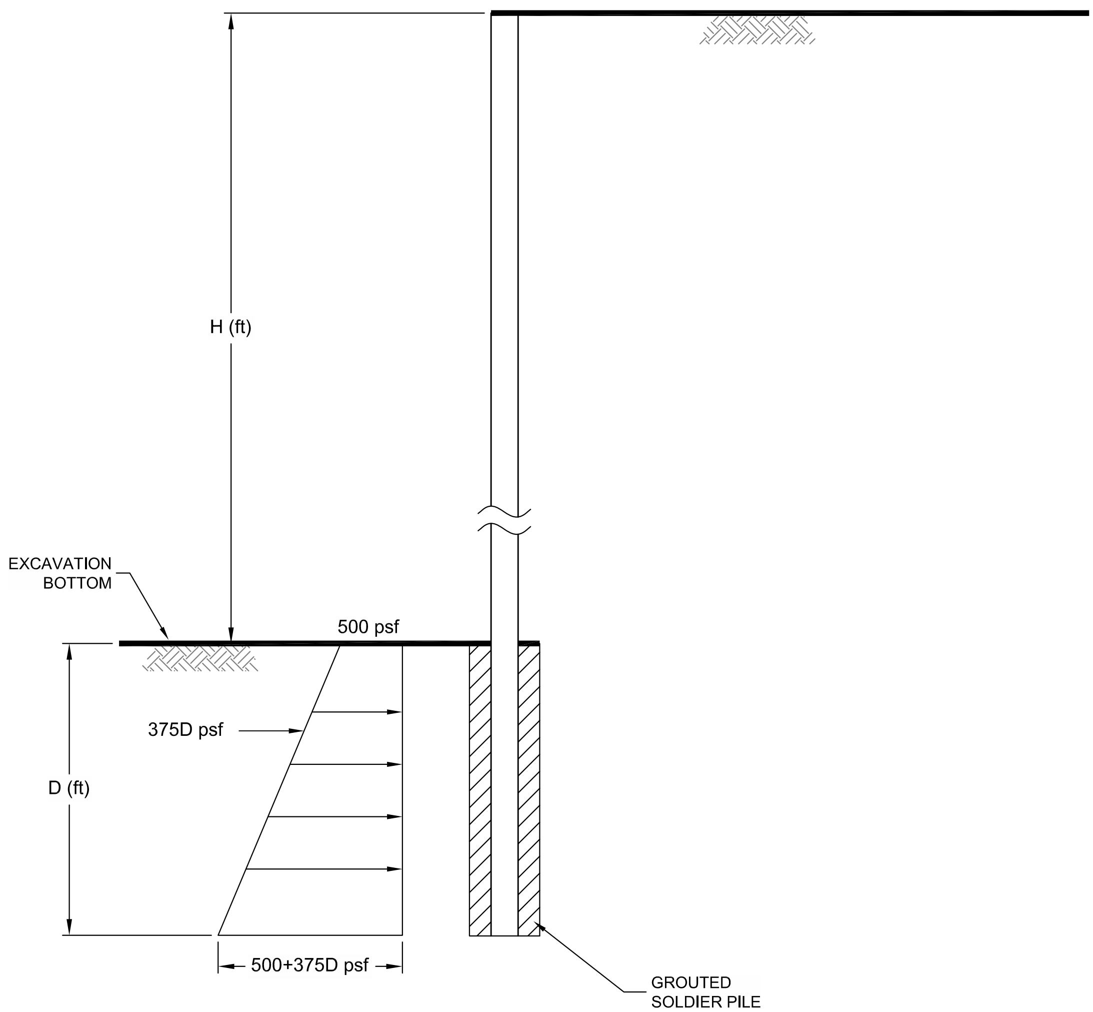
RM / AML		DSK/GTYPD	DATE 12 - 16 - 2016	PROJECT NO. G2059 - 42 - 01	FIG. 6



NO SCALE

SOLDIER PILE PASSIVE PRESSURE DISTRIBUTION

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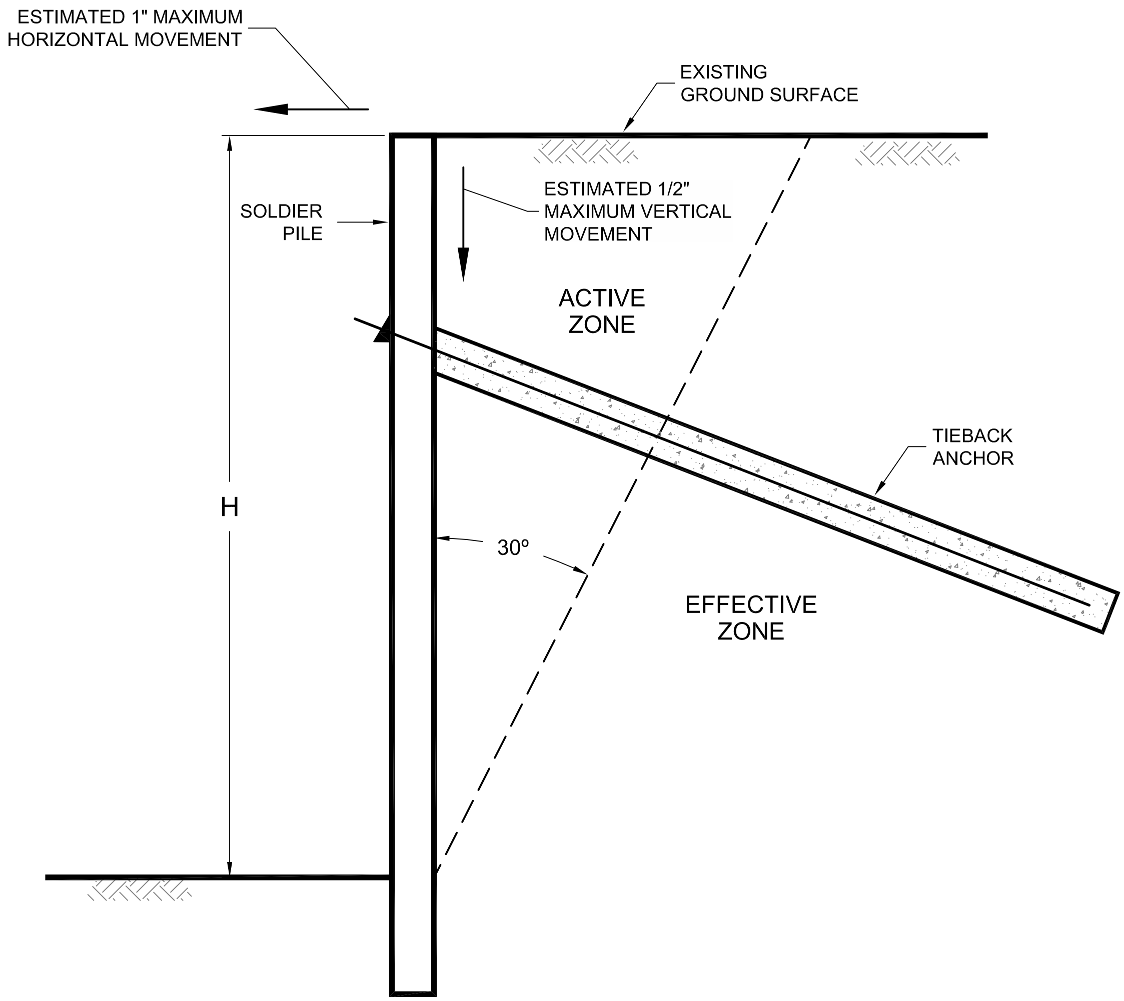
RM / AML		DSK/GTYPD	DATE 12 - 16 - 2016	PROJECT NO. G2059 - 42 - 01	FIG. 7



NO SCALE

RECOMMENDED EFFECTIVE ZONE FOR TIEBACK ANCHORS

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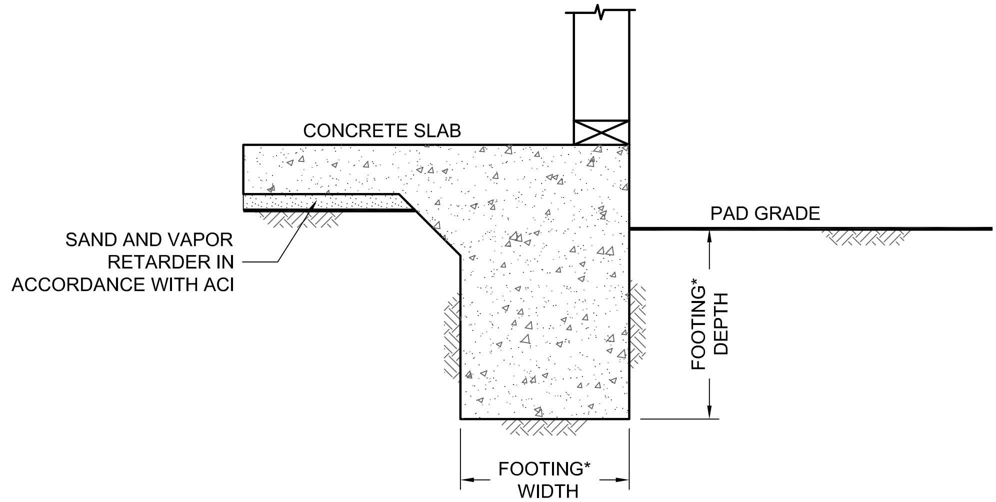
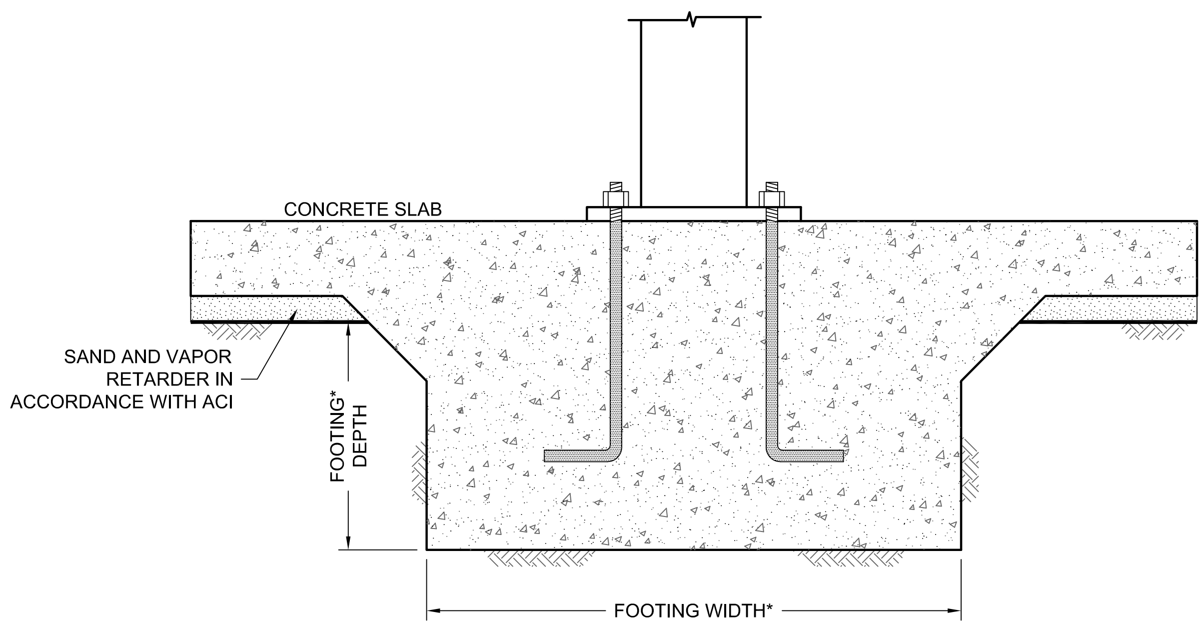
RM / AML		DSK/GTYPD	DATE 12 - 16 - 2016	PROJECT NO. G2059 - 42 - 01	FIG. 8





*....SEE REPORT FOR FOUNDATION WIDTH AND DEPTH RECOMMENDATION

NO SCALE

WALL / COLUMN FOOTING DIMENSION DETAIL

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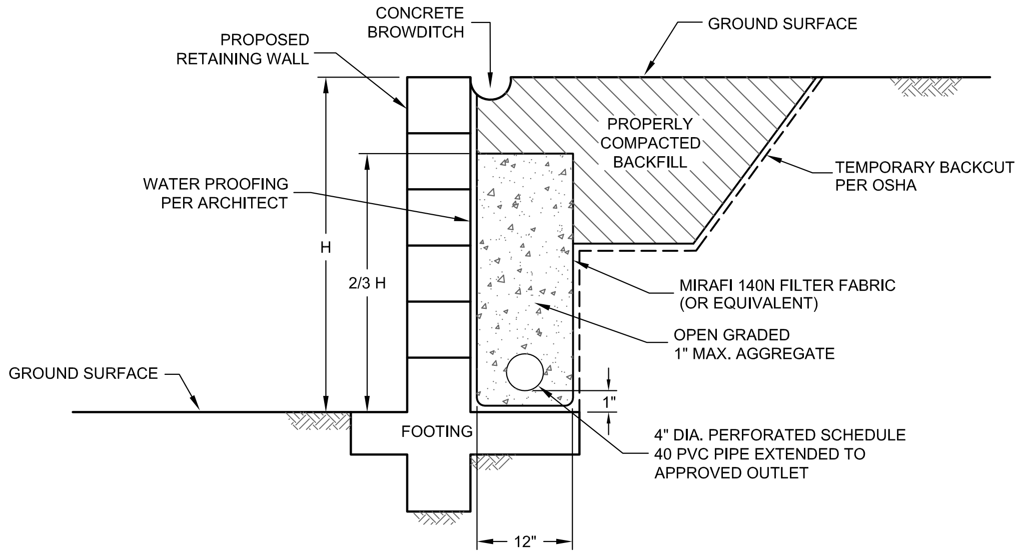
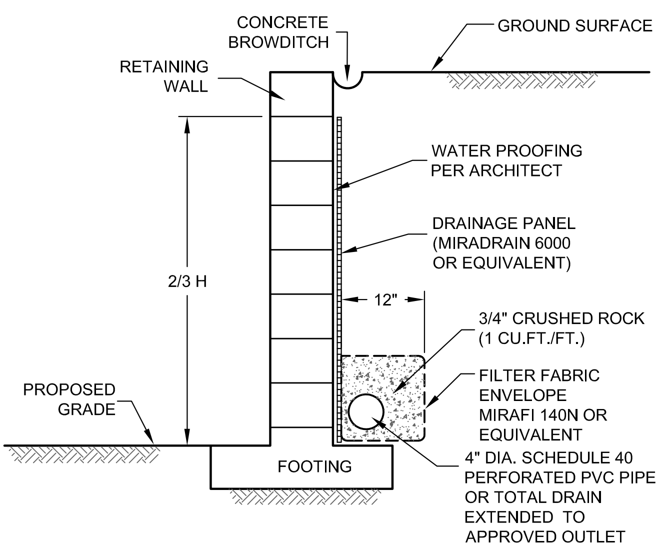
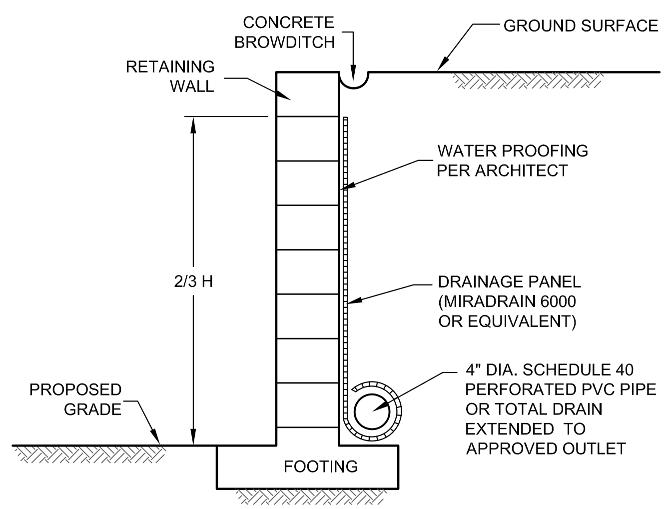
RM / AML		DSK/GTYPD	DATE 12 - 16 - 2016	PROJECT NO. G2059 - 42 - 01	FIG. 9





NOTE :

DRAIN SHOULD BE UNIFORMLY SLOPED TO GRAVITY OUTLET OR TO A SUMP WHERE WATER CAN BE REMOVED BY PUMPING



NO SCALE

TYPICAL RETAINING WALL DRAIN DETAIL

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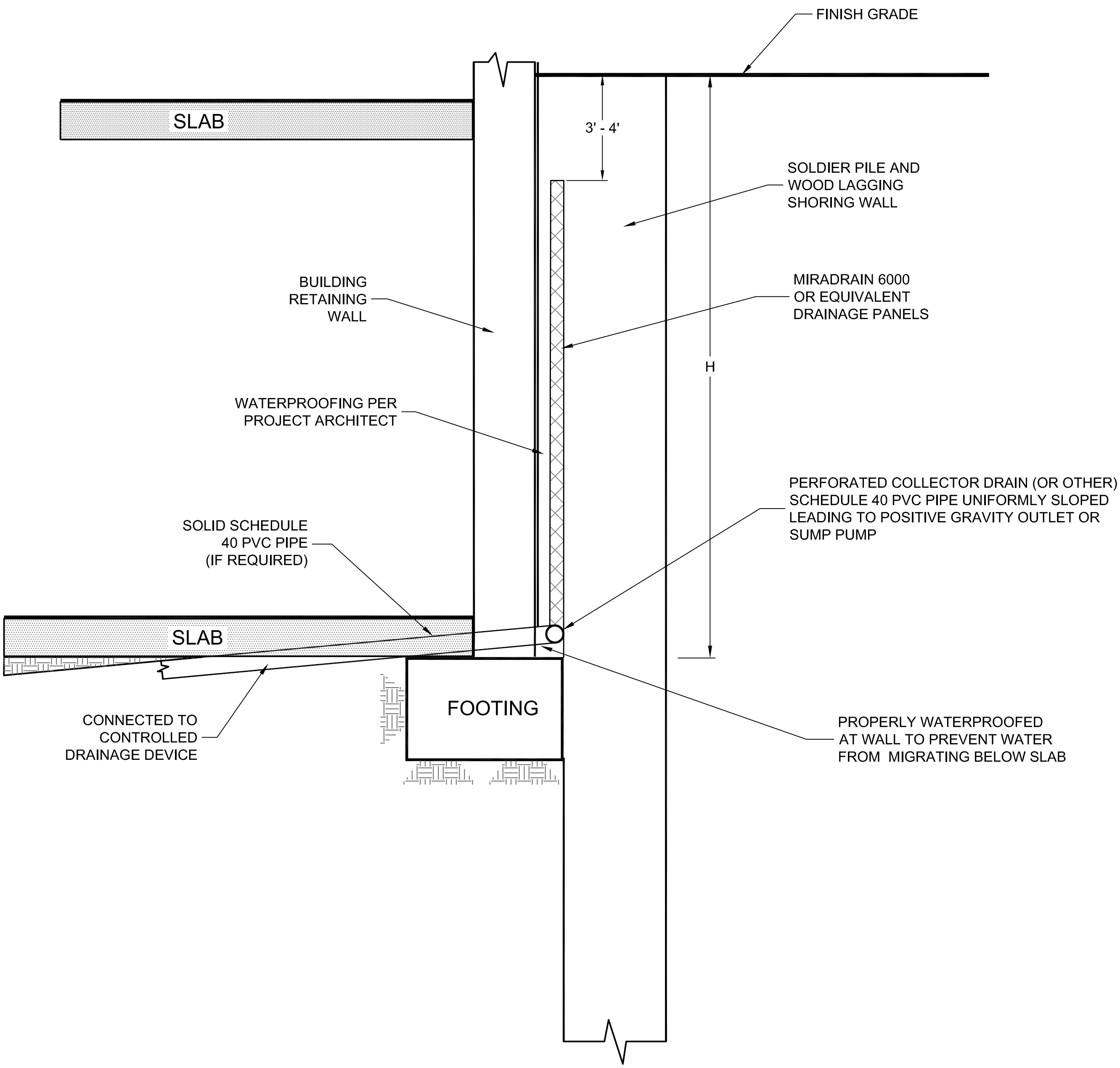
RM / AML		DSK/GTYPD	DATE 12 - 16 - 2016	PROJECT NO. G2059 - 42 - 01	FIG. 10

Plotted:12/15/2016 3:51PM | By:ALVIN LADRILLONO | File Location:Y:\PROJECTS\G2059-42-01 (9775 Towne Centre Dr)\DETAILS\Typical Retaining Wall Drainage Detail (RWDD7A).dwg



SOLDIER PILE WALL DRAINAGE DETAIL

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9775 TOWNE CENTRE DRIVE
SAN DIEGO, CALIFORNIA

RM / AML		DSK/GTYPD	DATE 12 - 16 - 2016	PROJECT NO. G2059 - 42 - 01	FIG. 11

Plotted:12/15/2016 3:52PM | By:ALVIN LADRILLONO | File Location:Y:\PROJECTS\G2059-42-01 (9775 Towne Centre Dr)\DETAILS\Soldier Pile Wall Drainage Detail (SPWDD3).dwg

APPENDIX A

APPENDIX A

FIELD INVESTIGATION

We performed the field investigation on November 21 and 22, 2016 and consisted of drilling five, small-diameter borings and four, 8-inch diameter infiltration test holes. The approximate locations of the exploratory borings and infiltration tests are shown on Figure 2.

The borings were drilled to depths ranging from approximately 18.5 to 70.5 feet below existing grade using a CME 75 drill rig equipped with 8-inch diameter hollow-stem augers. We obtained relatively undisturbed samples from the borings by driving a 3-inch-diameter, sampler 12 inches into the undisturbed soil mass with blows from a hammer weighing 140 pounds, dropped from a height of 30 inches. The sampler was lined with 1-inch by 2.5-inch-diameter brass rings to facilitate sampling. Bulk samples were also collected.

The soil conditions encountered in the borings were visually examined, classified, and logged in general accordance with American Society for Testing and Materials (ASTM) practice for Description and Identification of Soils (Visual-Manual Procedure D 2488). Logs of the exploratory borings are presented on Figures A-1 through A-5. The logs depict the soil and geologic conditions encountered and the depth at which samples were obtained.

BORING B 1

ELEV. (MSL.) **387'** DATE COMPLETED **11-21-2016**

EQUIPMENT **IR A-300** BY: **N. BORJA**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					6" **ASPHALT** Over 4" **BASE**			
	B1-1			CL	**UNDOCUMENTED FILL** Stiff, moist, olive brown, Sandy CLAY			
2	B1-2			SM	**VERY OLD TERRACE DEPOSITS** Dense, moist, reddish brown to brown, Silty, fine to coarse SAND	61		
4								
6	B1-3				-Becomes medium dense to dense	44	108.9	11.0
8					-Excavates with trace gravel at 8-9 feet			
10	B1-4					65	111.4	10.4
12	B1-5							
14				ML	**ARDATH SHALE** Hard, damp, mottled gray and yellowish brown, Sandy SILTSTONE			
16	B1-6					100/9"	103.1	22.2
	B1-7							
18								
20	B1-8					50/4"	106.1	18.6
22								
24				CL	Hard, moist, mottled, yellowish brown and light gray, Sandy to Silty CLAY			
26	B1-9					50/5"	106.6	19.2
28								
				SM/ML	Very dense, damp, mottled gray and yellowish brown, Silty, fine SAND to			

Figure A-1,
Log of Boring B 1, Page 1 of 3

G2059-42-01.GPJ

SAMPLE SYMBOLS			
	... SAMPLING UNSUCCESSFUL	... STANDARD PENETRATION TEST	... DRIVE SAMPLE (UNDISTURBED)
	... DISTURBED OR BAG SAMPLE	... CHUNK SAMPLE	... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

BORING B 1

ELEV. (MSL.) 387' DATE COMPLETED 11-21-2016

EQUIPMENT IR A-300 BY: N. BORJA

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
30	B1-10				Sandy SILT	50/5"	104.0	19.4
				CH	Hard, moist, yellowish to olive brown, Silty, FAT CLAY; highly plastic			
32								
				SM	Very dense, damp, yellowish brown, Silty, fine SAND			
34								
	B1-11					50/3"		
36								
38								
					-Becomes mottled yellowish brown and gray			
40	B1-12					50/3.5"		
42								
44				SM/ML	Very dense, damp, mottled yellowish brown and light gray, Silty, fine SAND to Sandy SILT			
	B1-13					50/4"		
46								
					-Concretion encountered from 47-48 feet			
48				SM	Very dense, damp, light gray, Silty, fine to medium SAND			
50	B1-14					50/4.5"		
52								
54					-Excavates with lenses of Sandy SILT			
	B1-15					50/4.5"		
56								
58								
				ML	Hard, damp, mottled yellowish brown and light gray, Sandy SILT			

Figure A-1,
Log of Boring B 1, Page 2 of 3

G2059-42-01.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

BORING B 1

ELEV. (MSL.) 387' DATE COMPLETED 11-21-2016

EQUIPMENT IR A-300 BY: N. BORJA

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
60	B1-16					85/9"	108.1	18.7
62								
64					-Becomes gray			
	B1-17					50/4"		
66								
68				SM	Very dense, damp, gray, Silty, fine SAND; trace sea shells			
70	B1-18					50/4"		

BORING TERMINATED AT 70.5 FEET
Groundwater not encountered
Backfilled with 23.7 ft³ of bentonite

Figure A-1,
Log of Boring B 1, Page 3 of 3

G2059-42-01.GPJ

SAMPLE SYMBOLS			
	... SAMPLING UNSUCCESSFUL	... STANDARD PENETRATION TEST	... DRIVE SAMPLE (UNDISTURBED)
	... DISTURBED OR BAG SAMPLE	... CHUNK SAMPLE	... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

BORING B 2

ELEV. (MSL.) **388'** DATE COMPLETED **11-21-2016**

EQUIPMENT **IR A-300** BY: **N. BORJA**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0	B2-1			CH	**UNDOCUMENTED FILL** Stiff, moist, dark olive brown to grayish brown, Sandy to Silty CLAY; highly plastic			
2	B2-2			CH	**VERY OLD TERRACE DEPOSITS** Very stiff to hard, moist, grayish brown, Silty CLAY; highly plastic	43		
4	B2-3			CL	Hard, moist, gray to grayish brown, Sandy CLAY	68		
6								
8				SM	Dense, moist, tan brown, Silty, fine to medium SAND			
10	B2-4				-Becomes mottled reddish brown and tan brown	76	113.2	7.4
12					-Excavates with trace gravel and cobble between 12 and 13 feet			
14								
16	B2-5					50/5"		
18	B2-6			SM	**ARDATH SHALE** Very dense, damp, mottled light gray and lights yellowish brown, Silty, fine SAND	50/5.5"		

BORING TERMINATED AT 19 FEET
Groundwater not encountered
Backfilled on 11/21/2016

Figure A-2,
Log of Boring B 2, Page 1 of 1

G2059-42-01.GPJ

SAMPLE SYMBOLS

- ... SAMPLING UNSUCCESSFUL
- ... DISTURBED OR BAG SAMPLE
- ... STANDARD PENETRATION TEST
- ... CHUNK SAMPLE
- ... DRIVE SAMPLE (UNDISTURBED)
- ... WATER TABLE OR SEEPAGE

GEOCON

PROJECT NO. G2059-42-01

BORING B 3

ELEV. (MSL.) **386'** DATE COMPLETED **11-21-2016**

EQUIPMENT **IR A-300** BY: **J. LAYOG**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					6" **ASPHALT** Over 7.5" **BASE**			
	B3-1			SM	**VERY OLD TERRACE DEPOSITS** Loose, moist to wet, orange brown, Silty, fine to coarse SAND; trace mica and mafic staining			
2	B3-2					10		
4								
	B3-3					15	106.4	15.8
6								
					-Becomes dense			
8								
10	B3-4				-Becomes very dense	78	106.6	16.1
12					-Layer of rounded gravel approx. 6-inch thick			
14								
	B3-5				-Becomes dense, fine grained	66		
16				SM	**ARDATH SHALE** Very dense, moist, light gray and orange, Silty, fine SANDSTONE			
18								
20	B3-6					76		
22								
24				ML	Hard, moist, olive brown and yellowish brown, Silty to Clayey SILT			
	B3-7					50/5"	103.9	21.7
26								
28								

Figure A-3,
Log of Boring B 3, Page 1 of 2

G2059-42-01.GPJ

SAMPLE SYMBOLS
- ... SAMPLING UNSUCCESSFUL
- ... STANDARD PENETRATION TEST
- ... DRIVE SAMPLE (UNDISTURBED)
- ... DISTURBED OR BAG SAMPLE
- ... CHUNK SAMPLE
- ... WATER TABLE OR SEEPAGE

GEOCON

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	BORING B 3 ELEV. (MSL.) 386' DATE COMPLETED 11-21-2016 EQUIPMENT IR A-300 BY: J. LAYOG MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
30								
32								
34								
	B3-8					50/5"		
					BORING TERMINATED AT 35.5 FEET Groundwater not encountered Backfilled with 12.2 ft^3 of bentonite on 11/22/2016			

Figure A-3,
Log of Boring B 3, Page 2 of 2

G2059-42-01.GPJ

SAMPLE SYMBOLS			
	... SAMPLING UNSUCCESSFUL	... STANDARD PENETRATION TEST	... DRIVE SAMPLE (UNDISTURBED)
	... DISTURBED OR BAG SAMPLE	... CHUNK SAMPLE	... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G2059-42-01

BORING B 4

ELEV. (MSL.) **386'** DATE COMPLETED **11-21-2016**

EQUIPMENT **IR A-300** BY: **J. LAYOG**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					6" **ASPHALT** Over 4" **BASE**			
	B4-1			CL	**UNDOCUMENTED FILL** Stiff, moist, dark brown, fine to medium Sandy CLAY; trace fine gravel			
2				SM	**VERY OLD TERRACE DEPOSITS** Very dense, moist, reddish brown to brown, Silty, fine to coarse SAND; trace fine gravel			
	B4-2					40		
4								
	B4-3					76/11"		
6								
8								
					-Becomes dense, damp, light brown, fine grained			
10	B4-4					74	96.4	8.0
12								
14								
	B4-5					77		
16				SM	**ARDATH SHALE** Very dense, moist, light brown and orange with black specks, Silty, fine SAND; trace silt; few gravel			
18	B4-6					50/4"		
					BORING TERMINATED AT 18.5 FEET Groundwater not encountered Backfilled on 11/22/2016			

Figure A-4,
Log of Boring B 4, Page 1 of 1

G2059-42-01.GPJ

SAMPLE SYMBOLS			
	... SAMPLING UNSUCCESSFUL	... STANDARD PENETRATION TEST	... DRIVE SAMPLE (UNDISTURBED)
	... DISTURBED OR BAG SAMPLE	... CHUNK SAMPLE	... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G2059-42-01

BORING B 5

ELEV. (MSL.) **387'** DATE COMPLETED **11-21-2016**

EQUIPMENT **IR A-300** BY: **J. LAYOG**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					3/4" **ASPHALT** Over 6" **BASE**			
	B5-1			SC	**UNDOCUMENTED FILL** Medium dense, moist, dark brown to brown, Clayey, fine to medium SAND			
2	B5-2			SM	**VERY OLD TERRACE DEPOSITS** Dense, moist, brown and orange, Silty, fine to medium SAND	77		
4				SM/ML	Dense, moist, light gray and orange with mafic staining, Silty, fine to medium, SANDSTONE to Sandy SILTSTONE			
	B5-3					77		
6				SM	Very dense, moist, reddish brown, Silty, fine to coarse SAND; trace silt			
8								
10	B5-4					76/11"		
12								
14					-Becomes fine grained			
	B5-5					54		
16								
					-Layer of gravel approx. 6-inch thick			
18				SM	**ARDATH SHALE** Very dense, moist, light gray and orange, Silty, fine SANDSTONE			
	B5-6					50/5"		

BORING TERMINATED AT 19 FEET
Groundwater not encountered
Backfilled on 11/22/2016

Figure A-5,
Log of Boring B 5, Page 1 of 1

G2059-42-01.GPJ

SAMPLE SYMBOLS			
	... SAMPLING UNSUCCESSFUL	... STANDARD PENETRATION TEST	... DRIVE SAMPLE (UNDISTURBED)
	... DISTURBED OR BAG SAMPLE	... CHUNK SAMPLE	... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

APPENDIX B

APPENDIX B

LABORATORY TESTING

We performed the laboratory tests in accordance with the currently accepted versions of the generally accepted American Society for Testing Materials (ASTM) procedures or other suggested procedures. We tested selected soil samples for their in-place density and moisture content, shear strength, expansion index, R-value, pH and resistivity, water-soluble sulfate, and gradation. The results of our laboratory tests are presented on the following tables and graphs.

TABLE B-I
SUMMARY OF LABORATORY IN PLACE MOISTURE AND DENSITY TEST RESULTS

Boring and Sample No.	Depth (feet)	Dry Density (pcf)	Moisture Content (%)
B1-4	10	111.4	10.4
B1-8	20	106.1	18.6
B1-10	30	104.0	19.4
B2-5	10	113.2	7.4
B3-3	5	106.4	15.8
B3-4	10	106.6	16.0
B3-7	25	103.9	21.7

TABLE B-II
SUMMARY OF LABORATORY DIRECT SHEAR TEST RESULTS
ASTM D 3080

Boring No.	Depth (feet)	Dry Density (pcf)	Moisture Content (%)		Unit Cohesion (psf)	Angle of Shear Resistance (degrees)
			Initial	Final		
B1-3	5	108.9	11.0	15.4	580	29
B1-6	15	103.1	22.2	24.8	690	36
B1-9	25	106.6	19.2	21.3	290	45
B1-16	60	108.1	18.7	22.9	300	39
B4-4	10	96.4	8.0	22.9	600	24

[1] Ultimate at end of test at 0.2 inch deflection.

TABLE B-III
SUMMARY OF LABORATORY EXPANSION INDEX TEST RESULTS
ASTM D 4829

Boring No.	Moisture Content (%)		Dry Density (pcf)	Expansion Index	Expansion Classification
	Before Test	After Test			
B1-5	8.8	14.1	114.7	5	Very Low
B2-1	12.4	26.4	99.3	114	High
B3-1	8.5	18.2	112.4	12	Very Low

TABLE B-IV
SUMMARY OF LABORATORY WATER-SOLUBLE SULFATE TEST RESULTS
CALIFORNIA TEST NO. 417

Boring No.	Water-Soluble Sulfate (%)	Sulfate Severity	Sulfate Class
B1-5	0.027	Not Applicable	S0
B3-1	0.021	Not Applicable	S0

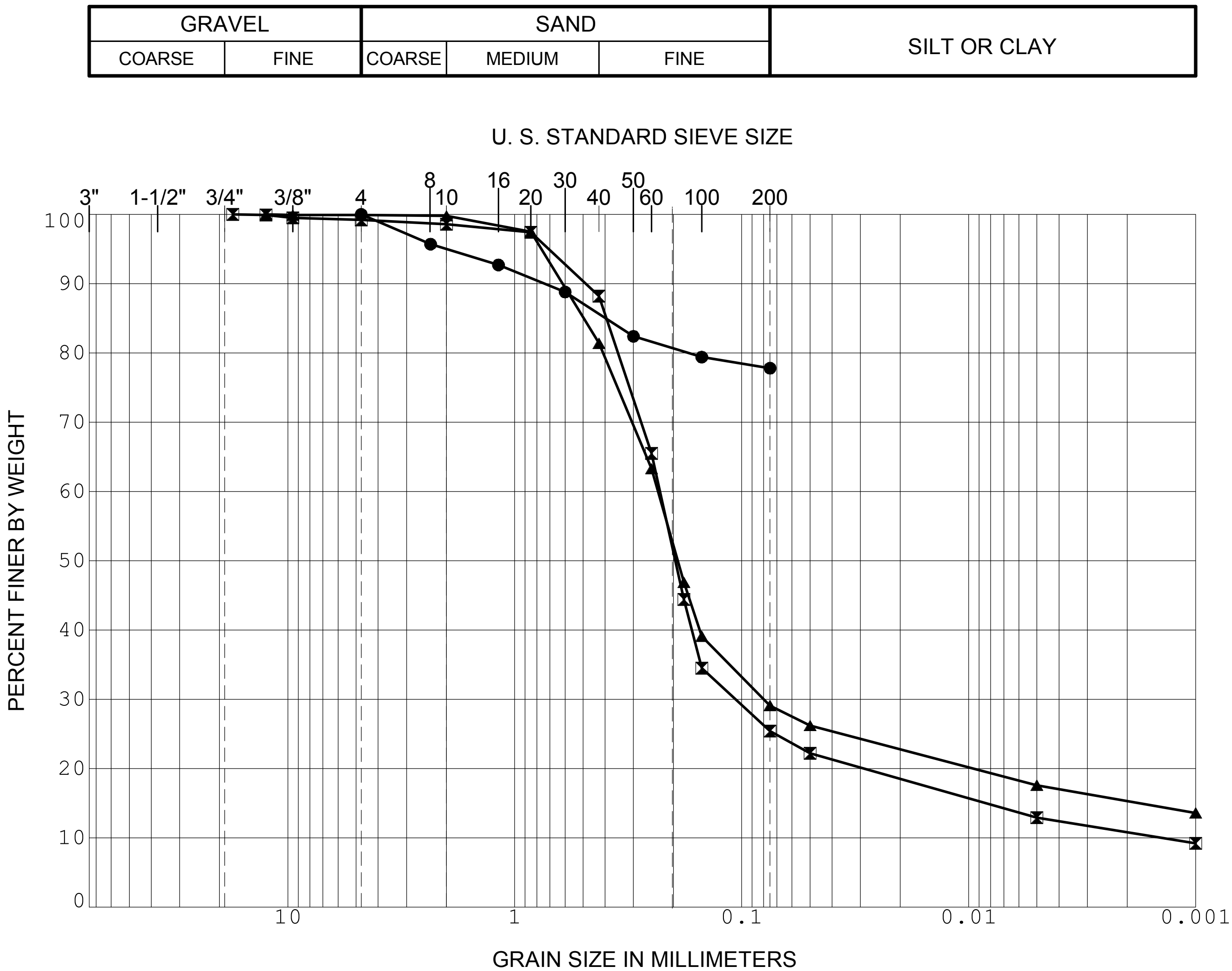
TABLE B-V
SUMMARY OF LABORATORY POTENTIAL OF HYDROGEN (PH) AND RESISTIVITY TEST RESULTS
CALIFORNIA TEST NO. 643

Boring No.	Depth (feet)	pH	Minimum Resistivity (ohm-centimeters)
B1-5	10 – 15	8.1	2,200

TABLE B-VI
SUMMARY OF LABORATORY RESISTANCE VALUE (R-VALUE) TEST RESULTS
ASTM D 2844

Sample No.	R-Value
B4-1	0

PROJECT NO. G2059-42-01



	SAMPLE	DEPTH (ft)	CLASSIFICATION	NAT WC	LL	PL	PI
●	B2-1	1.0	(CL) Lean CLAY with sand				
⧗	I-2	0.0	(SC) Clayey Sand				
▲	I-4	0.0	(SC) Clayey Sand				

GRADATION CURVE

9775 TOWNE CENTRE DRIVE

SAN DIEGO, CALIFORNIA

G2059-42-01.GPJ

Figure B-1

GEOCON

APPENDIX C

APPENDIX C

STORM WATER MANAGEMENT

If storm water management devices are not properly designed and constructed, there is a risk for distress to improvements and properties located hydrologically down gradient or adjacent to these devices. Factors such as the amount of water being detained, its residence time, and soil permeability have an important effect on seepage transmission and the potential adverse impacts that may occur if the storm water management features are not properly designed and constructed. We have not performed a hydrogeological study at the site. If infiltration of storm water runoff into the subsurface occurs, downstream improvements may be subjected to seeps, springs, slope instability, raised groundwater, movement of foundations and slabs, or other undesirable impacts as a result of water infiltration.

Hydrologic Soil Group

The United States Department of Agriculture (USDA), Natural Resources Conservation Services, provides general information regarding soil conditions for areas within the United States. The USDA website also provides the Hydrologic Soil Group. Table C-1 presents the descriptions of the hydrologic soil groups. If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

TABLE C-1
HYDROLOGIC SOIL GROUP DEFINITIONS

Soil Group	Soil Group Definition
A	Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.
B	Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.
C	Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.
D	Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

The subject property is underlain by very old terrace deposits and the Ardath Formation. The subject site falls within Hydraulic Soil Groups C and D, which have a very slow infiltration rating. Table C-2 presents the information from the USDA website for the property.

TABLE C-2
USDA WEB SOIL SURVEY – HYDROLOGIC SOIL GROUP

Map Unit Name	Map Unit Symbol	Approximate Percentage of Property	Hydrologic Soil Group
Altamont clay, 30 to 50 percent slopes	AtF	5.5	C
Chesterton fine sandy loam, 5 to percent slopes	CfC	94.5	D

In-Situ Testing

We performed 4 field-saturated, hydraulic conductivity tests at the site using a Soil Moisture Corp Aardvark Permeameter at the locations presented on the Geologic Map, Figure 2. All of the borings were drilled with a small-diameter drill rig using an 8-inch auger. Table C-3 presents the results of the saturated hydraulic conductivity testing.

We used the guidelines presented in the Riverside County Low Impact Development BMP Design Handbook which references the United States Bureau of Reclamation Well Permeameter Test Method (USBR 7300-89). Based on this widely accepted guideline, the saturated hydraulic conductivity (Ksat) is equal to the infiltration rate. Therefore, the Ksat value determined from the Aardvark Permeameter test is the unfactored infiltration rate. The Ksat (infiltration rate) equation provided in the Riverside County Handbook was used to compute the unfactored infiltration rate.

TABLE C-3
UNFACTORED, FIELD-SATURATED, INFILTRATION TEST RESULTS
USING THE SOILMOISTURE CORP AARDVARK PERMEAMETER

Test No.	Depth (feet)	Geologic Unit	Field Infiltration Rate, I (inches/hour)
I-1	4.2	Qvop	0.004
I-2	4.3	Qvop	0.003
I-3	3.6	Qvop	0.001
I-4	3.9	Qvop	0.001

Soil permeability values from in-situ tests can vary significantly from one location to another due to the non-homogeneous characteristics inherent to most soil. However, if a sufficient amount of field and laboratory test data is obtained, a general trend of soil permeability can usually be evaluated. For this project and for storm water purposes, the test results presented herein should be considered approximate values.

STORM WATER MANAGEMENT CONCLUSIONS

Soil Types

Very Old Terrace Deposits – Old Terrace Deposits underlie the site. Based on our exploratory borings and laboratory testing, the very old terrace deoists are comprised of very dense silty sand and very stiff sandy to silty clay. Because of the dense and stiff nature of this soil, there is a high potential for lateral water migration. Additionally, the rates indicate the soils are not suitable for full or partial infiltration.

Infiltration Rates

The results of the testing show infiltration rates ranging from approximately 0.0011 to 0.004 inches per hour. The rates are not high enough to support full or partial infiltration.

Groundwater

Groundwater was not encountered during our geotechnical investigation. We expect groundwater is at a depth greater than 100 feet below current grades. Groundwater is not a constraint for storm water infiltration.

Soil or Groundwater Contamination

We are unaware of contaminated soil or groundwater on the property. Therefore, infiltration associated with this risk is considered feasible.

Storm Water Management Devices

Liners and subdrains are recommended in the design and construction of the planned storm water devices. The liners should be impermeable (e.g. High-density polyethylene, HDPE, with a thickness of about 30 mil or equivalent Polyvinyl Chloride**,** PVC) to prevent water migration. The subdrains should be perforated within the liner area, installed at the base and above the liner, be at least 3 inches in diameter and consist of Schedule 40 PVC pipe. The subdrains outside of the liner should consist of solid pipe. The penetration of the liners at the subdrains should be properly waterproofed. The subdrains should be connected to a proper outlet. The devices should also be installed in accordance with the manufacturer's recommendations.

Storm Water Standard Worksheets

The SWS requests the geotechnical engineer complete the *Categorization of Infiltration Feasibility Condition* (Worksheet C.4-1 or I-8) worksheet information to help evaluate the potential for infiltration on the property. The attached Worksheet C.4-1 presents the completed information for the submittal process.

The regional storm water standards also have a worksheet (Worksheet D.5-1 or Form I-9) that helps the project civil engineer estimate the factor of safety based on several factors. Table C-4 describes the suitability assessment input parameters related to the geotechnical engineering aspects for the factor of safety determination.

TABLE C-4
SUITABILITY ASSESSMENT RELATED CONSIDERATIONS FOR INFILTRATION FACILITY SAFETY FACTORS

Consideration	High Concern – 3 Points	Medium Concern – 2 Points	Low Concern – 1 Point
Assessment Methods	Use of soil survey maps or simple texture analysis to estimate short-term infiltration rates. Use of well permeameter or borehole methods without accompanying continuous boring log. Relatively sparse testing with direct infiltration methods	Use of well permeameter or borehole methods with accompanying continuous boring log. Direct measurement of infiltration area with localized infiltration measurement methods (e.g., infiltrometer). Moderate spatial resolution	Direct measurement with localized (i.e. small-scale) infiltration testing methods at relatively high resolution or use of extensive test pit infiltration measurement methods.
Predominant Soil Texture	Silty and clayey soils with significant fines	Loamy soils	Granular to slightly loamy soils
Site Soil Variability	Highly variable soils indicated from site assessment or unknown variability	Soil boring/test pits indicate moderately homogenous soils	Soil boring/test pits indicate relatively homogenous soils
Depth to Groundwater/ Impervious Layer	<5 feet below facility bottom	5-15 feet below facility bottom	>15 feet below facility bottom

Table C-5 presents the estimated factor values for the evaluation of the factor of safety. The factor of safety is determined using the information contained in Table C-4 and the results of our geotechnical investigation. Table C-5 only presents the suitability assessment safety factor (Part A) of the worksheet. The project civil engineer should evaluate the safety factor for design (Part B of Worksheet D.5-1) and use the combined safety factor for the design infiltration rate.

TABLE C-5
FACTOR OF SAFETY WORKSHEET D.5-1 DESIGN VALUES – PART A[1]

Suitability Assessment Factor Category	Assigned Weight (w)	Factor Value (v)	Product (p = w x v)
Assessment Methods	0.25	2	0.50
Predominant Soil Texture	0.25	3	0.75
Site Soil Variability	0.25	2	0.50
Depth to Groundwater/Impervious Layer	0.25	1	0.25
Suitability Assessment Safety Factor, $S_A = \Sigma p$			2.0

[1] The project civil engineer should complete Worksheet D.5-1 or Form I-9 to determine the overall factor of safety.

CONCLUSIONS

Our results indicate the site has very dense and very still sols that inhibit infiltration. Because of these site conditions, it is our opinion that there is a high probability for lateral water migration. It is our opinion that full and partial infiltration is infeasible on this site. Liners and subdrains should be installed within BMP areas.

GEOCON

Aardvark Permeameter Data Analysis

Project Name: 9775 Towne Centre Drive
Project Number: G2059-42-01
Borehole Location: I-1

Date: 11/21/2016
By: JTL
Ref. EL (feet, MSL): 389.0
Bottom EL (feet, MSL): 384.8

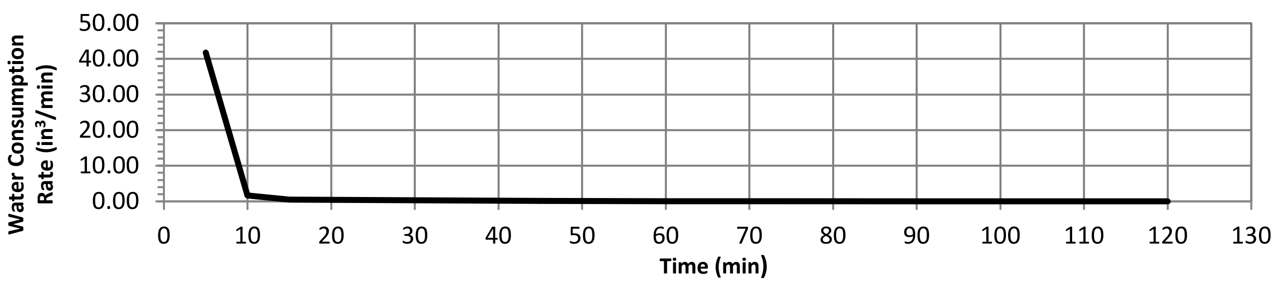
Borehole Diameter (inches): 8.00
Borehole Depth, **H** (inches): 50.00
Distance Between Reservoir & Top of Borehole (inches): 29.50
Depth to Water Table, **s** (feet): 100
Height APM Raised from Bottom (inches): 1.00

Wetted Area, **A** (in^2): 169.33

Distance Between Resevoir and APM, **D** (inches): 71.25
Head Height Calculated, **h** (inches): 4.74
Head Height Recorded, **h** (inches): 4.25
Distance Between Constant Head and Water Table, **L** (inches): 1155

Reading	Time (min)	Time Elapsed (min)	Reservoir Water Weight (g)	Resevoir Water Weight (lbs)	Interval Water Consumption (lbs)	Total Water Consumption (lbs)	*Water Consumption Rate (in^3/min)
1	0.00			23.370			
2	5.00	5.00		15.835	7.535	7.535	41.772
3	10.00	5.00		15.540	0.295	7.830	1.635
4	15.00	5.00		15.445	0.095	7.925	0.527
5	45.00	30.00		15.260	0.185	8.110	0.171
6	60.00	15.00		15.245	0.015	8.125	0.028
7	75.00	15.00		15.230	0.015	8.140	0.028
8	90.00	15.00		15.220	0.010	8.150	0.018
9	105.00	15.00		15.210	0.010	8.160	0.018
10	120.00	15.00		15.200	0.010	8.170	0.018
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							

Steady Flow Rate, Q (in^3/min): 0.018



Field-Saturated Hydraulic Conductivity (Infiltration Rate)

Case 1: L/h > 3 K_{sat} = 7.10E-05 in/min 0.004 in/hr

GEOCON

Aardvark Permeameter Data Analysis

Project Name:	9775 Towne Centre Drive	Date:	11/21/2016
Project Number:	G2059-42-01	By:	JTL
Borehole Location:	I-2	Ref. EL (feet, MSL):	385.0
		Bottom EL (feet, MSL):	380.7

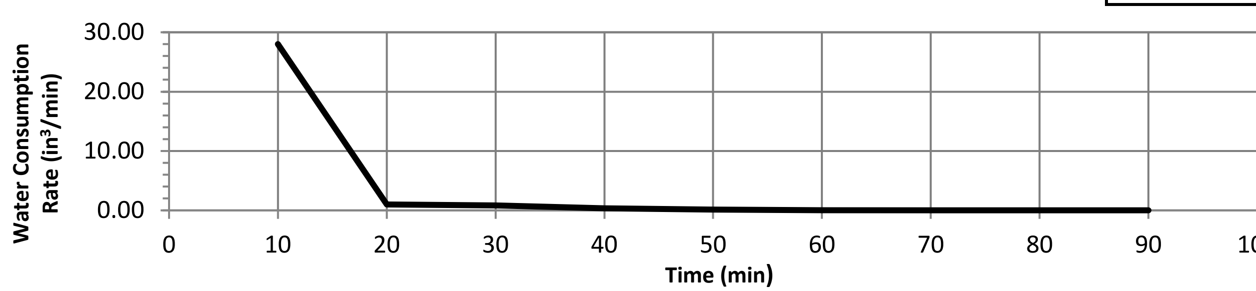
Borehole Diameter (inches):	8.00
Borehole Depth, **H** (inches):	52.00
Distance Between Reservoir & Top of Borehole (inches):	29.50
Depth to Water Table, **s** (feet):	100
Height APM Raised from Bottom (inches):	2.00

Wetted Area, **A** (in^2): 194.55

Distance Between Resevoir and APM, **D** (inches):	72.25
Head Height Calculated, **h** (inches):	5.74
Head Height Recorded, **h** (inches):	5.25
Distance Between Constant Head and Water Table, **L** (inches):	1154

Reading	Time (min)	Time Elapsed (min)	Reservoir Water Weight (g)	Resevoir Water Weight (lbs)	Interval Water Consumption (lbs)	Total Water Consumption (lbs)	*Water Consumption Rate (in^3/min)
1	0.00			24.130			
2	10.00	10.00		14.025	10.105	10.105	28.010
3	20.00	10.00		13.660	0.365	10.470	1.012
4	30.00	10.00		13.350	0.310	10.780	0.859
5	40.00	10.00		13.220	0.130	10.910	0.360
6	50.00	10.00		13.170	0.050	10.960	0.139
7	60.00	10.00		13.155	0.015	10.975	0.042
8	70.00	10.00		13.150	0.005	10.980	0.014
9	80.00	10.00		13.145	0.005	10.985	0.014
10	90.00	10.00		13.140	0.005	10.990	0.014
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							

Steady Flow Rate, Q (in^3/min): 0.014



Field-Saturated Hydraulic Conductivity (Infiltration Rate)

Case 1: L/h > 3 ***K_{sat} =*** 4.26E-05 in/min 0.003 in/hr

GEOCON

Aardvark Permeameter Data Analysis

Project Name: 9775 Towne Centre Drive
Project Number: G2059-42-01
Borehole Location: I-3

Date: 11/21/2016
By: JTL
Ref. EL (feet, MSL): 384.0
Bottom EL (feet, MSL): 380.4

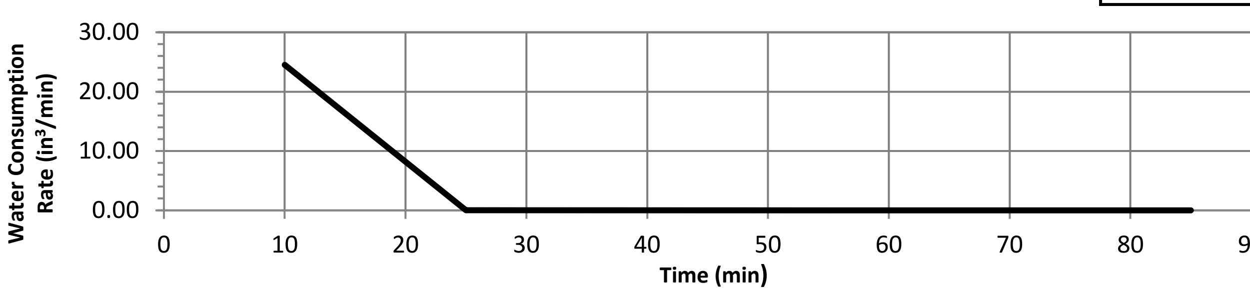
Borehole Diameter (inches): 8.00
Borehole Depth, **H** (inches): 43.00
Distance Between Reservoir & Top of Borehole (inches): 29.50
Depth to Water Table, **s** (feet): 100
Height APM Raised from Bottom (inches): 2.00

Wetted Area, **A** (in^2): 193.79

Distance Between Resevoir and APM, **D** (inches): 63.25
Head Height Calculated, **h** (inches): 5.71
Head Height Recorded, **h** (inches): 5.13
Distance Between Constant Head and Water Table, **L** (inches): 1163

Reading	Time (min)	Time Elapsed (min)	Reservoir Water Weight (g)	Resevoir Water Weight (lbs)	Interval Water Consumption (lbs)	Total Water Consumption (lbs)	*Water Consumption Rate (in^3/min)
1	0.00			24.600			
2	10.00	10.00		15.755	8.845	8.845	24.517
3	25.00	15.00		15.750	0.005	8.850	0.009
4	55.00	30.00		15.745	0.005	8.855	0.005
5	85.00	30.00		15.740	0.005	8.860	0.005
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							

Steady Flow Rate, Q (in^3/min): 0.005



Field-Saturated Hydraulic Conductivity (Infiltration Rate)

Case 1: L/h > 3 K_{sat} = 1.43E-05 in/min 0.001 in/hr

GEOCON

Aardvark Permeameter Data Analysis

Project Name:	9775 Towne Centre Drive	Date:	11/21/2016
Project Number:	G2059-42-01	By:	JTL
Borehole Location:	I-4	Ref. EL (feet, MSL):	386.0
		Bottom EL (feet, MSL):	382.1

Borehole Diameter (inches):	8.00
Borehole Depth, **H** (inches):	47.00
Distance Between Reservoir & Top of Borehole (inches):	29.50
Depth to Water Table, **s** (feet):	100
Height APM Raised from Bottom (inches):	2.00

Wetted Area, **A** (in^2): 194.13

Distance Between Resevoir and APM, **D** (inches):	67.25
Head Height Calculated, **h** (inches):	5.72
Head Height Recorded, **h** (inches):	5.25
Distance Between Constant Head and Water Table, **L** (inches):	1159

Reading	Time (min)	Time Elapsed (min)	Reservoir Water Weight (g)	Resevoir Water Weight (lbs)	Interval Water Consumption (lbs)	Total Water Consumption (lbs)	*Water Consumption Rate (in^3/min)
1	0.00			24.890			
2	10.00	10.00		16.135	8.755	8.755	24.268
3	20.00	10.00		16.110	0.025	8.780	0.069
4	30.00	10.00		16.090	0.020	8.800	0.055
5	40.00	10.00		16.065	0.025	8.825	0.069
6	50.00	10.00		16.045	0.020	8.845	0.055
7	60.00	10.00		16.025	0.020	8.865	0.055
8	70.00	10.00		16.020	0.005	8.870	0.014
9	90.00	20.00		16.015	0.005	8.875	0.007
10	110.00	20.00		16.010	0.005	8.880	0.007
11							
12							
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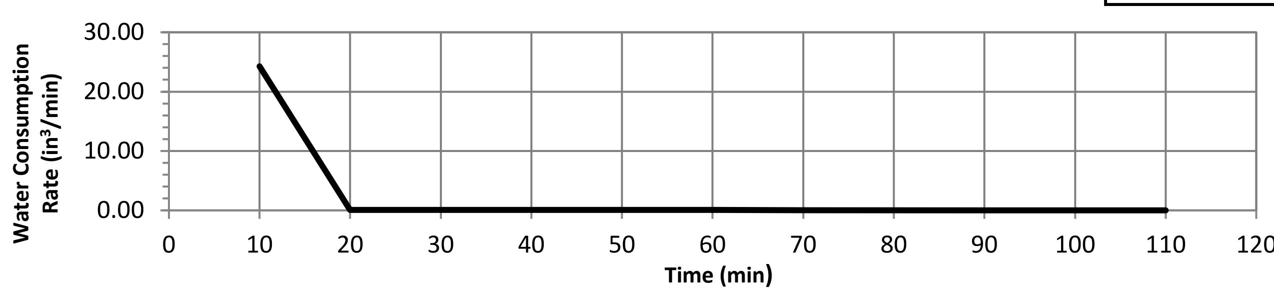
Steady Flow Rate, Q (in^3/min): 0.007



Field-Saturated Hydraulic Conductivity (Infiltration Rate)

Case 1: L/h > 3 K_{sat} = 2.14E-05 in/min 0.001 in/hr

<table>
<tr><th colspan="3">Categorization of Infiltration Feasibility Condition</th><th>Worksheet C.4-1</th></tr>
<tr><td colspan="4"><u>Part 1 - Full Infiltration Feasibility Screening Criteria</u>
Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?</td></tr>
<tr><td>Criteria</td><td>Screening Question</td><td>Yes</td><td>No</td></tr>
<tr><td>1</td><td>Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.</td><td></td><td>X</td></tr>
<tr><td colspan="4">Provide basis:

We performed 4 infiltration tests in the very old terrace deposits. The results of the infiltration rates are the following:

I-1: 0.004 in/hr; I-3: 0.001 in/hr
I-2: 0.003 in/hr I-4: 0.001 in/hr

This shows the soil does not have an estimated reliable infiltration rate greater than 0.5 inches per hour.</td></tr>
<tr><td>2</td><td>Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.</td><td></td><td>X</td></tr>
<tr><td colspan="4">Provide basis:

The site in underlain by very old terrace deposits. Based on the comprehensive study presented in the geotechnical report, infiltration could not be incorporated without increasing the risk of lateral water migration to adjacent properties and streets.</td></tr>
</table>

Worksheet C.4-1 Page 2 of 4			
Criteria	Screening Question	**Yes**	**No**
3	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis: Based on information obtained during our study, groundwater is at a depth of at least 70 feet below the existing ground surface.			
4	**Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis: Infiltration is not anticipated to have a negative impact on nearby water balance or discharge of contaminated groundwater to surface waters.			
Part 1 Result*	If all answers to rows 1 - 4 are "**Yes**" a full infiltration design is potentially feasible. The feasibility screening category is **Full Infiltration** If any answer from row 1-4 is "**No**", infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design. Proceed to Part 2		Full Infiltration is not feasible

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by the City to substantiate findings.

<table>
<tr><th colspan="4">Worksheet C.4-1 Page 3 of 4</th></tr>
<tr><td colspan="4"><u>Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria</u>

Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?</td></tr>
<tr><td>Criteria</td><td>Screening Question</td><td>Yes</td><td>No</td></tr>
<tr><td>5</td><td>Do soil and geologic conditions allow for infiltration in any appreciable rate or volume? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.</td><td></td><td>X</td></tr>
<tr><td colspan="4">Provide basis:

The unfactored infiltration rates are:

I-1: 0.004 in/hr
I-2: 0.003 in/hr
I-3: 0.001 in/hr
I-4: 0.001 in/hr

The infiltration rates are less than 0.01. Therefore, the site is not feasible for infiltration.</td></tr>
<tr><td>6</td><td>Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.</td><td></td><td>X</td></tr>
<tr><td colspan="4">Provide basis:

The site in underlain by very old terrace deposits. Based on the comprehensive study presented in the geotechnical report, infiltration could not be incorporated without increasing the risk of lateral water migration to adjacent properties and streets.</td></tr>
</table>

Worksheet C.4-1 Page 4 of 4			
Criteria	Screening Question	**Yes**	**No**
7	**Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis: Based on information obtained from our geotechnical investigation, groundwater is at a depth of at least 70 feet below the existing ground surface. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
8	**Can infiltration be allowed without violating downstream water rights**? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis: We are unaware of any downstream water rights that could be impacted from infiltration. The project civil engineer should confirm.			
Part 2 Result*	If all answers from row 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is **Partial Infiltration.** If any answer from row 5-8 is no, then infiltration of any volume is considered to be **infeasible** within the drainage area. The feasibility screening category is **No Infiltration.**	Partial Infiltration is not feasible	

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by the City to substantiate findings.

APPENDIX D

APPENDIX D

RECOMMENDED GRADING SPECIFICATIONS

FOR

9775 TOWNE CENTRE DRIVE
SAN DIEGO, CALIFORNIA

DECEMBER 16, 2016
PROJECT NO. G2059-42-01

RECOMMENDED GRADING SPECIFICATIONS

1. GENERAL

1.1 These Recommended Grading Specifications shall be used in conjunction with the Geotechnical Report for the project prepared by Geocon. The recommendations contained in the text of the Geotechnical Report are a part of the earthwork and grading specifications and shall supersede the provisions contained hereinafter in the case of conflict.

1.2 Prior to the commencement of grading, a geotechnical consultant (Consultant) shall be employed for the purpose of observing earthwork procedures and testing the fills for substantial conformance with the recommendations of the Geotechnical Report and these specifications. The Consultant should provide adequate testing and observation services so that they may assess whether, in their opinion, the work was performed in substantial conformance with these specifications. It shall be the responsibility of the Contractor to assist the Consultant and keep them apprised of work schedules and changes so that personnel may be scheduled accordingly.

1.3 It shall be the sole responsibility of the Contractor to provide adequate equipment and methods to accomplish the work in accordance with applicable grading codes or agency ordinances, these specifications and the approved grading plans. If, in the opinion of the Consultant, unsatisfactory conditions such as questionable soil materials, poor moisture condition, inadequate compaction, and/or adverse weather result in a quality of work not in conformance with these specifications, the Consultant will be empowered to reject the work and recommend to the Owner that grading be stopped until the unacceptable conditions are corrected.

2. DEFINITIONS

2.1 **Owner** shall refer to the owner of the property or the entity on whose behalf the grading work is being performed and who has contracted with the Contractor to have grading performed.

2.2 **Contractor** shall refer to the Contractor performing the site grading work.

2.3 **Civil Engineer** or **Engineer of Work** shall refer to the California licensed Civil Engineer or consulting firm responsible for preparation of the grading plans, surveying and verifying as-graded topography.

2.4 **Consultant** shall refer to the soil engineering and engineering geology consulting firm retained to provide geotechnical services for the project.

2.5 **Soil Engineer** shall refer to a California licensed Civil Engineer retained by the Owner, who is experienced in the practice of geotechnical engineering. The Soil Engineer shall be responsible for having qualified representatives on-site to observe and test the Contractor's work for conformance with these specifications.

2.6 **Engineering Geologist** shall refer to a California licensed Engineering Geologist retained by the Owner to provide geologic observations and recommendations during the site grading.

2.7 **Geotechnical Report** shall refer to a soil report (including all addenda) which may include a geologic reconnaissance or geologic investigation that was prepared specifically for the development of the project for which these Recommended Grading Specifications are intended to apply.

3. MATERIALS

3.1 Materials for compacted fill shall consist of any soil excavated from the cut areas or imported to the site that, in the opinion of the Consultant, is suitable for use in construction of fills. In general, fill materials can be classified as *soil* fills, *soil-rock* fills or *rock* fills, as defined below.

3.1.1 **Soil fills** are defined as fills containing no rocks or hard lumps greater than 12 inches in maximum dimension and containing at least 40 percent by weight of material smaller than ¾ inch in size.

3.1.2 **Soil-rock fills** are defined as fills containing no rocks or hard lumps larger than 4 feet in maximum dimension and containing a sufficient matrix of soil fill to allow for proper compaction of soil fill around the rock fragments or hard lumps as specified in Paragraph 6.2. **Oversize rock** is defined as material greater than 12 inches.

3.1.3 **Rock fills** are defined as fills containing no rocks or hard lumps larger than 3 feet in maximum dimension and containing little or no fines. Fines are defined as material smaller than ¾ inch in maximum dimension. The quantity of fines shall be less than approximately 20 percent of the rock fill quantity.

3.2 Material of a perishable, spongy, or otherwise unsuitable nature as determined by the Consultant shall not be used in fills.

3.3 Materials used for fill, either imported or on-site, shall not contain hazardous materials as defined by the California Code of Regulations, Title 22, Division 4, Chapter 30, Articles 9 and 10; 40CFR; and any other applicable local, state or federal laws. The Consultant shall not be responsible for the identification or analysis of the potential presence of hazardous materials. However, if observations, odors or soil discoloration cause Consultant to suspect the presence of hazardous materials, the Consultant may request from the Owner the termination of grading operations within the affected area. Prior to resuming grading operations, the Owner shall provide a written report to the Consultant indicating that the suspected materials are not hazardous as defined by applicable laws and regulations.

3.4 The outer 15 feet of *soil-rock* fill slopes, measured horizontally, should be composed of properly compacted *soil* fill materials approved by the Consultant. *Rock* fill may extend to the slope face, provided that the slope is not steeper than 2:1 (horizontal:vertical) and a soil layer no thicker than 12 inches is track-walked onto the face for landscaping purposes. This procedure may be utilized provided it is acceptable to the governing agency, Owner and Consultant.

3.5 Samples of soil materials to be used for fill should be tested in the laboratory by the Consultant to determine the maximum density, optimum moisture content, and, where appropriate, shear strength, expansion, and gradation characteristics of the soil.

3.6 During grading, soil or groundwater conditions other than those identified in the Geotechnical Report may be encountered by the Contractor. The Consultant shall be notified immediately to evaluate the significance of the unanticipated condition.

4. CLEARING AND PREPARING AREAS TO BE FILLED

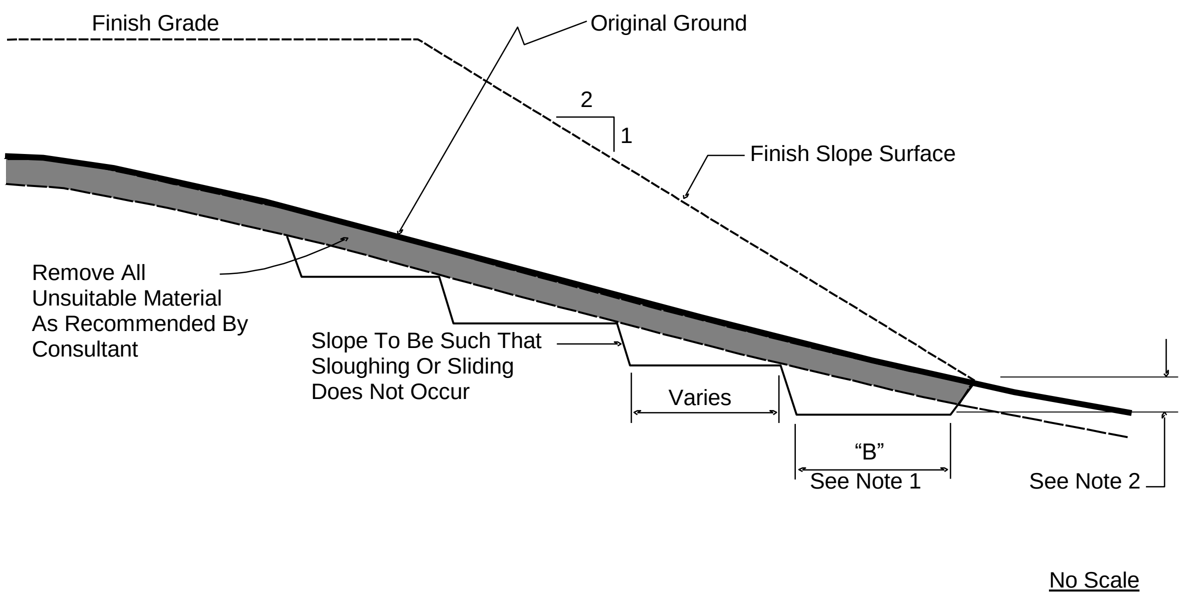
4.1 Areas to be excavated and filled shall be cleared and grubbed. Clearing shall consist of complete removal above the ground surface of trees, stumps, brush, vegetation, man-made structures, and similar debris. Grubbing shall consist of removal of stumps, roots, buried logs and other unsuitable material and shall be performed in areas to be graded. Roots and other projections exceeding 1½ inches in diameter shall be removed to a depth of 3 feet below the surface of the ground. Borrow areas shall be grubbed to the extent necessary to provide suitable fill materials.

4.2 Asphalt pavement material removed during clearing operations should be properly disposed at an approved off-site facility or in an acceptable area of the project evaluated by Geocon and the property owner. Concrete fragments that are free of reinforcing steel may be placed in fills, provided they are placed in accordance with Section 6.2 or 6.3 of this document.

4.3 After clearing and grubbing of organic matter and other unsuitable material, loose or porous soils shall be removed to the depth recommended in the Geotechnical Report. The depth of removal and compaction should be observed and approved by a representative of the Consultant. The exposed surface shall then be plowed or scarified to a minimum depth of 6 inches and until the surface is free from uneven features that would tend to prevent uniform compaction by the equipment to be used.

4.4 Where the slope ratio of the original ground is steeper than 5:1 (horizontal:vertical), or where recommended by the Consultant, the original ground should be benched in accordance with the following illustration.

TYPICAL BENCHING DETAIL



DETAIL NOTES: (1) Key width "B" should be a minimum of 10 feet, or sufficiently wide to permit complete coverage with the compaction equipment used. The base of the key should be graded horizontal, or inclined slightly into the natural slope.

(2) The outside of the key should be below the topsoil or unsuitable surficial material and at least 2 feet into dense formational material. Where hard rock is exposed in the bottom of the key, the depth and configuration of the key may be modified as approved by the Consultant.

4.5 After areas to receive fill have been cleared and scarified, the surface should be moisture conditioned to achieve the proper moisture content, and compacted as recommended in Section 6 of these specifications.

5. COMPACTION EQUIPMENT

5.1 Compaction of *soil* or *soil-rock* fill shall be accomplished by sheepsfoot or segmented-steel wheeled rollers, vibratory rollers, multiple-wheel pneumatic-tired rollers, or other types of acceptable compaction equipment. Equipment shall be of such a design that it will be capable of compacting the *soil* or *soil-rock* fill to the specified relative compaction at the specified moisture content.

5.2 Compaction of *rock* fills shall be performed in accordance with Section 6.3.

6. PLACING, SPREADING AND COMPACTION OF FILL MATERIAL

6.1 *Soil* fill, as defined in Paragraph 3.1.1, shall be placed by the Contractor in accordance with the following recommendations:

6.1.1 *Soil* fill shall be placed by the Contractor in layers that, when compacted, should generally not exceed 8 inches. Each layer shall be spread evenly and shall be thoroughly mixed during spreading to obtain uniformity of material and moisture in each layer. The entire fill shall be constructed as a unit in nearly level lifts. Rock materials greater than 12 inches in maximum dimension shall be placed in accordance with Section 6.2 or 6.3 of these specifications.

6.1.2 In general, the *soil* fill shall be compacted at a moisture content at or above the optimum moisture content as determined by ASTM D 1557.

6.1.3 When the moisture content of *soil* fill is below that specified by the Consultant, water shall be added by the Contractor until the moisture content is in the range specified.

6.1.4 When the moisture content of the *soil* fill is above the range specified by the Consultant or too wet to achieve proper compaction, the *soil* fill shall be aerated by the Contractor by blading/mixing, or other satisfactory methods until the moisture content is within the range specified.

6.1.5 After each layer has been placed, mixed, and spread evenly, it shall be thoroughly compacted by the Contractor to a relative compaction of at least 90 percent. Relative compaction is defined as the ratio (expressed in percent) of the in-place dry density of the compacted fill to the maximum laboratory dry density as determined in accordance with ASTM D 1557. Compaction shall be continuous over the entire area, and compaction equipment shall make sufficient passes so that the specified minimum relative compaction has been achieved throughout the entire fill.

6.1.6 Where practical, soils having an Expansion Index greater than 50 should be placed at least 3 feet below finish pad grade and should be compacted at a moisture content generally 2 to 4 percent greater than the optimum moisture content for the material.

6.1.7 Properly compacted *soil* fill shall extend to the design surface of fill slopes. To achieve proper compaction, it is recommended that fill slopes be over-built by at least 3 feet and then cut to the design grade. This procedure is considered preferable to track-walking of slopes, as described in the following paragraph.

6.1.8 As an alternative to over-building of slopes, slope faces may be back-rolled with a heavy-duty loaded sheepsfoot or vibratory roller at maximum 4-foot fill height intervals. Upon completion, slopes should then be track-walked with a D-8 dozer or similar equipment, such that a dozer track covers all slope surfaces at least twice.

6.2 *Soil-rock* fill, as defined in Paragraph 3.1.2, shall be placed by the Contractor in accordance with the following recommendations:

6.2.1 Rocks larger than 12 inches but less than 4 feet in maximum dimension may be incorporated into the compacted *soil* fill, but shall be limited to the area measured 15 feet minimum horizontally from the slope face and 5 feet below finish grade or 3 feet below the deepest utility, whichever is deeper.

6.2.2 Rocks or rock fragments up to 4 feet in maximum dimension may either be individually placed or placed in windrows. Under certain conditions, rocks or rock fragments up to 10 feet in maximum dimension may be placed using similar methods. The acceptability of placing rock materials greater than 4 feet in maximum dimension shall be evaluated during grading as specific cases arise and shall be approved by the Consultant prior to placement.

6.2.3 For individual placement, sufficient space shall be provided between rocks to allow for passage of compaction equipment.

6.2.4 For windrow placement, the rocks should be placed in trenches excavated in properly compacted *soil* fill. Trenches should be approximately 5 feet wide and 4 feet deep in maximum dimension. The voids around and beneath rocks should be filled with approved granular soil having a Sand Equivalent of 30 or greater and should be compacted by flooding. Windrows may also be placed utilizing an "open-face" method in lieu of the trench procedure, however, this method should first be approved by the Consultant.

6.2.5 Windrows should generally be parallel to each other and may be placed either parallel to or perpendicular to the face of the slope depending on the site geometry. The minimum horizontal spacing for windrows shall be 12 feet center-to-center with a 5-foot stagger or offset from lower courses to next overlying course. The minimum vertical spacing between windrow courses shall be 2 feet from the top of a lower windrow to the bottom of the next higher windrow.

6.2.6 Rock placement, fill placement and flooding of approved granular soil in the windrows should be continuously observed by the Consultant.

6.3 *Rock* fills, as defined in Section 3.1.3, shall be placed by the Contractor in accordance with the following recommendations:

6.3.1 The base of the *rock* fill shall be placed on a sloping surface (minimum slope of 2 percent). The surface shall slope toward suitable subdrainage outlet facilities. The *rock* fills shall be provided with subdrains during construction so that a hydrostatic pressure buildup does not develop. The subdrains shall be permanently connected to controlled drainage facilities to control post-construction infiltration of water.

6.3.2 *Rock* fills shall be placed in lifts not exceeding 3 feet. Placement shall be by rock trucks traversing previously placed lifts and dumping at the edge of the currently placed lift. Spreading of the *rock* fill shall be by dozer to facilitate *seating* of the rock. The *rock* fill shall be watered heavily during placement. Watering shall consist of water trucks traversing in front of the current rock lift face and spraying water continuously during rock placement. Compaction equipment with compactive energy comparable to or greater than that of a 20-ton steel vibratory roller or other compaction equipment providing suitable energy to achieve the required compaction or deflection as recommended in Paragraph 6.3.3 shall be utilized. The number of passes to be made should be determined as described in Paragraph 6.3.3. Once a *rock* fill lift has been covered with *soil* fill, no additional *rock* fill lifts will be permitted over the *soil* fill.

6.3.3 Plate bearing tests, in accordance with ASTM D 1196, may be performed in both the compacted *soil* fill and in the *rock* fill to aid in determining the required minimum number of passes of the compaction equipment. If performed, a minimum of three plate bearing tests should be performed in the properly compacted *soil* fill (minimum relative compaction of 90 percent). Plate bearing tests shall then be performed on areas of *rock* fill having two passes, four passes and six passes of the compaction equipment, respectively. The number of passes required for the *rock* fill shall be determined by comparing the results of the plate bearing tests for the *soil* fill and the *rock* fill and by evaluating the deflection variation with number of passes. The required number of passes of the compaction equipment will be performed as necessary until the plate bearing deflections are equal to or less than that determined for the properly compacted *soil* fill. In no case will the required number of passes be less than two.

6.3.4 A representative of the Consultant should be present during *rock* fill operations to observe that the minimum number of "passes" have been obtained, that water is being properly applied and that specified procedures are being followed. The actual number of plate bearing tests will be determined by the Consultant during grading.

6.3.5 Test pits shall be excavated by the Contractor so that the Consultant can state that, in their opinion, sufficient water is present and that voids between large rocks are properly filled with smaller rock material. In-place density testing will not be required in the *rock* fills.

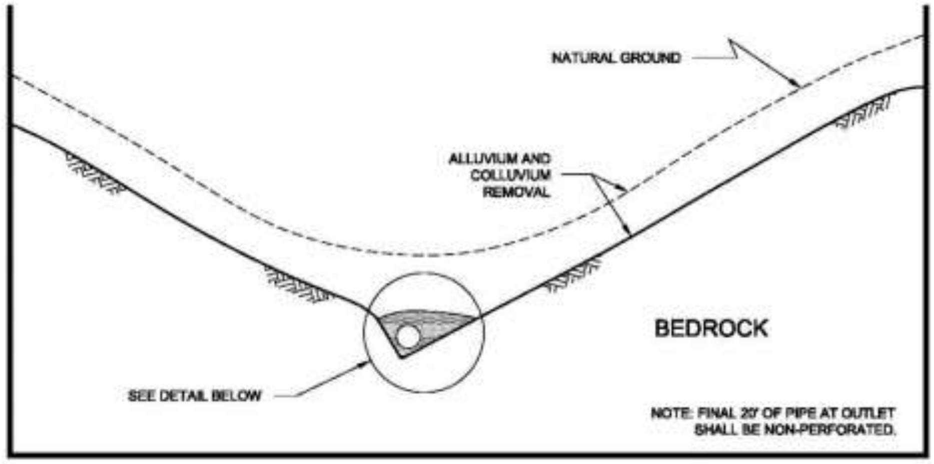
6.3.6 To reduce the potential for "piping" of fines into the *rock* fill from overlying *soil* fill material, a 2-foot layer of graded filter material shall be placed above the uppermost lift of *rock* fill. The need to place graded filter material below the *rock* should be determined by the Consultant prior to commencing grading. The gradation of the graded filter material will be determined at the time the *rock* fill is being excavated. Materials typical of the *rock* fill should be submitted to the Consultant in a timely manner, to allow design of the graded filter prior to the commencement of *rock* fill placement.

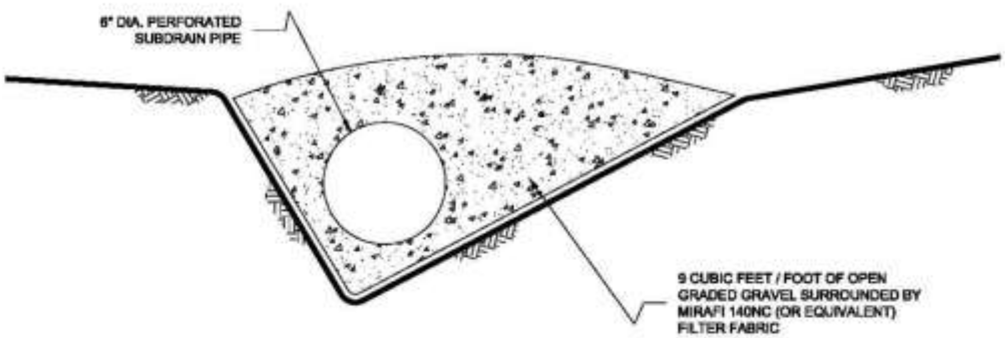
6.3.7 *Rock* fill placement should be continuously observed during placement by the Consultant.

7. SUBDRAINS

7.1 The geologic units on the site may have permeability characteristics and/or fracture systems that could be susceptible under certain conditions to seepage. The use of canyon subdrains may be necessary to mitigate the potential for adverse impacts associated with seepage conditions. Canyon subdrains with lengths in excess of 500 feet or extensions of existing offsite subdrains should use 8-inch-diameter pipes. Canyon subdrains less than 500 feet in length should use 6-inch-diameter pipes.

TYPICAL CANYON DRAIN DETAIL





NOTES:

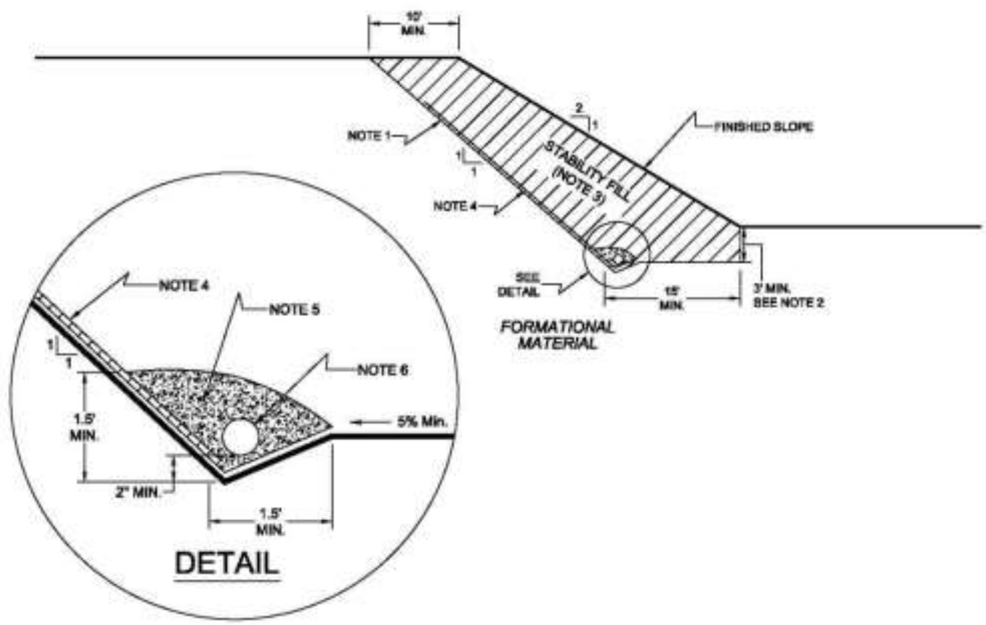
1......8-INCH DIAMETER, SCHEDULE 80 PVC PERFORATED PIPE FOR FILLS
IN EXCESS OF 100-FEET IN DEPTH OR A PIPE LENGTH OF LONGER THAN 500 FEET.

2......6-INCH DIAMETER, SCHEDULE 40 PVC PERFORATED PIPE FOR FILLS
LESS THAN 100-FEET IN DEPTH OR A PIPE LENGTH SHORTER THAN 500 FEET.

NO SCALE

7.2 Slope drains within stability fill keyways should use 4-inch-diameter (or lager) pipes.

TYPICAL STABILITY FILL DETAIL



NOTES:

1.....EXCAVATE BACKCUT AT 1:1 INCLINATION (UNLESS OTHERWISE NOTED).

2.....BASE OF STABILITY FILL TO BE 3 FEET INTO FORMATIONAL MATERIAL, SLOPING A MINIMUM 5% INTO SLOPE.

3.....STABILITY FILL TO BE COMPOSED OF PROPERLY COMPACTED GRANULAR SOIL.

4.....CHIMNEY DRAINS TO BE APPROVED PREFABRICATED CHIMNEY DRAIN PANELS (MIRADRAIN G200N OR EQUIVALENT) SPACED APPROXIMATELY 20 FEET CENTER TO CENTER AND 4 FEET WIDE. CLOSER SPACING MAY BE REQUIRED IF SEEPAGE IS ENCOUNTERED.

5.....FILTER MATERIAL TO BE 3/4-INCH, OPEN-GRADED CRUSHED ROCK ENCLOSED IN APPROVED FILTER FABRIC (MIRAFI 140NC).

6.....COLLECTOR PIPE TO BE 4-INCH MINIMUM DIAMETER, PERFORATED, THICK-WALLED PVC SCHEDULE 40 OR EQUIVALENT, AND SLOPED TO DRAIN AT 1 PERCENT MINIMUM TO APPROVED OUTLET.

NO SCALE

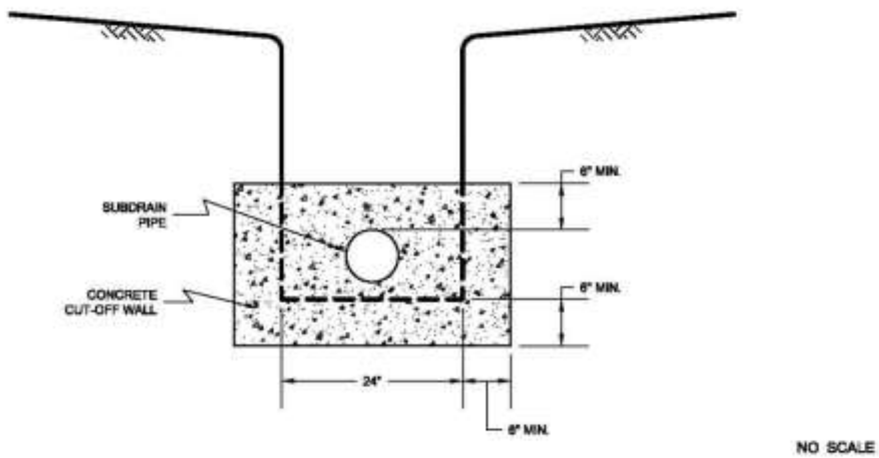
7.3 The actual subdrain locations will be evaluated in the field during the remedial grading operations. Additional drains may be necessary depending on the conditions observed and the requirements of the local regulatory agencies. Appropriate subdrain outlets should be evaluated prior to finalizing 40-scale grading plans.

7.4 *Rock* fill or *soil-rock* fill areas may require subdrains along their down-slope perimeters to mitigate the potential for buildup of water from construction or landscape irrigation. The subdrains should be at least 6-inch-diameter pipes encapsulated in gravel and filter fabric. *Rock* fill drains should be constructed using the same requirements as canyon subdrains.

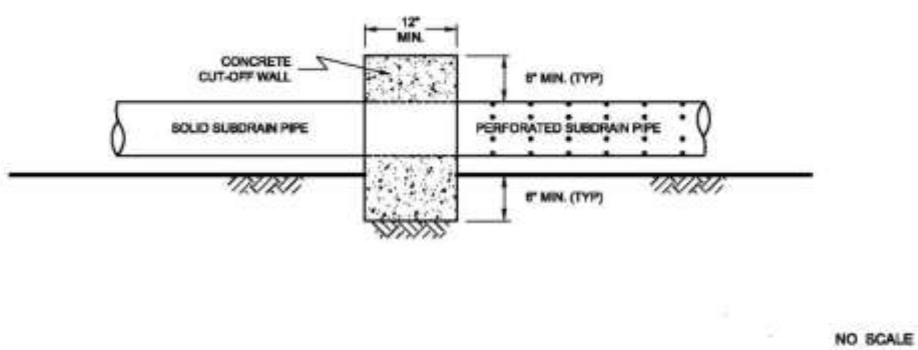
7.5 Prior to outletting, the final 20-foot segment of a subdrain that will not be extended during future development should consist of non-perforated drainpipe. At the non-perforated/ perforated interface, a seepage cutoff wall should be constructed on the downslope side of the pipe.

TYPICAL CUT OFF WALL DETAIL

FRONT VIEW

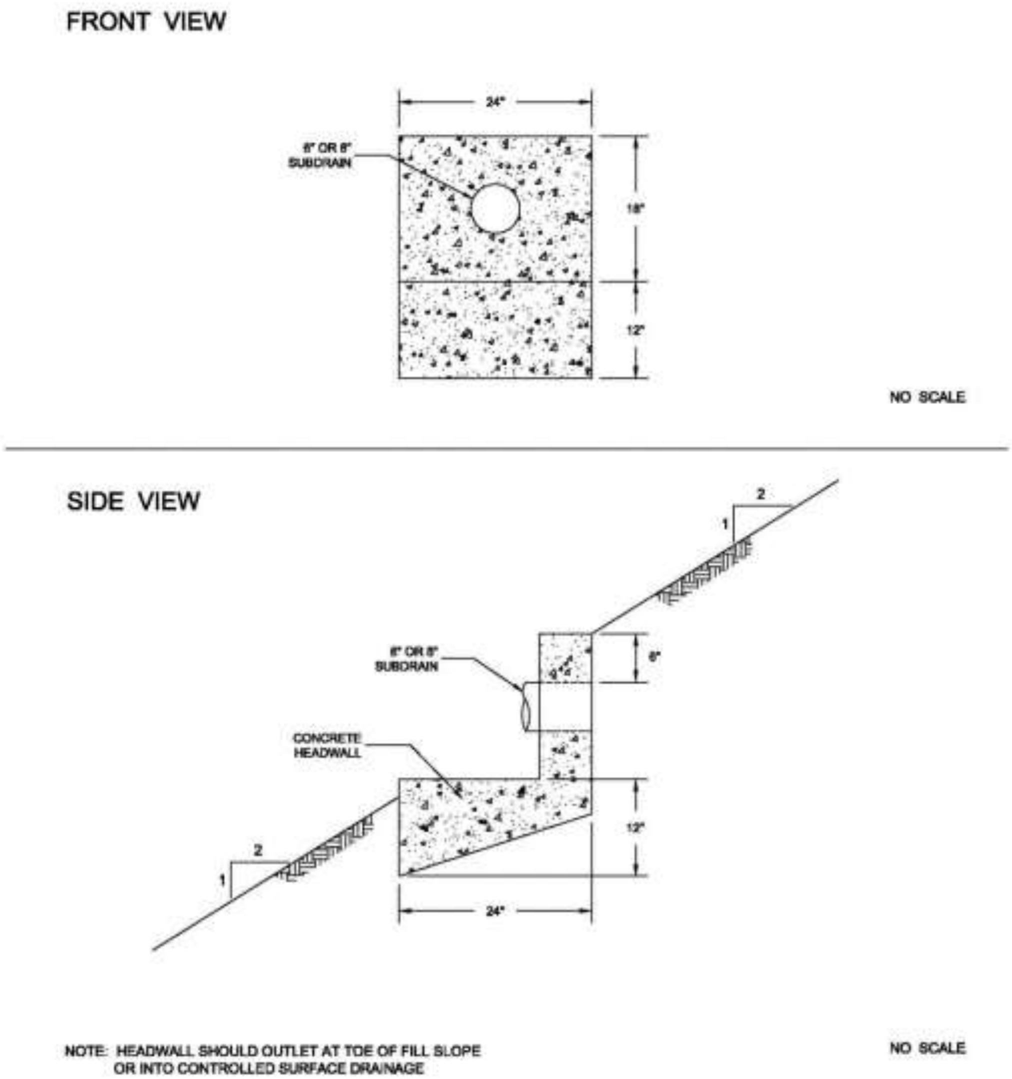


SIDE VIEW



7.6 Subdrains that discharge into a natural drainage course or open space area should be provided with a permanent headwall structure.

TYPICAL HEADWALL DETAIL



7.7 The final grading plans should show the location of the proposed subdrains. After completion of remedial excavations and subdrain installation, the project civil engineer should survey the drain locations and prepare an "as-built" map showing the drain locations. The final outlet and connection locations should be determined during grading operations. Subdrains that will be extended on adjacent projects after grading can be placed on formational material and a vertical riser should be placed at the end of the subdrain. The grading contractor should consider videoing the subdrains shortly after burial to check proper installation and functionality. The contractor is responsible for the performance of the drains.

8. OBSERVATION AND TESTING

8.1 The Consultant shall be the Owner's representative to observe and perform tests during clearing, grubbing, filling, and compaction operations. In general, no more than 2 feet in vertical elevation of *soil* or *soil-rock* fill should be placed without at least one field density test being performed within that interval. In addition, a minimum of one field density test should be performed for every 2,000 cubic yards of *soil* or *soil-rock* fill placed and compacted.

8.2 The Consultant should perform a sufficient distribution of field density tests of the compacted *soil* or *soil-rock* fill to provide a basis for expressing an opinion whether the fill material is compacted as specified. Density tests shall be performed in the compacted materials below any disturbed surface. When these tests indicate that the density of any layer of fill or portion thereof is below that specified, the particular layer or areas represented by the test shall be reworked until the specified density has been achieved.

8.3 During placement of *rock* fill, the Consultant should observe that the minimum number of passes have been obtained per the criteria discussed in Section 6.3.3. The Consultant should request the excavation of observation pits and may perform plate bearing tests on the placed *rock* fills. The observation pits will be excavated to provide a basis for expressing an opinion as to whether the *rock* fill is properly seated and sufficient moisture has been applied to the material. When observations indicate that a layer of *rock* fill or any portion thereof is below that specified, the affected layer or area shall be reworked until the *rock* fill has been adequately seated and sufficient moisture applied.

8.4 A settlement monitoring program designed by the Consultant may be conducted in areas of *rock* fill placement. The specific design of the monitoring program shall be as recommended in the Conclusions and Recommendations section of the project Geotechnical Report or in the final report of testing and observation services performed during grading.

8.5 We should observe the placement of subdrains, to check that the drainage devices have been placed and constructed in substantial conformance with project specifications.

8.6 Testing procedures shall conform to the following Standards as appropriate:

8.6.1 Soil and Soil-Rock Fills:

8.6.1.1 Field Density Test, ASTM D 1556, *Density of Soil In-Place By the Sand-Cone Method.*

8.6.1.2 Field Density Test, Nuclear Method, ASTM D 6938, *Density of Soil and Soil-Aggregate In-Place by Nuclear Methods (Shallow Depth).*

8.6.1.3 Laboratory Compaction Test, ASTM D 1557, *Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-Pound Hammer and 18-Inch Drop*.

8.6.1.4. Expansion Index Test, ASTM D 4829, *Expansion Index Test*.

9. PROTECTION OF WORK

9.1 During construction, the Contractor shall properly grade all excavated surfaces to provide positive drainage and prevent ponding of water. Drainage of surface water shall be controlled to avoid damage to adjoining properties or to finished work on the site. The Contractor shall take remedial measures to prevent erosion of freshly graded areas until such time as permanent drainage and erosion control features have been installed. Areas subjected to erosion or sedimentation shall be properly prepared in accordance with the Specifications prior to placing additional fill or structures.

9.2 After completion of grading as observed and tested by the Consultant, no further excavation or filling shall be conducted except in conjunction with the services of the Consultant.

10. CERTIFICATIONS AND FINAL REPORTS

10.1 Upon completion of the work, Contractor shall furnish Owner a certification by the Civil Engineer stating that the lots and/or building pads are graded to within 0.1 foot vertically of elevations shown on the grading plan and that all tops and toes of slopes are within 0.5 foot horizontally of the positions shown on the grading plans. After installation of a section of subdrain, the project Civil Engineer should survey its location and prepare an *as-built* plan of the subdrain location. The project Civil Engineer should verify the proper outlet for the subdrains and the Contractor should ensure that the drain system is free of obstructions.

10.2 The Owner is responsible for furnishing a final as-graded soil and geologic report satisfactory to the appropriate governing or accepting agencies. The as-graded report should be prepared and signed by a California licensed Civil Engineer experienced in geotechnical engineering and by a California Certified Engineering Geologist, indicating that the geotechnical aspects of the grading were performed in substantial conformance with the Specifications or approved changes to the Specifications.

LIST OF REFERENCES

City of San Diego (2008), *Seismic Safety Study, Geologic Hazards and Faults, Map Sheet 34*;

Chiou, B. S. J., and Youngs, R. R., (2008), *A NGA Model for the Average Horizontal Component of Peak Ground Motion and Response Spectra,* preprint for article to be published in NGA Special Edition for Earthquake Spectra;

Kennedy, M. P., and Tan, S. S., (2008), *Geologic Map of the San Diego 30' x 60' Quadrangle, California*, USGS Regional Geologic Map Series, 1:100,000 Scale, Map No. 3;

Risk Engineering (2015), *EZ-FRISK, Version 7.65*;

USDA (1953), Aerial photographs AXN 4M 86;

USGS (2016), *Quaternary Fault and Fold Database of the United States:* U.S. Geological Survey website, http://earthquakes,usgs.gov/hazards/qfaults, accessed December 14, 2016;

TRANSPORTATION IMPACT ANALYSIS

For

9775 TOWNE CENTRE DRIVE

Prepared for

BMR-Apex LP

5th Submittal: November 16, 2017

TRAFFIC PLANNING & ENGINEERING, MARKETING & PROJECT SUPPORT
CONSULTANTS TO INDUSTRY AND GOVERNMENT
8451 Miralani Drive, Suite A
San Diego, CA 92126
(858) 560-4911

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1. EXECUTIVE SUMMARY

This study was commissioned by BMR-Apex LP, to determine potential transportation impacts and appropriate mitigation measures for the proposed 9775 Towne Centre Drive project (proposed project). The proposed project is located on the east side of Towne Centre Drive approximately 2,000 feet north of Eastgate Mall in the University City Community of the City of San Diego. The proposed project plans to demolish an existing 100,000 square foot (SF) building and construct a new 165,000 SF building. Within this building, 8,500 SF is accessory space and the remaining 156,500 is considered trip generating space of which 100,000 SF of trip generating space is already entitled, leaving a net increase of 56,500 SF of new trip generating space. Accessory space, as defined by the University Community Plan is amenity space intended to serve users within the project site and adjacent sites. The use of the building will be Scientific Research.

The proposed 156,500 SF Scientific Research facility is expected to generate 1,252 average daily trips (ADT) with 200 (180 inbound / 20 outbound) trips in the AM peak hour and 175 trips (17 inbound / 158 outbound) in the PM peak hour. After accounting for the trips generated by the existing 100,000 square foot building, the proposed project is expected to generate 452 average daily trips (ADT) with 72 (65 inbound / 7 outbound) trips in the AM peak hour and 63 trips (7 inbound / 56 outbound) in the PM peak hour from its net increase of 56,500 SF of trip generating space.

In order to determine a scope of work for the Transportation Impact Study, staff of Urban Systems Associates, Inc. (USAI) completed a preliminary analysis and had discussions with City Transportation staff. Based on the evaluation, study area intersections and street segments were identified for the analysis. The project's distribution was based on a San Diego Association of Governments (SANDAG) Series 12 Year 2035 travel forecast. New count data was obtained on November 17, 2016 to supplement counts taken in June 2015 which included both machine and manual traffic counts of the existing daily and peak hour traffic flow data for the study intersections and street segments.

The traffic generation of the Project was estimated based on trip generation rates in the City of San Diego's May 2003 Trip Generation Manual. The addition of project traffic was evaluated in Existing, Near Term, and Horizon Year 2035 scenarios, and an impact analysis was completed in which six scenarios were analyzed. The following scenarios were included in the report: Existing, Existing With Project, Near Term Without Project, Near Term With Project, Horizon Year 2035 Without Project, and Horizon Year 2035 With Project. The term "Near Term" is meant to discuss a condition occurring at the project's estimated opening day (Year 2019) where traffic from other known development projects in the area is added onto existing traffic volumes. This reflects the best information available for determining what traffic would be in the next several years. The term "Horizon Year 2035" is meant to discuss traffic conditions to the Year 2035. The analysis year used for Series 12 traffic modeling purposes is the Year 2035. A SANDAG Series 12 Year 2035 Select Zone analysis dated November 15, 2016 was used to estimate the distribution of project traffic and project horizon year (Year 2035 With Project) traffic volumes.

Study Results:

Based upon this transportation impact analysis, it was determined that development of the proposed project would have the following impacts:

Impacts:

1. **Street Segments –** The proposed project is expected to have no direct project impacts to street segments in the Existing With Project scenario as shown in **Table 1-1**. The proposed project has no direct project impacts in the Near Term With Project scenario as shown in **Table 1-2**. The proposed project is expected to have no significant cumulative project impacts in the Horizon Year 2035 scenario as shown in **Table 1-3**.

2. **Intersections –** As shown in **Table 1-4**, the project is expected to have no direct project impacts to intersections in the Existing With Project comparison table. As shown in **Table 1-5** the project is expected to have no direct project impacts to intersections in the Near Term With Project comparison table. As shown in **Table 1-6** the project is expected to have no direct project impacts to intersections in the Year 2035 With Project comparison table.

3. **Freeway Main lanes** – No freeway segments were analyzed in this study since the project contributed less than the 50 trips required to study freeway main lanes.

Freeway Ramp Meters – Since project traffic does not meet the threshold requirements for ramps to be studied they were not included in this analysis.

PROPOSED MITIGATION:

STREET SEGMENTS:

The analysis shows no direct or cumulative significant street segment impacts would occur as a result of the proposed project. Therefore, no mitigation has been identified on any of the studied street segments.

INTERSECTIONS:

Since there are no significant impacts for intersection, no mitigation is proposed as a result of this project.

FREEWAY RAMP METER:

Since project traffic does not meet the threshold requirements for ramps to be studied they were not included in this analysis.

TABLE 1-1

Existing With and Without Project Street Segment Significance

Road	Segment	Cap.	Class.	Existing Count	Existing 9775 Building	Adjusted Existing			Project Only	Existing + Project			Δ V/C	Is this impact Significant?
				Volume	Volume	LOS	Volume	V/C	Volume	LOS	Volume	V/C		
Genesee Ave.	I-5 NB Ramps to Eastgate Mall	60,000	6-PA	29,457	80	B	29,537	0.49	45	B	29,582	0.49	0.001	***NO***
Eastgate Mall	Genesee Ave. to Towne Centre Dr.	30,000	4-C	14,046	272	C	14,318	0.48	154	C	14,472	0.48	0.005	***NO***
	Towne Centre Dr. to Judicial Dr.	40,000	4-M	13,442	152	A	13,594	0.34	86	A	13,680	0.34	0.002	***NO***
Towne Centre Dr.	North of Eastgate Mall	40,000	4-M	9,322	752	A	10,074	0.25	425	A	10,499	0.26	0.011	***NO***
	Eastgate Mall to Executive Dr.	40,000	4-M	12,237	328	A	12,565	0.31	185	A	12,750	0.32	0.005	***NO***
	Executive Dr. to La Jolla Village Dr.	40,000	4-M	18,118	256	B	18,374	0.46	145	B	18,519	0.46	0.004	***NO***
La Jolla Village Dr.	East of Towne Centre Dr.	80,000	8-PA	61,449	232	C	61,681	0.77	131	C	61,812	0.77	0.002	***NO***

Legend:

LOS= Level of Service
V/C= Volume to Capacity Ratio
ΔV/C= Change in V/C ratio

#-PA = Number of Lanes- Prime Arterial
4-C= Four lane Collector Road
4-M= Four lane Major Road

TABLE 1-2

Near Term With and Without Project Street Segment Significance

Road	Segment	Cap.	Class.	Near Term			Near Term + Project			Δ V/C	Is this impact Significant?
				LOS	Volume	V/C	LOS	Volume	V/C		
Genesee Ave.	I-5 NB Ramps to Eastgate Mall	60,000	6-PA	B	33,783	0.56	B	33,828	0.56	0.001	***NO***
Eastgate Mall	Genesee Ave. to Towne Centre Dr.	30,000	4-C	C	14,843	0.49	C	14,997	0.50	0.005	***NO***
	Towne Centre Dr. to Judicial Dr.	40,000	4-M	A	13,939	0.35	A	14,025	0.35	0.002	***NO***
Towne Centre Dr.	North of Eastgate Mall	40,000	4-M	A	10,343	0.26	A	10,768	0.27	0.011	***NO***
	Eastgate Mall to Executive Dr.	40,000	4-M	A	13,083	0.33	A	13,268	0.33	0.005	***NO***
	Executive Dr. to La Jolla Village Dr.	40,000	4-M	B	18,704	0.47	B	18,849	0.47	0.004	***NO***
La Jolla Village Dr.	East of Towne Centre Dr.	80,000	8-PA	D	71,641	0.90	D	71,772	0.90	0.002	***NO***

Legend:

LOS= Level of Service
V/C= Volume to Capacity Ratio
ΔV/C= Change in V/C ratio

#-PA = Number of Lanes- Prime Arterial
4-C= Four lane Collector Road
4-M= Four lane Major Road

TABLE 1-3

Horizon Year 2035 and Horizon Year 2035 + Project Street Segment Significance

Road	Segment	Cap.	Class.	Year 2035			Year 2035 + Project			Δ V/C	Is this impact Significant?
				LOS	Volume	V/C	LOS	Volume	V/C		
Genesee Ave.	I-5 NB Ramps to Eastgate Mall	60,000	6-PA	C	36,655	0.61	C	36,700	0.61	0.001	***NO***
Eastgate Mall	Genesee Ave. to Towne Centre Dr.	30,000	4-C	D	20,646	0.69	D	20,800	0.69	0.005	***NO***
	Towne Centre Dr. to Judicial Dr.	40,000	4-M	A	14,300	0.36	A	14,386	0.36	0.002	***NO***
Towne Centre Dr.	North of Eastgate Mall	40,000	4-M	A	14,375	0.36	A	14,800	0.37	0.011	***NO***
	Eastgate Mall to Executive Dr.	40,000	4-M	C	29,015	0.73	C	29,200	0.73	0.005	***NO***
	Executive Dr. to La Jolla Village Dr.	40,000	4-M	D	33,655	0.84	D	33,800	0.85	0.004	***NO***
La Jolla Village Dr.	East of Towne Centre Dr.	80,000	8-PA	C	69,500	0.87	C	69,631	0.87	0.002	***NO***

Legend:

LOS= Level of Service
V/C= Volume to Capacity Ratio
ΔV/C= Change in V/C ratio

#-PA = Number of Lanes- Prime Arterial
4-C= Four lane Collector Road
4-M= Four lane Major Road

TABLE 1-4

Existing Without and Existing With Project Intersection Comparison

#	Intersection	Existing				Existing + Project							
		AM Peak Hour		PM Peak Hour		AM Peak Hour		Δ	S ?	PM Peak Hour		Δ	S ?
		Delay	LOS	Delay	LOS	Delay	LOS			Delay	LOS		
1	Eastgate Mall at Genesee Ave.	41.1	D	39.9	D	41.3	D	0.2	No	40.0	D	0.1	No
2	Towne Centre Dr. at Eastgate Mall	31.9	C	34.9	C	33.1	C	1.2	No	35.8	D	0.9	No
3	Towne Centre Dr. at Executive Dr.	25.3	C	29.8	C	25.4	C	0.1	No	29.9	C	0.1	No
4	Towne Centre Dr. at La Jolla Village Dr.	34.6	C	40.4	D	34.7	C	0.1	No	40.8	D	0.4	No
5	I-805 SB Ramps at La Jolla Village Dr.	50.8	D	36.8	D	51.7	D	0.9	No	36.9	D	0.1	No
6	I-805 NB Ramps at La Jolla Village Dr.	27.4	C	38.2	D	28.1	C	0.7	No	38.3	D	0.1	No

Notes:
Delay = Seconds per vehicle
LOS = Level of Service
Δ = Change
S = Significant

TABLE 1-5

Near Term Without and Near Term With Project Intersection Comparison

#	Intersection	Near Term				Near Term + Project							
		AM Peak Hour		PM Peak Hour		AM Peak Hour		Δ	S ?	PM Peak Hour		Δ	S ?
		D	LOS	D	LOS	D	LOS			D	LOS		
1	Eastgate Mall at Genesee Ave.	46.4	D	44.3	D	46.9	D	0.5	No	44.5	D	0.2	No
2	Towne Centre Dr. at Eastgate Mall	35.5	D	41.8	D	36.9	D	1.4	No	43.0	D	1.2	No
3	Towne Centre Dr. at Executive Dr.	29.6	C	50.8	D	29.7	C	0.1	No	52.2	D	1.4	No
4	Towne Centre Dr. at La Jolla Village Dr.	43.9	D	50.6	D	44.5	D	0.6	No	51.6	D	1.0	No
5	I-805 SB Ramps at La Jolla Village Dr.	124.0	F	81.5	F	124.4	F	0.4	No	81.8	F	0.3	No
6	I-805 NB Ramps at La Jolla Village Dr.	39.6	D	41.3	D	40.0	D	0.4	No	41.6	D	0.3	No

Notes:

LOS = Level of Service
Δ = Change
S = Significant
D= Delay

TABLE 1-6

Horizon Year 2035 Without and Horizon Year 2035 + Project Intersection Summary

#	Intersection	Year 2035				Year 2035 + Project							
		AM Peak Hour		PM Peak Hour		AM Peak Hour		Δ	S ?	PM Peak Hour		Δ	S ?
		D	LOS	D	LOS	D	LOS			D	LOS		
1	Eastgate Mall at Genesee Ave.	56.8	E	45.7	D	57.8	E	1.0	No	45.9	D	0.2	No
2	Towne Centre Dr. at Eastgate Mall	55.4	E	51.7	D	56.8	E	1.4	No	54.8	D	3.1	No
3	Towne Centre Dr. at Executive Dr.	56.2	E	60.4	E	56.6	E	0.4	No	61.3	E	0.9	No
4	Towne Centre Dr. at La Jolla Village Dr.	65.1	E	68.1	E	66.3	E	1.2	No	70.0	E	1.9	No
5	I-805 SB Ramps at La Jolla Village Dr.	93.4	F	28.6	C	94.1	F	0.7	No	28.6	C	0.0	No
6	I-805 NB Ramps at La Jolla Village Dr.	31.5	C	31.5	C	34.7	C	3.2	No	33.2	C	1.7	No

Notes:

LOS = Level of Service
Δ = Change
S = Significant
D= Delay

2. INTRODUCTION

Urban Systems Associates, Inc. (USAI) was retained by BMR-Apex LP to determine the potential transportation impacts and appropriate mitigation measures for a proposed Community Plan Amendment and rezone to redevelop the property at 9775 Towne Centre Drive in the North University City Community Plan area. The proposed project is located on the east side of Towne Centre Drive north of Eastgate Mall (See **Figure 2-1**). The proposed project plans to demolish the existing 100,000 square foot (SF) building and construct a new 165,000 SF building. Within this building, 8,500 SF is accessory space and the remaining 156,500 is considered trip generating space. Accessory space, as defined by the University Community Plan is amenity space intended to serve users within the project site and adjacent sites. The use of the building will be Scientific Research.

The existing 100,000 SF scientific research building was previously entitled with construction completed in 1989. An EIR was completed for the Eastgate Technology Park PID in 1982. The existing building is currently vacant, in which the most recent lease expired on 5/31/14.

The existing building is currently vacant and the current proposal would redevelop the site within the development intensity level of 2,604,200 square feet—equating to 18,229 ADT—for the overall Park analyzed in the 1982 EIR. The 1982 EIR is included for informational purposes in **Appendix A**. The proposed project will provide intra-PID density transfers and inter-PID density transfers via a Community Plan Amendment, along with TDM measures to ensure consistency with the Development Intensities contained in the Community Plan. A further discussion of Community Plan Conformance is included in Section 16.0. The proposed 156,500 SF Scientific Research facility would generate 1,252 average daily trips (ADT) with 200 (180 inbound / 20 outbound) trips in the AM peak hour and 175 trips (17 inbound /

158 outbound) in the PM peak hour. After accounting for the trips generated by the existing 100,000 square foot building, the proposed project is expected to generate 452 average daily trips (ADT) with 72 (65 inbound / 7 outbound) trips in the AM peak hour and 63 trips (7 inbound / 56 outbound) in the PM peak hour from its net increase of 56,500 SF of new trip generating space. **Figure 2-2** shows the proposed project site plan. **Figure 2-3** shows the project vicinity map.

In order to determine the project's trip distribution, USAI used a San Diego Association of Governments (SANDAG) Series 12 Year 2035 Select Zone model run, see **Appendix B**. For study area purposes, USAI used City and regional guidelines that 50 trips in one direction during a peak hour be used as a threshold for study intersections and street segments. Also, based on the City and regional guidelines, USAI used 50 peak directional trips as the basis for studying freeway segments and 20 peak hour trips for studying metered freeway on ramps. Based on the study area criteria, no freeway segments were included in this study. **Figure 2-4** shows the study area boundary and the intersection key selected for the study. USAI then gathered information or oversaw the machine and manual traffic counts of the existing ADT and peak hour traffic flow data for the study intersections and street segments. Counts were completed on November 17, 2016 when schools (UCSD and La Jolla Country Day school) were still in session. **Table 2-1** shows the study area street segments and intersections.

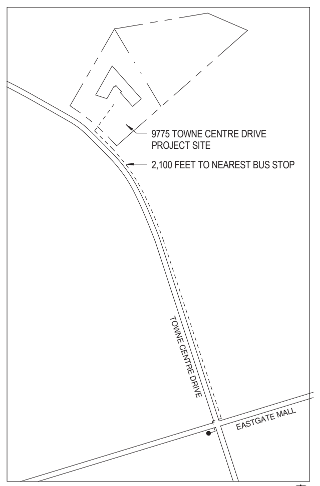
FIGURE 2-1

Project Location Map

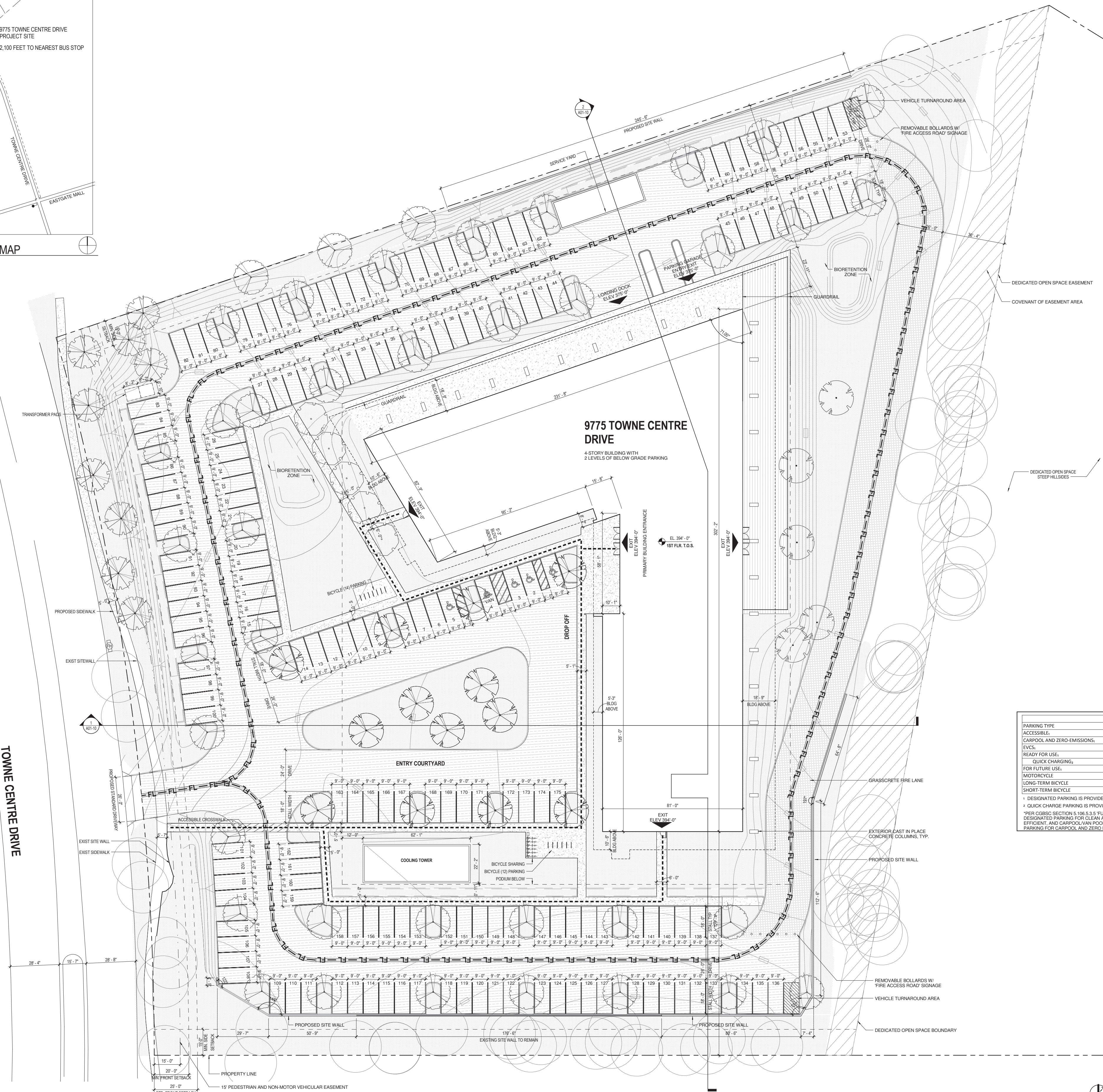
Site Plan provided on the following page in 11” x 17” format

FIGURE 2-2

Project Site Plan



2 PUBLIC TRANSIT MAP
1" = 400'-0"



1 SITE PLAN, LEVEL 01
1" = 20'-0"

ARCHITECTURAL SITE GENERAL NOTES

1. ARCHITECTURAL SITE PLAN IS ISSUED FOR REFERENCE ONLY.
2. REFERENCE CIVIL DRAWINGS FOR ALL SITE CONSTRUCTION INFORMATION INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
   - SITE GEOMETRY AND DIMENSIONAL CONTROL
   - SITE UTILITIES
   - SITE GRADING AND DRAINAGE
   - ASPHALT/CONCRETE PAVING DETAILS
   - PAVING MARKERS
   - CONCRETE SIDEWALK, CURB, AND GUTTER DETAILS
   - PARKING BUMPERS
   - TRAFFIC SIGNAGE
   - PAVING STRIPING AND CURB MARKINGS
   - TYPICAL HANDICAP SIGNAGE/SPACES
   - FIRE ACCESS
3. REFERENCE LANDSCAPE DRAWINGS FOR:
   - LANDSCAPE PLANTING AND DETAILS
   - SODDING AND SEEDING
   - LANDSCAPE BED DRAINAGE
   - HARDSCAPE LAYOUT AND DETAILS (SPECIALTY PAVING)
4. REFERENCE IRRIGATION IN LANDSCAPE DRAWINGS FOR:
   - HEAD AND VALVE LOCATIONS AND SIZES
   - IRRIGATION SLEEVING LOCATIONS AND SIZES
   - IRRIGATION SYSTEM CONTROLLER LOCATION
   - DETAILS AND SPECIFICATIONS
5. ALL PLANTING AND IRRIGATION LOADS ASSOCIATED WITH THE PARKING STRUCTURE WILL BE INCORPORATED IN THE DESIGN OF THE UPPER LEVEL DECK.
6. BUILDING SIGNAGE AND MONUMENT SIGNAGE WILL BE PROPOSED UNDER A SEPARATE PERMIT.
7. PROVIDE BUILDING ADDRESS NUMBERS, VISIBLE AND LEGIBLE FROM THE STREET OR ROAD FRONTING THE PROPERTY PER FHPS POLICY P-00-6 (UFC 901.4.4).
8. PROVIDE FIRE ACCESS ROADWAY SIGNS OR MARKINGS IN ACCORDANCE FPB POLICY A-14-1.
9. THE BUILDING WILL BE PROVIDED WITH AN AUTOMATIC SPRINKLER SYSTEM THROUGHOUT.
10. POST-INDICATOR VALVES, FIRE DEPARTMENT CONNECTIONS, & ALARM BELL TO BE LOCATED ON THE ADDRESS / ACCESS SIDE OF THE STRUCTURE. UFC 1001.4
11. FIRE LANE OVER UNDERGROUND PARKING OR WITHIN SITE SHALL BE DESIGNED TO SUPPORT A MIN. LOAD OF 75,000 LBS.
12. REFUSE AND RECYCLING MATERIALS STORAGE IS LOCATED WITHIN BELOW-GRADE PARKING STRUCTURE. REFER TO SHEET A10-P1 FOR LOCATION AND DIMENSIONS.
13. THERE IS NO BUS STOP AT THE PROPERTY. REFER TO 2/A01-01 FOR LOCATION OF NEAREST BUS STOP
14. RIDE SHARING INFORMATION IS LOCATED AT THE P1 LEVEL. REFER TO SHEET A10-P1 FOR LOCATION.

ARCHITECTURAL SITE PLAN LEGEND

- Ref XX A-XXX — SITE SECTION TAG
- PROPERTY LINE
- BUILDING SET BACK
- EASEMENT
- ACCESSIBLE ROUTE TO PUBLIC RIGHT OF WAY (60" WIDE MIN / MAX SLOPE OF 1:20)
- FL—FL—FL—FL — FIRE LANE
- PAVING PER LANDSCAPE
- COVENANT OF EASEMENT AREA
- ACCESSIBLE PARKING STALL
- VAN — ACCESSIBLE VAN PARKING STALL
- FH — FIRE HYDRANT

PARKING ANALYSIS

THE PROJECT SITE IS ZONED IP-1-1 SCIENTIFIC RESEARCH. THE PROPOSED PROJECT IS AN INDUSTRIAL SCIENTIFIC RESEARCH AND DEVELOPMENT BUILDING AND THE PROPOSED TOTAL BUILDING SQUARE FOOTAGE IS 165,000 SF. 8,500 SF IS ACCESSORY SPACE AND IS NOT TRIP GENERATING. THEREFORE 156,500 SF IS THE TRIP GENERATING SQUARE FOOTAGE PARKED AT 2.5 PARKING STALLS PER EACH 1,000 SF OF GROSS BUILDING AREA FEET. THIS YIELDS A TOTAL NUMBER OF 391 PARKING STALLS. THE SITE IS DESIGNED SO THAT THERE ARE 320 PARKING SPACES BELOW GRADE UNDER THE BUILDING AND THERE ARE 175 PARKING SPACES ABOVE GRADE, PROVIDING A TOTAL OF 495 SPACES.

PARKING SCHEDULE	
MIN. PARKING REQUIRED	391 SPACES
	(2.5 / 1000 SF)
TOTAL NEW PARKING	495 SPACES
	(3.16 / 1000 SF)
ON GRADE	175
STANDARD	170
ACCESSIBLE	5
LEVEL P1	151
STANDARD	149
ACCESSIBLE	2
LEVEL P2/P3	169
STANDARD	167
ACCESSIBLE	2

PARKING SUMMARY TABLE					
PARKING TYPE	CGBSC/SDMC	CGBSC/SDMC %	CAP	CAP %	PROVIDED
ACCESSIBLE[1]	9	N/A	N/A	N/A	9
CARPOOL AND ZERO-EMISSIONS[1]	40	8% OF PROVIDED	N/A	N/A	40*
EVCS[1]	30	6% OF PROVIDED	30	6% OF PROVIDED	30
READY FOR USE[1]	N/A	N/A	15	50% OF EVCS REQUIRED	15
QUICK CHARGING[2]	N/A	N/A	2	10% OF READY FOR USE EVCS	2
FOR FUTURE USE[1]	30	100% OF EVCS REQUIRED	6	50% OF EVCS REQUIRED	15*
MOTORCYCLE	8	2% OF MIN. REQUIRED	N/A	N/A	8
LONG-TERM BICYCLE	20	5% OF MIN. REQUIRED	> 20	> SDMC MIN. REQUIRED	25
SHORT-TERM BICYCLE	20	5% OF MIN. REQUIRED	> 20	> SDMC MIN. REQUIRED	25

1 DESIGNATED PARKING IS PROVIDED WITHIN THE TOTAL PARKING PROVIDED FOR THE PROJECT, NOT IN ADDITION TO IT.

2 QUICK CHARGE PARKING IS PROVIDED WITHIN THE TOTAL 'READY FOR USE' EVCS PROVIDED FOR THE PROJECT, NOT IN ADDITION TO IT.

*PER CGBSC SECTION 5.106.5.3.5 'FUTURE CHARGING SPACES QUALIFY AS DESIGNATED PARKING AS DESCRIBED IN SECTION 5.106.5.2 DESIGNATED PARKING FOR CLEAN AIR VEHICLES'. PER CGBSC SECTION 5.106.5.2, CLEAN AIR VEHICLES INCLUDE LOW-EMITTING, FUEL EFFICIENT, AND CARPOOL/VAN POOL VEHICLES. THE 15 EVCS STALLS THAT ARE FOR FUTURE USE ALSO SERVE AS DESIGNATED PARKING FOR CARPOOL AND ZERO EMISSION VEHICLES.

PERKINS +WILL
1301 Fifth Avenue
Suite 2300
Seattle, WA 98101
t 206.381.6000
f 206.441.4981
www.perkinswill.com

PROJECT

9775 TOWNE CENTRE DRIVE

9775 Towne Centre Drive
San Diego,CA 92121

BMR-APEX LP
17190 Bernardo Center Drive
San Diego, CA 92128

CONSULTANTS

CIVIL
Latitude 33 Planning + Engineering
9968 Hibert St. 2nd Fl.
San Diego, CA 92131

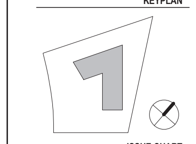
STRUCTURAL
Hope-Amundson Structural Engineering
1301 Third Ave, Suite 300
San Diego, CA 92101

MEP
EXP
5670 Oberlin Drive
San Diego, CA 92121

LANDSCAPE ARCHITECT
OJB Landscape Architecture
550 Lomas Santa Fe Drive, Suite A
Solana Beach, CA 92075

SITE DEVELOPMENT PERMIT
12/20/2016

KEYPLAN



ISSUE CHART

DEVELOPER: BMR-APEX LP
17190 BERNARDO CENTER DRIVE
SAN DIEGO, CA 92128
(858) 485-9840

PLANNING: LATITUDE 33 PLANNING & ENGINEERING
9968 HIBERT STREET, SECOND FLOOR
SAN DIEGO, CA 92131
(858) 751-0633 FAX(858) 751-0634

LANDSCAPE ARCHITECT: OFFICE OF JAMES BURNETT
550 LOMAS SANTA FE DRIVE, SUITE A
SOLANA BEACH, CA 92075
(858) 793-6970 FAX(858) 793-6905

CIVIL ENGINEER: LATITUDE 33 PLANNING & ENGINEERING
9968 HIBERT STREET, SECOND FLOOR
SAN DIEGO, CA 92131
(858) 751-0633 FAX(858) 751-0634

ARCHITECT: PERKINS+WILL
1301 FIFTH
AVENUE, SUITE 2300
SEATTLE, WA 98101
(206) 381-6000 FAX(206) 441-4981

PREPARED BY:

NAME: LATITUDE 33 PLANNING & ENGINEERING
ADDRESS: 9968 Hibert Street, 2nd Floor
SAN DIEGO, CA 92131
PHONE #: (858) 751-0633
FAX #: (858) 751-0634

PROJECT ADDRESS:
9775 TOWNE CENTRE DRIVE

PROJECT NAME:
9775 TOWNE CENTRE DRIVE

SHEET TITLE:
A01-01
ARCHITECTURAL SITE PLAN

REVISION 14:
REVISION 13:
REVISION 12:
REVISION 11:
REVISION 10:
REVISION 9:
REVISION 8:
REVISION 7:
REVISION 6:
REVISION 5:
REVISION 4:
REVISION 3:
REVISION 2: 08-09-17 3RD SUBMITTAL
REVISION 1: 05-16-17 2ND SUBMITTAL

ORIGINAL DATE: 12-20-16

SHEET 13 OF 23

DEPT NO.

FIGURE 2-3

Project Vicinity Map

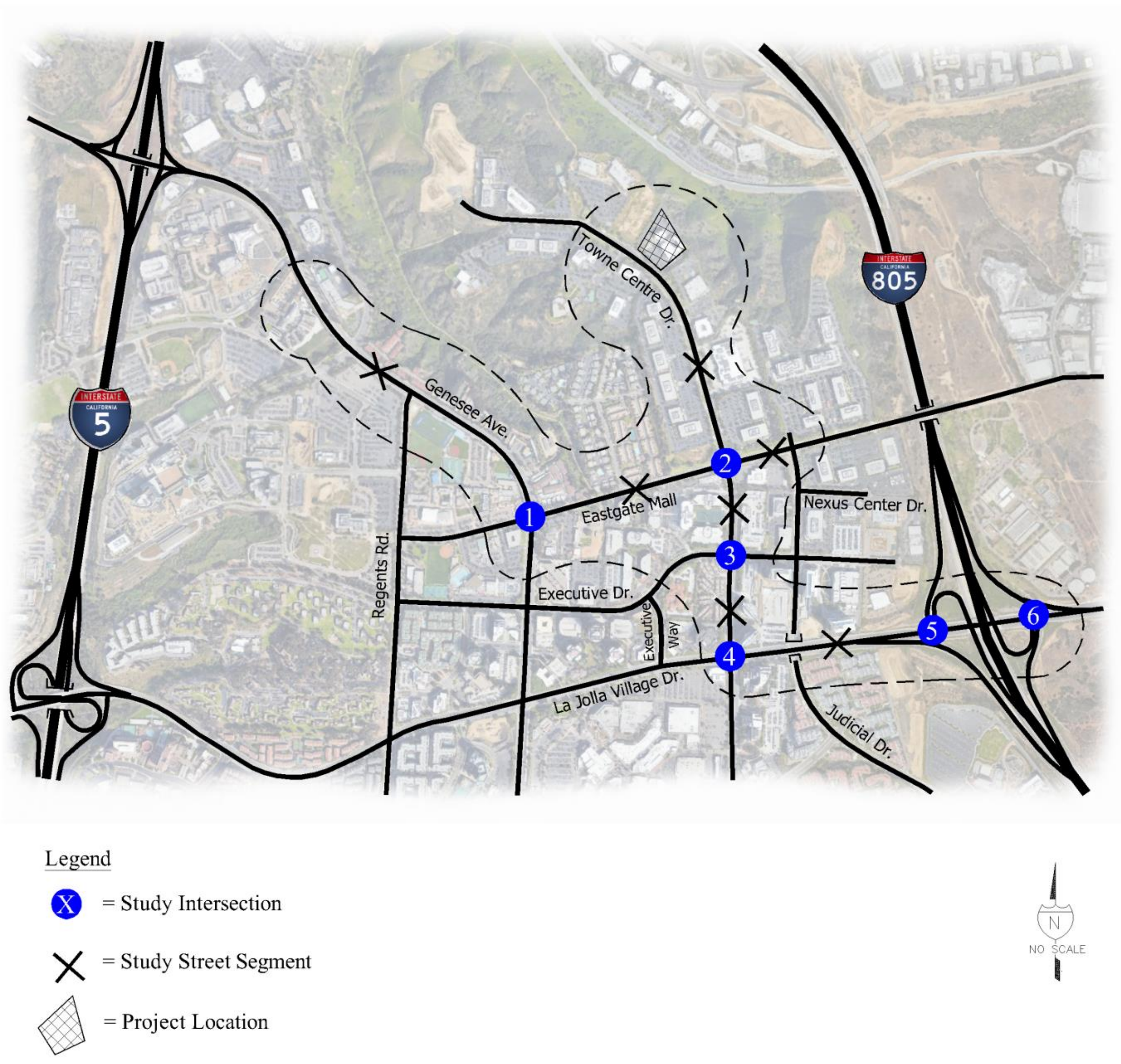


FIGURE 2-4

Study Area Boundary and Intersection Key

TABLE 2-1

Study Area Street Segments and Intersections

Street Segments	
Road	**Segment**
Genesee Ave.	I-5 NB Ramps to Eastgate Mall
Eastgate Mall	Genesee Ave. to Towne Centre Dr.
	Towne Centre Dr. to Judicial Dr.
Towne Centre Dr.	North of Eastgate Mall
	Eastgate Mall to Executive Dr.
	Executive Dr. to La Jolla Village Dr.
La Jolla Village Dr.	East of Towne Centre Dr.

Intersections	
Number	**Intersection**
1	Eastgate Mall at Genesee Ave.
2	Towne Centre Dr. at Eastgate Mall
3	Towne Centre Dr. at Executive Dr.
4	Towne Centre Dr. at La Jolla Village Dr.
5	I-805 SB Ramps at La Jolla Village Dr.
6	I-805 NB Ramps at La Jolla Village Dr.

In order to summarize project impacts and required mitigation, this report is divided into the following text sections:

1.0 Executive Summary

2.0 Introduction

3.0 Proposed Project

4.0 Methodology

5.0 Existing Conditions

6.0 Existing With Project

7.0 Other Projects

8.0 Near Term Without Project

9.0 Near Term With Project

10.0 Horizon Year 2035 Without Project

11.0 Horizon Year 2035 With Project

12.0 Access and Parking

13.0 Transit and Other Modes

14.0 Transportation Demand Management (TDM)

15.0 Conclusions and Recommendations

16.0 Community Plan Comparison

17.0 References

18.0 Urban Systems Associates, Inc., Preparers

3. PROPOSED PROJECT

The proposed project plans to demolish the existing 100,000 square foot building and construct a new 165,000 square foot building for Scientific Research uses. This building will include approximately 8,500 SF of accessory space and 156,500 SF of trip generating space. A Community Plan Amendment is required to increase the density allocated to the project site via trip transfers from other sites outside the PID. A Planned Development Permit and Site Development Permit are also being processed to support the project and authorize the increase in density allocated to the project site via trip transfers from inside the PID. TDM measures are also a feature of the project.

3.1 TRIP GENERATION

The proposed 156,500 SF Scientific Research facility is expected to generate 1,252 average daily trips (ADT) with 200 (180 inbound / 20 outbound) trips in the AM peak hour and 175 trips (17 inbound / 158 outbound) in the PM peak hour. After accounting for the trips generated by the existing 100,000 square foot building, the proposed project is expected to generate 452 average daily trips (ADT) with 72 (65 inbound / 7 outbound) trips in the AM peak hour and 63 trips (7 inbound / 56 outbound) in the PM peak hour from its net increase of 56,500 SF of new trip generating space as shown in **Table 3-1**.

3.2 TRIP DISTRIBUTION AND ASSIGNMENT

Figure 3-1 shows the project only trip distribution percentages which were derived from a select zone analysis using SANDAG's Series 12 Traffic Model. Project only average daily traffic volumes found in **Figure 3-1** are based on the daily new traffic generation from **Table 3-1** and distribution of project only traffic. This traffic model was adjusted to include land uses for the proposed project. Due to the proposed project being on a dead end street all the project traffic is being distributed to the south. **Figure 3-2** shows the project only AM and PM peak hour traffic volumes.

TABLE 3-1

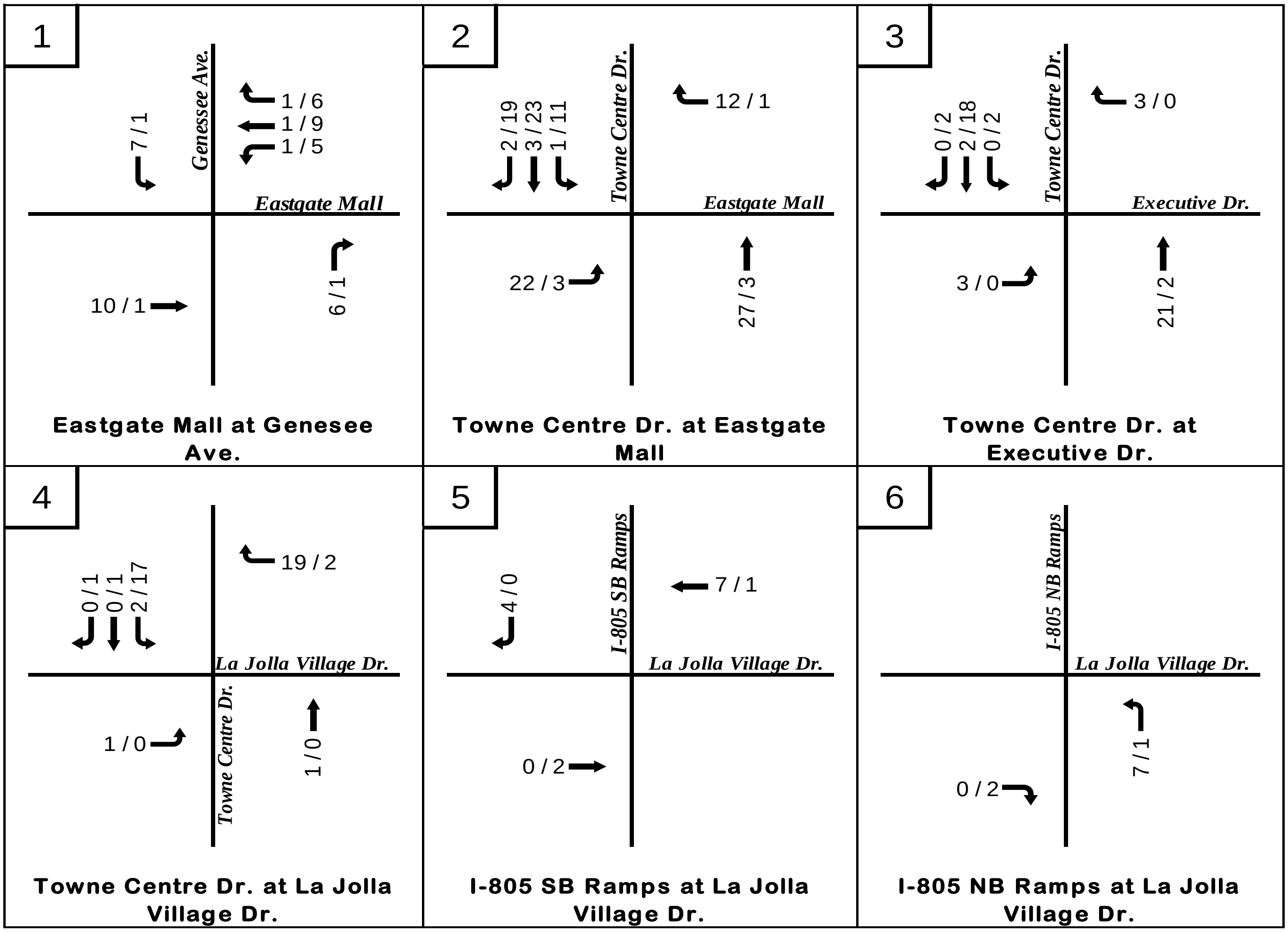
9775 Towne Centre Drive Project Trip Generation Table

Land Use	Intensity		Rate*	ADT	AM						PM					
					Rate *	Vol.	In %	Out%	In	Out	Peak Rate*	Vol.	In %	Out%	In	Out
Proposed Trips																
Scientific Research	**156,500**	**SF**	**8 /KSF**	**1,252**	**16%**	**200**	90%	: 10%	**180**	**20**	**14%**	**175**	10%	: 90%	**18**	**157**
Existing Trips																
Scientific Research	**100,000**	**SF**	**8 /KSF**	**800**	**16%**	**128**	90%	: 10%	**115**	**13**	**14%**	**112**	10%	: 90%	**11**	**101**
Net Trips																
Net Total (Proposed - Existing)	**56,500**	**DU**		**452**		**72**			**65**	**7**		**63**			**7**	**56**

Source:
*Rates are used from City of San Diego Trip Generation Manual 2003
.
Note:
ADT= Average Daily Trips
KSF = 1,000 Square Feet

FIGURE 3-1

Project Only ADT / Project Distribution Percentages



XX / XX = AM / PM Peak hour volumes

FIGURE 3-2

Project Only AM / PM Peak Hour Traffic

4. METHODOLOGY

This section of the report describes various analysis procedures and criteria that are used to determine if the proposed project has a significant impact and if mitigation is required. Mitigation may be either specific improvements by the project for a direct or cumulative impact or a financial contribution toward an improvement by others if a cumulative impact occurs. Two criteria must be met before project mitigation is required. First, the intersection or street segment must be projected to operate at an unacceptable LOS after project trips are added (i.e., "E" or "F" as discussed below). Second, the amount of project traffic must be significant based on the application of criteria also discussed below. For an intersection, if the change in delay anticipated due to the project is greater than 2 seconds or 1 second and the LOS is "E" or "F" respectively, then the project's intersection impacts would be considered significant. For a street segment, if the change in volume to capacity ratio (V/C ratio) anticipated due to the project exceeds 0.02 or 0.01, and the LOS is "E" or "F," respectively, then the project's street segment impact would be considered significant. If project traffic causes an intersection, roadway segment, or freeway segment to degrade from LOS "D" to LOS "E" or LOS "F," the project impact would be significant and project mitigation is required. For freeway segment impacts to be considered significant, the segment would need to operate at an unacceptable LOS and exceed a change in V/C ratio of 0.01 or 0.005 for LOS "E" and "F," respectively. A project ramp meter impact would be significant if the ramp meter calculations show 15 minutes of delay or greater and the change in delay due to the project is greater than 2 minutes or 1 minute and the freeway mainline segments are expected to operate at LOS "E" and "F," respectively, using the most restrictive meter rate method.

4.1 CITY OF SAN DIEGO GUIDELINES

The City of San Diego has developed a Traffic Impact Study Manual (July 1998). The stated purpose of the Traffic Impact Study Manual is "....to ensure consistency with all applicable City and State regulations." The Traffic Impact Study Manual provides guidance regarding preparation of traffic impact reports in the City of San Diego. Since the proposed project is located in the City of San Diego, this traffic impact report follows the procedures outlined in their traffic manual. The manual includes guidelines for forecasting, trip generation and assignment, and analysis procedures.

The City's Significance Determination Thresholds (2011) establish criteria that identify the allowable change in delay or V/C ratio due to project impacts. This publication also establishes criteria for measuring project impacts at intersections. This method establishes an allowable increase in delay at intersections due to the addition of project trips. The City Traffic Impact Study Manual specifies use of the most current Highway Capacity Manual (HCM) operational method for studying intersections. For analyzing intersections, a software package called Synchro is used. This software package is a direct and faithful application of the HCM methodology.

4.2 TRIP DISTRIBUTION

The projected trips were distributed based on a select zone analysis from the SANDAG Series 12 Year 2035 transportation model. It should be noted forecast includes 156500 SF of Scientific Research and Development (intended user). See **Appendix B** for select zone information.

4.3 STREET LOS THRESHOLD

When analyzing street segments, the LOS must be determined. LOS is a measure used to describe the conditions of traffic flow. LOS is expressed using letter designations from “A” to “F.” LOS “A” represents the best case, and LOS “F” represents the worst case. Generally, LOS “A” through “C” represents free-flowing traffic conditions with little or no delay. LOS “D” represents limited congestion and some delay. However, the duration of periods of delay is acceptable to most people. LOS “E” and “F” represent significant delays on local streets, which are generally unacceptable for urban design purposes. The LOS descriptions are from Chapter 12 of the HCM (Transportation Research Board 2016).

The City of San Diego has developed LOS threshold tables based on the different functional street classifications and their ability to carry traffic. For the City of San Diego, LOS “D” is the acceptable LOS standard for roadways and intersections.

4.4 INTERSECTION LOS PROCEDURES

The City and Regional Congestion Management Program (CMP) guidelines, as adopted by SANDAG (2006), determine the procedures to be used for intersection peak hour analysis. To determine an intersection peak hour LOS, the CMP guidelines require use of the most recent procedure from Chapters 19-21 of the HCM (Transportation Research Board 2016). The procedure in Chapters 19-21, which is used to analyze signalized intersections, is the “operational method.” This method determines LOS based on average control delay expressed in seconds. **Table 4-1** shows the LOS based upon the delay. A computer program (Synchro) is used to complete the analysis. As discussed above, the City and CMP guidelines have established LOS “D” or better as the objective for intersections and street segments.

4.5 CONGESTION MANAGEMENT PROGRAM

Federal Highway Administration 23 CFR 450.320 requires that each transportation management area (TMA) address congestion management through a process involving an analysis of multimodal metropolitan wide strategies that are cooperatively developed to foster safety and integrated management of new and existing transportation facilities eligible for federal funding.

SANDAG has been designated as the TMA for the San Diego region. The 2050 Regional Transportation Plan meets the requirements of 23 CFR 450.320 by incorporating the following federal congestion management process: performance monitoring and measurement of the regional transportation system, multimodal alternatives and non-SOV analysis, land us impact analysis, the provision of congestion management tools, and integration with the regional transportation improvement program process.

California State Proposition 111, passed by voters in 1990, established a requirement that urbanized areas prepare and regularly update a Congestion Management Program (CMP). The requirements within the State CMP were developed to monitor the performance of the transportation system, develop programs to address near-term and long-term congestion, and better integrate transportation and land use planning. SANDAG provided regular updates for the State CMP, and since this decision, SANDAG has been abiding by 23 CFR 450.320 to ensure the region's continued compliance with the federal congestion management process. Therefore, the City of San Diego has been exempted from the requirements of the State CMP.

TABLE 4-1

Level of Service Criteria for Signalized Intersections

Level of Service	Control Delay Per Vehicle (sec)
A	≤10
B	>10 and ≤20
C	>20 and ≤35
D	>35 and ≤55
E	>55 and ≤80
F	>80

Source: Transportation Research Board 2016, Table 19-8

Level of Service Criteria for Un-signalized Intersections

Level of Service	Control Delay Per Vehicle (sec)
A	≤10
B	>10 and ≤15
C	>15 and ≤25
D	>25 and ≤35
E	>35 and ≤50
F	>50

Source: Transportation Research Board 2016, Table 20-2

4.6 FREEWAY SEGMENT LOS PROCEDURES

As discussed in Section 2.0, no freeway segments were included in this analysis since project traffic (26 trips) is less than the 50 peak hour trip threshold per the City's *Traffic Impact Study Guidelines*.

4.7 SIGNIFICANCE THRESHOLDS

As discussed above, two criteria must be met before project traffic mitigation is required. First, an unacceptable LOS (i.e., "E" or "F") must occur, and second, significance thresholds for only project traffic must be exceeded. Alternatively, if project traffic causes a facility to degrade from LOS "D" to "E," a significant impact would occur. The City's significance thresholds are summarized in **Table 4-2**. These thresholds are used in this analysis along with LOS to determine if project mitigation is required. **Table 4-3** shows the roadway classifications for the City of San Diego.

TABLE 4-2

Significance Thresholds

Level of Service with Project*	Allowable Increase Due to Project Impacts**					
	Freeways		Roadway Segments		Intersections	Ramp Metering
	V/C	*Speed (mph)*	*V/C*	*Speed (mph)*	*Delay (sec.)*	*Delay (min.)*
E (or ramp meter delays above 15 minutes)	0.010	1.0	0.02	1.0	2.0	2.0
F (or ramp meter delays above 15 minutes)	0.005	0.5	0.01	0.5	1.0	1.0

Note 1: The allowable increase in delay at a ramp meter with more than 15 minutes delay and freeway LOS E is 2 minutes.
Note 2: The allowable increase in delay at a ramp meter with more than 15 minutes delay and freeway LOS F is 1 minute.
* All LOS measurements are based upon Highway Capacity Manual procedures for peak-hour conditions. However, V/C ratios for roadway segments are estimated on an ADT/24-hour traffic volume basis (using Table 2 of the City's Traffic Impact Study Manual). The acceptable LOS for freeways, roadways, and intersections is generally "D" ("C" for undeveloped locations). For metered freeway ramps, LOS does not apply. However,ramp meter delays above 15 minutes are considered excessive.

** If a proposed project's traffic causes the values shown in the table to be exceeded, the impacts are determined to be significant. The project applicant shall then identify feasible improvements (within the Traffic Impact Study) that will restore/ and maintain the traffic facility at an acceptable LOS. If the LOS with the proposed project becomes unacceptable (see above * note), or if the project adds a significant amount of peak hour trips to cause any traffic queues to exceed on- or off-ramp storage capacities, the project applicant shall be responsible for mitigating the project's direct significant and / or cumulatively considerable traffic impacts.

Key:

1. V/C =Volume to Capacity Ratio
2. Speed = Arterial speed measured in miles per hour
3. Delay = Average control delay per vehicle measured in seconds for intersections, or minutes for ramp meters
4. LOS = Level of Service

TABLE 4-3

Roadway Classifications

		Level of Service W/ADT				
Street Classification	**Lanes**	**A**	**B**	**C**	**D**	**E**
Freeway	8 lanes	60,000	84,000	120,000	140,000	150,000
Freeway	6 lanes	45,000	63,000	90,000	110,000	120,000
Freeway	4 lanes	30,000	42,000	60,000	70,000	80,000
Expressway	6 Lanes	30,000	42,000	60,000	70,000	80,000
Prime Arterial	6 Lanes	25,000	35,000	50,000	55,000	60,000
Major Arterial	6 Lanes	20,000	28,000	40,000	45,000	50,000
Major Arterial	4 Lanes	15,000	21,000	30,000	35,000	40,000
Collector	4 Lanes	10,000	14,000	20,000	25,000	30,000
Collector (no center lane) (continuous left-turn lane)	4 Lanes 2 Lanes	5,000	7,000	10,000	13,000	15,000
Collector (no fronting property)	2 Lanes	4,000	5,500	7,500	9,000	10,000
Collector (commercial-industrial fronting)	2 Lanes	2,500	3,500	5,000	6,500	8,000
Collector (multi-family)	2 Lanes	2,500	3,500	5,000	6,500	8,000
Sub-Collector (single-family)	2 Lanes	---	---	2,200	---	---

Legend

XXX/XXX =Approximate recommended ADT based on the City of San Diego Street Design Manual

Notes:

1. The volumes and the average daily level of service listed above are only intended as a general planning guideline.
2. Levels of service are not applied to residential streets since their primary purpose is to serve abutting lots, not carry through traffic. Levels of service normally apply to roads carrying through traffic between major trip generators and attractors.

5. EXISTING CONDITIONS

The proposed project is located on the east side of Towne Centre Dr. approximately 2,000 feet north of Eastgate Mall. See **Figure 2-1** for details.

5.1 EXISTING ROADWAY FACILITIES

Genesee Avenue – is oriented in a north-south direction and is functionally classified as a six lane Major Street from Eastgate Mall to Executive Drive. This portion of Genesee Avenue is currently built to its ultimate classification as shown in the University Community Plan. A raised median is currently provided on Genesee Avenue and on-street parking is prohibited. The posted speed limit is 45 miles per hour on this segment. Class II bike lanes are provided on both sides of the roadway.

Eastgate Mall – is oriented in an east-west direction and is functionally classified as a four lane Collector Street from Genesee Avenue to Towne Centre Drive within the project study area. The posted speed limit ranges from 35 mph to 45 mph. The speed limit is 40 mph for eastbound Towne Centre Drive and 35 mph for westbound Towne Centre Drive. Based on the University Community Plan Circulation Element, this road is ultimately classified as a four lane Major Street between Genesee Avenue and Towne Centre Drive, and as a four lane Collector Street between Towne Centre Drive and La Jolla Village Drive-Miramar Road. Parking is prohibited on Eastgate Mall within the study area and no bike lanes are provided.

Towne Center Drive - is oriented in a north-south direction and is functionally classified as a four lane Major Street between Eastgate Mall and La Jolla Village Drive. This is consistent with the ultimate classification as shown in the University Community Plan Circulation Element. The posted speed limit is 40 mph and Class II bike lanes (south of Executive Drive) are provided on both sides of the roadway.

Parking is prohibited on Towne Centre Drive within the study area. Direct project access is provided via a driveway at the north end of Towne Centre Drive.

Judicial Drive – is oriented in a north-south direction and is functionally classified as a four lane Major Street between Eastgate Mall and Golden Haven Drive. The road is currently built to its ultimate classification as shown in the University Community Plan. Parking is allowed along some portions of Judicial Drive North of Executive Drive. The posted speed limit is 40 mph. Class II bike lanes are currently provided on both sides of the roadway south of Executive Drive. The Community Plan currently calls for Class II bike lanes on Judicial Drive from Eastgate Mall to Executive Drive, however, the existing parking would need to be removed. Please see Chapter 13.0 of this report for additional information.

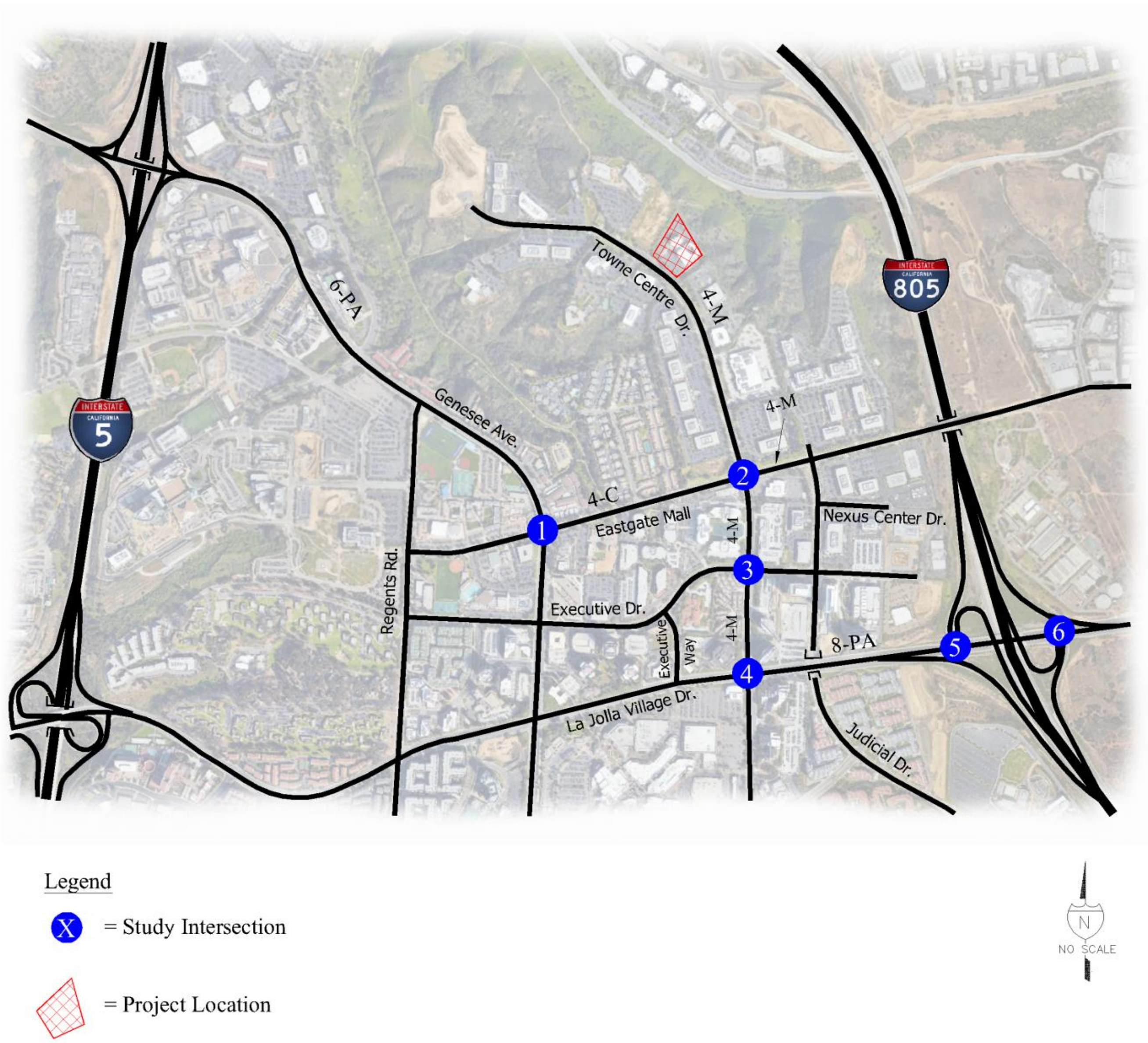
La Jolla Village Drive – is oriented in an east-west direction and is classified as an eight lane Prime Arterial from Judicial Drive to I-805 according to the University Community Plan, as shown in **Appendix D**. The roadway has a posted speed limit of 45 mph with a raised median.

5.2 EXISTING TRAFFIC VOLUMES

Figure 5-1 shows the existing average weekday 24-hour traffic volumes for street segments in the project study area. These counts were conducted on November 17, 2016 or April and May 2015. Please refer to **Appendix C** for existing count sheets. Existing street segment functional classifications were used for purposes of this analysis. **Figure 5-2** shows the functional classification of the existing roadway network. The ultimate roadway classifications are shown in the University Community Plan Transportation Element provided in **Appendix D**.

FIGURE 5-1

Existing Average Daily Traffic



6-PA = 6 Lane Prime Arterial
4-C = 4 Lane Collector
4-M = 4 Lane Major
8-PA = 8 Lane Prime Arterial

FIGURE 5-2

Existing Road Classification

Appendix E includes building calculations for the existing 9775 building. Estimated traffic volumes generated by the existing building have been added to existing traffic counts as discussed in Section 3.0. This ensures that traffic volumes from the currently vacant building are included in the cumulative analysis. All future sections of this report include the traffic from the existing 9775 building.

5.3 STREET SEGMENT ANALYSIS

As shown on **Table 5-1**, all street segments are projected to operate at acceptable LOS in the existing condition.

5.4 EXISTING INTERSECTIONS

Figure 5-4 shows the existing lane configurations for the intersections in the study area.

5.5 EXISTING INTERSECTION PEAK HOUR VOLUMES AND LOS

Figure 5-3 shows the existing AM and PM peak hour intersection traffic data, which was collected at the intersections on November 17, 2016. As required by the City of San Diego, the analysis of peak hour intersection performance was based on the HCM using operational analysis procedures. A computer program (Synchro), which is based on the HCM, was used to complete the analysis. As shown on **Table 5-2**, all intersections currently operate at a LOS "D" or better during the AM and PM peak hour.

LOS calculation worksheets for existing conditions can be found in **Appendix F**.

TABLE 5-1

Existing Street Segment Levels of Service

Road	Segment	Class.	Cap.	Existing	9775 Exist. Building	Adjusted Existing	V/C	LOS
Genesee Ave.	I-5 NB Ramps to Eastgate Mall	6-PA	60,000	29,457	80	29,537	0.49	B
Eastgate Mall	Genesee Ave. to Towne Centre Dr.	4-C	30,000	14,046	272	14,318	0.48	C
	Towne Centre Dr. to Judicial Dr.	4-M	40,000	13,442	152	13,594	0.34	A
Towne Centre Dr.	North of Eastgate Mall	4-M	40,000	9,322	752	10,074	0.25	A
	Eastgate Mall to Executive Dr.	4-M	40,000	12,237	328	12,565	0.31	A
	Executive Dr. to La Jolla Village Dr.	4-M	40,000	18,118	256	18,374	0.46	B
La Jolla Village Dr.	East of Towne Centre Dr.	8-PA	80,000	61,449	232	61,681	0.77	C

Legend:

Class. = Functional Class

Cap. = Capacity

LOS = Level of Service

#-PA = Number of Lanes- Prime Arterial

4-C= Four lane Collector Road

4-M= Four lane Major Road

Count Date: April and May 2015 and November 2016

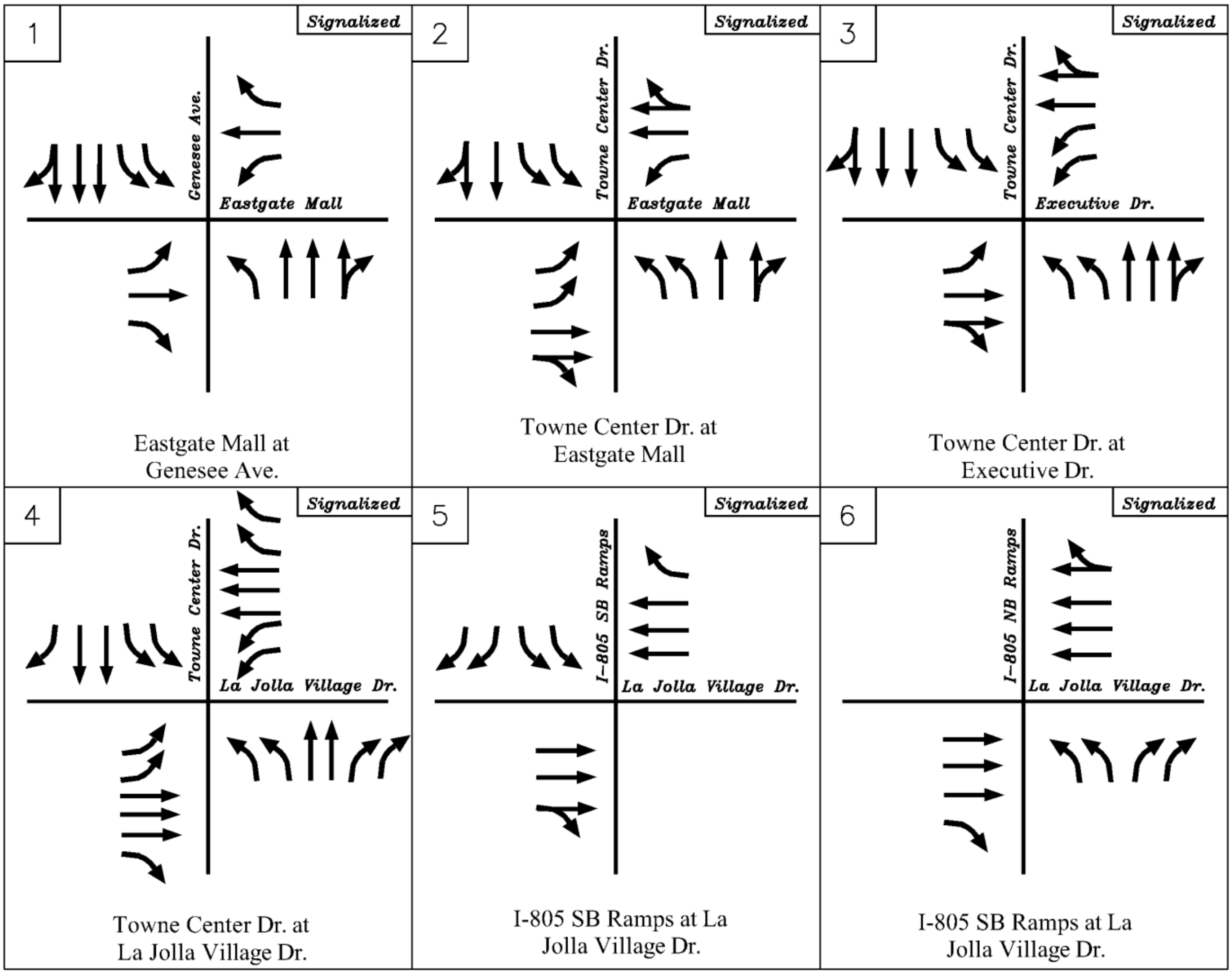
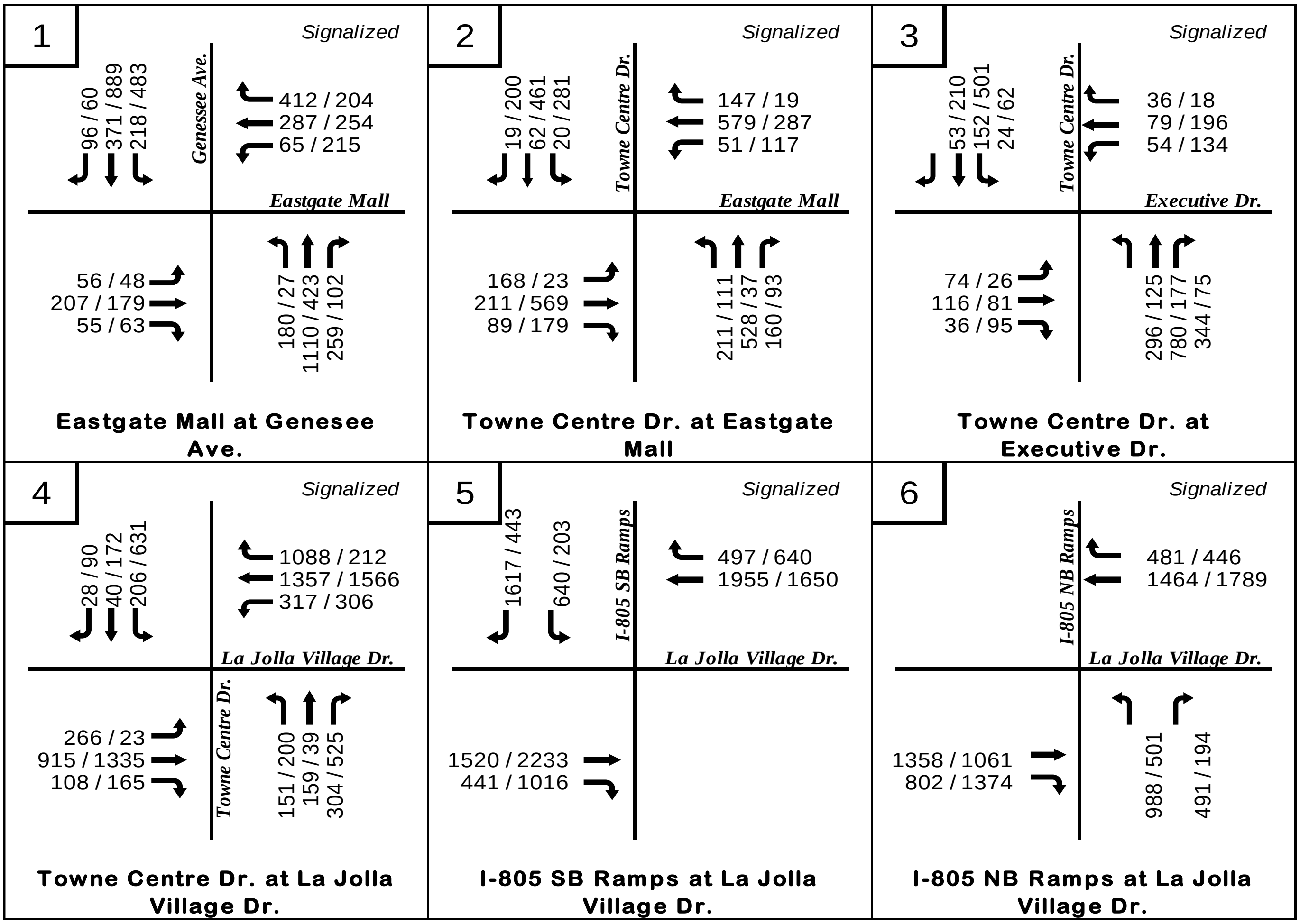


FIGURE 5-3

Existing Lane Configurations



XX / XX = AM / PM Peak hour volumes

FIGURE 5-4

Existing AM/PM Peak Hour Traffic

TABLE 5-2

Existing Intersection Levels of Service

Number	Intersection	Control	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
1	Eastgate Mall at Genesee Ave.	Signalized	41.1	D	39.9	D
2	Towne Centre Dr. at Eastgate Mall	Signalized	31.9	C	34.9	C
3	Towne Centre Dr. at Executive Dr.	Signalized	25.3	C	29.8	C
4	Towne Centre Dr. at La Jolla Village Dr.	Signalized	34.6	C	40.4	D
5	I-805 SB Ramps at La Jolla Village Dr.	Signalized	50.8	D	36.8	D
6	I-805 NB Ramps at La Jolla Village Dr.	Signalized	27.4	C	38.2	D

Notes:

LOS = Level of Service

5.6 EXISTING FREEWAY RAMP METER ANALYSIS

Since project traffic does not meet the threshold requirements for ramps to be studied they were not included in this analysis.

6. EXISTING WITH PROJECT

The purpose of this chapter is to evaluate the impacts of the Existing With Project analysis. This analysis evaluates the project's "direct impacts" by comparing existing conditions without the proposed project to existing conditions with the Scientific Research use. **Appendix G** includes the Existing With Project Synchro worksheets.

6.1 STREET SEGMENTS

Street segments LOS with project traffic were determined by adding expected project only daily volumes to the adjusted existing daily volumes. **Figure 6-1** shows the Existing With Project average daily traffic volumes. **Table 6-1** shows street segment LOS with the addition of the project traffic. As shown, all study street segments are currently operating at acceptable levels of service.

6.2 INTERSECTIONS

Project traffic for the AM and PM peaks were added to existing traffic as shown in **Figure 6-2**. Intersection delays and LOS for the Existing With Project peak hour traffic is provided in **Table 6-2**. As shown, all intersections analyzed within the study area are projected to operate at acceptable LOS "D" or better.

6.3 FREEWAY RAMP METER

Since project traffic does not meet the threshold requirements for ramps to be studied they were not included in this analysis.

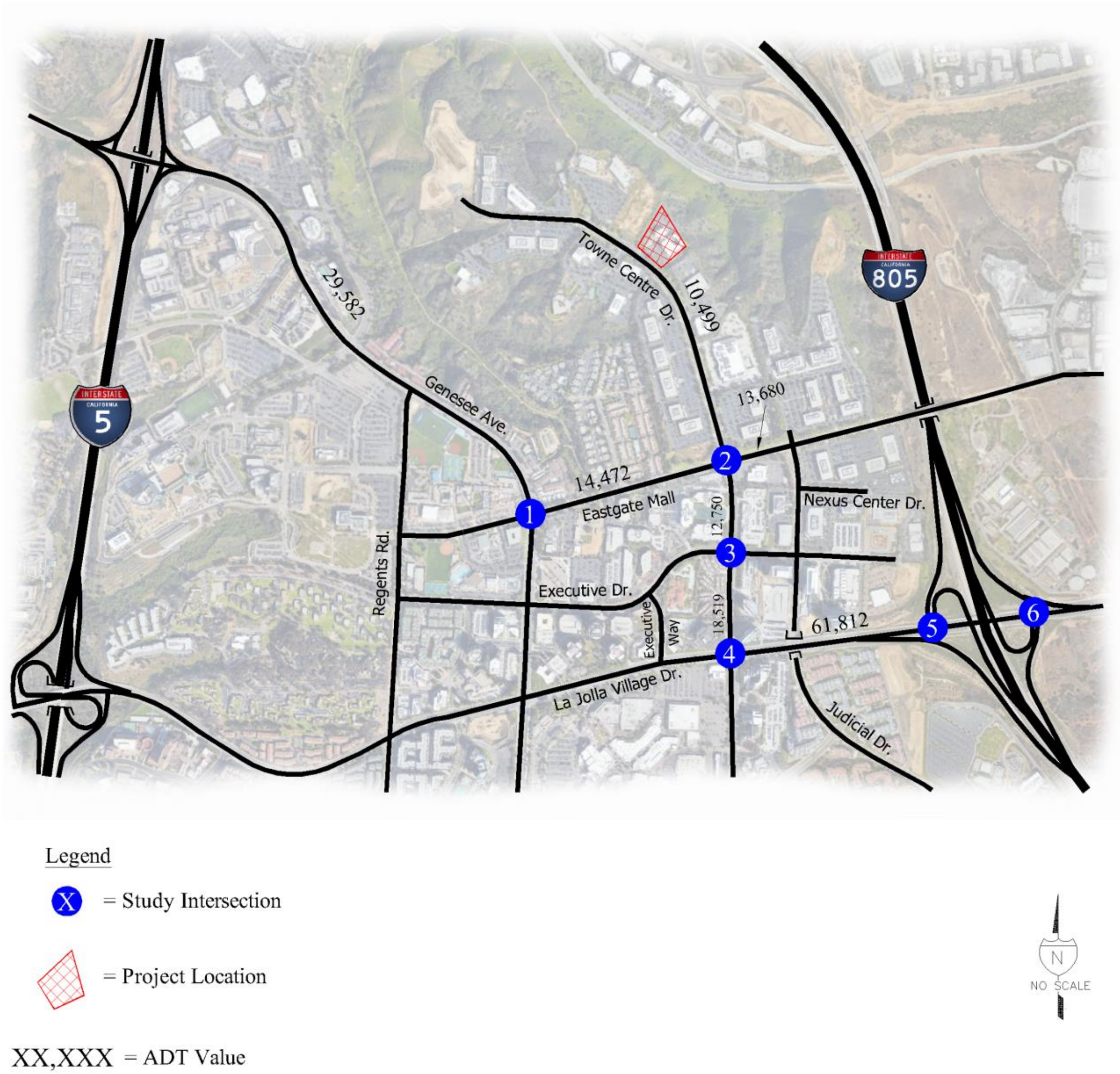


FIGURE 6-1

Existing With Project Average Daily Traffic

TABLE 6-1

Existing With Project Street Segment Levels of Service

Road	Segment	Class.	Cap.	Existing Adjusted Volume	Existing with Project Volume	V/C	LOS
Genesee Ave.	I-5 NB Ramps to Eastgate Mall	6-PA	60,000	29,537	29,582	0.49	B
Eastgate Mall	Genesee Ave. to Towne Centre Dr.	4-C	30,000	14,318	14,472	0.48	C
	Towne Centre Dr. to Judicial Dr.	4-M	40,000	13,594	13,680	0.34	A
Towne Centre Dr.	North of Eastgate Mall	4-M	40,000	10,074	10,499	0.26	A
	Eastgate Mall to Executive Dr.	4-M	40,000	12,565	12,750	0.32	A
	Executive Dr. to La Jolla Village Dr.	4-M	40,000	18,374	18,519	0.46	B
La Jolla Village Dr.	East of Towne Centre Dr.	8-PA	80,000	61,681	61,812	0.77	C

Legend:

Class. = Functional Class

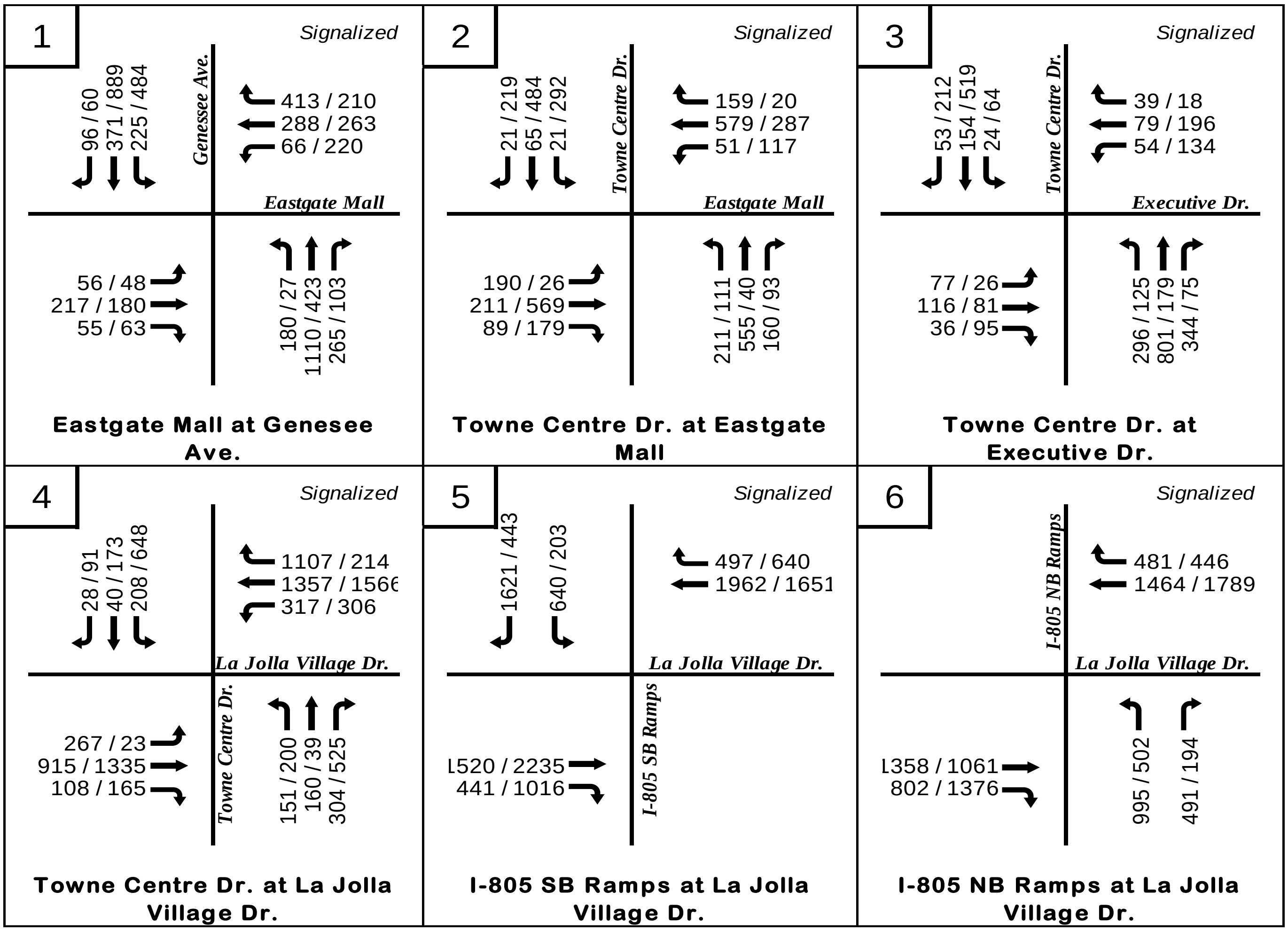
Cap. = Capacity

LOS = Level of Service

#-PA = Number of Lanes- Prime Arterial

4-C= Four lane Collector Road

4-M= Four lane Major Road



XX / XX = AM / PM Peak hour volumes

FIGURE 6-2

Existing With Project AM/PM Peak Hour Traffic

TABLE 6-2

Existing With Project Intersection Levels of Service

Number	Intersection	Control	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
1	Eastgate Mall at Genesee Ave.	Signalized	41.3	D	40	D
2	Towne Centre Dr. at Eastgate Mall	Signalized	33.1	C	35.8	D
3	Towne Centre Dr. at Executive Dr.	Signalized	25.4	C	29.9	C
4	Towne Centre Dr. at La Jolla Village Dr.	Signalized	34.7	C	40.8	D
5	I-805 SB Ramps at La Jolla Village Dr.	Signalized	51.7	D	36.9	D
6	I-805 NB Ramps at La Jolla Village Dr.	Signalized	28.1	C	38.3	D

Notes:

Delay = seconds per vehicle

LOS = Level of Service

7. OTHER PROJECTS

To find the Near Term (Existing + Other Projects) traffic volumes, USAI contacted City staff to determine other proposed or approved projects that are expected to be completed and occupied after the date of existing traffic counts but prior to the project's expected opening day and have impacts within the project study area. From this contact, USAI determined there are seventeen (17) other projects that may have impacts within the project study area. However, thirteen (13) of the Near Term "other projects" were found to add traffic in the vicinity of the project, see **Table 7-1**.

Trip distribution, trip generation, and project only data for the cumulative projects can be found in **Appendix H**.

Project only volumes from the approved other projects were extracted from other traffic studies, and manually added to existing traffic volumes to get Near Term "other project" volumes. **Figure 7-1** shows the other projects average daily traffic volumes. **Figure 7-2** shows the other projects AM/PM peak hour traffic volumes.

TABLE 7-1

Other Projects List

#	Project	Land Use		ADT	Status
Projects Included in Near Term Analysis					
1	La Jolla Commons III	120 DU	Residential	10,319	Approved
		325 Rooms	Hotel		
		162,000 SF	Office		
		106,000 SF	Research & Development / Office		
2	Nexus Tech Center	67,000 SF	Research & Development / Office	1,915	Approved
3	Scripps Memorial Hospital La Jolla(1)	198,180 SF	Medical Office (Phase 1)	3,097	Approved
4	Genesee Executive Plaza	29,000 SF	Medical Office Conversion	788	Approved
5	UCSD East Campus Bed Tower	245 Beds	Medical	4,900	Approved
6	Coast Income Properties	100,000 SF	Office	1,688	Pending
7	UTC Revitalization Project(1)	251,454 SF	Regional Retail (Phase 2A)	5,541	Under Construction
8	La Jolla Centre 3	278,800 SF	Commercial Office	4,162	Approved
9	Monte Verde	560 DU (HD)	Residential	3,360	Approved
10	Bio Med Innovation Center	250,000 SF	Scientific Research & Development	585	Approved
11	La Jolla Crossroads IV	472 DU	Multi-Family Residential	2,832	Under Construction
12	Alexandria Campus Point	740,000 SF	Scientific Research	2,224	Under Review
13	Salk Institute	12 DU	Residential Quarters	1,788	Approved
		96,400 SF	Science Complex		
		1115,182 SF	Community Center		
12	9455 Towne Centre Drive	150,000 SF	Corporate Headquarters	1,500	Under Review
Projects Considered but Not Included in Near Term Analysis(2)					
14	Scripps Green Hospital	39,024 SF	Hospital	780	Included in Existing Counts
15	University City Village	464 DU	Retirement Housing	1,856	Not included in project study area
16	Illumina Campus	123,375 SF	Scientific Research	987	Not included in project study area
17	La Jolla Country Day	1,050 Students	Replacement of Existing School	65	Included in Existing Counts

Notes:
(1) = The buildout phases of these projects are included in the Year 2035 forcast.
(2) = These projects are currently built and counts include these projects and/or traffic from these projects are outside the study area for 9455 Towne Centre Dr.

Legend:
SF = square feet
DU = dwelling unit
HD = high density
ADT = Average Daily Traffic

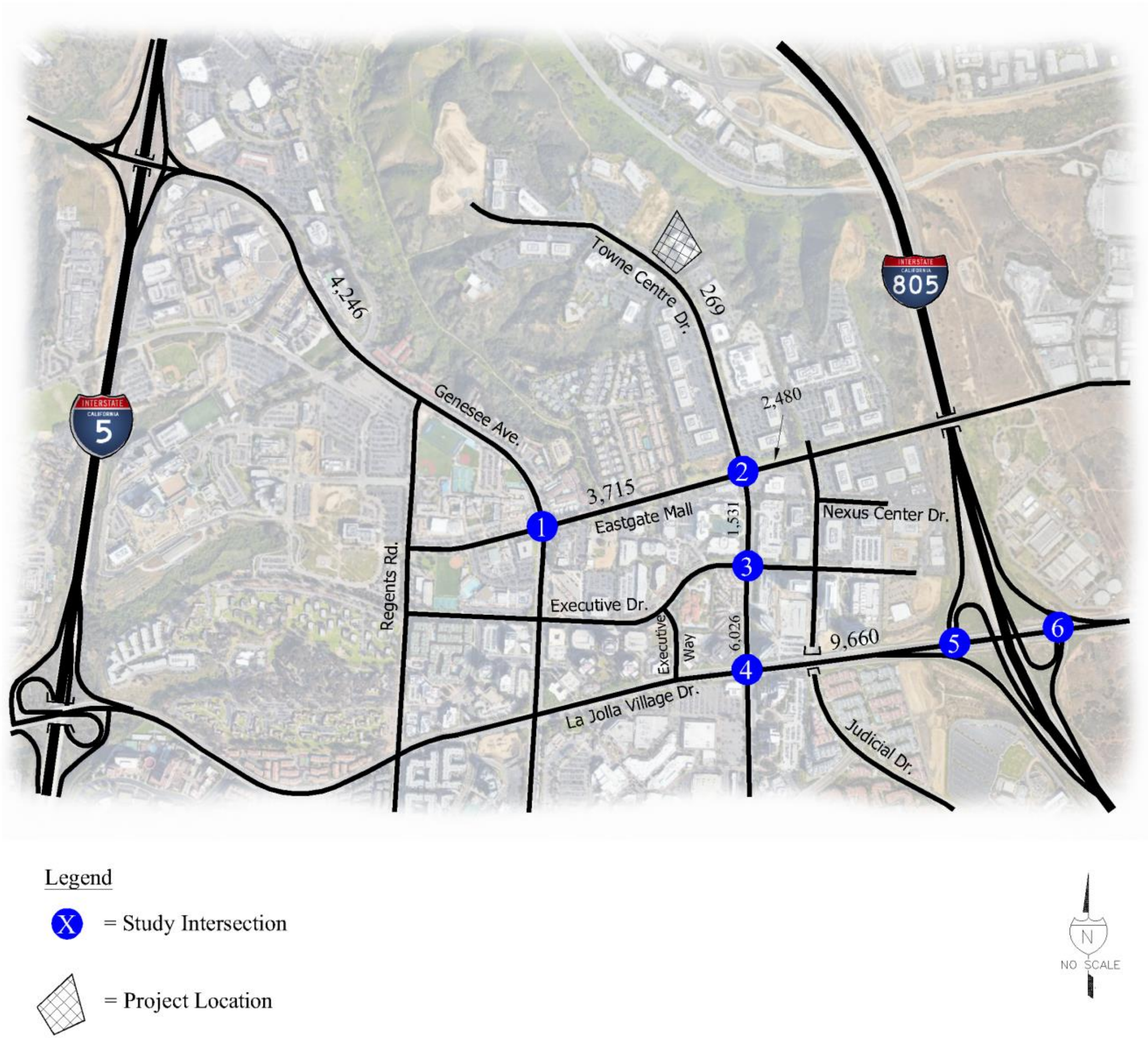
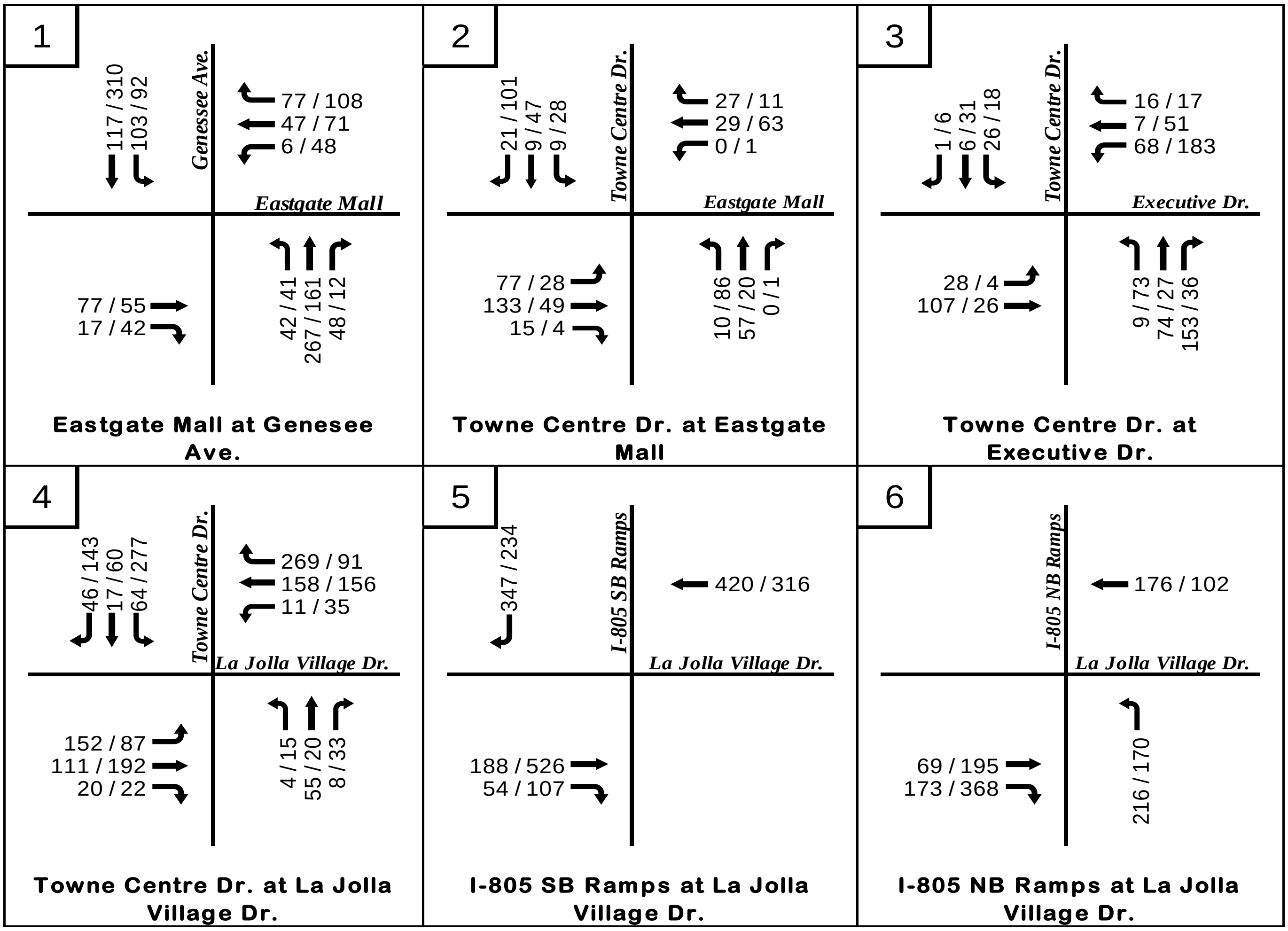


FIGURE 7-1

Other Projects Average Daily Traffic Volumes



XX / XX = AM / PM Peak hour volumes

FIGURE 7-2

Other Projects AM/PM Peak Hour Traffic Volumes

8. NEAR TERM WITHOUT PROJECT

In order to determine Near Term traffic, USAI followed the methodology outlined in the City of San Diego Traffic Impact Study Manual. An examination of the immediate area surrounding the project to include projects that were approved, pending approval, or planned in the area and assumed to be constructed and occupied at the project's opening day (late 2018) were evaluated, as shown in the previous section of this report. The project only traffic for these projects was manually added to the existing traffic to reflect an "existing plus other project" or Near Term scenario. No changes to the existing roadway network were assumed.

8.1 STREET SEGMENTS

Figure 8-1 shows average daily traffic volumes from the other projects added to existing average daily traffic volumes.

Table 8-1 shows street segment LOS without project traffic. As shown in the table, all street segments are projected to operate at acceptable levels of service.

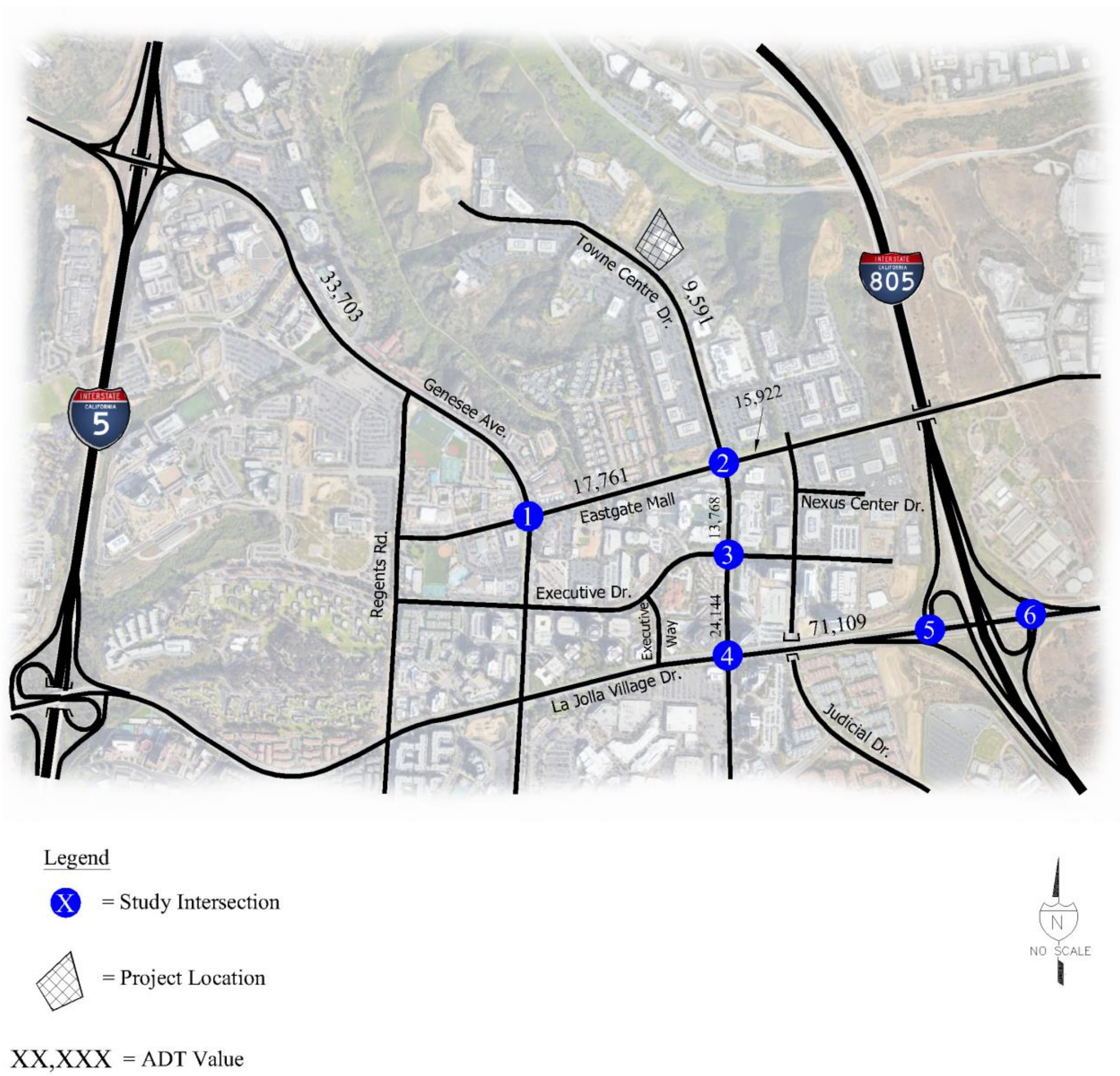


FIGURE 8-1

Near Term Without Project Average Daily Traffic

TABLE 8-1

Near Term Without Project Street Segment Levels of Service

Road	Segment	Class.	Cap.	Volume	V/C	LOS
Genesee Ave.	I-5 NB Ramps to Eastgate Mall	6-PA	60,000	33,783	0.56	B
Eastgate Mall	Genesee Ave. to Towne Centre Dr.	4-C	30,000	14,843	0.49	C
	Towne Centre Dr. to Judicial Dr.	4-M	40,000	13,939	0.35	A
Towne Centre Dr.	North of Eastgate Mall	4-M	40,000	10,343	0.26	A
	Eastgate Mall to Executive Dr.	4-M	40,000	13,083	0.33	A
	Executive Dr. to La Jolla Village Dr.	4-M	40,000	18,704	0.47	B
La Jolla Village Dr.	East of Towne Centre Dr.	8-PA	80,000	71,641	0.90	D

Legend:

Class. = Functional Class

Cap. = Capacity

LOS = Level of Service

#-PA = Number of Lanes- Prime Arterial

4-C= Four lane Collector Road

4-M= Four lane Major Road

8.2 INTERSECTIONS

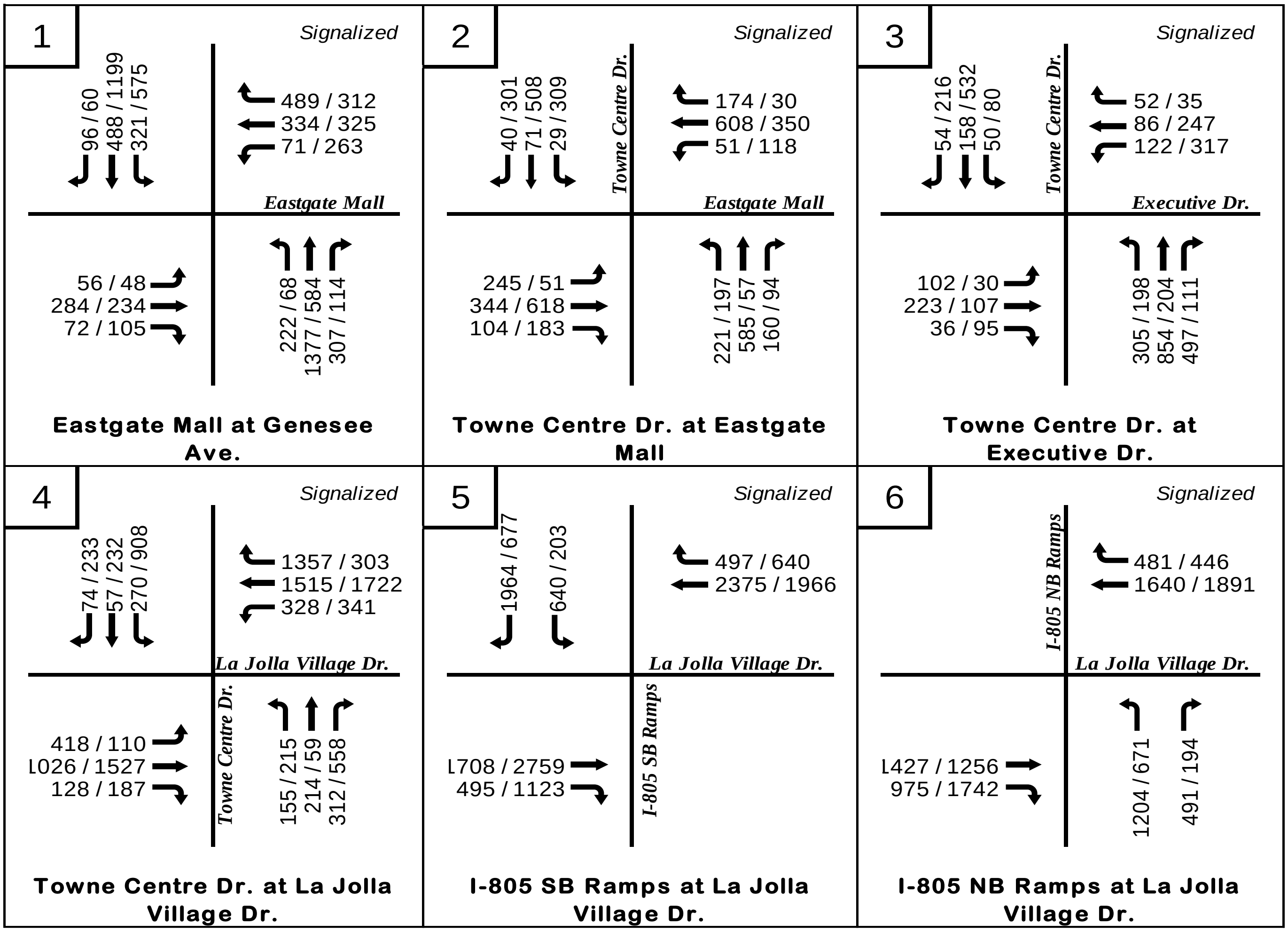
Figure 8-2 shows the peak hour traffic volumes from the other projects when added to existing peak hour volumes at the study area intersections. **Table 8-2** shows the resulting AM and PM peak hour LOS. As shown in **Table 8-2**, all study intersections are projected to operate at acceptable levels of service with the exception of:

- I-805 SB Ramps / La Jolla Village Drive LOS F in the AM and PM

Appendix I includes the Near Term Without Project Synchro worksheets.

8.3 FREEWAY RAMP METER

Since project traffic does not meet the threshold requirements for ramps to be studied they were not included in this analysis.



XX / XX = AM / PM Peak hour volumes

FIGURE 8-2

Near Term Without Project AM/PM Peak Hour Traffic

TABLE 8-2

Near Term Without Project Intersection Levels of Service

Number	Intersection	Control	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
1	Eastgate Mall at Genesee Ave.	Signalized	46.4	D	44.3	D
2	Towne Centre Dr. at Eastgate Mall	Signalized	35.5	D	41.8	D
3	Towne Centre Dr. at Executive Dr.	Signalized	29.6	C	50.8	D
4	Towne Centre Dr. at La Jolla Village Dr.	Signalized	43.9	D	50.6	D
5	I-805 SB Ramps at La Jolla Village Dr.	Signalized	124.0	F	81.5	F
6	I-805 NB Ramps at La Jolla Village Dr.	Signalized	39.6	D	41.3	D

Notes:

Delay = seconds per vehicle

LOS = Level of Service

9. NEAR TERM WITH PROJECT

This section of the report evaluates the Near Term With Project traffic conditions by adding the other projects plus the Scientific Research use traffic to existing volumes and evaluating project traffic impacts from the proposed project.

9.1 STREET SEGMENTS

Figure 9-1 shows average daily traffic volumes with project traffic added to existing plus other projects traffic volumes.

Table 9-1 shows street segment levels of service with project traffic.

As shown in **Table 9-1**, all street segments analyzed in the study area are projected to operate at acceptable levels of service.

FIGURE 9-1

Near Term With Project Average Daily Traffic

TABLE 9-1

Near Term With Project Street Segment Levels of Service

Road	Segment	Class.	Cap.	Volume	V/C	LOS
Genesee Ave.	I-5 NB Ramps to Eastgate Mall	6-PA	60,000	33,828	0.56	B
Eastgate Mall	Genesee Ave. to Towne Centre Dr.	4-C	30,000	14,997	0.50	C
	Towne Centre Dr. to Judicial Dr.	4-M	40,000	14,025	0.35	A
Towne Centre Dr.	North of Eastgate Mall	4-M	40,000	10,768	0.27	A
	Eastgate Mall to Executive Dr.	4-M	40,000	13,268	0.33	A
	Executive Dr. to La Jolla Village Dr.	4-M	40,000	18,849	0.47	B
La Jolla Village Dr.	East of Towne Centre Dr.	8-PA	80,000	71,772	0.90	D

Legend:

Class. = Functional Class

Cap. = Capacity

LOS = Level of Service

#-PA = Number of Lanes- Prime Arterial

4-C= Four lane Collector Road

4-M= Four lane Major Road

9.2 INTERSECTIONS

Figure 9-2 shows existing plus other projects plus project combined traffic volumes during AM/PM peak hours at study area intersections.

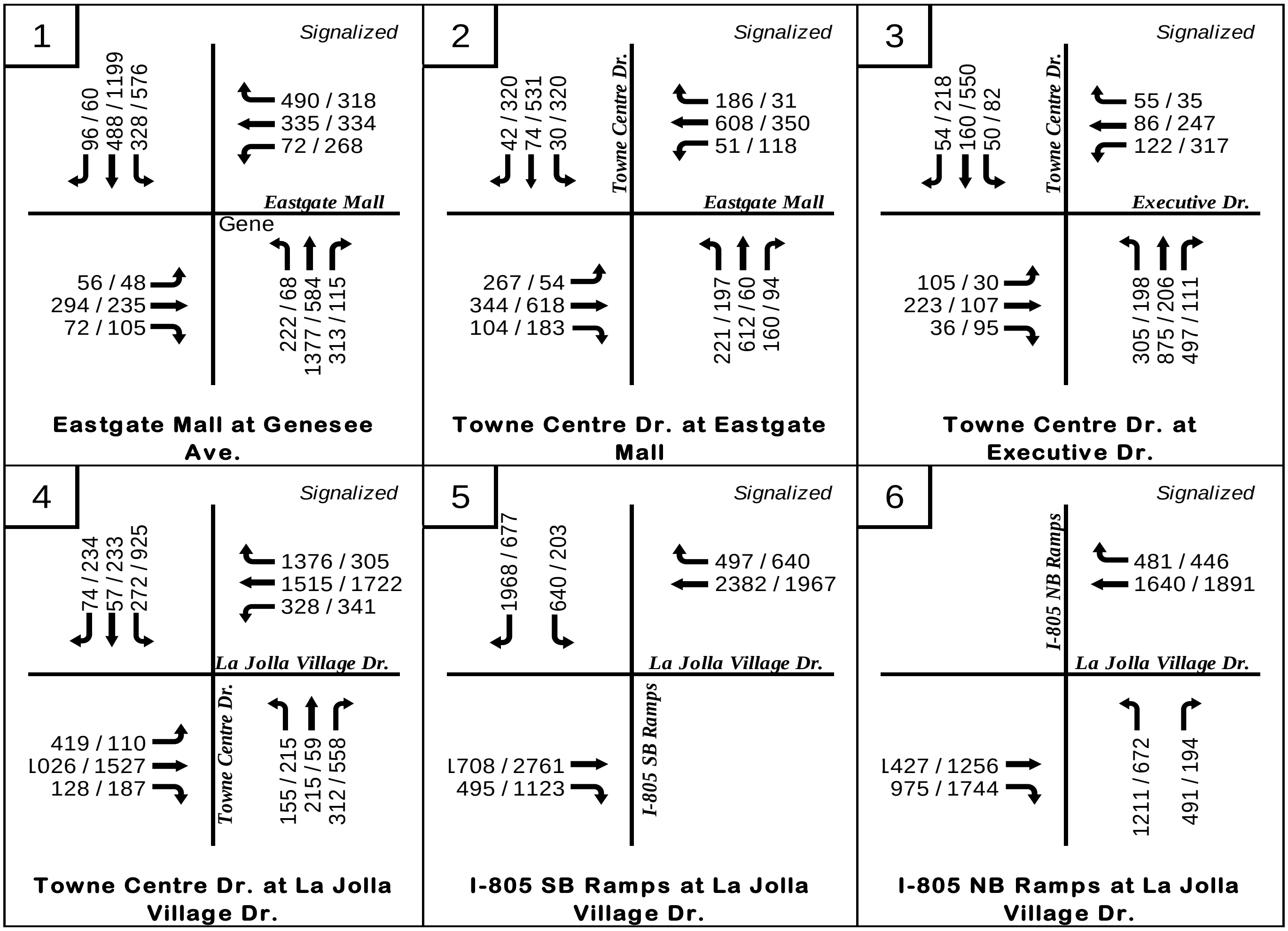
Table 9-2 includes study area intersection LOS with the project traffic added. As shown in **Table 9-2**, all intersections are projected to operate at acceptable levels of service except at:

- I-805 SB Ramps / La Jolla Village Drive Los F in the AM and PM

Appendix I includes the Near Term With Project Synchro worksheets.

9.3 FREEWAY RAMP METER

Since project traffic does not meet the threshold requirements for ramps to be studied they were not included in this analysis.



XX / XX = AM / PM Peak hour volumes

FIGURE 9-2

Near Term With Project AM/PM Peak Hour Traffic

TABLE 9-2

Near Term With Project Intersection Levels of Service

Number	Intersection	Control	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
1	Eastgate Mall at Genesee Ave.	Signalized	46.9	D	44.5	D
2	Towne Centre Dr. at Eastgate Mall	Signalized	36.9	D	43	D
3	Towne Centre Dr. at Executive Dr.	Signalized	29.7	C	52.2	D
4	Towne Centre Dr. at La Jolla Village Dr.	Signalized	44.5	D	51.6	D
5	I-805 SB Ramps at La Jolla Village Dr.	Signalized	124.4	F	81.8	F
6	I-805 NB Ramps at La Jolla Village Dr.	Signalized	40	D	41.6	D

Notes:

Delay = seconds per vehicle

LOS = Level of Service

10. HORIZON YEAR 2035 WITHOUT PROJECT

This section of the report evaluates the Horizon Year 2035 Without Project condition. As discussed in Chapter 3.0, the estimated traffic generated by the existing 100,000 SF Scientific Research building was added to existing traffic conditions. In addition, the full 156,500 SF building was included in the SANDAG model so that all trips are accounted for. The SANDAG Series 12 Year 2035 regional traffic forecast model is based on planning efforts involving all jurisdictions within the County of San Diego. SANDAG, as the regional planning agency, collects data from these plans and collates this data within a traffic model. SANDAG also prepared the regional transportation plan utilized by the traffic model as a basis for estimating future traffic. The 156,500-square-foot scientific research and development project was incorporated in this traffic model with a specific project zone created and a "select-zone" forecast plot obtained. The analysis in this report uses the Select Zone traffic model which includes scientific research and development due to the similarity in uses. The land-uses in the traffic model were modified to reflect the proposed project (refer to **Appendix B** for land use inputs).

A factoring method was used to derive the Year 2035 with project peak hour traffic volumes based on Existing ADT and Year 2035 With Project ADT. Since the traffic model included project volumes, the project was subtracted from Year 2035 with project volumes to calculate the Year 2035 without project condition. This had the effect of removing project traffic from future volumes to reflect the existing vacant condition. No road network changes were assumed in the analysis of the Year 2035 conditions.

For the street segments of Eastgate Mall from Towne Centre Drive to Judicial Drive and La Jolla Village Drive east of Towne Centre Drive, street segment volumes from the University CPA Traffic Impact Study from June 2016 (found in **Appendix B**) were used for Horizon Year 2035 condition; the projects ADT was added to that to determine Horizon Year 2035 With Project volumes. This was done because Near

Term volumes were significantly higher than the Horizon Year 2035 volumes that were projected by SANDAG. USAI determined that using the highest and most recent volumes available that have been previously accepted by the City would produce a more conservative analysis.

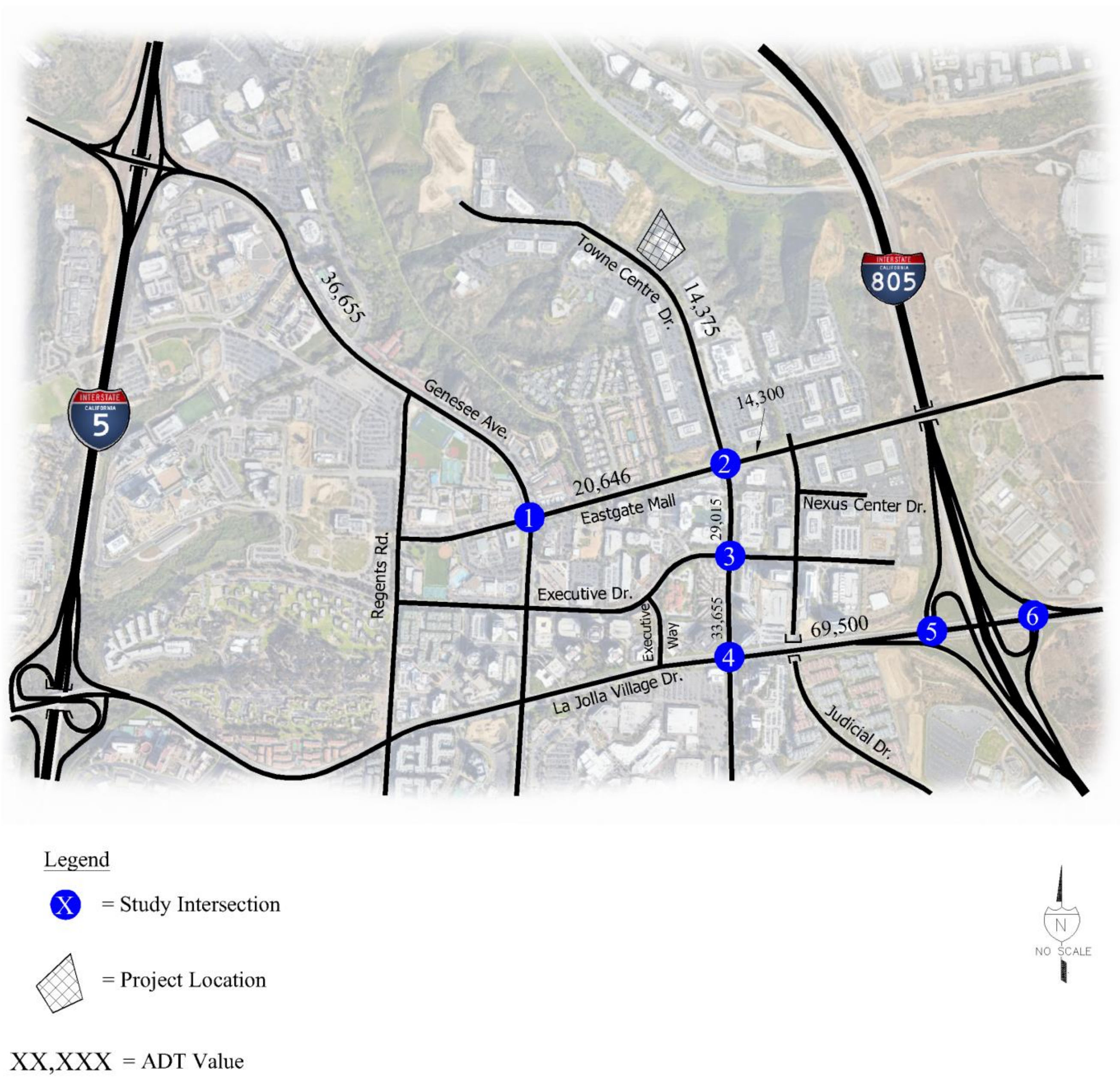


FIGURE 10-1

Horizon Year 2035 Without Project Average Daily Traffic Volumes

TABLE 10-1

Horizon Year 2035 Without Project Street Segment Levels of Service

Road	Segment	Class.	Cap.	Volume	V/C	LOS
Genesee Ave.	I-5 NB Ramps to Eastgate Mall	6-PA	60,000	36,655	0.61	C
Eastgate Mall	Genesee Ave. to Towne Centre Dr.	4-C	30,000	20,646	0.69	D
	Towne Centre Dr. to Judicial Dr.	4-M	40,000	14,300	0.36	A
Towne Centre Dr.	North of Eastgate Mall	4-M	40,000	14,375	0.36	A
	Eastgate Mall to Executive Dr.	4-M	40,000	29,015	0.73	C
	Executive Dr. to La Jolla Village Dr.	4-M	40,000	33,655	0.84	D
La Jolla Village Dr.	East of Towne Centre Dr.	8-PA	80,000	69,500	0.87	C

Legend:

Class. = Functional Class

Cap. = Capacity

LOS = Level of Service

#-PA = Number of Lanes- Prime Arterial

4-C= Four lane Collector Road

4-M= Four lane Major Road

10.1 STREET SEGMENTS

Street segment volumes for Horizon Year 2035 conditions without the project are shown in **Figure 10-1**. The street segments LOS for Horizon Year 2035 conditions without the project are shown in **Table 10-1**. All street segments within the study area are projected to operate at an acceptable level of service.

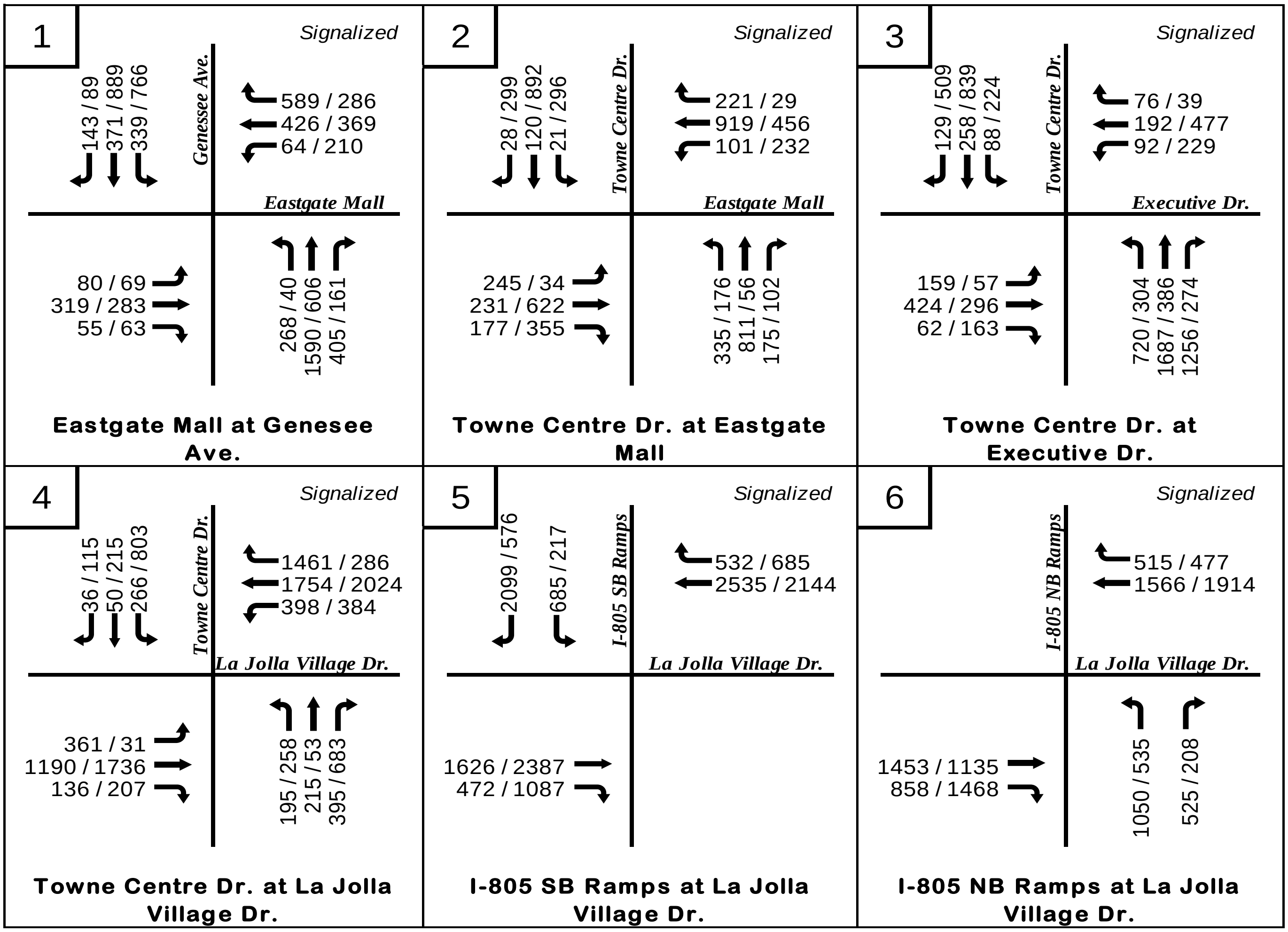
10.2 INTERSECTIONS

AM/PM peak hour turn volumes were established by using a factoring method based on Existing volumes and Horizon Year 2035 With Project daily volumes. All study intersections AM/PM peak hour turn volumes used the factoring method to develop Horizon Year 2035 With Project volumes. Project only peak hour volumes were subtracted from Horizon Year 2035 With Project volumes. The factoring worksheets for all study intersections can be found in **Appendix J**. **Figure 10-2** shows the expected Horizon Year 2035 Without Project peak hour volumes at the intersections analyzed. **Table 10-2** shows the peak hour intersection level of service.

As shown, five (5) intersections are projected to operate at unacceptable levels of service.

- Eastgate Mall at Genesee Ave. LOS E in the AM
- Towne Centre Dr. at Eastgate Mall LOS E in the AM
- Towne Centre Dr. at Executive Dr. LOS E in the AM and PM
- Towne Centre Dr. at La Jolla Village Dr. LOS E in the AM and PM
- I-805 SB Ramps / La Jolla Village Dr. LOS F in the AM

The Synchro worksheets for the Horizon Year 2035 Without Project condition can be found in **Appendix K**.



XX / XX = AM / PM Peak hour volumes

FIGURE 10-2

Horizon Year 2035 Without Project AM/PM Peak Hour Traffic Volumes

TABLE 10-2

Horizon Year 2035 Without Project Intersection Levels of Service

Number	Intersection	Control	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
1	Eastgate Mall at Genesee Ave.	Signalized	56.8	E	45.7	D
2	Towne Centre Dr. at Eastgate Mall	Signalized	55.4	E	51.7	D
3	Towne Centre Dr. at Executive Dr.	Signalized	56.2	E	60.4	E
4	Towne Centre Dr. at La Jolla Village Dr.	Signalized	65.1	E	68.1	E
5	I-805 SB Ramps at La Jolla Village Dr.	Signalized	93.4	F	28.6	C
6	I-805 NB Ramps at La Jolla Village Dr.	Signalized	31.5	C	31.5	C

Notes:

Delay = seconds per vehicle

LOS = Level of Service

10.3 FREEWAY RAMP METER

Since project traffic does not meet the threshold requirements for ramps to be studied, they were not included in this analysis.

11. HORIZON YEAR 2035 WITH PROJECT

As previously discussed, Horizon Year 2035 With Project volumes were taken from the SANDAG Series 12 Year 2035 traffic model. The project land uses were inserted in the traffic model to obtain a forecast of traffic conditions in the future with the project. Street segment volumes were read directly from the traffic model. Intersection volumes were developed with a growth factor based on Year 2035 With Project ADT divided by Existing ADT. Existing intersection counts were multiplied by the growth factor to create the 2035 intersection volumes.

For the street segments of Eastgate Mall from Towne Centre Drive to Judicial Drive and La Jolla Village Drive east of Towne Centre Drive, street segment volumes from the June 2016 University CPA Traffic Impact Study (found in **Appendix B**) were used for Horizon Year 2035 Without Project volumes. The project's ADTs were then added to determine Horizon Year 2035 With Project volumes. This was done because Near Term volumes were significantly higher than the Horizon Year 2035 volumes that were projected by SANDAG.

11.1 VEHICLE MILES TRAVELED

According to SANDAG modeling, the total Vehicle Miles Traveled (VMT) associated with the project is 11,710. This VMT includes the existing 100,000 SF building and is broken down as follows:

- 11,710 / 1,600 = 7.31 VMT per Person Trip Generated
- 11,710 / 1,330 = 8.81 VMT per Vehicle Trip Generated
- 11,710 / 1,244 = 9.41 VMT per Vehicle Trip Assigned
- 11,710 / 165 = 70.97 VMT per Thousand Square Feet of Industrial Park
- 11,710 / 138 = 84.85 VMT per Employee

As the proposed project would be demolishing an existing building and constructing a larger building, the VMT from the site would increase. However, this is partially offset through the implementation of Transportation Demand Management (TDM) measures as discussed in Section 15.0. Additional information can be found in **Appendix B**.

11.2 STREET SEGMENTS

Figure 11-1 shows the Horizon Year 2035 With Project street segment traffic volumes.

An analysis was completed for street segments in the Horizon Year 2035 With Project condition. As shown on **Table 11-1**, all street segments are expected to operate at acceptable levels of service.

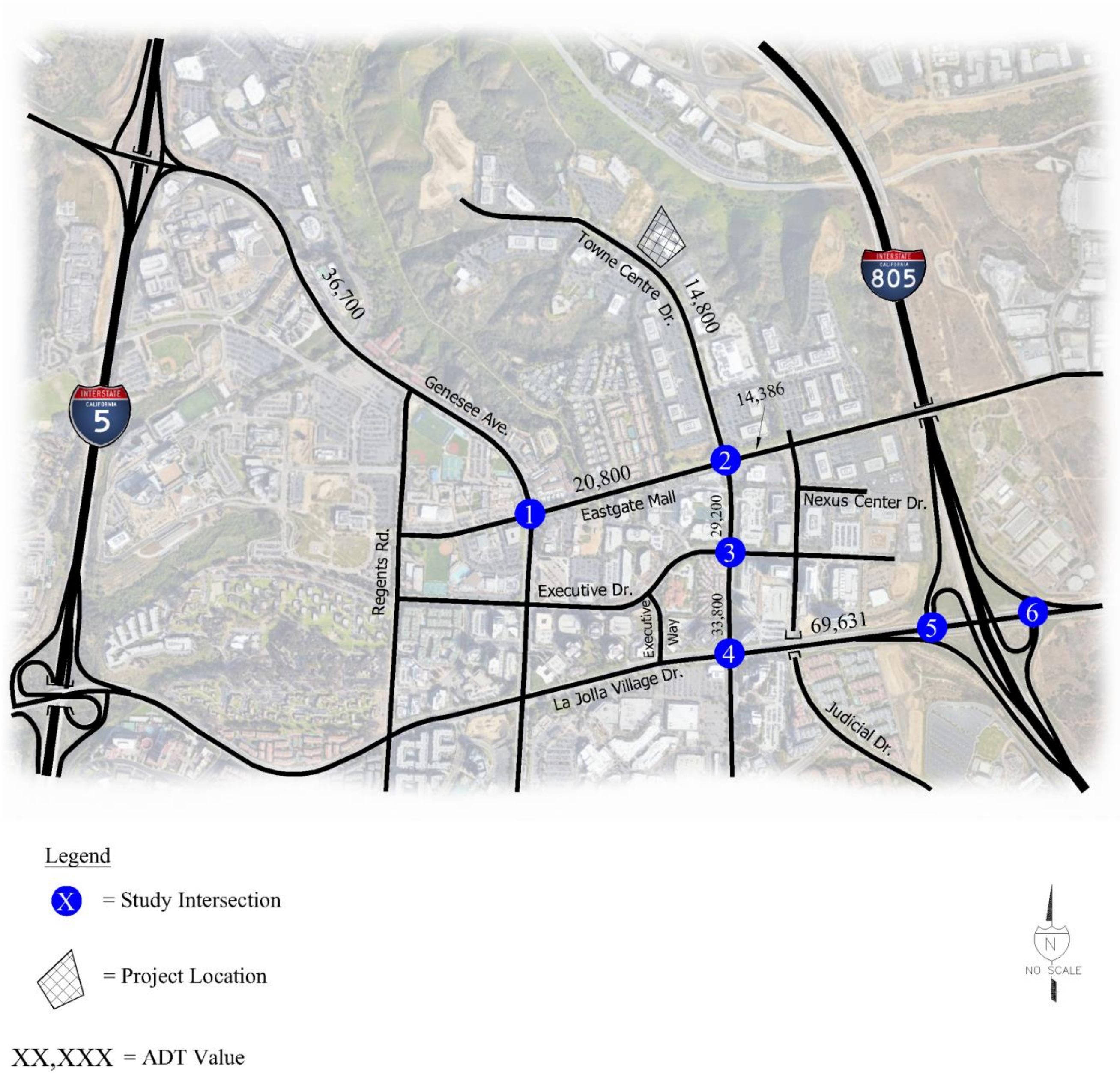


FIGURE 11-1

Horizon Year 2035 With Project Average Daily Traffic Volumes

TABLE 11-1

Horizon Year 2035 With Project Street Segment Levels of Service

Road	Segment	Class.	Cap.	Volume	V/C	LOS
Genesee Ave.	I-5 NB Ramps to Eastgate Mall	6-PA	60,000	36,700	0.61	C
Eastgate Mall	Genesee Ave. to Towne Centre Dr.	4-C	30,000	20,800	0.69	D
	Towne Centre Dr. to Judicial Dr.	4-M	40,000	14,386	0.36	A
Towne Centre Dr.	North of Eastgate Mall	4-M	40,000	14,800	0.37	A
	Eastgate Mall to Executive Dr.	4-M	40,000	29,200	0.73	C
	Executive Dr. to La Jolla Village Dr.	4-M	40,000	33,800	0.85	D
La Jolla Village Dr.	East of Towne Centre Dr.	8-PA	80,000	69,631	0.87	C

Legend:

Class. = Functional Class

Cap. = Capacity

LOS = Level of Service

#-PA = Number of Lanes- Prime Arterial

4-C= Four lane Collector Road

4-M= Four lane Major Road

11.3 HORIZON YEAR 2035 WITH PROJECT INTERSECTIONS

Figure 11-2 shows the expected peak hour volumes at Horizon Year 2035 With Project for the intersections analyzed. **Table 11-2** shows the AM and PM peak hour LOS for the Horizon Year 2035 With Project condition.

As shown, five (5) intersection is expected to operate at unacceptable levels of service.

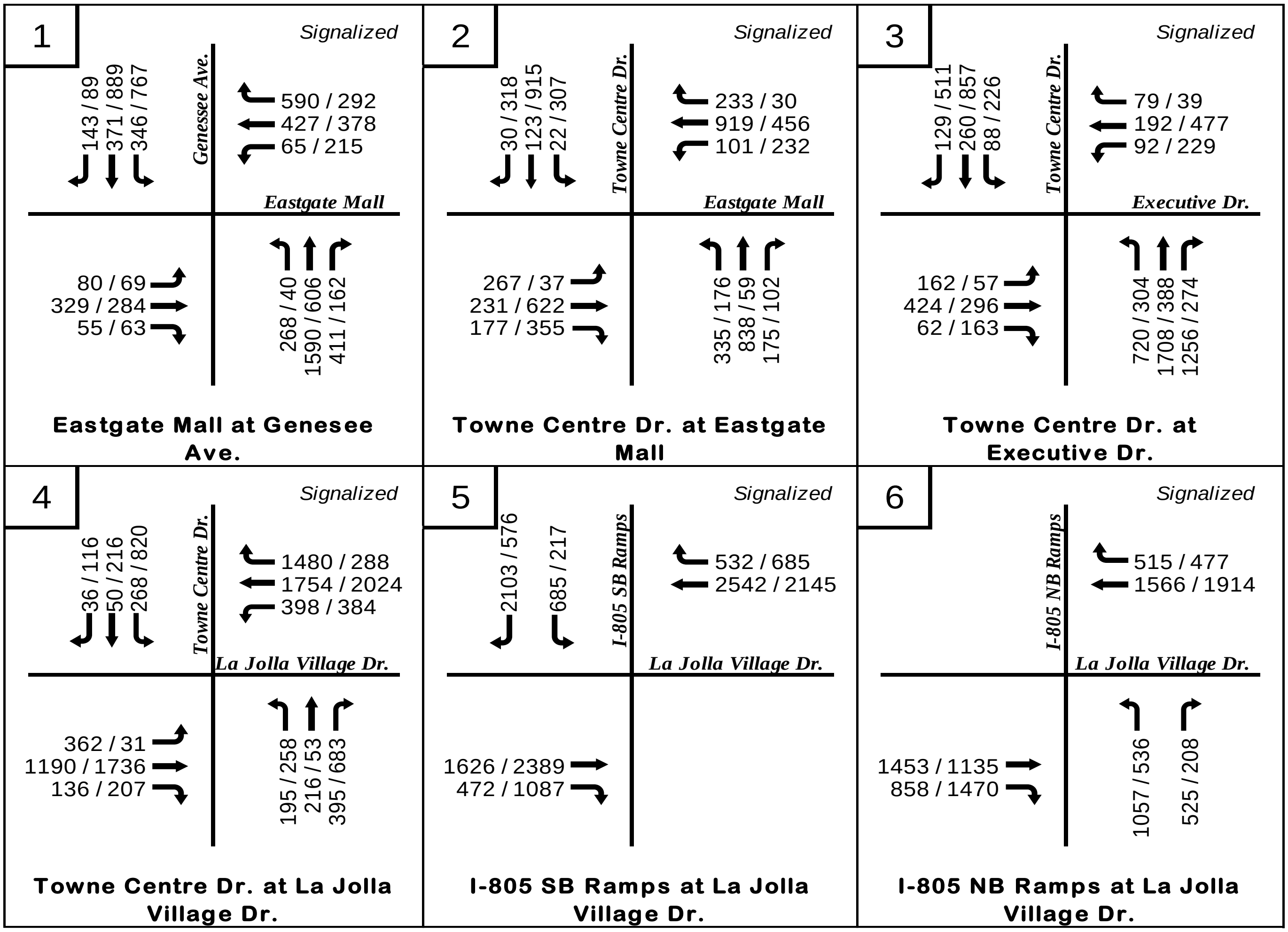
- Eastgate Mall at Genesee Ave. LOS E in the AM
- Towne Centre Dr. at Eastgate Mall LOS E in the AM
- Towne Centre Dr. at Executive Dr. LOS E in the AM and PM
- Towne Centre Dr. at La Jolla Village Dr. LOS E in the AM and PM
- I-805 SB Ramps / La Jolla Village Dr. LOS F in the AM

Although the intersection above is projected to operate at an unacceptable level of service, it is not anticipated to be significant. Significant project impacts are further discussed in Section 15.0 of this study.

Appendix K includes Synchro worksheets for Horizon Year 2035 With Project condition.

11.4 HORIZON YEAR 2035 WITH PROJECT RAMP METER

Since project traffic does not meet the threshold requirements for ramps to be studied, they were not included in this analysis.



XX / XX = AM / PM Peak hour volumes

FIGURE 11-2

Horizon Year 2035 With Project AM/PM Peak Hour Traffic Volumes

TABLE 11-2

Horizon Year 2035 With Project Intersection Levels of Service

Number	Intersection	Control	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
1	Eastgate Mall at Genesee Ave.	Signalized	57.8	E	45.9	D
2	Towne Centre Dr. at Eastgate Mall	Signalized	56.8	E	54.8	D
3	Towne Centre Dr. at Executive Dr.	Signalized	56.6	E	61.3	E
4	Towne Centre Dr. at La Jolla Village Dr.	Signalized	66.3	E	70	E
5	I-805 SB Ramps at La Jolla Village Dr.	Signalized	94.1	F	28.6	C
6	I-805 NB Ramps at La Jolla Village Dr.	Signalized	34.7	C	33.2	C

Notes:

Delay = Seconds per vehicle

LOS = Level of Service

12. ACCESS AND PARKING

12.1 ACCESS

The proposed project site will be accessed via one all-way access driveway on Towne Centre Drive see **Figure 12-1**.

12.2 PARKING

Parking at the site will comply with City of San Diego Municipal Code requirements. According to the City's Municipal Code, the minimum parking spaces required for the proposed 156,500 SF Scientific Research use is 391 based on a rate of 2.5 spaces per 1,000 SF. The maximum parking spaces permitted for the proposed 156,500 SF Scientific Research building is 626 spaces based on a rate of 4.0 spaces per 1,000 SF found in the Municipal Code. The project proposes to provide parking consistent with these requirements at 495 total spaces. As can be seen on **Figure 12-1**, the site will include both surface and subterranean parking. The site will also provide 9 accessible parking spaces, 40 carpool/zero-emissions parking spaces, 25 long-term bicycle spaces, 25 short-term bicycle spaces, 8 motorcycle parking spaces, and in the future 30 electric vehicle charging stations (15 ready for use and 15 for future use).

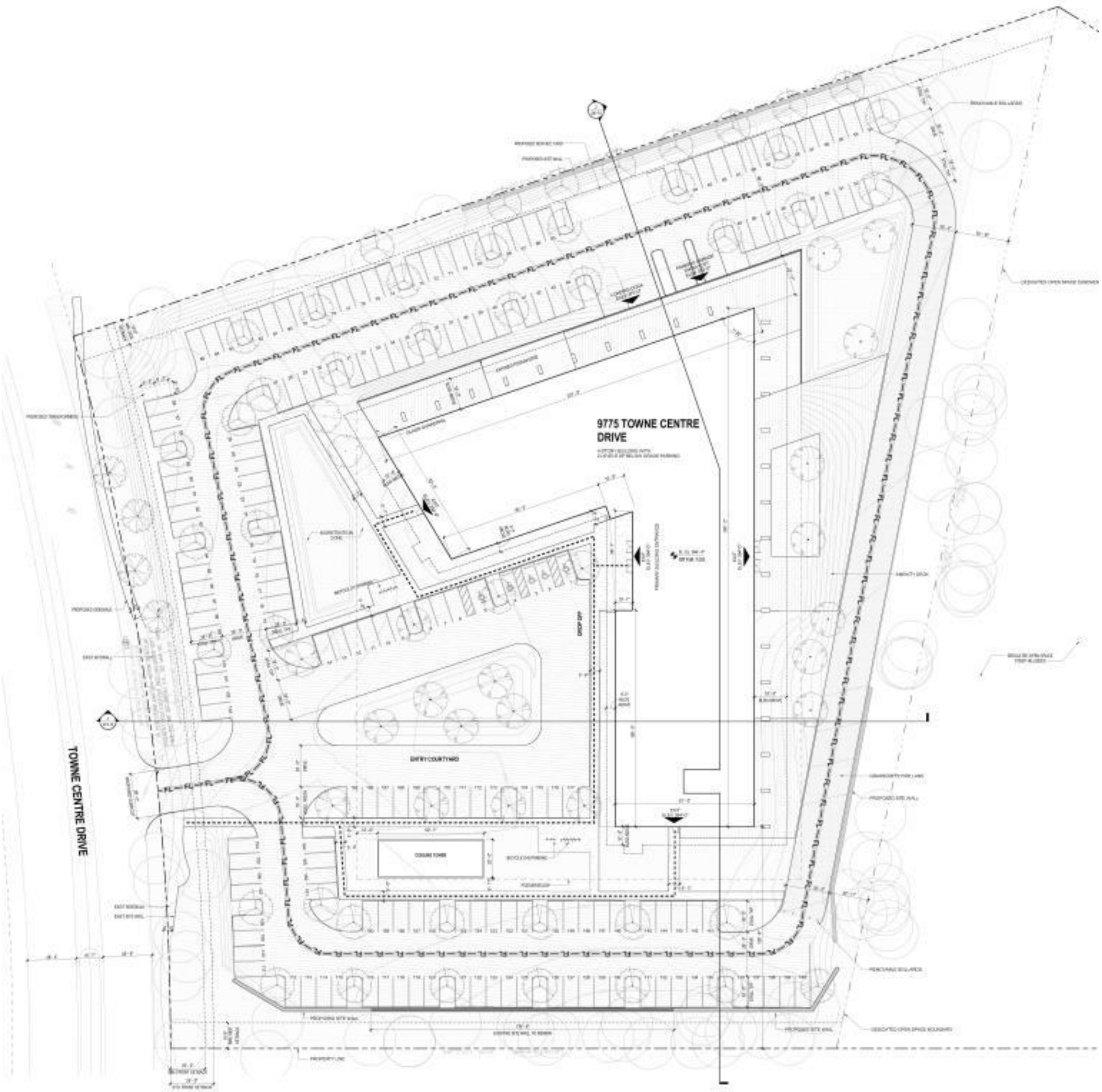


FIGURE 12-1

Parking & Access Plan

13. TRANSIT AND OTHER MODES

13.1 PEDESTRIAN AND BICYCLES

Pedestrian and bicycle access are currently provided through existing sidewalks on Towne Centre Drive. Non-contiguous sidewalks are provided on both sides of Towne Centre Drive north of Eastgate Mall. According to the City of San Diego Bike Master Plan (located in **Appendix D**), the street segments of Genesee Avenue from I-5 Northbound to Eastgate Mall, Eastgate Mall from Genesee Avenue to Towne Centre Drive and from Town Centre Drive to Judicial Drive all have Class II bike routes. All other studied street segments are shown to not have bike routes according to the City of San Diego Bike Master Plan; however, current conditions show that Towne Centre Drive from Executive drive to La Jolla Village Drive does contain a Class II bike route as well.

13.2 TRANSIT

As depicted on **Figure 13-1**, the site is currently within a half mile of (approximately 2,500 feet) MTS bus service Route 31. Bus Route 31 travels on Eastgate Mall just south of the project with a stop just west of the intersection of Towne Centre Drive and Judicial Drive. Additionally, a bus stop located at the intersection of Eastgate Mall and Towne Centre Drive (approximately 2,100 from the project), services Route 979—which also travels along Eastgate Mall. Route 979 connects to the UTC Transit Center as shown in **Figure 13-2**. Route 204 (Superloop) also travels in the project vicinity on Executive Drive and Judicial Drive as shown in **Figure 13-3**. The bus stops nearest to the project that service Route 204 are located at the intersections of Executive Way at Executive Drive and Judicial Drive at Executive Drive; both of these bus stops are roughly 4000 feet from the project. No trip reductions for transit service were assumed as part of this analysis.

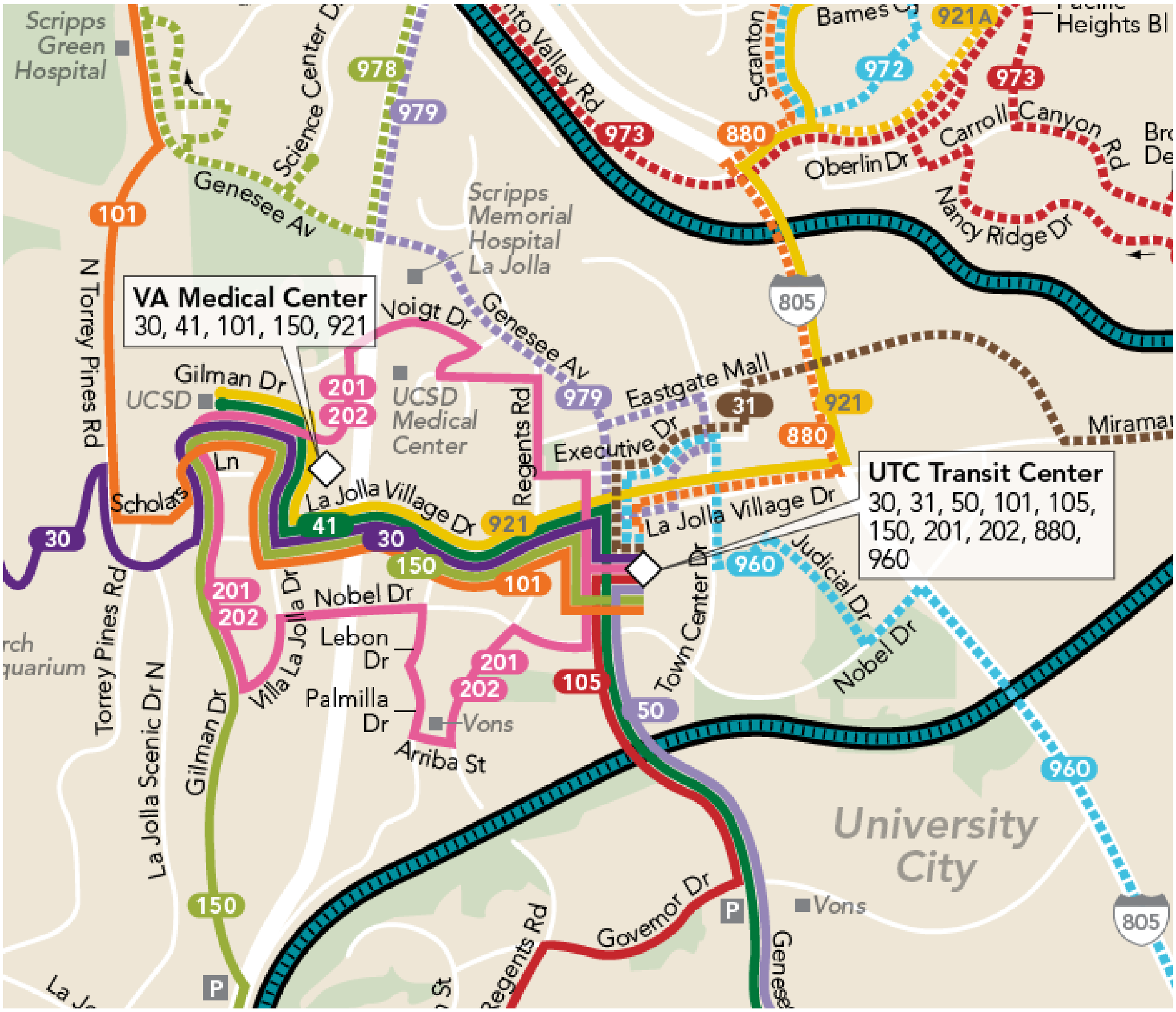


FIGURE 13-1
Transit Service North Central Region

Route 979 — Monday through Friday / *lunes a viernes*

UTC ➡ Sorrento Valley COASTER Station

		Morning (AM)					Afternoon/Evening (PM)				
	Sorrento Valley COASTER Station **DEPART***	6:39a	7:19a	7:53a	8:16a	8:54a		**4:12p**	**4:44p**	**5:18p**	**6:09p**
54	SB Genesee Ave & Scripps Driveway (after intersection)										
55	SB Genesee Ave & Campus Point Drive (after intersection)	6:46	7:26	8:00	8:23	9:01	**3:41p**	**4:19**	**4:51**	**5:25**	**6:16**
56	EB Eastgate Mall & Easter Way (before intersection)										
57	EB Eastgate Mall & Towne Centre Way (before turn)										
58	Towne Centre Way & Executive Drive (before turn)										
59	Executive Way & Executive Drive (before turn)										
60	NB Genesee Ave & La Jolla Village Drive (after turn)	6:51	7:31	8:05	8:28	9:06	**3:46**	**4:24**	**4:56**	**5:30**	**6:21**
61	NB Genesee Ave & Executive Drive (before intersection)										
62	NB Genesee Ave & Eastgate Mall (after intersection)										
63	NB Genesee Ave & Campus Point Drive (after intersection)										
64	NB Genesee Ave & Scripps Driveway (after intersection)										
	Sorrento Valley COASTER Station **ARRIVE**	7:01	7:41	8:15	8:38	—	**3:59**	**4:37**	**5:09**	**5:43**	**6:34**

FIGURE 13-2

Bus Route 979

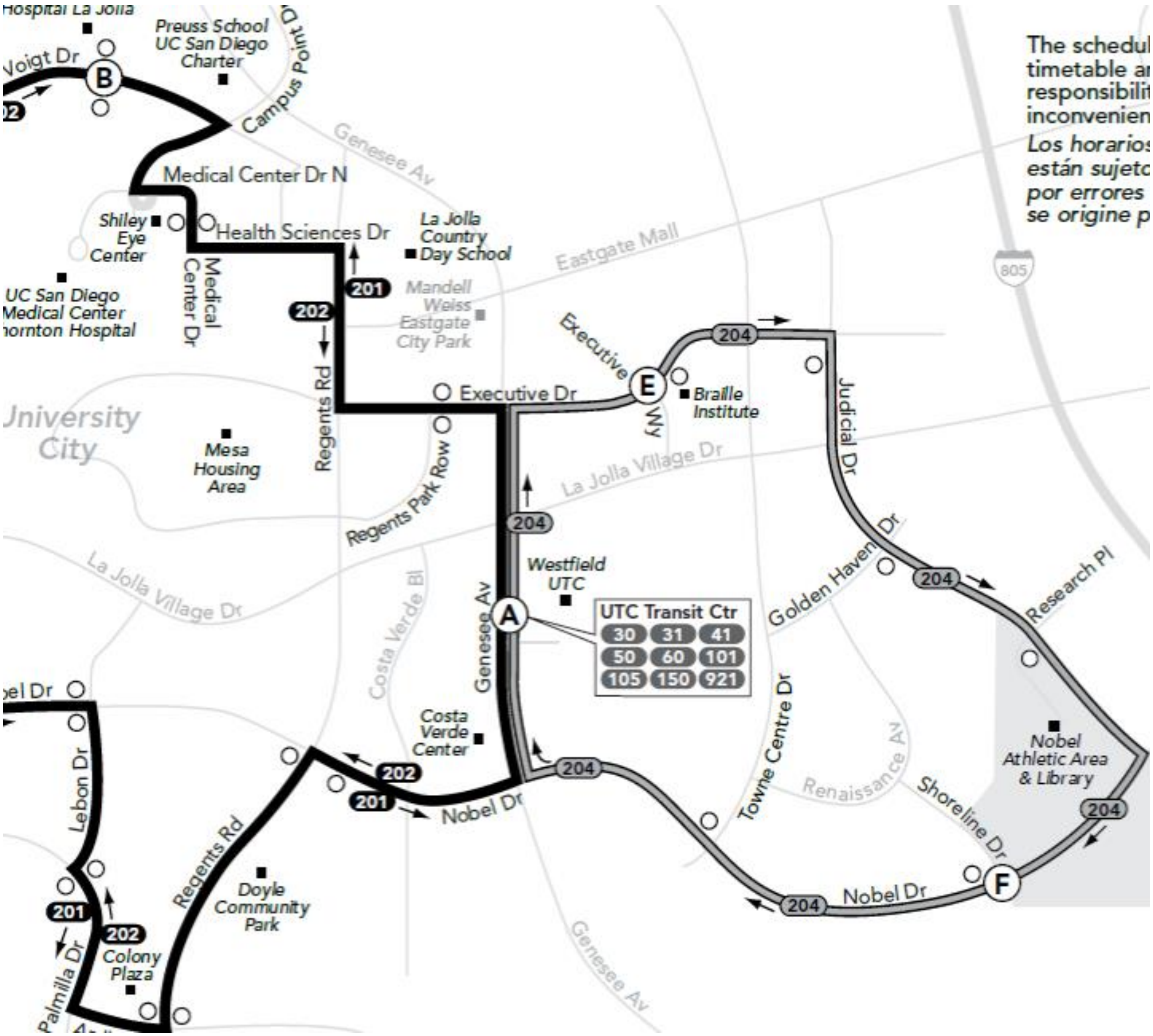


FIGURE 13-3

Bus Route 204 (Superloop)

14. TRANSPORTATION DEMAND MANAGEMENT (TDM)

14.1 TDM

Transportation Demand Management, called "TDM" for short, is a strategy designed to reduce single occupant vehicle trips during the AM and PM peak weekday hours. Since most commuting and congestion occur during weekday peak periods, TDM seeks to shift commuters to transportation modes other than cars as well as reduce peak hour trips by encouraging commuting in non-peak periods and other strategies.

The project will include the following TDM Strategies:

- Transit Subsidies/ Parking Cash-Out: Provide subsidized transit passes or fares to reduce the cost of these high-capacity modes and create cost-competitive alternatives that make SOV commutes seem more expensive by comparison. This benefit is part of a parking cash out system where those who commute by other modes and do not use parking will receive incentives. 9775 Towne Centre Drive will provide a Transit Benefit to all employees who purchase a monthly transit pass. The benefit is limited to $30 per month or $360 per year.
- Bicycle Subsidies/ Parking Cash-Out: Provide financial incentive to reduce the cost of these active transportation modes. This benefit is part of a parking cash out system where those who commute by other modes and do not use parking will receive incentives. 9775 Towne Centre Drive will provide a Bicycle Subsidy to all employees who ride their bike to work a minimum of 3 days per week for any calendar month. The subsidy is limited to $30 per month or $360 per year.
- Bike and Walk Facilities: Implement secure workplace parking for bikes, as well as shower and locker facilities that will be available for those who walk to work (21 lockers).

- Preferred Parking for Carpoolers: Provide preferred spaces for carpool and vanpool vehicles consistent with the Municipal Code.
- User Information: The applicant will work through a TDM Administrator to provide information to 9775 tenants on available alternatives to driving alone and provide educational sessions on available TDM programs. This Administrator may make use of print marketing; information kiosks; websites; ride-matching services; and/or participating in employee-oriented informational/educational sessions which will orient and remind employees of alternative transportation options as well as additional transportation information. The TDM Administrator will be responsible for providing information to employees regarding all TDM programs as well as assisting employees in signing up for applicable programs.
- Provide a bike share program with up to five bicycles available to employees for short trips.
- Provide a bicycle repair station
- Offer on-site food and beverage opportunities such as a coffee cart and snack station to reduce the need for offsite trips during peak times
- Last mile transportation: The project will implement last mile solutions based on tenant demand. Upon full building occupancy, a low-speed electric vehicle shuttle or alternative will be provided during peak periods or longer at the discretion of the applicant based on tenant demand. The low speed electric shuttle or alternative may provide transportation to the University Towne Center transit station and other properties if usage supports the shuttle. The shuttle may be expanded if warranted. If demand is insufficient to warrant a shuttle after an initial one year trial period, an alternative will be explored which may include rideshare options such as Uber and Lyft. This TDM measure may be discontinued at the applicant's option in favor of other TDM measures if there is low utilization.

Additional TDM measures to be managed by future tenants as a lease requirement:

- Telecommuting: Allow employees to work from home or a non-office location one or more days a week. As IT systems continue to evolve, 9775 Towne Centre Drive expects participation in the Telecommuting program to increase as convenience increases. The program has a target participation rate of 5% of employees telecommuting at least one day per week.
- Compressed Workweek: Enable employees to compress regularly scheduled hours into fewer work days per week
- Flexible Schedule: Allow employees to offset work hours from the typical 9-5 standard and shift commute travel to off-peak hours.
- Guaranteed-Ride-Home: This employer will participate in the iCommute program (or equivalent) which provides benefits to allow for up to three free taxi rides or rental cars for unplanned trips home that cannot be accommodated by the employee's normal commute mode (e.g., working late past last scheduled bus, carpool passenger with sick child at school).
- Encourage participation in Sandag's iCommute Rideshare Challenge!

Additional TDM measures such as an on-demand car-share, unbundling parking costs, employee incentives, or subsidies for carpools / vanpools may be considered to achieve a 20% trip reduction goal.

Monitoring and Reporting Program:

In order to ensure the proposed TDM strategies are adequately implemented and maintained, a TDM Monitoring and Reporting Program will be conducted. The TDM Monitoring Program will analyze the TDM program and its effectiveness for a five-year period, including, to the extent feasible, quantifying the adoption rate of the components of the program. The Monitoring efforts will include conducting average daily vehicle (counts) and peak hour counts at the project site. Data relating to transit usage, carpool/vanpool usage, transit and other subsidies will also be collected that will be supplemented by on-site surveys. This information will be broken down into estimated percentages of number of employees participating in each TDM strategy. A TDM Monitoring Report will be prepared and submitted to the City Engineer on the first anniversary of the issuance of a certificate of occupancy for the project and on such date each year thereafter during the five-year monitoring period.

Additional BioMed Properties:

BioMed Realty (owner of BMR-Apex LP) is committed to ensuring sustainable communities. TDM is an important element of sustainability. Therefore, upon implementation of the above TDM program for the 9775 Towne Centre Drive site, the appointed TDM administrator will request meetings with other BioMed tenants in the University City area. The importance of TDM and the overall benefits of employing TDM strategies to contribute to employee wellness and sustainability will be discussed with tenants. A list of TDM measures will be reviewed and BioMed Realty will assist tenants wishing to voluntarily incorporate TDM measures at their site and participate in a larger TDM program. In addition, as leases turnover at various BioMed properties, they will be reviewed by the TDM administrator in order to incorporate TDM measures as appropriate for each property. Such measures may include requiring tenants to participate in the iCommute program, providing secure bicycle parking and showers, restriping parking lots to add preferred parking for carpool or vanpool vehicles, providing bicycle repair stations, incorporating bikeshare programs and facilities and more.

15. CONCLUSIONS AND RECOMMENDATIONS

15.1 PROJECT TRIP GENERATION

The project of 156,500 SF Scientific Research use is expected to generate approximately 452 average daily vehicle trips with 72 AM (65 inbound / 7 outbound) peak hour trips and 63 PM (8 inbound / 57 outbound) peak hour trips from its new 56,500 SF of trip generating space.

15.2 EXISTING CONDITIONS

Street Segments:

All street segments are shown to operate at LOS "D" or better in the Existing condition.

Intersections:

All intersections are expected to operate at LOS "D" or better in the Existing condition.

15.3 EXISTING WITH PROJECT

When project traffic is added to existing traffic, the following results occur.

Street Segments:

All street segments are anticipated to operate at acceptable levels of service in the Existing With Project scenario.

Intersections:

All intersections are projected to operate at LOS "D" or better in the Existing With Project scenario.

15.4 NEAR TERM WITHOUT PROJECT

Street Segments:

All street segments are anticipated to operate at LOS "D" or better in the Near Term Without Project scenario.

Intersections:

All intersections are projected to operate at LOS "D" or better in Near Term Without Project scenario except for these locations:

- I-805 SB Ramps / La Jolla Village Dr. LOS F in the AM and PM peak hour

15.5 NEAR TERM WITH PROJECT

When the existing plus the other projects plus the proposed project is added, the following results occur.

Street Segments:

All street segments are projected to operate at LOS "D" or better in the Near Term With Project condition.

Intersections:

All intersections are projected to operate at LOS "D" or better in this condition with the project except for the following intersections:

- I-805 SB Ramps / La Jolla Village Dr. LOS F in the AM and PM peak hour

DIRECT IMPACTS:

Street Segments:

Table 15-1 shows the summary of the direct impacts in the Existing Plus Project scenario for street segments within the study area. As shown, there are no significant direct street segment impacts expected as a result of the project. A summary of direct impacts in the Near Term Plus Project scenario for street segments within the study area is shown in **Table 15-2**. As shown, there are no significant direct street segment impacts expected as a result of the project.

Intersections:

Table 15-3 shows the summary of the direct impacts in the Existing with Project scenario for intersections within the study area. As shown in the table, there are no significant impacts. A summary of direct impacts in the Near Term with Project scenario for intersections within the study area are shown in **Table 15-4**. As shown, there are no significant direct impacts as a result of the project.

TABLE 15-1

Existing With and Without Project Street Segment Significance

Road	Segment	Cap.	Class.	Existing Count	Existing 9775 Building	Adjusted Existing			Project Only	Existing + Project			Δ V/C	Is this impact Significant?
				Volume	Volume	LOS	Volume	V/C	Volume	LOS	Volume	V/C		
Genesee Ave.	I-5 NB Ramps to Eastgate Mall	60,000	6-PA	29,457	80	B	29,537	0.49	45	B	29,582	0.49	0.001	***NO***
Eastgate Mall	Genesee Ave. to Towne Centre Dr.	30,000	4-C	14,046	272	C	14,318	0.48	154	C	14,472	0.48	0.005	***NO***
	Towne Centre Dr. to Judicial Dr.	40,000	4-M	13,442	152	A	13,594	0.34	86	A	13,680	0.34	0.002	***NO***
Towne Centre Dr.	North of Eastgate Mall	40,000	4-M	9,322	752	A	10,074	0.25	425	A	10,499	0.26	0.011	***NO***
	Eastgate Mall to Executive Dr.	40,000	4-M	12,237	328	A	12,565	0.31	185	A	12,750	0.32	0.005	***NO***
	Executive Dr. to La Jolla Village Dr.	40,000	4-M	18,118	256	B	18,374	0.46	145	B	18,519	0.46	0.004	***NO***
La Jolla Village Dr.	East of Towne Centre Dr.	80,000	8-PA	61,449	232	C	61,681	0.77	131	C	61,812	0.77	0.002	***NO***

Legend:

LOS= Level of Service
V/C= Volume to Capacity Ratio
ΔV/C= Change in V/C ratio

#-PA = Number of Lanes- Prime Arterial
4-C= Four lane Collector Road
4-M= Four lane Major Road

TABLE 15-2

Near Term With and Without Project Street Segment Significance

Road	Segment	Cap.	Class.	Near Term			Near Term + Project			Δ V/C	Is this impact Significant?
				LOS	Volume	V/C	LOS	Volume	V/C		
Genesee Ave.	I-5 NB Ramps to Eastgate Mall	60,000	6-PA	B	33,783	0.56	B	33,828	0.56	0.001	***NO***
Eastgate Mall	Genesee Ave. to Towne Centre Dr.	30,000	4-C	C	14,843	0.49	C	14,997	0.50	0.005	***NO***
	Towne Centre Dr. to Judicial Dr.	40,000	4-M	A	13,939	0.35	A	14,025	0.35	0.002	***NO***
Towne Centre Dr.	North of Eastgate Mall	40,000	4-M	A	10,343	0.26	A	10,768	0.27	0.011	***NO***
	Eastgate Mall to Executive Dr.	40,000	4-M	A	13,083	0.33	A	13,268	0.33	0.005	***NO***
	Executive Dr. to La Jolla Village Dr.	40,000	4-M	B	18,704	0.47	B	18,849	0.47	0.004	***NO***
La Jolla Village Dr.	East of Towne Centre Dr.	80,000	8-PA	D	71,641	0.90	D	71,772	0.90	0.002	***NO***

Legend:

LOS= Level of Service
V/C= Volume to Capacity Ratio
ΔV/C= Change in V/C ratio

#-PA = Number of Lanes- Prime Arterial
4-C= Four lane Collector Road
4-M= Four lane Major Road

TABLE 15-3

Existing With and Without Project Intersection Comparison

#	Intersection	Existing				Existing + Project							
		AM Peak Hour		PM Peak Hour		AM Peak Hour		Δ	S ?	PM Peak Hour		Δ	S ?
		Delay	LOS	Delay	LOS	Delay	LOS			Delay	LOS		
1	Eastgate Mall at Genesee Ave.	41.1	D	39.9	D	41.3	D	0.2	No	40.0	D	0.1	No
2	Towne Centre Dr. at Eastgate Mall	31.9	C	34.9	C	33.1	C	1.2	No	35.8	D	0.9	No
3	Towne Centre Dr. at Executive Dr.	25.3	C	29.8	C	25.4	C	0.1	No	29.9	C	0.1	No
4	Towne Centre Dr. at La Jolla Village Dr.	34.6	C	40.4	D	34.7	C	0.1	No	40.8	D	0.4	No
5	I-805 SB Ramps at La Jolla Village Dr.	50.8	D	36.8	D	51.7	D	0.9	No	36.9	D	0.1	No
6	I-805 NB Ramps at La Jolla Village Dr.	27.4	C	38.2	D	28.1	C	0.7	No	38.3	D	0.1	No

Notes:

Delay = Seconds per vehicle
LOS = Level of Service
Δ = Change
S = Significant

TABLE 15-4

Near Term With and Without Project Intersection Comparison

#	Intersection	Near Term				Near Term + Project									
		AM Peak Hour		PM Peak Hour		AM Peak Hour		Δ	S ?	PM Peak Hour		Δ	S ?
		D	LOS	D	LOS	D	LOS			D	LOS		
1	Eastgate Mall at Genesee Ave.	46.4	D	44.3	D	46.9	D	0.5	No	44.5	D	0.2	No
2	Towne Centre Dr. at Eastgate Mall	35.5	D	41.8	D	36.9	D	1.4	No	43.0	D	1.2	No
3	Towne Centre Dr. at Executive Dr.	29.6	C	50.8	D	29.7	C	0.1	No	52.2	D	1.4	No
4	Towne Centre Dr. at La Jolla Village Dr.	43.9	D	50.6	D	44.5	D	0.6	No	51.6	D	1.0	No
5	I-805 SB Ramps at La Jolla Village Dr.	124.0	F	81.5	F	124.4	F	0.4	No	81.8	F	0.3	No
6	I-805 NB Ramps at La Jolla Village Dr.	39.6	D	41.3	D	40.0	D	0.4	No	41.6	D	0.3	No

Notes:

LOS = Level of Service
Δ = Change
S = Significant
D= Delay

15.6 HORIZON YEAR 2035 WITHOUT PROJECT

When the project traffic is subtracted from future model volumes, the following results occur.

Street Segments:

All street segments are projected to operate at LOS "D" or better in the Horizon Year 2035 Without Project condition.

Intersections:

All intersections are projected to operate at LOS "D" or better in this condition without the project except at the following locations:

- Eastgate Mall at Genesee Ave. LOS E in the AM
- Towne Centre Dr. at Eastgate Mall LOS E in the AM
- Towne Centre Dr. at Executive Dr. LOS E in the AM and PM
- Towne Centre Dr. at La Jolla Village Dr. LOS E in the AM and PM
- I-805 SB Ramps / La Jolla Village Dr. LOS F in the AM

15.7 HORIZON YEAR 2035 WITH PROJECT

When future model volumes including project traffic are evaluated, the following results occur.

Street Segments:

All street segments are projected to operate at LOS "D" or better in the Horizon Year 2035 With Project condition.

Intersections:

All intersections are projected to operate at LOS “D” or better in this condition with the project except at the following locations:

- Eastgate Mall at Genesee Ave. LOS E in the AM
- Towne Centre Dr. at Eastgate Mall LOS E in the AM
- Towne Centre Dr. at Executive Dr. LOS E in the AM and PM
- Towne Centre Dr. at La Jolla Village Dr. LOS E in the AM and PM
- I-805 SB Ramps / La Jolla Village Dr. LOS F in the AM

Although I-805 SB Ramps at La Jolla Village Drive and Towne Centre Drive at Executive Drive would operate at an unacceptable level of service in this condition, as shown in **Table 15-6**, the change in delay caused by the project is less than the threshold required to cause a significant impact. Information regarding impact thresholds can be found in Section 4.0 of this report.

15.8 CUMULATIVE LONG TERM (YEAR 2035) IMPACTS

Street Segments:

Table 15-5 shows the summary of the cumulative impacts in the Horizon Year 2035 With Project scenario for street segments within the study area. As shown, there are no significant street segment impacts as a result of the project.

Intersections:

Table 15-6 shows the summary of the cumulative impacts in the Horizon Year 2035 With Project scenario for intersections within the study area. As shown in the table, there are no significant impacts as a result of the project.

TABLE 15-5

Horizon Year 2035 With and Without Project Street Segment Significance

Road	Segment	Cap.	Class.	Year 2035			Year 2035 + Project			Δ V/C	Is this impact Significant?
				LOS	Volume	V/C	LOS	Volume	V/C		
Genesee Ave.	I-5 NB Ramps to Eastgate Mall	60,000	6-PA	C	36,655	0.61	C	36,700	0.61	0.001	***NO***
Eastgate Mall	Genesee Ave. to Towne Centre Dr.	30,000	4-C	D	20,646	0.69	D	20,800	0.69	0.005	***NO***
	Towne Centre Dr. to Judicial Dr.	40,000	4-M	A	14,300	0.36	A	14,386	0.36	0.002	***NO***
Towne Centre Dr.	North of Eastgate Mall	40,000	4-M	A	14,375	0.36	A	14,800	0.37	0.011	***NO***
	Eastgate Mall to Executive Dr.	40,000	4-M	C	29,015	0.73	C	29,200	0.73	0.005	***NO***
	Executive Dr. to La Jolla Village Dr.	40,000	4-M	D	33,655	0.84	D	33,800	0.85	0.004	***NO***
La Jolla Village Dr.	East of Towne Centre Dr.	80,000	8-PA	C	69,500	0.87	C	69,631	0.87	0.002	***NO***

Legend:

LOS= Level of Service
V/C= Volume to Capacity Ratio
ΔV/C= Change in V/C ratio

#-PA = Number of Lanes- Prime Arterial
4-C= Four lane Collector Road
4-M= Four lane Major Road

TABLE 15-6

Horizon Year 2035 Without and With Project Intersection Summary

#	Intersection	Year 2035				Year 2035 + Project							
		AM Peak Hour		PM Peak Hour		AM Peak Hour		Δ	S ?	PM Peak Hour		Δ	S ?
		D	LOS	D	LOS	D	LOS			D	LOS		
1	Eastgate Mall at Genesee Ave.	56.8	E	45.7	D	57.8	E	1.0	No	45.9	D	0.2	No
2	Towne Centre Dr. at Eastgate Mall	55.4	E	51.7	D	56.8	E	1.4	No	54.8	D	3.1	No
3	Towne Centre Dr. at Executive Dr.	56.2	E	60.4	E	56.6	E	0.4	No	61.3	E	0.9	No
4	Towne Centre Dr. at La Jolla Village Dr.	65.1	E	68.1	E	66.3	E	1.2	No	70.0	E	1.9	No
5	I-805 SB Ramps at La Jolla Village Dr.	93.4	F	28.6	C	94.1	F	0.7	No	28.6	C	0.0	No
6	I-805 NB Ramps at La Jolla Village Dr.	31.5	C	31.5	C	34.7	C	3.2	No	33.2	C	1.7	No

Notes:

LOS = Level of Service

Δ = Change

S = Significant

D= Delay

15.9 FREEWAY RAMP METERS

Ramp meters were not analyzed since the proposed project would place less trips then the required 20 trip rule for ramps to be studied.

15.10 MITIGATION

STREET SEGMENTS:

The analysis shows no direct or cumulative significant impacts occur as a result of the proposed project for street segments. Therefore, no mitigation has been identified on any of the studied street segments.

INTERSECTIONS:

The analysis shows no direct or cumulative significant impacts occur as a result of the proposed project for intersections. Therefore, no mitigation has been identified on any of the studied intersections.

16. COMMUNITY PLAN COMPARISON

As previously discussed, the 9775 Towne Centre Drive site has an existing fully entitled and leasable vacant building with 100,000 square feet of Scientific Research and Development uses (at a rate of 8 ADT/1,000 SF). This intensity of use would be expected to generate 800 ADT. However, to account for future growth in ADT caused by intensification on the site with 56,500 SF of new traffic generating space, development rights (ADT) must be transferred from other properties and TDM measures must be incorporated.

16.1 Transfer of ADT

The proposed 9775 Towne Centre Drive project proposes to amend the current University City Community Plan through the transfer of development rights as well as modification of language in Table 3 of the Community Plan (See **Appendix D**). The transfer of development rights is discussed on Page 175 of the Community Plan under Section E. This transfer is allowed within subdivisions or subareas of the Community Plan. However, the proposed project plans to transfer development rights both within the subdivision as well as from adjacent subdivisions. Therefore, an amendment to the Community Plan is appropriate as described below. These proposed amendments to the Community Plan are discussed in more detail in the project application. However, from a traffic perspective, the amendments to the Community Plan will transfer trips (ADT) within Subarea 12 as well as from Subarea 11 to Subarea 12 with the receiving property on Lot 6A at 9775 Towne Centre Drive. Specifically, the proposed project will transfer a total of 151 ADT (using 8 trips per 1,000 sf of Scientific Research use) within Subarea 12 from lots 3A, 3B and 3D to lot 6A. A map of Subarea 12 within the Eastgate Technology Park can be found in **Appendix D**. In addition, the Community Plan will be amended to transfer 61 ADT from Subarea 11 (9855-9885 Towne Centre Drive) to Subarea 12, Lot 6A. A copy of the Land Use and Development Intensity Subarea Map within the University City Community Plan can also be found in

Appendix D. In total, 212 ADT will be transferred for 26,500 square feet of equivalent Scientific Research uses. With the existing 100,000 square feet of entitled Scientific Research uses on the 9775 Towne Centre Drive property, the total of existing and transferred square footage will be 126,500 square feet. Of note, the transfer and receiving site are all along the same road and the only outlet from the Subarea 11 lot is along Towne Centre Drive through Subarea 12. Consequently, the transfer is not expected to increase congestion on Town Centre Drive beyond levels already anticipated for this segment of the road. TDM measures targeting a reduction in trip generation for the 9775 Towne Centre Drive site by 20% corresponding to 250 ADT. Although not required for mitigation, if the TDM program is not successful in adequately reducing trips, additional measures will be implemented. Taken together, the existing entitled ADT, the transferred ADT, and the TDM measures totals an allowance of 1,262 ADT. The project is expected to generate 1,252 ADT.

17. REFERENCES

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18. URBAN SYSTEMS ASSOCIATES, INC., PREPARERS

Principal Engineer

Andrew P. Schlaefli; M.S. Civil Engineering, B.S. Civil Engineering
Registered Civil Engineer, Licensed Traffic Engineer

Senior Project Manager

Justin P. Schlaefli; B.S. Civil Engineering, MCE
Registered Civil Engineer, Licensed Traffic Engineer

Project Manager

Matthew Vahabzadeh

Technical Support, Graphics, and Illustrations

Jackson Schulz

Word Processing, Report Production and Compilation

Matthew Vahabzadeh

This report is site and time specific and is intended for a one-time use for this intended project under the conditions described as "Proposed Project." Any changes or delay in implementation may require re-analysis and re-consideration by the public agency granting approvals. California land development planning involves subjective political considerations as well as frequently re-interpreted principals of law as well as changes in regulations, policies, guidelines and procedures. Urban Systems and their professionals make no warrant, either express or implied, regarding our findings, recommendations, or professional advice as to the ability to successfully accomplish this land development project.

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Appendix A

1982 EIR Excerpts

EASTGATE TECHNOLOGY PARK

ENVIRONMENTAL IMPACT REPORT

EQD #81-12-31

SECTION III

ENVIRONMENTAL ANALYSIS

A. TRAFFIC AND CIRCULATION

Existing Conditions

The project site is located in the University Community, which has recently been the subject of detailed computerized travel forecasting. The University City Travel Forecast Computer Model was originally developed in 1980 by the City of San Diego Engineering and Development Department, Transportation and Traffic Engineering Division, with assistance from Herman Kimmel & Associates. The model uses a series of programs (Planpac) developed by the Federal Highway Administration to simulate Traffic Generation, Distribution and Assignment, and is a disaggregate version of the City's North Subregional Computer Model.

The original modelling process tested land use assumptions for the University Community based on developments already built or approved and input from local property owners and developers for undeveloped parcels. It included a detailed analysis of probable turning movements at critical intersections and proposed mitigation measures. Assumptions by the City Transportation and Traffic Engineering Division included a Planned Industrial Development (PID) of 200 buildable acres at the project site north of Eastgate Mall with a 30 percent floor area ratio (FAR) for a total of 2.6 million square feet of Industrial Park. The parcel south of Eastgate Mall was assumed to be open space with no trips associated with it. With the trip generation rate of seven trips per 1000 square feet, the project site was anticipated to generate an Average Daily Traffic (ADT) of 18,200 vehicles.

The project site is served by Eastgate Mall, a two lane, bi-directional facility that connects with a network of roadways providing regional freeway access. Eastgate Mall, which experiences a current average two-way traffic volume of 3400 vehicles, extends to the east, overcrosses I-805 and eventually intersects with Miramar Road. To the west, Eastgate Mall intersects Genesee Avenue and Regents Road. Genesee Avenue intersects La Jolla Village Drive (Miramar Road) about 1 mile southwest of the site; the latter facility provides access to I-5 to the west and I-805 to the east. Genesee Avenue extends north to I-5, and south to SR 52. The existing circulation system and current traffic volumes are shown in Figure 8.

In addition to existing facilities, two major streets assumed in the computer model are planned to cross the project site. Towne Centre Drive would continue north, from its present terminus at La Jolla Village Drive, and may connect to Roselle Street in Sorrento Valley at some point in the future. Cooks Road would intersect Towne Centre Drive within the project site and turn south, generally paralleling Towne Centre Drive. Cooks Road would then continue under La Jolla Village Drive and eventually intersect Nobel Drive near its future interchange with I-805. Both of these roads are proposed to be

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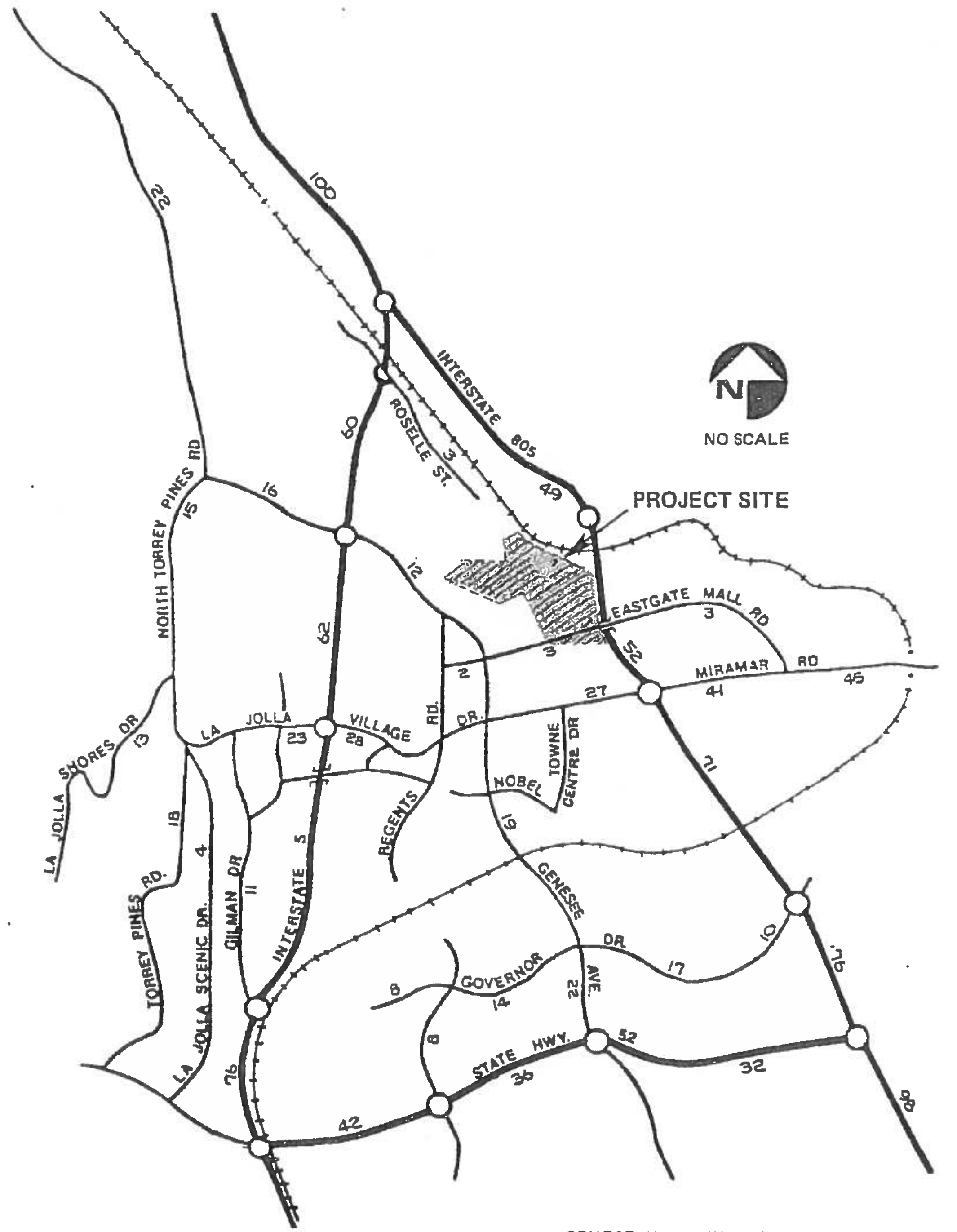

SOURCE: Herman Kimmel and Associates, April 1981

Existing Circulation System and Traffic Volumes (1981)

FIGURE 8

constructed onsite as part of this project. Figure 9 shows the planned 1995 circulation network for the University Community. Although no specific schedule has been established for the construction of the planned facilities, the extension of Towne Centre Drive to Eastgate Mall will probably occur in the next 5 years. Funding of this construction would come as a condition of surrounding development. The other connections would be constructed on a similar basis as the circulation needs occur.

Impacts

The maximum floor area allowed to be developed under the proposed PID (2,604,200 square feet) was used to assess the potential traffic impacts of the project. Based on a generation rate of seven trips per 1000 square feet of floor space, total ADT would be 18,229 which is equivalent to that assumed in the 1980 forecast. Table 2 includes a summary of travel forecasts.

A limited number of trips would be internal to the project site; however, it is estimated that the majority of trips would leave the site. Because the actual degree of internal trip generation is dependent on the interrelationships of the individual occupants of the parcels within the project, a worst case (no internal trips) was assumed. As much as 5 percent of internal trips, however, may occur (Kimmel, 1981). An onsite commercial facility to minimize internal trips would not be permitted because of the limitations of Proposition B (see Section III-B, Land Use). However, onsite food service facilities will be provided for each lot according to the PID Development Standards.

Based on available computer data from previous analyses, and the location of residential areas, shopping facilities, and other trip sources, a distribution of traffic generated from the site was estimated by Herman Kimmel and Associates. The precise computer assignment of these travel patterns to the street system is not available; however, Figure 10 shows an approximate projected network assignment of project-related traffic for the expected ADT rates. The northerly destinations for site traffic would diminish slightly with the elimination of the Roselle Street connection, as only about 1 percent of the trips would use that route. The actual percentages of traffic leaving the site would be as follows: 1 percent northbound on Towne Centre Drive; 9 percent eastbound on Eastgate Mall; 15 percent southbound on Cooks Road; 30 percent southbound on Towne Centre Drive; and 40 percent westbound on Eastgate Mall (Kimmel, 1981).

The volumes on Figure 10 show an incremental contribution of Average Daily Traffic (ADT) to the total 1995 ADT for expected ADT, respectively: Towne Centre Drive north of La Jolla Village Drive (30 percent); Genesee Avenue north of Miramar Road (35 percent); Eastgate Mall between Genesee Avenue and Towne Centre Drive (45 percent); and the entire length of Cooks Road (20 to 60 percent). A comparison of these traffic volumes and the recent computer forecast volumes (Figure 11) indicates that the critical locations impacted by project-related traffic would be the intersections of La Jolla Village Drive with Genesee Avenue and Towne Centre Drive. Both of these intersections would experience some level of congestion during peak periods,

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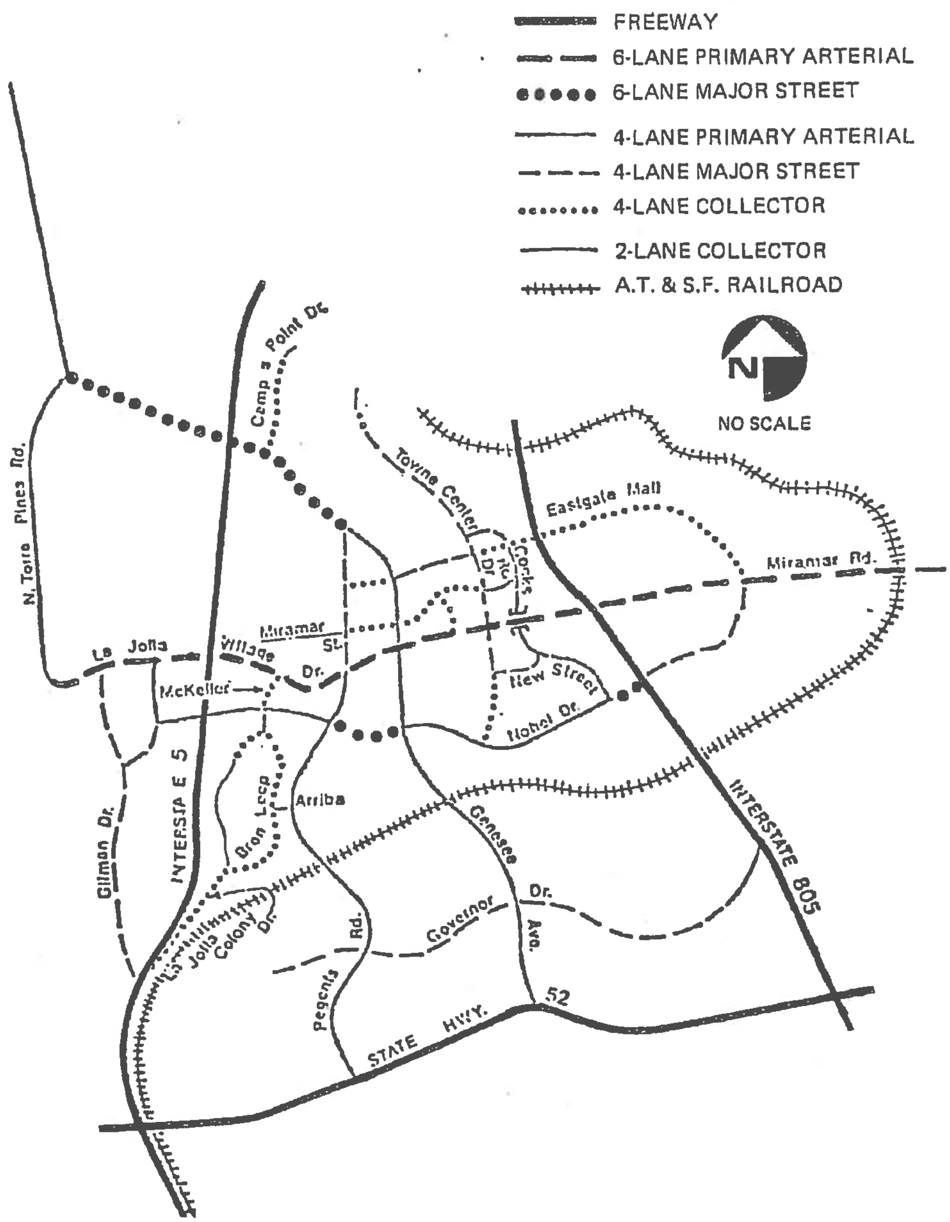


SOURCE: City of San Diego, April 1981

University Community 1995 Street Network

FIGURE 9

Table 2

SUMMARY OF TRAVEL FORECASTS

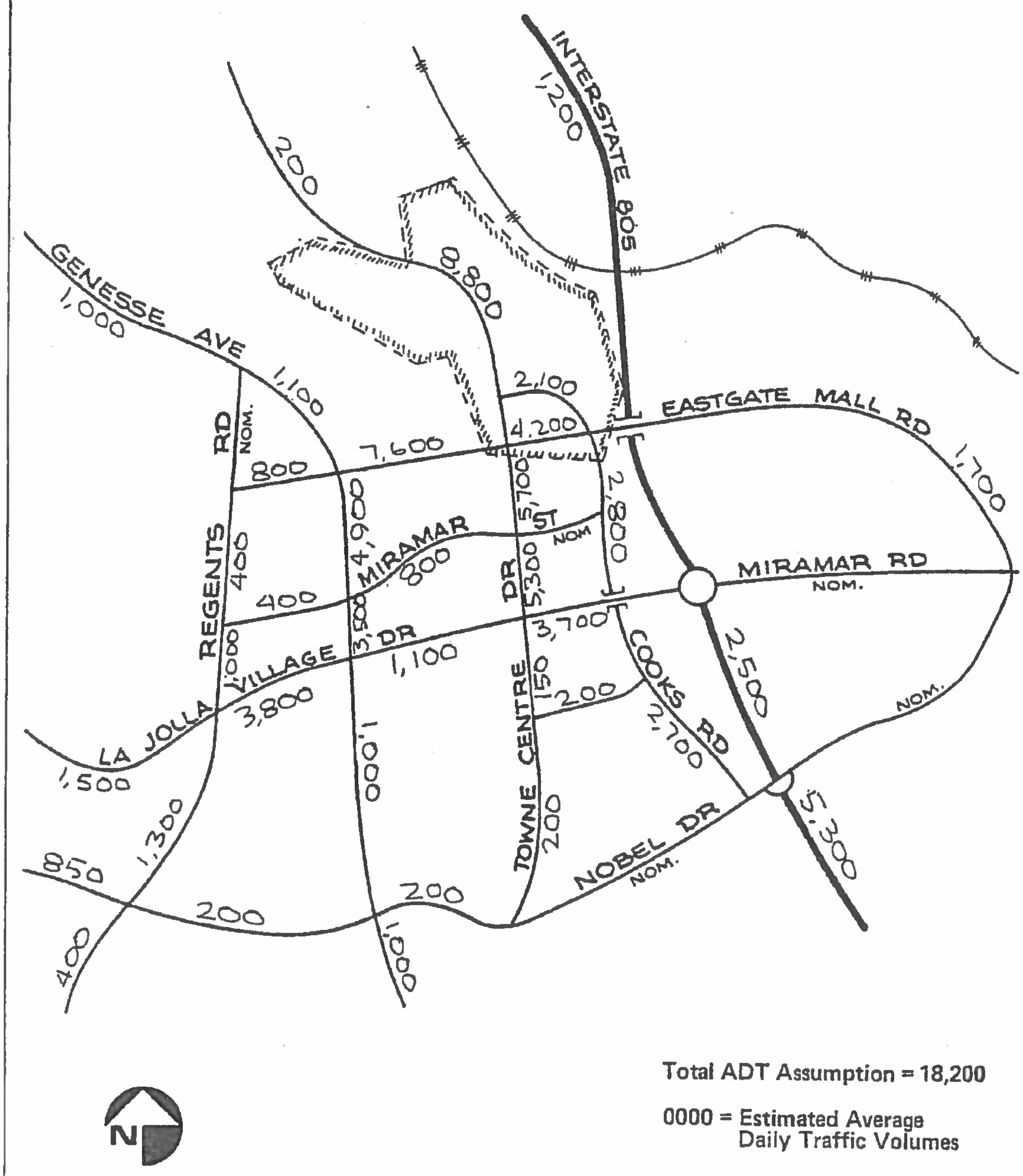
Assumed Condition	Developable Acreage	Square Feet (million)	Average Daily Trips (ADT)*	% Δ
1980 Forecast**	200	2.60	18,200	—
"Worst Cast" Project***	132.8	2.604	18,229	+1

*Trip generation rate = 7 trips/1000 square feet.

**FAR = 30 percent.

***Maximum floor area = 2,604,200 as specified by PID.

WESTEC Services, Inc.

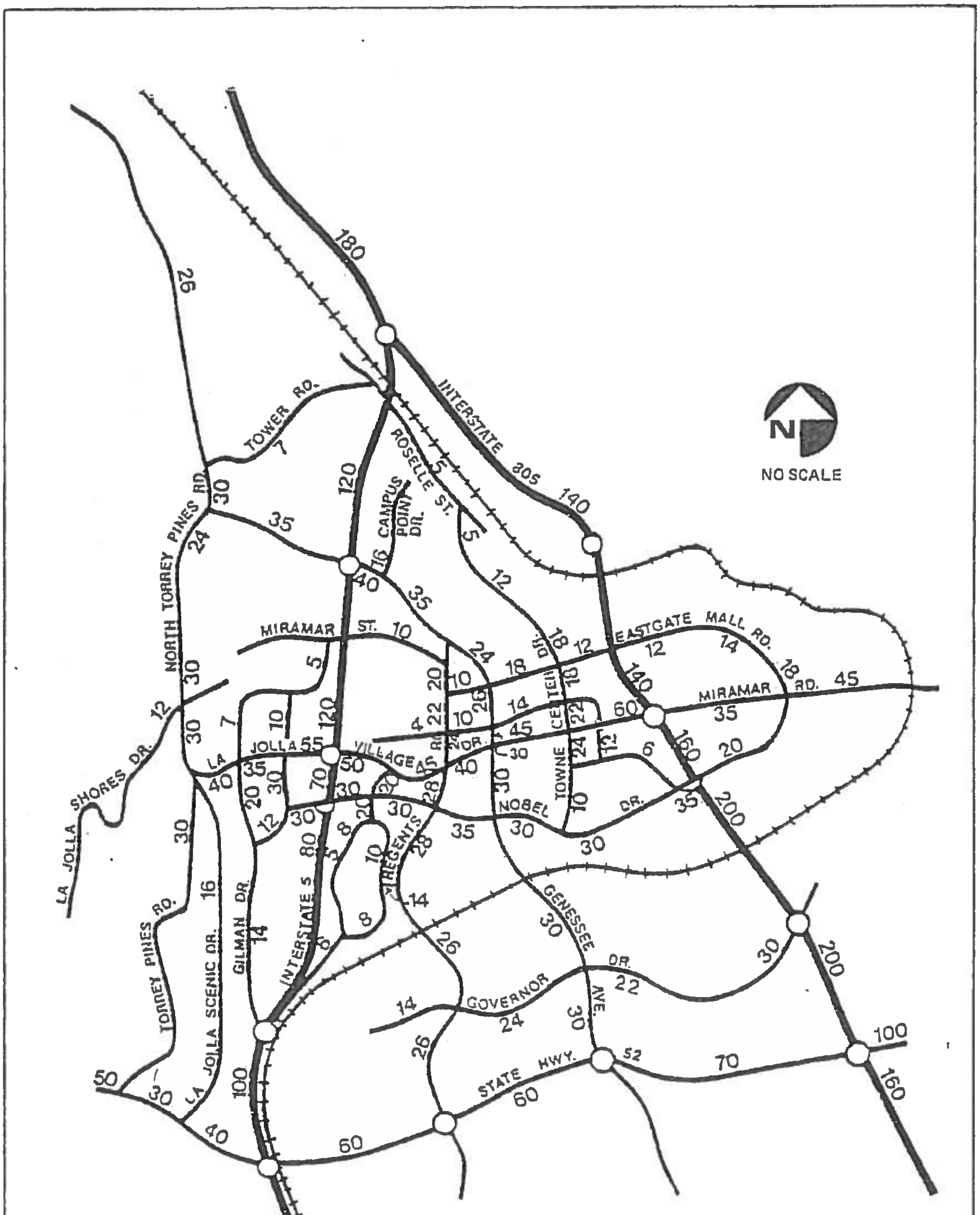


SOURCE: Herman Kimmel and Associates, Inc.

Projected Eastgate Technology Park Network Assignment

FIGURE 10

WESTEC Services, Inc.



University Community 1995 Traffic Volumes

FIGURE 11

which would be generally about 19 percent of the ADT, and predominantly (13 percent) in the inbound direction.

The proposed project will develop total square footage which will generate trips at or below the total ADT projected by the 1980 forecast, thus no significant impacts would result.

Mitigation

Since project-related traffic will be equivalent to that projected in the 1980 forecast, no mitigation measures are necessary.

Improvements at critical intersections which would minimize impacts resulting from project traffic (i.e., additional travel and turning lanes) include implementing the recommended intersection configurations found in Appendix A. The configurations are based on previous forecast volumes, as well as intersection capacity utilization (ICU) calculations.

To assure the completion of planned roadways, funding of this construction would come either from the City's Facilities Benefit Assessment (FBA) Program or as a condition of surrounding development. The improvements should occur concurrently with area development.

Towne Centre Drive and Cooks Road would be completed onsite as part of the proposed project. In addition, approximately 400 feet of Cooks Road will be constructed offsite to the south. In order to further reduce area traffic congestion, Transportation System Management (TSM) techniques such as car and vanpooling, staggered work hours, improved transit service, and traffic signal coordination could be employed. Such techniques can be encouraged; but are not included in the proposed project. In addition, it should be noted that unless they are implemented on a community-wide basis, the mitigating potential is limited in effect.

B. LAND USE

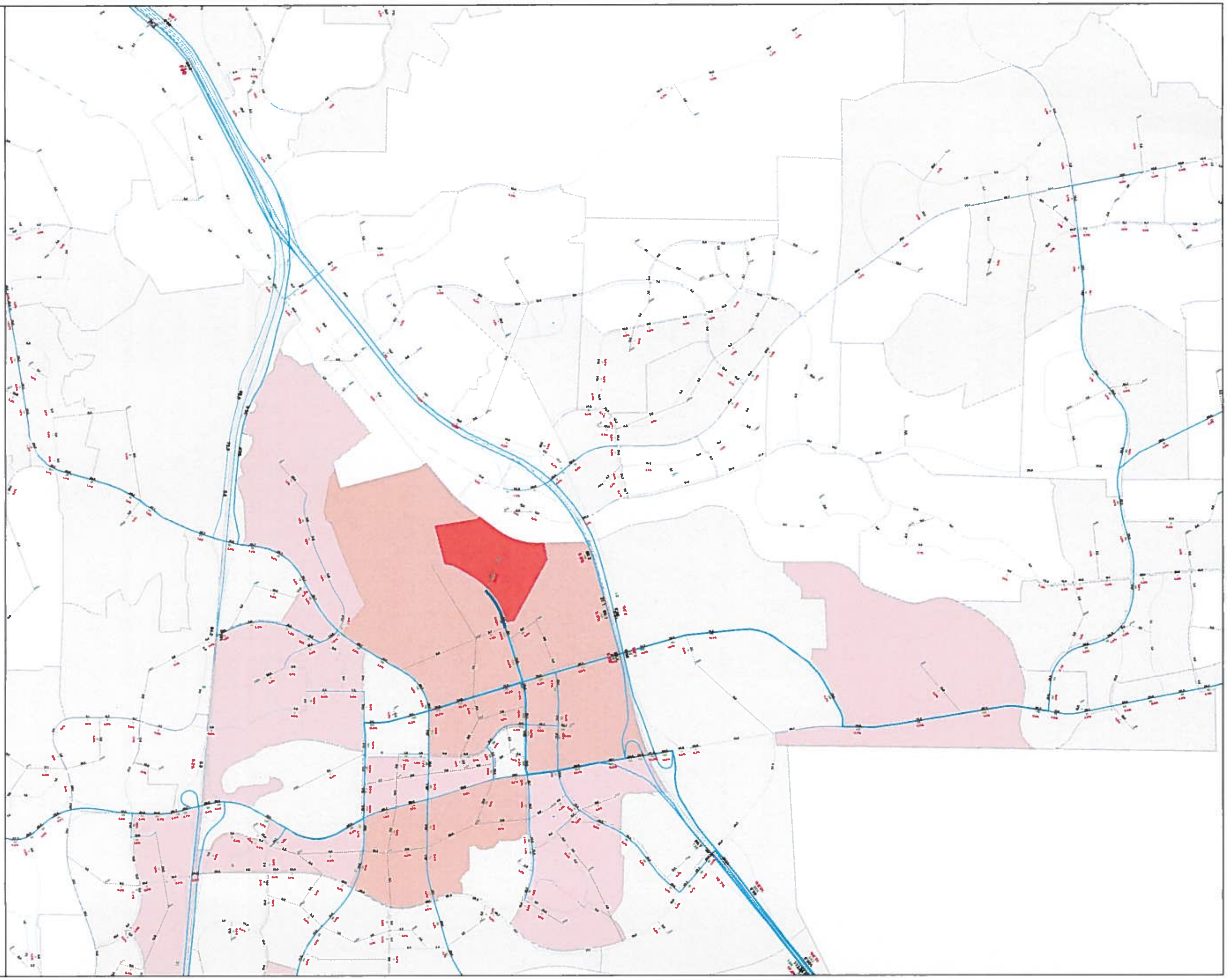
Existing Conditions

On September 18, 1979 the electors of the City of San Diego approved Proposition B, which ratified an ordinance authorizing the sale or lease of City-owned Pueblo Lands for the purpose of financing police substations. A General Plan Amendment (GPA) was adopted on December 15, 1981 that changed the Industrial Element Map, the General Plan Map, and the Industrial Land Inventory of the City's Progress Guide and General Plan to designate approximately 140 acres of the project site as General Industrial (Figure 3). The Eastgate Technology Park project represents the City's effort to proceed with the mandate of Proposition B in compliance with the GPA.

The project site is generally surrounded by urban development: the University Towne Centre regional shopping complex is located approximately 1 mile south. Bordering the southwest corner are multi-family residential developments, and several existing or planned technology parks lie to the north and northwest in Sorrento Valley. The current zoning of the site is R-1-5 which

Appendix B

SANDAG Series 12 Year 2035 Forecast
VMT Information
University CPA TIS June 2016 volumes table



SANDAG Series 12
2035 Highway Network
Select Zone Assignment

UTC Area

Forecasted Volumes:

- Unadjusted Volume (in Thousands)
- Select Link Volume
- Select Link Percentage
- Traffic Analysis Zone

Link Distributions:

- 100%
- 50.1% -> 99.9%
- 25.1% -> 50.0%
- 10.1% -> 25.0%
- 5.1% -> 10.0%
- 0.1% -> 5.0%
- 0%

Zonal Distributions:

- 100%
- 25.1% -> 99.9%
- 10.1% -> 25.0%
- 1.1% -> 10.0%
- 0.6% -> 1.0%
- 0.1% -> 0.5%
- Zero Trips (0.0%)

SANDAG

Table 7-3 Future Year Volume-Based Roadway Segment Analysis Summary

ROADWAY SEGMENT	ROADWAY CLASSIFICATION (a)	LOS E CAPACITY	Existing			Future Alt A Regents Bridge 6-lane Genesee			Future Alt B Regents Bridge 4-lane Genesee			Future Alt C No Bridge 6-lane Genesee			Future Alt D No Bridge 4-lane Genesee		
			ADT (b)	V/C RATIO (c)	LOS	ADT (b)	V/C RATIO (c)	LOS	ADT (b)	V/C RATIO (c)	LOS	ADT (b)	V/C RATIO (c)	LOS	ADT (b)	V/C RATIO (c)	LOS
Eastgate Mall																	
Regents Rd to Genesee Ave	2 Lane Collector (continuous left-turn lane)	15,000	6,187	0.412	B	12,100	0.807	D	12,200	0.813	D	12,300	0.820	D	12,300	0.820	D
Genesee Ave to Easter Way	4 Lane Collector	30,000	14,767	0.492	C	**25,000**	**0.833**	**E**	**25,100**	**0.837**	**E**	24,900	0.830	D	**25,400**	**0.847**	**E**
Easter Way to Judicial Dr	4 Lane Major Arterial	40,000	11,115	0.278	A	14,100	0.353	A	14,300	0.358	A	14,000	0.350	A	14,300	0.358	A
Judicial Drive to Eastgate Dr (Freeway Overpass)	2 Lane Collector (no fronting property)	10,000	10,096	1.010	**F**	**19,500**	**1.950**	**F**	**19,500**	**1.950**	**F**	**19,500**	**1.950**	**F**	**19,400**	**1.940**	**F**
Eastgate Dr to Miramar Rd	2 Lane Collector (continuous left-turn lane)	15,000	14,668	0.978	E	**28,800**	**1.920**	**F**	**28,700**	**1.913**	**F**	**29,000**	**1.933**	**F**	**29,200**	**1.947**	**F**
Executive Drive																	
Regents Rd to Genesee Ave	4 Lane Collector (no center lane)	15,000	4,397	0.293	A	5,900	0.393	B	6,000	0.400	B	6,600	0.440	B	6,400	0.427	B
Genesee Ave to Judicial Dr	4 Lane Collector	30,000	5,914	0.197	A	8,900	0.297	A	8,700	0.290	A	9,300	0.310	A	9,300	0.310	A
Executive Way																	
Executive Dr to La Jolla Village Dr	4 Lane Collector	30,000	5,923	0.197	A	11,400	0.380	B	11,100	0.370	B	11,000	0.367	B	11,100	0.370	B
Genesee Avenue																	
N. Torrey Pines Rd to I-5 SB Ramps	6 Lane Prime Arterial	60,000	35,124	0.585	C	46,100	0.768	C	46,100	0.768	C	46,100	0.768	C	46,000	0.767	C
I-5 SB Ramps to I-5 NB Ramps	4 Lane Major Arterial	40,000	49,051	1.226	**F**												
	8 Lane Prime Arterial	80,000				62,100	0.776	C	62,200	0.778	C	62,300	0.779	C	62,100	0.776	C
I-5 NB Ramps to Regents Rd	6 Lane Prime Arterial	60,000	48,542	0.809	C	54,300	0.905	D	54,700	0.912	D	54,800	0.913	D	54,600	0.910	D
Regents Rd to La Jolla Village Dr	6 Lane Prime Arterial	60,000	29,457	0.589	C	40,600	0.812	D	40,300	0.806	D	40,700	0.814	D	40,800	0.816	D
La Jolla Village to Esplande Ct	4 Lane Major Arterial	40,000	28,054	0.701	C												
	6 Lane Major Arterial	50,000				41,800	0.836	D	41,900	0.838	D	**46,500**	**0.930**	**E**	**46,400**	**0.928**	**E**
Esplande Ct to Nobel Dr	6 Lane Major Arterial	50,000	23,744	0.475	B	27,300	0.546	B	27,400	0.548	B	30,300	0.606	C	29,700	0.594	C
Nobel Dr to Centurion Square	4 Lane Major Arterial	40,000	30,922	0.773	D				**39,600**	**0.990**	**E**				**46,500**	**1.163**	**F**
	6 Lane Major Arterial	50,000				39,600	0.792	C				**49,400**	**0.988**	**E**			
Centurion Square to Governor Dr	4 Lane Major Arterial	40,000	30,325	0.758	D				**40,900**	**1.023**	**F**				**54,600**	**1.365**	**F**
	6 Lane Major Arterial	50,000				43,900	0.878	D				**58,200**	**1.164**	**F**			
Governor Dr to SR-52 WB Ramps	4 Lane Major Arterial	40,000	30,325	0.758	D				**44,300**	**1.108**	**F**				**43,500**	**1.088**	**F**
	6 Lane Major Arterial	50,000				**48,700**	**0.974**	**E**				**47,700**	**0.954**	**E**			
SR-52 WB Ramps to SR-52 EB Ramps	4 Lane Major Arterial	40,000	31,170	0.779	D	**37,300**	**0.933**	**E**	**36,500**	**0.913**	**E**	**39,000**	**0.975**	**E**	**38,000**	**0.950**	**E**
SR-52 EB Ramps to Lehrer Dr	4 Lane Major Arterial	40,000	30,581	0.765	D	**37,100**	**0.928**	**E**	**36,600**	**0.915**	**E**	**38,900**	**0.973**	**E**	**38,400**	**0.960**	**E**
Gilman Drive																	
UCSD Campus to La Jolla Village Dr	4 Lane Collector	30,000	10,069	0.336	B	13,800	0.460	B	13,900	0.463	B	13,700	0.457	B	13,700	0.457	B
La Jolla Village Dr to Via Alicante	4 Lane Collector	30,000	15,095	0.503	C	21,800	0.727	D	21,800	0.727	D	21,000	0.700	D	20,700	0.690	D
Via Alicante to I-5 SB Ramps	4 Lane Major Arterial	40,000	17,138	0.428	B	24,300	0.608	C	24,500	0.613	C	24,000	0.600	C	23,400	0.585	C
I-5 SB Ramps to I-5 NB Ramps	4 Lane Major Arterial	40,000	11,873	0.297	A	14,900	0.373	A	15,000	0.375	B	16,800	0.420	B	16,500	0.413	B
Golden Haven Drive																	
Towne Center Dr to Judicial Dr	4 Lane Major Arterial	40,000	6,712	0.168	A	7,500	0.188	A	7,300	0.183	A	7,700	0.193	A	7,600	0.190	A

Notes:

Bold values indicate roadway segments operating at LOS E or F

(a) Road classifications are based on ___________________

(b) Average Daily Traffic (ADT) volumes for the roadway segments were determined from SANDAG Modeling

(c) The v/c Ratio is calculated by dividing the ADT volume by each respective roadway segment's capacity

Table 7-3 Future Year Volume-Based Roadway Segment Analysis Summary (continued)

ROADWAY SEGMENT	ROADWAY CLASSIFICATION (a)	LOS E CAPACITY	Existing			Future Alt A Regents Bridge 6-lane Genesee			Future Alt B Regents Bridge 4-lane Genesee			Future Alt C No Bridge 6-lane Genesee			Future Alt D No Bridge 4-lane Genesee		
			ADT (b)	V/C RATIO (c)	LOS	ADT (b)	V/C RATIO (c)	LOS	ADT (b)	V/C RATIO (c)	LOS	ADT (b)	V/C RATIO (c)	LOS	ADT (b)	V/C RATIO (c)	LOS
Governor Drive																	
Regents Road to Genesee Ave	4 Lane Major Arterial	40,000	16,796	0.420	B	11,400	0.285	A	10,700	0.268	A	23,200	0.580	C	23,000	0.575	C
Genesee Ave to I-805 SB Ramps	4 Lane Major Arterial	40,000	19,737	0.493	B	24,000	0.600	C	23,300	0.583	C	23,900	0.598	C	23,300	0.583	C
I-805 SB Ramps to I-805 NB Ramps	4 Lane Major Arterial	40,000	10,417	0.260	A	9,900	0.248	A	10,600	0.265	A	10,000	0.250	A	10,700	0.268	A
Judicial Drive																	
Eastgate Mall to La Jolla Village Dr	4 Lane Major Arterial	40,000	4,828	0.121	A	10,600	0.265	A	10,400	0.260	A	9,900	0.248	A	9,700	0.243	A
La Jolla Village Dr to Nobel Drive	4 Lane Major Arterial	40,000	6,574	0.164	A	9,300	0.233	A	9,300	0.233	A	9,500	0.238	A	9,400	0.235	A
La Jolla Scenic Drive																	
La Jolla Village Drive to South	4 Lane Major Arterial	40,000	7,928	0.198	A	12,900	0.323	A	12,900	0.323	A	14,100	0.353	A	14,100	0.353	A
La Jolla Village Drive																	
Revelle College Drive to Villa La Jolla	6 Lane Prime Arterial	60,000	44,520	0.742	C	54,300	0.905	D	54,100	0.902	D	55,100	0.918	E	55,000	0.917	E
Villa La Jolla Drive to I-5 SB Ramps	6 Lane Prime Arterial	60,000	62,258	1.038	F	76,400	1.273	F	76,400	1.273	F	76,600	1.277	F	76,800	1.280	F
I-5 SB Ramps to I-5 NB Ramps	6 Lane Major Arterial	50,000	51,391	1.028	F	59,400	1.188	F	60,100	1.202	F	61,200	1.224	F	60,900	1.218	F
I-5 NB Ramps to Lebon Dr	6 Lane Major Arterial	50,000	44,335	0.887	D	52,000	1.040	F	52,500	1.050	F	53,200	1.064	F	53,200	1.064	F
Lebon Dr to Regents Road	6 Lane Major Arterial	50,000	42,863	0.857	D	49,900	0.998	E	50,100	1.002	F	51,500	1.030	F	51,500	1.030	F
Regents Road to Genesee Ave	6 Lane Major Arterial	50,000	38,474	0.769	C	52,400	1.048	F	52,400	1.048	F	50,500	1.010	F	50,700	1.014	F
Genesee Ave to Executive Way	6 Lane Major Arterial	50,000	45,117	0.902	E	49,400	0.988	E	49,600	0.992	E	48,900	0.978	E	49,200	0.984	E
Executive Way to Towne Center Dr	6 Lane Major Arterial	50,000	45,117	0.902	E	67,600	1.352	F	68,700	1.374	F	69,300	1.386	F	69,500	1.390	F
Towne Center Dr to I-805 SB Ramps	8 Lane Prime Arterial	80,000	58,833	0.735	C	67,600	0.845	C	68,700	0.859	C	69,300	0.866	C	69,500	0.869	C
Lebon Drive																	
Palmilla Drive to Nobel Drive	4 Lane Major Arterial	40,000	11,192	0.280	A	16,100	0.403	B	16,000	0.400	B	12,300	0.308	A	12,400	0.310	A
Nobel Drive to La Jolla Village Drive	5 Lane Major Arterial	45,000	9,212	0.205	A	13,600	0.302	A	13,600	0.302	A	11,300	0.251	A	11,800	0.262	A
Miramar Road																	
I-805 SB Ramps to I-805 NB Ramps	6 Lane Prime Arterial	60,000	66,139	1.102	F	64,600	1.077	F	65,700	1.095	F	65,400	1.090	F	66,000	1.100	F
I-805 NB Ramps to Nobel Dr	8 Lane Prime Arterial	80,000	47,991	0.600	B	51,400	0.643	C	50,400	0.630	C	49,600	0.620	B	50,300	0.629	C
Nobel Dr to Eastgate Mall	8 Lane Prime Arterial	80,000	64,557	0.807	C	69,000	0.863	C	69,000	0.863	C	69,000	0.863	C	69,100	0.864	C
Eastgate Mall to Miramar Mall	6 Lane Prime Arterial	60,000	67,748	1.129	F												
	7 Lane Prime Arterial	70,000				72,200	1.031	F	72,300	1.033	F	72,200	1.031	F	72,200	1.031	F
Miramar Mall to Camino Santa Fe	6 Lane Prime Arterial	60,000	67,748	1.129	F	72,200	1.203	F	72,300	1.205	F	72,200	1.203	F	72,200	1.203	F

Notes:

Bold values indicate roadway segments operating at LOS E or F.

(a) Road classifications are based on ________________

(b) Average Daily Traffic (ADT) volumes for the roadway segments were determined from SANDAG Modeling

(c) The v/c Ratio is calculated by dividing the ADT volume by each respective roadway segment's capacity

Mike Inerowicz

From: Calandra, Mike <Mike.Calandra@sandag.org>
Sent: Tuesday, November 15, 2016 7:40 AM
To: 'Mike Inerowicz'
Cc: 'Justin Schlaefli'; andy@urbansystems.net
Subject: RE: Meeting with regards to North UC project for Biomed - Urban Systems
Attachments: slkpl.pdf

Flag Status: Flagged

Hi Mike,

We are indeed all set with your request…please find a select zone assignment plot attached…

Anticipating subsequent VMT questions, tracing all ADT distributed through the network, the total VMT associated with the project is 11,710. Here is an attempt to put the VMT in context:

11,710 / 1,600 = 7.31 VMT per Person Trip Generated
11,710 / 1,330 = 8.81 VMT per Vehicle Trip Generated
11,710 / 1,244 = 9.41 VMT per Vehicle Trip Assigned
11,710 / 165 = 70.97 VMT per Thousand Square Feet of Industrial Park

165,000 / 1,200* = 138 Employees (* - Employment density data derived for Series 13 includes 1,200 square feet per employee of Industrial Park)
11,710 / 138 = 84.85 VMT per Employee

Mike Calandra
Senior Transportation Modeler

SANDAG
(619) 699-6929
401 B Street, Suite 800, San Diego, CA 92101

SANDAG

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From: Mike Inerowicz [mailto:mike@urbansystems.net]
Sent: Thursday, November 10, 2016 2:35 PM
To: Calandra, Mike <Mike.Calandra@sandag.org>
Cc: 'Justin Schlaefli' <Justin@urbansystems.net>; andy@urbansystems.net
Subject: RE: Meeting with regards to North UC project for Biomed - Urban Systems

Thank You Mr. Mike,

All looks good.

Mike Inerowicz
Junior Civil Engineer - Project Manager
Urban Systems Associates, Inc.
8451 Miralani Drive -Suite A
San Diego, CA 92126
858-649-1161 (direct)
619-471-7151 (cell)
858-560-4911 x104 (office)

From: Calandra, Mike [mailto:Mike.Calandra@sandag.org]
Sent: Thursday, November 10, 2016 2:00 PM
To: 'Mike Inerowicz'
Cc: 'Justin Schlaefli'; andy@urbansystems.net
Subject: RE: Meeting with regards to North UC project for Biomed - Urban Systems

Hi Mike,

Take 2 with the network. Note that I did not delete the old ZC but added in the one you wanted. Since this is a cul-de-sac, there will be zero volume assigned to the link north of your project loading.

The other file, subtgmx.pr, reflects the land use changes noted below. As is, this should be ready to go on Monday. Otherwise, please let me know of any other changes and we will get it run Monday night…

Mike Calandra
Senior Transportation Modeler

SANDAG
(619) 699-6929
401 B Street, Suite 800, San Diego, CA 92101

SANDAG

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From: Mike Inerowicz [mailto:mike@urbansystems.net]
Sent: Thursday, November 10, 2016 12:39 PM
To: Calandra, Mike <Mike.Calandra@sandag.org>
Cc: 'Justin Schlaefli' <Justin@urbansystems.net>; andy@urbansystems.net
Subject: RE: Meeting with regards to North UC project for Biomed - Urban Systems

Good Afternoon Mr. Mike,

Thank you for your email. With regards to the 2035 network the plot looks good with respect to TAZ 2095 and 4683. For adjacent TAZ 2083 could you please relocate the North-West connector so it runs East (see Figures 1). There is a substantial development located along Towne Center Dr. with driveway access limited to Towne

Center Dr. (Figure 2). Please correct me if I am wrong but the way that connector is coded now very few trips will be put on it and most of the trips from that zone (2083) will be placed directly onto Eastgate Mall or Genesee Ave not accounting for the above mentioned development.

With regards to trip generation in TAZ 4683 to keep the project isolated please delete A) Industrial (178 employees/802 trips) and transfer B) Office (611 employees/ 4603 trips) to TAZ 2095. As you mentioned TAZ 4683 will get 165 KSF of scientific research at a rate of 8 trips/KSF.

Kind Regards,

Mike Inerowicz

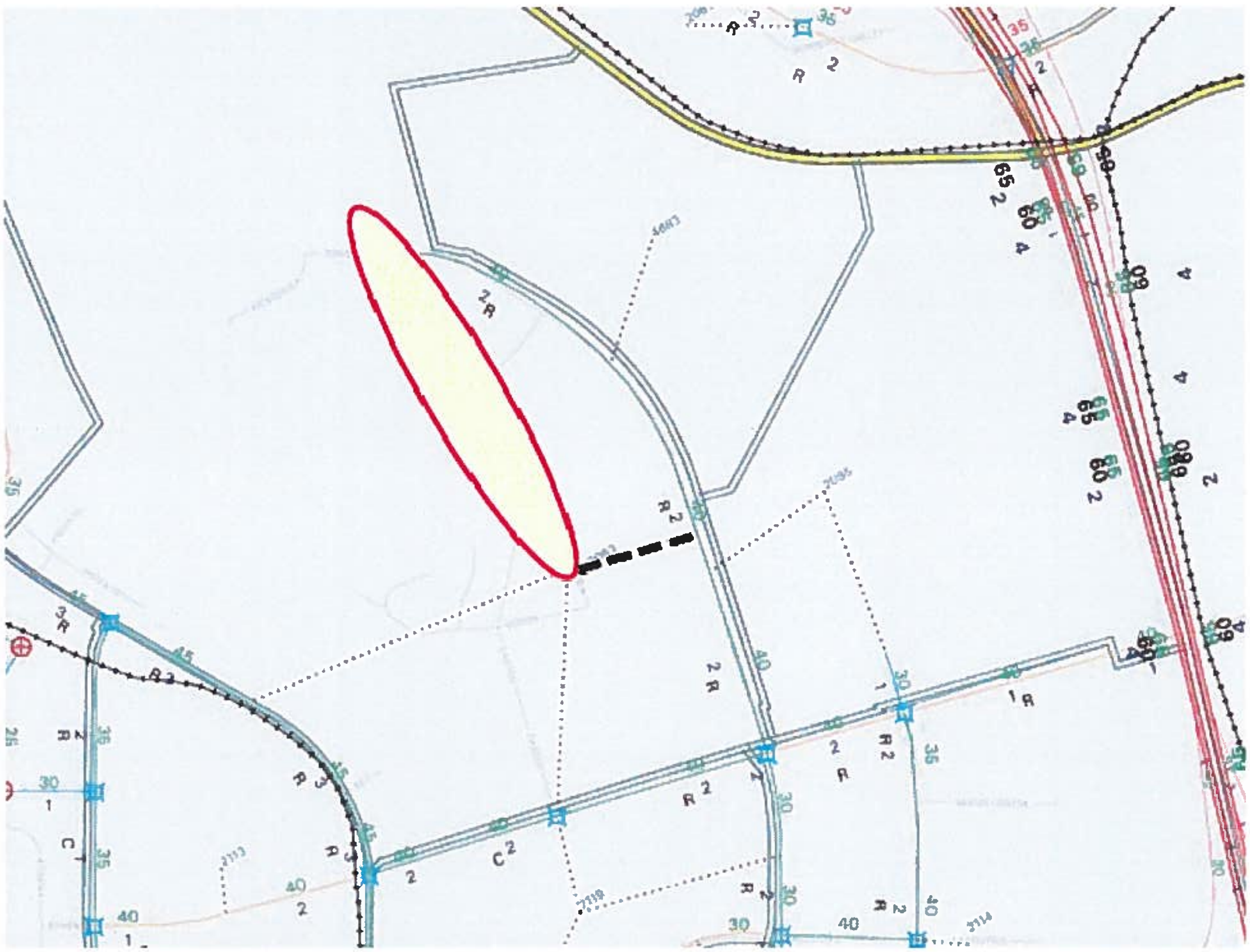

Figure 1. TAZ 2083 connectors & connector relocation

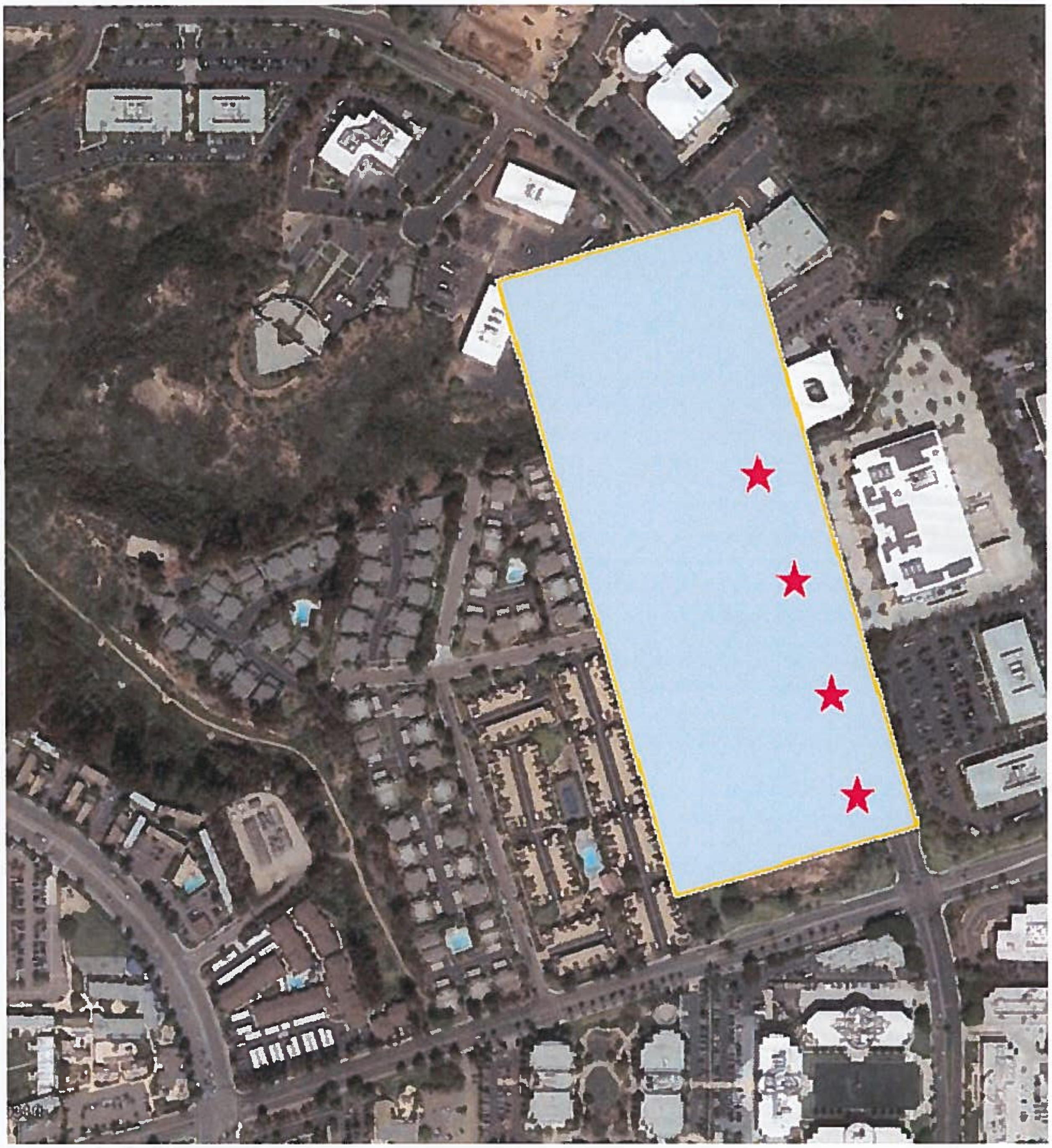
Figure 2. Development in TAZ 2083

Mike Inerowicz
Junior Civil Engineer - Project Manager
Urban Systems Associates, Inc.
8451 Miralani Drive -Suite A
San Diego, CA 92126
858-649-1161 (direct)
619-471-7151 (cell)
858-560-4911 x104 (office)

From: Calandra, Mike [mailto:Mike.Calandra@sandag.org]
Sent: Thursday, November 10, 2016 7:33 AM

To: 'Mike Inerowicz'
Cc: 'Justin Schlaefli'; andy@urbansystems.net
Subject: RE: Meeting with regards to North UC project for Biomed - Urban Systems

Gents,

TAZ 2095 has been split, and the 2008 base year run with the new zone system.

Attached is a 2035 network plot, please review and let me know if anything here needs to change..?

Also attached is a trip generation report for TAZs 2095 and 4683 from the Regional model (prior to your custom inputs). Since trip generation in the UTC community is employee-based, I am going to need a little assistance in getting this correct for your needs. That is, we will put 165 KSF of industrial (scientific center) into TAZ 4683. To keep your project isolated in that TAZ, I need to know how many of the **A)** Industrial (178 employees) and **B)** Office (611 employees) to either **1)** move to TAZ 2095 or **2)** delete in lieu of the 165 KSF…

Clear as mud? Let me know if so and we can have a quick phone call…

For reference, here is an aerial view of TAZ 4683:

Mike Calandra
Senior Transportation Modeler

SANDAG
(619) 699-6929
401 B Street, Suite 800, San Diego, CA 92101

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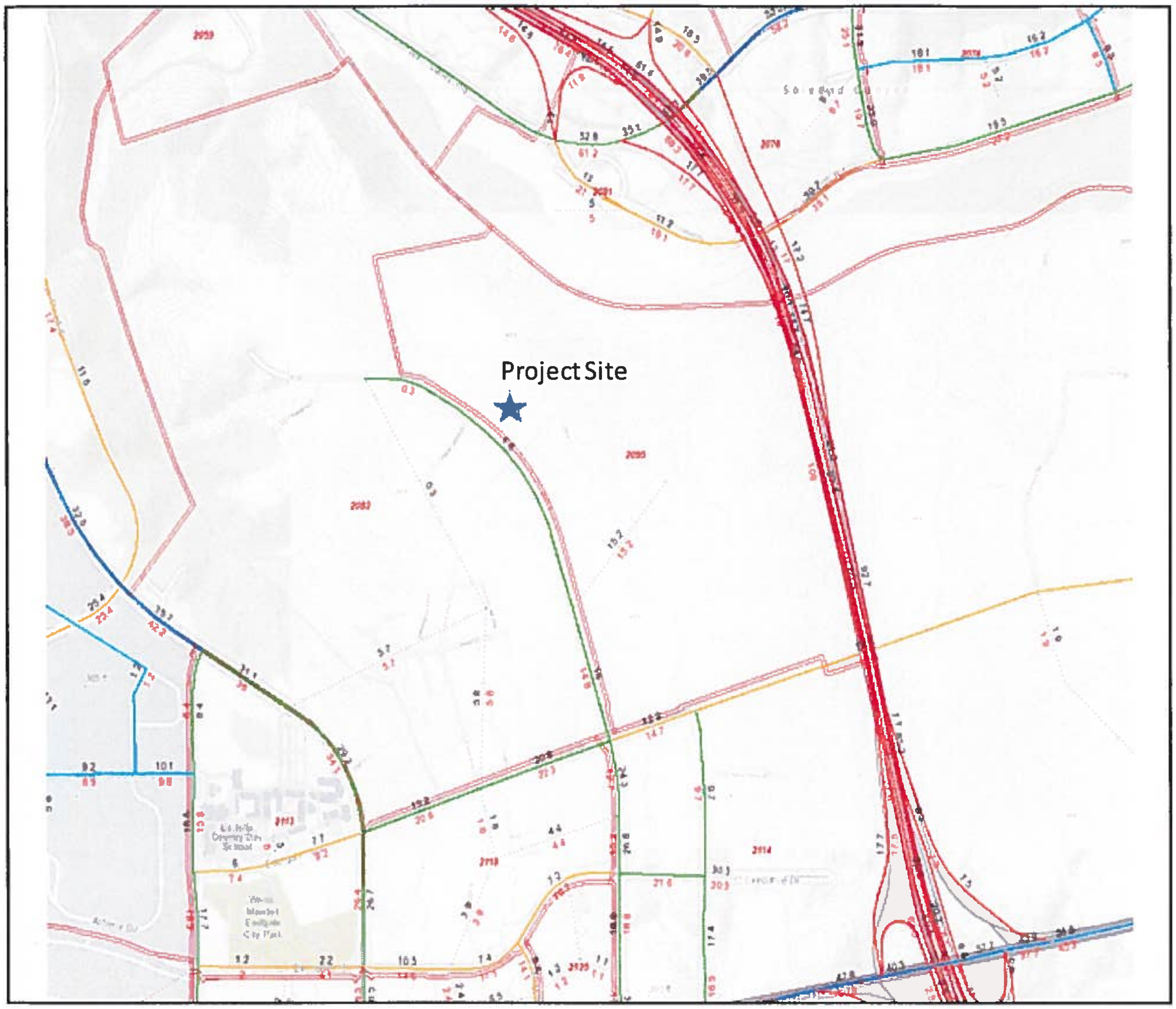
From: Mike Inerowicz [mailto:mike@urbansystems.net]
Sent: Monday, November 07, 2016 4:19 PM
To: Calandra, Mike <Mike.Calandra@sandag.org>
Cc: 'Justin Schlaefli' <Justin@urbansystems.net>; andy@urbansystems.net
Subject: RE: Meeting with regards to North UC project for Biomed - Urban Systems

Good Afternoon Mike,

We would like to proceed with the North UC project we discussed on November 1st. City Staff has decided to go with Series 12 forecast, so we will be going with the 2035 Series 12 Select Zone Forecast. The address of existing 100,000 SF of development is 9775 Towne Centre Drive. Existing development will be demolished and replaced with 165,000 SF of scientific research, so we will be taking credit for the 100,000 SF of existing development and introducing 65,000 SF. The rate for the development will be 8/KSF (please use this rate in the model). In addition we would like to do a sub zone for the development. With the Series 12 this is not a concern, as all trips from zone 2095 are loaded through a single connector onto Town Centre Drive, but please ensures this is the case as we do not want to have a connector to Eastgate Mall.

Thank You,


Project Site

SANDAG

Final 2050 Regional Transportation Plan

San Diego Regional Traffic Forecast Information Center
Trip Generation and Land Use by Zone - Year: 2035
Traffic Analysis Zone: 2,095

Land Use Code	Description	Type	Amount	Person Trips	Vehicle Trips
2101	INDUSTRIAL PARK	acre	17.8	2,443	2,008
4112	RIGHT-OF-WAY	acre	7.2	0	0
6002	LOW RISE OFFICE	acre	61.1	18,430	14,237
9101	INACTIVE USE	acre	63.2	10	9
	TOTAL			20,883	16,254
	LOADED VEHICLE TRIPS				15,230

Mike Inerowicz
Junior Civil Engineer - Project Manager
Urban Systems Associates, Inc.

8451 Miralani Drive -Suite A
San Diego, CA 92126
858-649-1161 (direct)
619-471-7151 (cell)
858-560-4911 x104 (office)

From: Mike Inerowicz [mailto:mike@urbansystems.net]
Sent: Wednesday, October 26, 2016 2:01 PM
To: 'Calandra, Mike'
Cc: 'Justin Schlaefli'; 'andy@urbansystems.net'
Subject: RE: Meeting with regards to North UC project for Biomed - Urban Systems

Good Afternoon Mr. Calandra,

Would 11:00AM on Tuesday (November 1st) work for you?

Thank you,

Mike Inerowicz
Junior Civil Engineer - Project Manager
Urban Systems Associates, Inc.
8451 Miralani Drive -Suite A
San Diego, CA 92126
858-649-1161 (direct)
619-471-7151 (cell)
858-560-4911 x104 (office)

From: Calandra, Mike [mailto:Mike.Calandra@sandag.org]
Sent: Wednesday, October 26, 2016 1:47 PM
To: 'Mike Inerowicz'
Cc: 'Justin Schlaefli'; andy@urbansystems.net
Subject: RE: Meeting with regards to North UC project for Biomed - Urban Systems

Hi Mike,

No worries. Wednesday the 2nd looks like it is already shot for me.

Tuesday the 1st looks pretty good though. Again, the AM would be best..let me know what time in the morning on Tuesday November 1st works for you..?

Mike Calandra
Senior Transportation Modeler

SANDAG
(619) 699-6929
401 B Street, Suite 800, San Diego, CA 92101

SANDAG

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From: Mike Inerowicz [mailto:mike@urbansystems.net]
Sent: Wednesday, October 26, 2016 1:43 PM
To: Calandra, Mike <Mike.Calandra@sandag.org>
Cc: 'Justin Schlaefli' <Justin@urbansystems.net>; andy@urbansystems.net
Subject: RE: Meeting with regards to North UC project for Biomed - Urban Systems

Mr. Calandra,

Thank you for a quick response. The end of this week is booked full for us, would it be possible to schedule the meeting early next week Tuesday (Nov 1st) or Wednesday (Nov 2nd).

Kind Regards,

Mike Inerowicz
Junior Civil Engineer - Project Manager
Urban Systems Associates, Inc.
8451 Miralani Drive -Suite A
San Diego, CA 92126
858-649-1161 (direct)
619-471-7151 (cell)
858-560-4911 x104 (office)

From: Calandra, Mike [mailto:Mike.Calandra@sandag.org]
Sent: Wednesday, October 26, 2016 1:34 PM
To: 'Mike Inerowicz'
Cc: 'Justin Schlaefli'; andy@urbansystems.net
Subject: RE: Meeting with regards to North UC project for Biomed - Urban Systems

Hi Mike,

With the exception of 9-10am Friday the 28th, my calendar is otherwise free in the AM for this Thursday and/or Friday…

This Thursday afternoon is booked, and Friday it would have to be early in the afternoon…

Mike Calandra
Senior Transportation Modeler

SANDAG
(619) 699-6929
401 B Street, Suite 800, San Diego, CA 92101

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From: Mike Inerowicz [mailto:mike@urbansystems.net]
Sent: Wednesday, October 26, 2016 1:08 PM
To: Calandra, Mike <Mike.Calandra@sandag.org>

Cc: 'Justin Schlaefli' <Justin@urbansystems.net>; andy@urbansystems.net
Subject: Meeting with regards to North UC project for Biomed - Urban Systems

Good Afternoon Mr. Calandra,

Urban Systems would like to set up a meeting with you early next week with regards to North UC project for Biomed. Could you please let us know if this would be possible and provide your availability.

Thank You,

Mike Inerowicz
Junior Civil Engineer - Project Manager
Urban Systems Associates, Inc.
8451 Miralani Drive -Suite A
San Diego, CA 92126
858-649-1161 (direct)
619-471-7151 (cell)
858-560-4911 x104 (office)

Appendix C

Existing Traffic Counts / Signal Timing Sheets

Table 7-2 Existing Conditions Summary of Roadway Segment ADT Based Analysis

ROADWAY SEGMENT	ROADWAY CLASSIFICATION (a)	LOS E CAPACITY	ADT (b)	V/C RATIO (c)	LOS
Eastgate Mall					
Regents Rd to Genesee Ave	2 Lane Collector (continuous left-turn lane)	15,000	6,187	0.412	B
Genesee Ave to Easter Way	4 Lane Collector	30,000	14,767	0.492	C
Easter Way to Judicial Dr	4 Lane Major Arterial	40,000	11,115	0.278	A
Judicial Dr to Eastgate Dr (Freeway Overpass)	2 Lane Collector (no fronting property)	10,000	10,096	1.010	**F**
Eastgate Dr to Miramar Rd	2 Lane Collector (continuous left-turn lane)	15,000	14,668	0.978	**E**
Executive Drive					
Regents Rd to Genesee Ave	4 Lane Collector (no center lane)	15,000	4,397	0.293	A
Genesee Ave to Judicial Dr	4 Lane Collector	30,000	5,914	0.197	A
Executive Way					
Executive Dr to La Jolla Village Dr	4 Lane Collector	30,000	5,923	0.197	A
Genesee Avenue					
N. Torrey Pines Rd to I-5 SB Ramps	6 Lane Prime Arterial	60,000	35,124	0.585	C
I-5 SB Ramps to I-5 NB Ramps	4 Lane Major Arterial	40,000	49,051	1.226	**F**
I-5 NB Ramps to Regents Rd	6 Lane Prime Arterial	60,000	48,542	0.809	C
Regents Rd to La Jolla Village Dr	6 Lane Prime Arterial	60,000	29,457	0.491	B
La Jolla Village Dr to Esplande Ct	4 Lane Major Arterial	40,000	28,054	0.701	C
Esplande Ct to Nobel Dr	6 Lane Major Arterial	50,000	23,744	0.475	B
Nobel Dr to Centurion Square	4 Lane Major Arterial	40,000	30,922	0.773	D
Centurion Square to SR-52 WB Ramps	4 Lane Major Arterial	40,000	30,325	0.758	D
SR-52 WB Ramps to SR-52 EB Ramps	4 Lane Major Arterial	40,000	31,170	0.779	D
SR-52 EB Ramps to Lehrer Dr	4 Lane Major Arterial	40,000	30,581	0.765	D
Gilman Drive					
UCSD Campus to La Jolla Village Dr	4 Lane Collector	30,000	10,069	0.336	B
La Jolla Village Dr to Via Alicante	4 Lane Collector	30,000	15,095	0.503	C
Via Alicante to I-5 SB Ramps	4 Lane Major Arterial	40,000	17,138	0.428	B
I-5 SB Ramps to I-5 NB Ramps	4 Lane Major Arterial	40,000	11,873	0.297	A
Golden Haven Drive					
Towne Centre Dr to Judicial Dr	4 Lane Major Arterial	40,000	6,712	0.168	A

Notes:
Bold values indicate roadway segments operating at LOS E or F.
(a) Existing road classifications are based on field work conducted May 13, 2015.
(b) Average Daily Traffic (ADT) volumes for the roadway segments were provided by Accurate Video Counts Inc and measured in April and May 2015.
(c) The v/c Ratio is calculated by dividing the ADT volume by each respective roadway segment's capacity.

THURSDAY - NOVEMBER 17TH, 2016 CITY: UTC PROJECT: PTD16-1118-03

TOWNE CENTRE N-O EASTGATE MALL

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	4		8					12:00	98		140				
00:15	4		6					12:15	83		92				
00:30	3		3					12:30	100		77				
00:45	1	12	3	20			32	12:45	135	416	79	388			804
01:00	5		6					13:00	98		78				
01:15	2		3					13:15	98		49				
01:30	1		3					13:30	75		55				
01:45	1	9	2	14			23	13:45	79	350	72	254			604
02:00	3		4					14:00	44		84				
02:15	2		2					14:15	39		78				
02:30	2		2					14:30	37		102				
02:45	3	10	2	10			20	14:45	44	164	99	363			527
03:00	1		5					15:00	50		106				
03:15	2		2					15:15	33		106				
03:30	4		3					15:30	31		162				
03:45	0	7	1	11			18	15:45	22	136	136	510			646
04:00	5		1					16:00	15		177				
04:15	5		6					16:15	19		141				
04:30	9		2					16:30	22		215				
04:45	26	45	4	13			58	16:45	19	75	188	721			796
05:00	30		6					17:00	16		262				
05:15	47		13					17:15	18		199				
05:30	55		10					17:30	15		184				
05:45	96	228	6	35			263	17:45	16	65	159	804			869
06:00	89		10					18:00	15		117				
06:15	108		9					18:15	13		102				
06:30	168		14					18:30	25		93				
06:45	169	534	19	52			586	18:45	22	75	66	378			453
07:00	184		20					19:00	7		64				
07:15	151		19					19:15	11		32				
07:30	188		22					19:30	8		31				
07:45	195	718	28	89			807	19:45	2	28	21	148			176
08:00	188		19					20:00	4		29				
08:15	155		22					20:15	8		14				
08:30	162		23					20:30	11		13				
08:45	177	682	20	84			766	20:45	6	29	18	74			103
09:00	188		29					21:00	5		12				
09:15	136		28					21:15	4		8				
09:30	106		35					21:30	4		6				
09:45	103	533	31	123			656	21:45	5	18	4	30			48
10:00	80		37					22:00	5		6				
10:15	72		30					22:15	7		8				
10:30	61		42					22:30	2		8				
10:45	57	270	45	154			424	22:45	2	16	5	27			43
11:00	66		44					23:00	6		5				
11:15	70		35					23:15	4		8				
11:30	88		65					23:30	5		8				
11:45	95	319	88	232			551	23:45	8	23	5	26			49
Total Vol.		3367		837			**4204**			1395		3723			**5118**

Daily Totals

NB	SB	EB	WB	**Combined**
4762	4560			**9322**

	AM			PM		
Split %	80.1%	19.9%	**45.1%**	27.3%	72.7%	**54.9%**
Peak Hour	07:30	11:45	**07:30**	12:30	16:30	**16:30**
Volume	726	397	**817**	431	864	**939**
P.H.F.	0.93	0.71	**0.92**	0.80	0.82	**0.84**

THURSDAY - NOVEMBER 17TH, 2016 CITY: UTC PROJECT: PTD16-1118-03

EASTGATE MALL BTN TOWNE CENTRE & JUDICIAL

AM Period	NB		SB		EB		WB			PM Period	NB		SB		EB		WB		
00:00					9		3			12:00					112		130		
00:15					4		3			12:15					99		123		
00:30					8		4			12:30					106		106		
00:45					6	27	3	13	40	12:45					123	440	124	483	923
01:00					7		6			13:00					90		113		
01:15					5		5			13:15					101		116		
01:30					10		4			13:30					84		111		
01:45					6	28	5	20	48	13:45					85	360	88	428	788
02:00					4		8			14:00					113		107		
02:15					5		5			14:15					95		97		
02:30					3		6			14:30					115		90		
02:45					2	14	5	24	38	14:45					91	414	110	404	818
03:00					10		8			15:00					132		95		
03:15					3		3			15:15					97		83		
03:30					11		5			15:30					131		101		
03:45					5	29	1	17	46	15:45					173	533	103	382	915
04:00					4		6			16:00					168		105		
04:15					5		5			16:15					166		88		
04:30					6		10			16:30					219		111		
04:45					14	29	12	33	62	16:45					218	771	91	395	1166
05:00					14		12			17:00					252		121		
05:15					16		27			17:15					244		105		
05:30					29		41			17:30					235		88		
05:45					33	92	51	131	223	17:45					166	897	94	408	1305
06:00					46		63			18:00					173		123		
06:15					46		60			18:15					134		97		
06:30					42		106			18:30					120		89		
06:45					64	198	95	324	522	18:45					89	516	63	372	888
07:00					90		128			19:00					58		47		
07:15					80		195			19:15					63		43		
07:30					115		166			19:30					43		30		
07:45					103	388	215	704	1092	19:45					34	198	39	159	357
08:00					88		205			20:00					47		20		
08:15					81		184			20:15					25		13		
08:30					94		190			20:30					26		22		
08:45					87	350	184	763	1113	20:45					33	131	19	74	205
09:00					108		226			21:00					24		23		
09:15					104		155			21:15					42		12		
09:30					78		130			21:30					41		34		
09:45					80	370	122	633	1003	21:45					23	130	7	76	206
10:00					76		88			22:00					22		16		
10:15					79		113			22:15					25		15		
10:30					76		80			22:30					20		10		
10:45					71	302	80	361	663	22:45					14	81	7	48	129
11:00					91		66			23:00					16		12		
11:15					75		87			23:15					15		8		
11:30					92		147			23:30					19		9		
11:45					104	362	133	433	795	23:45					10	60	8	37	97
Total Vol.						2189		3456	**5645**							4531		3266	**7797**

Daily Totals

NB	SB	EB	WB	Combined
		6720	6722	**13442**

	AM			PM		
Split %	38.8%	61.2%	**42.0%**	58.1%	41.9%	**58.0%**
Peak Hour	11:45	07:45	**07:15**	16:45	12:00	**16:30**
Volume	421	794	**1167**	949	483	**1361**
P.H.F.	0.94	0.92	**0.92**	0.94	0.93	**0.91**

THURSDAY - NOVEMBER 17TH, 2016 CITY: UTC PROJECT: PTD16-1118-03

EASTGATE MALL E-O JUDICIAL

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			6		6			12:00			103		80		
00:15			5		3			12:15			94		79		
00:30			5		5			12:30			90		89		
00:45			6	22	0	14	36	12:45			120	407	82	330	737
01:00			3		5			13:00			78		84		
01:15			4		5			13:15			80		86		
01:30			11		2			13:30			77		77		
01:45			1	19	5	17	36	13:45			89	324	70	317	641
02:00			3		5			14:00			89		62		
02:15			4		3			14:15			91		44		
02:30			2		5			14:30			148		65		
02:45			0	9	4	17	26	14:45			91	419	67	238	657
03:00			9		5			15:00			161		67		
03:15			2		1			15:15			146		60		
03:30			8		7			15:30			158		71		
03:45			8	27	2	15	42	15:45			167	632	65	263	895
04:00			6		6			16:00			193		74		
04:15			7		8			16:15			199		64		
04:30			3		7			16:30			221		73		
04:45			10	26	12	33	59	16:45			211	824	79	290	1114
05:00			16		10			17:00			245		93		
05:15			12		22			17:15			229		74		
05:30			22		36			17:30			207		84		
05:45			20	70	40	108	178	17:45			184	865	77	328	1193
06:00			28		58			18:00			206		65		
06:15			28		64			18:15			148		72		
06:30			39		87			18:30			99		45		
06:45			38	133	93	302	435	18:45			86	539	45	227	766
07:00			46		114			19:00			58		27		
07:15			51		184			19:15			44		30		
07:30			66		179			19:30			39		21		
07:45			69	232	198	675	907	19:45			33	174	24	102	276
08:00			74		217			20:00			31		12		
08:15			79		199			20:15			25		9		
08:30			73		201			20:30			20		13		
08:45			80	306	161	778	1084	20:45			18	94	10	44	138
09:00			82		155			21:00			15		13		
09:15			84		141			21:15			26		8		
09:30			78		98			21:30			29		24		
09:45			60	304	86	480	784	21:45			15	85	10	55	140
10:00			65		61			22:00			16		10		
10:15			68		73			22:15			23		9		
10:30			73		64			22:30			17		7		
10:45			67	273	54	252	525	22:45			8	64	5	31	95
11:00			68		57			23:00			12		8		
11:15			64		64			23:15			8		9		
11:30			94		95			23:30			9		9		
11:45			120	346	99	315	661	23:45			10	39	5	31	70
Total Vol.				1767		3006	**4773**					4466		2256	**6722**

Daily Totals

NB	SB	EB	WB	Combined
		6233	5262	**11495**

	AM			PM		
Split %	37.0%	63.0%	**41.5%**	66.4%	33.6%	**58.5%**
Peak Hour	11:30	07:45	**07:45**	16:30	12:30	**16:30**
Volume	411	815	**1110**	906	341	**1225**
P.H.F.	0.86	0.94	**0.95**	0.92	0.96	**0.91**

THURSDAY - NOVEMBER 17TH, 2016 CITY: UTC PROJECT: PTD16-1118-03

TOWNE CENTRE BTN EASTGATE MALL & EXECUTIVE DR

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	6		13					12:00	107		142				
00:15	4		11					12:15	104		118				
00:30	4		4					12:30	132		102				
00:45	4	18	5	33			51	12:45	137	480	108	470			950
01:00	2		6					13:00	117		122				
01:15	2		7					13:15	105		90				
01:30	4		7					13:30	109		80				
01:45	4	12	3	23			35	13:45	101	432	90	382			814
02:00	1		3					14:00	69		117				
02:15	1		7					14:15	76		99				
02:30	4		6					14:30	71		126				
02:45	1	7	5	21			28	14:45	63	279	114	456			735
03:00	4		4					15:00	73		142				
03:15	3		1					15:15	60		138				
03:30	8		2					15:30	54		179				
03:45	7	22	4	11			33	15:45	64	251	173	632			883
04:00	3		1					16:00	44		184				
04:15	12		6					16:15	59		157				
04:30	24		3					16:30	67		199				
04:45	36	75	9	19			94	16:45	69	239	179	719			958
05:00	34		9					17:00	65		198				
05:15	64		10					17:15	66		168				
05:30	77		10					17:30	71		188				
05:45	113	288	13	42			330	17:45	64	266	161	715			981
06:00	106		20					18:00	66		177				
06:15	110		8					18:15	49		153				
06:30	144		21					18:30	52		113				
06:45	153	513	30	79			592	18:45	55	222	91	534			756
07:00	158		36					19:00	22		98				
07:15	150		40					19:15	24		53				
07:30	211		64					19:30	23		58				
07:45	221	740	58	198			938	19:45	17	86	39	248			334
08:00	205		53					20:00	15		37				
08:15	198		47					20:15	19		28				
08:30	174		68					20:30	20		19				
08:45	245	822	64	232			1054	20:45	19	73	22	106			179
09:00	199		68					21:00	18		27				
09:15	154		51					21:15	14		20				
09:30	107		53					21:30	19		24				
09:45	103	563	58	230			793	21:45	14	65	16	87			152
10:00	87		54					22:00	14		17				
10:15	87		55					22:15	9		16				
10:30	85		55					22:30	13		15				
10:45	89	348	51	215			563	22:45	5	41	7	55			96
11:00	88		88					23:00	6		8				
11:15	83		112					23:15	9		9				
11:30	90		138					23:30	5		10				
11:45	99	360	131	469			829	23:45	7	27	5	32			59
Total Vol.		3768		1572			**5340**			2461		4436			**6897**

Daily Totals

NB	SB	EB	WB	Combined
6229	6008			**12237**

	AM			PM		
Split %	70.6%	29.4%	**43.6%**	35.7%	64.3%	**56.4%**
Peak Hour	07:30	11:30	**08:15**	12:30	16:30	**16:30**
Volume	835	529	**1063**	491	744	**1011**
P.H.F.	0.94	0.93	**0.86**	0.92	0.93	**0.95**

THURSDAY - NOVEMBER 17TH, 2016 | CITY: UTC | PROJECT: PTD16-1118-03

TOWNE CENTRE BTN EXECUTIVE & LA JOLLA VILLAGE

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	13		15					12:00	166		175				
00:15	5		7					12:15	193		187				
00:30	6		6					12:30	184		143				
00:45	6	30	5	33			63	12:45	191	734	183	688			1422
01:00	2		7					13:00	187		145				
01:15	5		4					13:15	193		155				
01:30	5		8					13:30	184		122				
01:45	7	19	8	27			46	13:45	181	745	164	586			1331
02:00	4		5					14:00	142		130				
02:15	7		6					14:15	103		144				
02:30	6		24					14:30	119		135				
02:45	7	24	12	47			71	14:45	118	482	132	541			1023
03:00	6		4					15:00	119		142				
03:15	5		6					15:15	99		151				
03:30	13		2					15:30	87		135				
03:45	11	35	3	15			50	15:45	72	377	142	570			947
04:00	8		1					16:00	61		165				
04:15	18		8					16:15	77		177				
04:30	47		1					16:30	66		212				
04:45	81	154	7	17			171	16:45	68	272	235	789			1061
05:00	58		12					17:00	70		218				
05:15	113		11					17:15	66		210				
05:30	143		12					17:30	98		188				
05:45	204	518	18	53			571	17:45	94	328	177	793			1121
06:00	204		22					18:00	96		151				
06:15	217		13					18:15	76		165				
06:30	241		34					18:30	104		141				
06:45	297	959	25	94			1053	18:45	82	358	135	592			950
07:00	280		43					19:00	51		141				
07:15	288		45					19:15	60		121				
07:30	319		63					19:30	55		79				
07:45	366	1253	69	220			1473	19:45	43	209	77	418			627
08:00	351		60					20:00	34		70				
08:15	305		53					20:15	44		49				
08:30	342		81					20:30	29		50				
08:45	384	1382	75	269			1651	20:45	36	143	19	188			331
09:00	363		78					21:00	33		51				
09:15	279		74					21:15	24		42				
09:30	246		88					21:30	33		35				
09:45	218	1106	63	303			1409	21:45	16	106	30	158			264
10:00	169		75					22:00	19		22				
10:15	157		66					22:15	19		15				
10:30	147		85					22:30	14		23				
10:45	174	647	101	327			974	22:45	14	66	13	73			139
11:00	118		162					23:00	12		15				
11:15	176		165					23:15	16		11				
11:30	146		177					23:30	11		9				
11:45	174	614	157	661			1275	23:45	9	48	12	47			95
Total Vol.		6741		2066			**8807**			3868		5443			**9311**

Daily Totals				
NB	SB	EB	WB	Combined
10609	7509			**18118**

	AM			PM		
Split %	76.5%	23.5%	**48.6%**	41.5%	58.5%	**51.4%**
Peak Hour	08:15	11:30	**08:15**	12:15	16:30	**12:00**
Volume	1394	696	**1681**	755	875	**1422**
P.H.F.	0.91	0.93	**0.92**	0.98	0.93	**0.94**

THURSDAY - NOVEMBER 17TH, 2016 CITY: UTC PROJECT: PTD16-1118-03

LA JOLLA VILLAGE BTN EXECUTIVE WAY & TOWNE CENTRE

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			70		77			12:00			344		325		
00:15			66		65			12:15			325		355		
00:30			70		70			12:30			362		342		
00:45			66	272	68	280	552	12:45			305	1336	362	1384	2720
01:00			56		51			13:00			295		355		
01:15			40		52			13:15			284		342		
01:30			55		65			13:30			325		315		
01:45			51	202	55	223	425	13:45			333	1237	328	1340	2577
02:00			68		32			14:00			319		319		
02:15			56		35			14:15			305		336		
02:30			44		44			14:30			342		328		
02:45			32	200	51	162	362	14:45			318	1284	316	1299	2583
03:00			44		62			15:00			333		344		
03:15			51		55			15:15			362		328		
03:30			70		65			15:30			352		352		
03:45			66	231	70	252	483	15:45			384	1431	384	1408	2839
04:00			65		90			16:00			435		384		
04:15			70		88			16:15			362		428		
04:30			88		111			16:30			418		462		
04:45			105	328	128	417	745	16:45			362	1577	444	1718	3295
05:00			111		123			17:00			342		452		
05:15			132		170			17:15			418		462		
05:30			162		188			17:30			352		518		
05:45			184	589	195	676	1265	17:45			333	1445	484	1916	3361
06:00			151		218			18:00			305		428		
06:15			161		205			18:15			342		452		
06:30			184		241			18:30			325		435		
06:45			216	712	223	887	1599	18:45			322	1294	404	1719	3013
07:00			195		251			19:00			305		352		
07:15			215		319			19:15			284		342		
07:30			312		362			19:30			262		333		
07:45			333	1055	412	1344	2399	19:45			215	1066	315	1342	2408
08:00			318		405			20:00			242		342		
08:15			306		410			20:15			210		262		
08:30			352		368			20:30			184		244		
08:45			366	1342	366	1549	2891	20:45			166	802	252	1100	1902
09:00			378		351			21:00			152		222		
09:15			389		344			21:15			140		170		
09:30			362		352			21:30			125		184		
09:45			377	1506	342	1389	2895	21:45			111	528	162	738	1266
10:00			352		333			22:00			88		151		
10:15			342		318			22:15			95		111		
10:30			358		305			22:30			98		95		
10:45			344	1396	326	1282	2678	22:45			70	351	70	427	778
11:00			318		335			23:00			65		65		
11:15			305		328			23:15			77		77		
11:30			333		342			23:30			54		84		
11:45			334	1290	344	1349	2639	23:45			66	262	95	321	583
Total Vol.				9123		9810	**18933**					12613		14712	**27325**

Daily Totals

NB	SB	EB	WB	Combined
		21736	24522	**46258**

	AM			PM		
Split %	48.2%	51.8%	**40.9%**	46.2%	53.8%	**59.1%**
Peak Hour	09:00	07:45	**08:30**	15:45	17:00	**17:00**
Volume	1506	1595	**2914**	1599	1916	**3361**
P.H.F.	0.97	0.97	**0.99**	0.92	0.92	**0.95**

THURSDAY - NOVEMBER 17TH, 2016 | CITY: UTC | PROJECT: PTD16-1118-03

LA JOLLA VILLAGE E-O TOWNE CENTRE

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			84		77			12:00			555		367		
00:15			77		65			12:15			518		384		
00:30			60		70			12:30			503		333		
00:45			68	289	66	278	567	12:45			518	2094	342	1426	3520
01:00			56		60			13:00			449		352		
01:15			44		55			13:15			495		326		
01:30			35		68			13:30			484		345		
01:45			40	175	54	237	412	13:45			518	1946	366	1389	3335
02:00			51		70			14:00			555		305		
02:15			44		66			14:15			528		345		
02:30			65		65			14:30			519		333		
02:45			51	211	70	271	482	14:45			495	2097	342	1325	3422
03:00			44		90			15:00			528		362		
03:15			35		88			15:15			518		395		
03:30			40		128			15:30			555		388		
03:45			51	170	116	422	592	15:45			618	2219	405	1550	3769
04:00			66		142			16:00			628		442		
04:15			65		135			16:15			566		519		
04:30			90		162			16:30			528		535		
04:45			88	309	191	630	939	16:45			588	2310	528	2024	4334
05:00			125		184			17:00			635		488		
05:15			111		202			17:15			642		526		
05:30			135		277			17:30			566		584		
05:45			142	513	262	925	1438	17:45			484	2327	566	2164	4491
06:00			150		318			18:00			505		528		
06:15			161		328			18:15			519		535		
06:30			184		444			18:30			456		484		
06:45			215	710	489	1579	2289	18:45			455	1935	435	1982	3917
07:00			216		512			19:00			435		428		
07:15			284		555			19:15			452		405		
07:30			352		628			19:30			428		395		
07:45			362	1214	720	2415	3629	19:45			388	1703	366	1594	3297
08:00			333		718			20:00			365		370		
08:15			325		655			20:15			340		342		
08:30			384		675			20:30			284		305		
08:45			410	1452	691	2739	4191	20:45			265	1254	266	1283	2537
09:00			418		638			21:00			205		270		
09:15			462		606			21:15			184		235		
09:30			444		542			21:30			135		205		
09:45			452	1776	423	2209	3985	21:45			144	668	184	894	1562
10:00			435		444			22:00			128		177		
10:15			462		415			22:15			111		141		
10:30			415		395			22:30			128		128		
10:45			484	1796	388	1642	3438	22:45			105	472	105	551	1023
11:00			519		362			23:00			98		88		
11:15			555		377			23:15			99		95		
11:30			526		319			23:30			103		88		
11:45			535	2135	333	1391	3526	23:45			88	388	95	366	754
Total Vol.				10750		14738	**25488**					19413		16548	**35961**

Daily Totals

NB	SB	EB	WB	Combined
		30163	31286	**61449**

	AM			PM		
Split %	42.2%	57.8%	**41.5%**	54.0%	46.0%	**58.5%**
Peak Hour	11:15	07:45	**08:30**	16:45	17:30	**16:45**
Volume	2171	2768	**4284**	2431	2213	**4557**
P.H.F.	0.98	0.96	**0.97**	0.95	0.95	**0.98**

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: PACIFIC TECHNICAL DATA

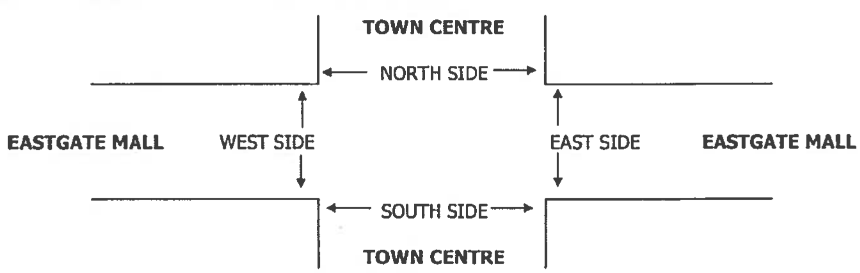
DATE:	LOCATION:	UTC	PROJECT #:	PTD16-1118-03
11/17/16	NORTH & SOUTH:	TOWN CENTRE	LOCATION #:	1
THURSDAY	EAST & WEST:	EASTGATE MALL	CONTROL:	SIGNAL

NOTES:

AM PM MD OTHER OTHER

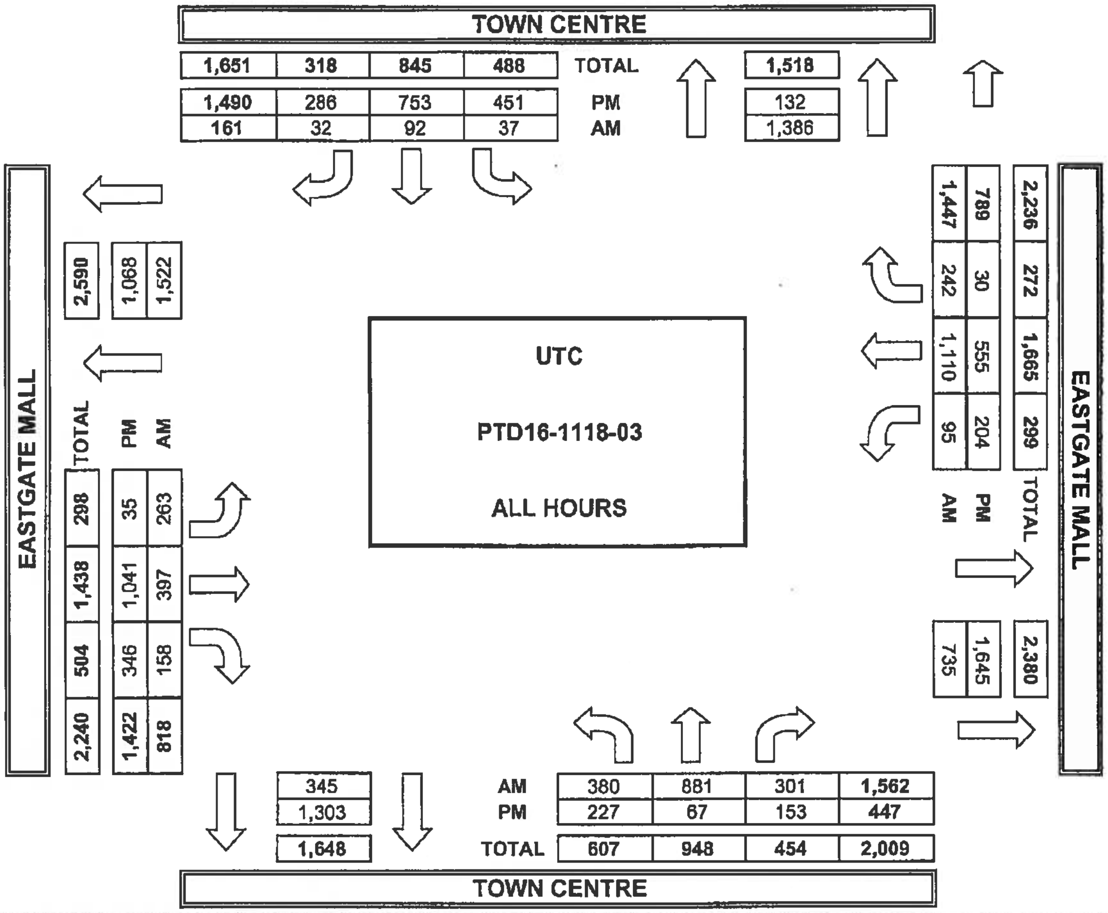
▲ N ◄ W E ► S ▼

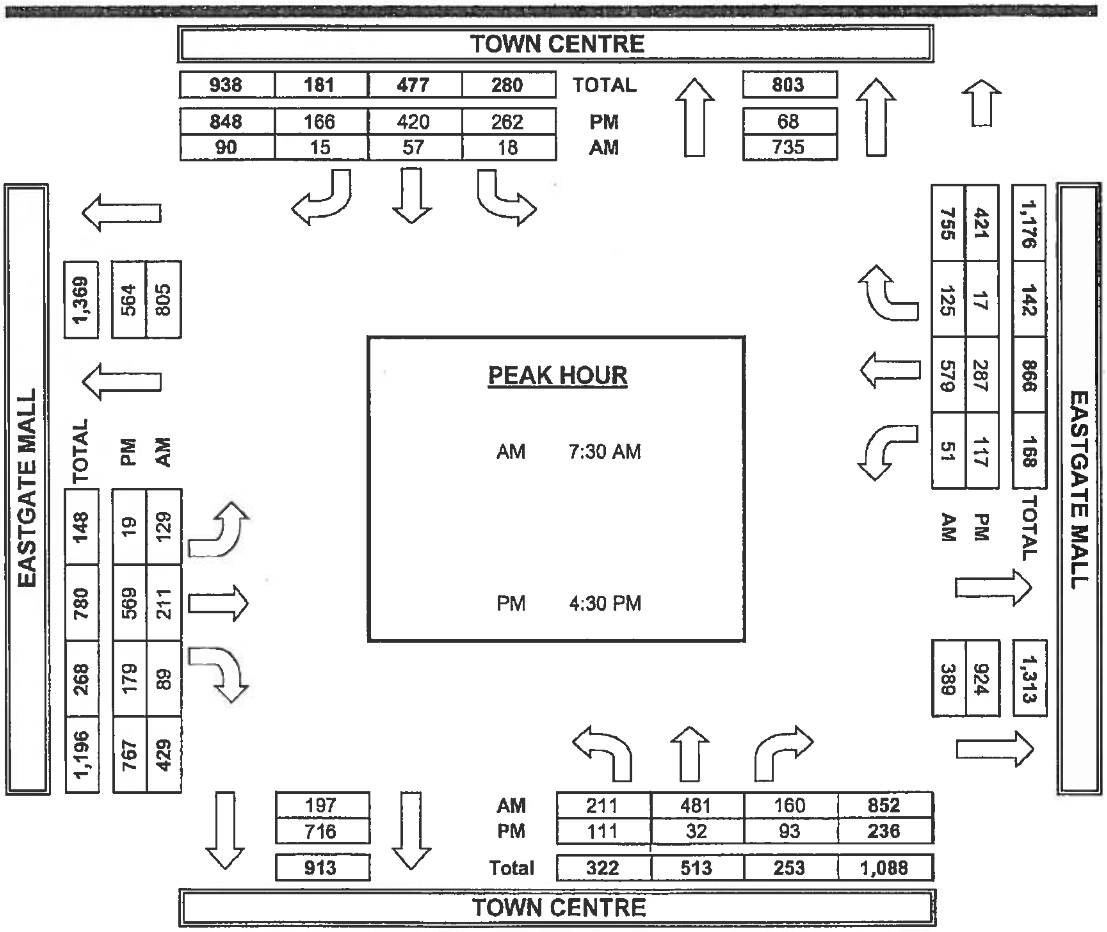
		NORTHBOUND TOWN CENTRE			SOUTHBOUND TOWN CENTRE			EASTBOUND EASTGATE MALL			WESTBOUND EASTGATE MALL				U-TURNS				
		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB	TTL
	LANES:	2	2	0	2	2	0	2	2	0	1	2	0		X	X	X	X	
AM	7:00 AM	26	115	33	4	8	5	28	51	11	9	98	28	416					0
AM	7:15 AM	31	101	31	6	9	3	33	40	16	8	162	20	460					0
AM	7:30 AM	55	126	44	6	12	3	35	66	19	8	135	26	535					0
AM	7:45 AM	51	135	35	3	18	2	31	68	21	12	166	33	575					0
AM	8:00 AM	55	121	40	5	11	4	28	42	26	16	152	35	535					0
AM	8:15 AM	50	99	41	4	16	6	35	35	23	15	126	31	481					0
AM	8:30 AM	46	84	42	4	10	3	40	44	20	11	138	25	467					0
AM	8:45 AM	66	100	35	5	8	6	33	51	22	16	133	44	519					0
AM	VOLUMES	380	881	301	37	92	32	263	397	158	95	1,110	242	3,988	0	0	0	0	0
AM	APPROACH %	24%	56%	19%	23%	57%	20%	32%	49%	19%	7%	77%	17%						
AM	APP/DEPART	1,562	/	1,386	161	/	345	818	/	735	1,447	/	1,522	0					
AM	BEGIN PEAK HR		7:30 AM																
AM	VOLUMES	211	481	160	18	57	15	129	211	89	51	579	125	2,126					
AM	APPROACH %	25%	56%	19%	20%	63%	17%	30%	49%	21%	7%	77%	17%						
AM	PEAK HR FACTOR		0.947			0.865			0.894			0.895		0.924					
AM	APP/DEPART	852	/	735	90	/	197	429	/	389	755	/	805	0					
PM	4:00 PM	29	8	16	40	104	24	5	96	30	29	79	5	465			2		2
PM	4:15 PM	31	7	10	39	84	16	4	126	47	22	52	3	441			1		1
PM	4:30 PM	28	9	14	59	124	33	4	134	48	32	70	5	560	1				1
PM	4:45 PM	24	6	18	44	102	31	6	161	39	20	59	6	516			1		1
PM	5:00 PM	30	8	37	81	116	60	4	135	50	32	84	3	640	2		1		3
PM	5:15 PM	29	9	24	78	78	42	5	139	42	33	74	3	556			4		4
PM	5:30 PM	31	9	25	59	64	51	5	136	51	21	72	3	527			1		1
PM	5:45 PM	25	11	9	51	81	29	2	114	39	15	65	2	443	2		1		3
PM	VOLUMES	227	67	153	451	753	286	35	1,041	346	204	555	30	4,148	5	0	11	0	16
PM	APPROACH %	51%	15%	34%	30%	51%	19%	2%	73%	24%	26%	70%	4%						
PM	APP/DEPART	447	/	132	1,490	/	1,303	1,422	/	1,645	789	/	1,068	0					
PM	BEGIN PEAK HR		4:30 PM																
PM	VOLUMES	111	32	93	262	420	166	19	569	179	117	287	17	2,272					
PM	APPROACH %	47%	14%	39%	31%	50%	20%	2%	74%	23%	28%	68%	4%						
PM	PEAK HR FACTOR		0.787			0.825			0.931			0.884		0.888					
PM	APP/DEPART	236	/	68	848	/	716	767	/	924	421	/	564	0					



		PEDESTRIAN CROSSINGS					PEDESTRIAN ACTIVATIONS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM					0					0					0
AM	7:15 AM					0					0					0
AM	7:30 AM					0					0					0
AM	7:45 AM					0					0					0
AM	8:00 AM					0					0					0
AM	8:15 AM					0					0					0
AM	8:30 AM					0					0					0
AM	8:45 AM					0					0					0
AM	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM	4:00 PM					0					0					0
PM	4:15 PM					0					0					0
PM	4:30 PM					0					0					0
PM	4:45 PM					0					0					0
PM	5:00 PM					0					0					0
PM	5:15 PM					0					0					0
PM	5:30 PM					0					0					0
PM	5:45 PM					0					0					0
PM	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PACIFIC TECHNICAL DATA
TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: PACIFIC TECHNICAL DATA

DATE:	LOCATION:	UTC	PROJECT #:	PTD16-1118-03
11/17/16	NORTH & SOUTH:	JUDICAL	LOCATION #:	2
THURSDAY	EAST & WEST:	EASTGATE MALL	CONTROL:	SIGNAL

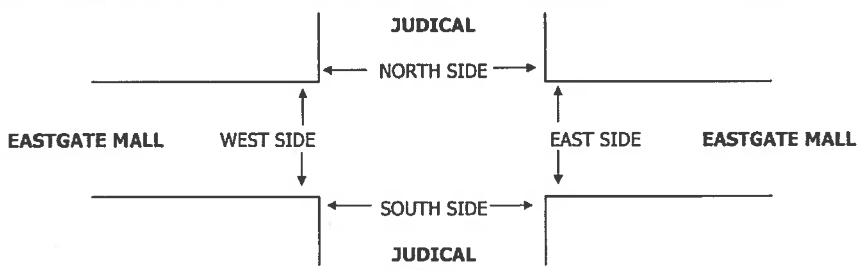
NOTES:

AM PM MD OTHER OTHER

▲ N ◀ W E ▶ S ▼

		NORTHBOUND JUDICAL			SOUTHBOUND JUDICAL			EASTBOUND EASTGATE MALL			WESTBOUND EASTGATE MALL			
		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	LANES:	1	1	1	1	1	0	1	2	0	1	2	0	
AM	7:00 AM	41	20	8	1	0	0	24	45	3	19	96	4	261
	7:15 AM	37	19	16	0	2	1	27	43	4	31	146	4	330
	7:30 AM	57	21	16	0	4	5	32	45	8	23	140	11	362
	7:45 AM	56	22	25	0	0	3	31	59	13	19	157	6	391
	8:00 AM	46	22	19	2	1	7	33	55	15	24	166	12	402
	8:15 AM	31	28	20	6	3	4	30	56	12	34	152	11	387
	8:30 AM	42	23	22	1	1	4	28	58	20	29	161	9	398
	8:45 AM	66	27	23	1	1	2	29	59	26	30	131	5	400
	VOLUMES	376	182	149	11	12	26	234	420	101	209	1,149	62	2,931
	APPROACH %	53%	26%	21%	22%	24%	53%	31%	56%	13%	15%	81%	4%	
	APP/DEPART	707	/	478	49	/	322	755	/	580	1,420	/	1,551	0
	BEGIN PEAK HR		8:00 AM											
	VOLUMES	185	100	84	10	6	17	120	228	73	117	610	37	1,587
	APPROACH %	50%	27%	23%	30%	18%	52%	29%	54%	17%	15%	80%	5%	
	PEAK HR FACTOR		0.795			0.635			0.923			0.946		0.987
	APP/DEPART	369	/	257	33	/	196	421	/	322	764	/	812	0
PM	4:00 PM	31	0	41	19	23	30	4	141	36	15	49	0	389
	4:15 PM	33	2	34	13	15	21	4	132	33	13	54	0	354
	4:30 PM	32	2	54	19	11	25	4	134	24	21	56	1	383
	4:45 PM	42	3	36	9	22	20	7	164	58	22	56	1	440
	5:00 PM	26	6	49	22	32	24	3	179	70	16	68	0	495
	5:15 PM	28	1	27	10	9	22	5	169	51	17	56	1	396
	5:30 PM	23	2	42	13	13	14	3	138	57	28	53	1	387
	5:45 PM	31	0	23	7	15	19	2	158	54	12	61	0	382
	VOLUMES	246	16	306	112	140	175	32	1,215	383	144	453	4	3,226
	APPROACH %	43%	3%	54%	26%	33%	41%	2%	75%	23%	24%	75%	1%	
	APP/DEPART	568	/	52	427	/	667	1,630	/	1,633	601	/	874	0
	BEGIN PEAK HR		4:45 PM											
	VOLUMES	119	12	154	54	76	80	18	650	236	83	233	3	1,718
	APPROACH %	42%	4%	54%	26%	36%	38%	2%	72%	26%	26%	73%	1%	
	PEAK HR FACTOR		0.880			0.673			0.897			0.949		0.868
	APP/DEPART	285	/	33	210	/	395	904	/	858	319	/	432	0

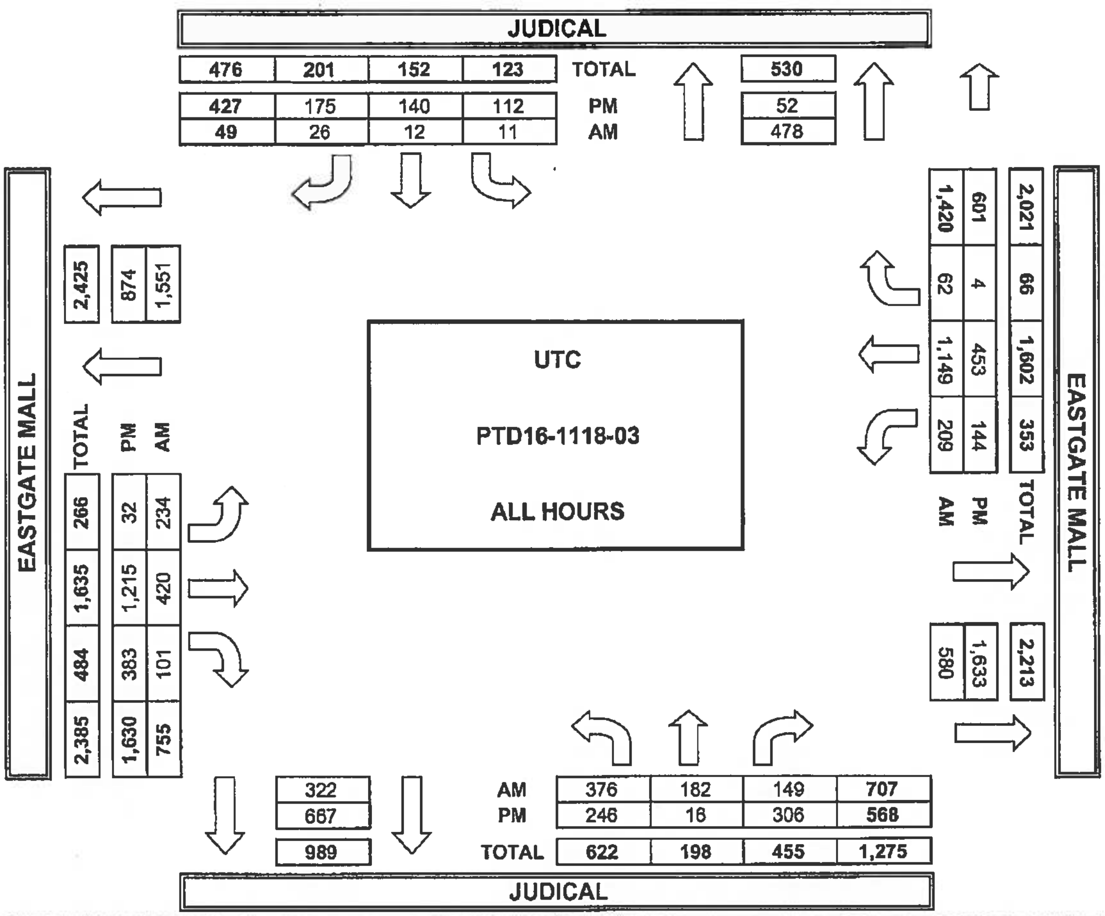
U-TURNS					
	NB	SB	EB	WB	TTL
	X	X	X	X	
7:00 AM					0
7:15 AM	2		2		4
7:30 AM	4				4
7:45 AM	1				1
8:00 AM	3				3
8:15 AM	1				1
8:30 AM	3				3
8:45 AM	2				2
AM TOTAL	16	0	2	0	18
4:00 PM	4		1		5
4:15 PM	6				6
4:30 PM	6				6
4:45 PM	6				6
5:00 PM	2			1	3
5:15 PM	4				4
5:30 PM	4			1	5
5:45 PM	8				8
PM TOTAL	40	0	1	2	43

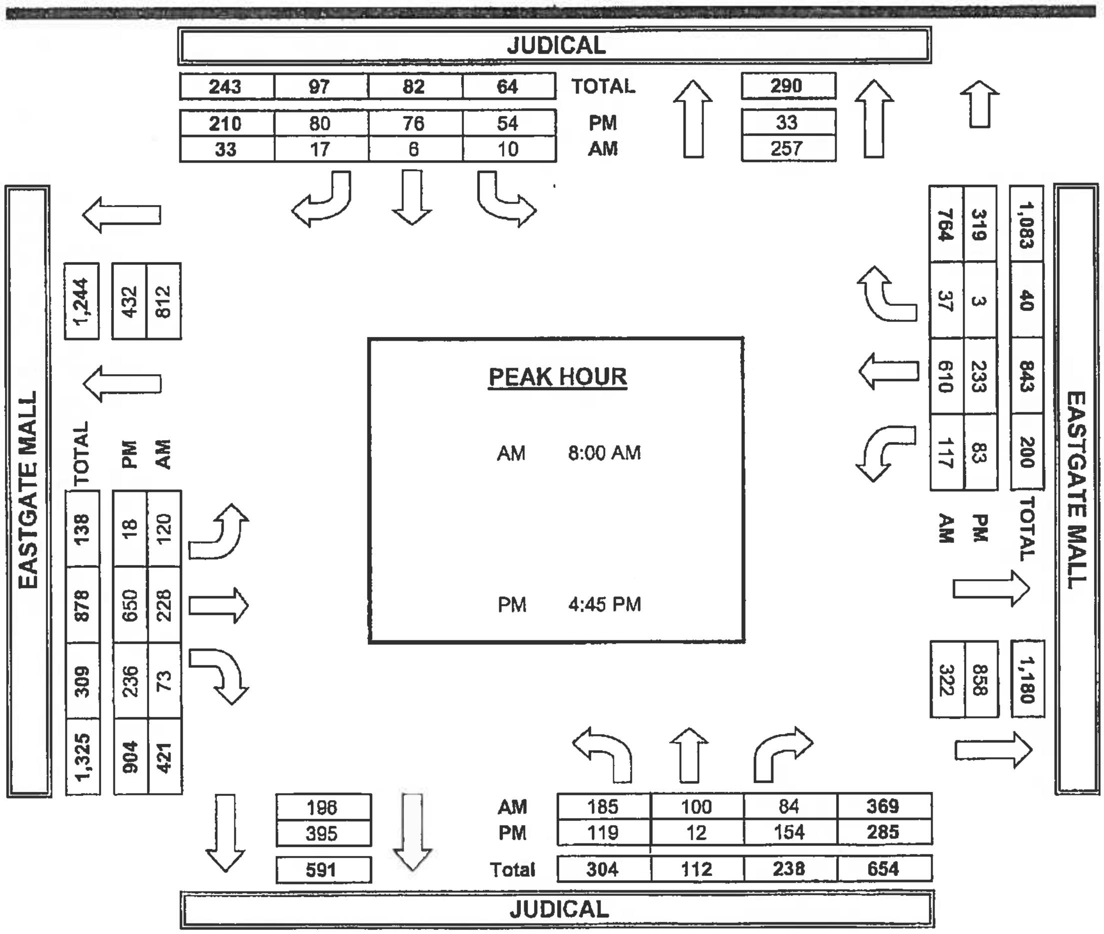


		PEDESTRIAN CROSSINGS					PEDESTRIAN ACTIVATIONS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM					0					0					0
	7:15 AM					0					0					0
	7:30 AM					0					0					0
	7:45 AM					0					0					0
	8:00 AM					0					0					0
	8:15 AM					0					0					0
	8:30 AM					0					0					0
	8:45 AM					0					0					0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM	4:00 PM					0					0					0
	4:15 PM					0					0					0
	4:30 PM					0					0					0
	4:45 PM					0					0					0
	5:00 PM					0					0					0
	5:15 PM					0					0					0
	5:30 PM					0					0					0
	5:45 PM					0					0					0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PACIFIC TECHNICAL DATA

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: PACIFIC TECHNICAL DATA

DATE:	LOCATION:	UTC	PROJECT #:	PTD16-1118-03
11/17/16	NORTH & SOUTH:	TOWNE CENTRE	LOCATION #:	3
THURSDAY	EAST & WEST:	EXECUTIVE	CONTROL:	SIGNAL

NOTES:

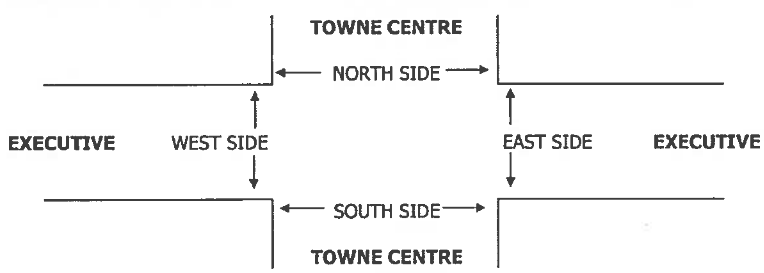
AM PM MD OTHER OTHER

N S W E

		NORTHBOUND TOWNE CENTRE			SOUTHBOUND TOWNE CENTRE			EASTBOUND EXECUTIVE			WESTBOUND EXECUTIVE			
		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	LANES:	1	2	1	1	2	0	1	2	0	1	2	0	
AM	7:00 AM	30	153	83	3	20	4	0	14	7	7	11	2	334
AM	7:15 AM	47	154	77	6	26	7	8	16	11	8	13	3	376
AM	7:30 AM	61	203	66	8	41	7	14	19	10	10	28	1	468
AM	7:45 AM	64	211	88	4	35	9	17	29	11	9	21	6	504
AM	8:00 AM	86	194	74	6	30	15	17	35	9	14	19	4	503
AM	8:15 AM	73	164	73	5	27	16	21	27	6	12	18	10	452
AM	8:30 AM	77	166	93	5	49	10	11	27	11	16	18	5	488
AM	8:45 AM	60	219	104	7	42	11	20	27	10	12	24	12	548
AM	VOLUMES	498	1,464	658	44	270	79	108	194	75	88	152	43	3,673
AM	APPROACH %	19%	56%	25%	11%	69%	20%	29%	51%	20%	31%	54%	15%	
AM	APP/DEPART	2,620	/	1,615	393	/	433	377	/	896	283	/	729	0
AM	BEGIN PEAK HR		8:00 AM											
AM	VOLUMES	296	743	344	23	148	52	69	116	36	54	79	31	1,991
AM	APPROACH %	21%	54%	25%	10%	66%	23%	31%	52%	16%	33%	48%	19%	
AM	PEAK HR FACTOR		0.903			0.871			0.906			0.854		0.908
AM	APP/DEPART	1,383	/	843	223	/	238	221	/	483	164	/	427	0
PM	4:00 PM	20	30	10	10	124	51	6	16	24	44	73	2	410
PM	4:15 PM	30	34	15	12	104	38	4	14	21	32	51	4	359
PM	4:30 PM	25	35	12	11	104	67	10	26	33	40	54	10	427
PM	4:45 PM	36	36	15	14	124	55	8	11	33	23	58	6	419
PM	5:00 PM	29	40	21	20	121	50	6	26	18	43	47	3	424
PM	5:15 PM	22	44	15	13	110	41	8	17	27	39	45	5	386
PM	5:30 PM	38	53	24	11	114	60	4	27	17	29	46	4	427
PM	5:45 PM	54	47	26	14	110	44	11	23	15	27	37	5	413
PM	VOLUMES	254	319	138	105	911	406	57	160	188	277	411	39	3,265
PM	APPROACH %	36%	45%	19%	7%	64%	29%	14%	40%	46%	38%	57%	5%	
PM	APP/DEPART	711	/	415	1,422	/	1,376	405	/	403	727	/	1,071	0
PM	BEGIN PEAK HR		4:45 PM											
PM	VOLUMES	125	173	75	58	469	206	26	81	95	134	196	18	1,656
PM	APPROACH %	34%	46%	20%	8%	64%	28%	13%	40%	47%	39%	56%	5%	
PM	PEAK HR FACTOR		0.811			0.949			0.732			0.837		0.970
PM	APP/DEPART	373	/	217	733	/	698	202	/	214	348	/	527	0

U-TURNS

		NB	SB	EB	WB	TTL
		X	X	X	X	
AM	7:00 AM					0
AM	7:15 AM				1	1
AM	7:30 AM			1	2	3
AM	7:45 AM					0
AM	8:00 AM	1		1	1	3
AM	8:15 AM	4	2			6
AM	8:30 AM	1	1			2
AM	8:45 AM	2	1			3
AM	VOLUMES	8	4	2	4	18
PM	4:00 PM	1			2	3
PM	4:15 PM		4		2	6
PM	4:30 PM	3			2	5
PM	4:45 PM	4			1	5
PM	5:00 PM	3	1		4	8
PM	5:15 PM	4			3	7
PM	5:30 PM	6	3		2	11
PM	5:45 PM	5	1		2	8
PM	VOLUMES	26	9	0	18	53



		PEDESTRIAN CROSSINGS					PEDESTRIAN ACTIVATIONS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM					0					0					0
AM	7:15 AM					0					0					0
AM	7:30 AM					0					0					0
AM	7:45 AM					0					0					0
AM	8:00 AM					0					0					0
AM	8:15 AM					0					0					0
AM	8:30 AM					0					0					0
AM	8:45 AM					0					0					0
AM	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM	4:00 PM					0					0					0
PM	4:15 PM					0					0					0
PM	4:30 PM					0					0					0
PM	4:45 PM					0					0					0
PM	5:00 PM					0					0					0
PM	5:15 PM					0					0					0
PM	5:30 PM					0					0					0
PM	5:45 PM					0					0					0
PM	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PACIFIC TECHNICAL DATA
TURNING MOVEMENT COUNTS

TOWNE CENTRE

1,815	485	1,181	149	TOTAL
1,422	406	911	105	PM
393	79	270	44	AM

2,030
415
1,815

EXECUTIVE

TOTAL	PM	AM
1,800	1,071	729
165	57	108
354	160	194
263	188	75
782	405	377

UTC

PTD16-1118-03

ALL HOURS

EXECUTIVE

AM	PM	TOTAL
283	727	1,010
43	39	82
152	411	563
88	277	365
896	403	1,299

433
1,376
1,809

AM	498	1,464	658	2,620
PM	254	319	138	711
TOTAL	752	1,783	796	3,331

TOWNE CENTRE

TOWNE CENTRE

956	258	617	81	TOTAL
733	206	469	58	PM
223	52	148	23	AM

1,060
217
843

EXECUTIVE

TOTAL	PM	AM
954	527	427
95	26	69
197	81	116
131	95	36
423	202	221

PEAK HOUR

AM 8:00 AM

PM 4:45 PM

EXECUTIVE

AM	PM	TOTAL
164	348	512
31	18	49
79	196	275
54	134	188
483	214	697

238
698
936

AM	296	743	344	1,383
PM	125	173	75	373
Total	421	916	419	1,756

TOWNE CENTRE

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: PACIFIC TECHNICAL DATA

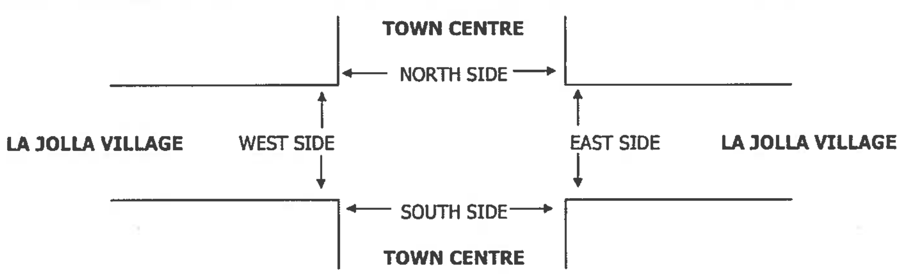
DATE:	LOCATION:	UTC	PROJECT #:	PTD16-1118-03
11/17/16	NORTH & SOUTH:	TOWN CENTRE	LOCATION #:	5
THURSDAY	EAST & WEST:	LA JOLLA VILLAGE	CONTROL:	SIGNAL

NOTES:

AM
PM
MD
OTHER
OTHER

N
◄ W
E ►
S

	NORTHBOUND TOWN CENTRE			SOUTHBOUND TOWN CENTRE			EASTBOUND LA JOLLA VILLAGE			WESTBOUND LA JOLLA VILLAGE				U-TURNS				
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB	TTL
LANES:	2	1	2	2	2	0	2	3	1	2	2.5	1.5		X	X	X	X	
AM																		
7:00 AM	25	25	49	33	5	4	38	128	14	59	217	234	831					0
7:15 AM	32	24	56	38	5	2	38	170	9	66	270	215	925					0
7:30 AM	42	31	61	42	6	4	53	232	20	77	312	215	1,095					0
7:45 AM	24	51	82	46	7	5	60	231	29	81	375	267	1,258					0
8:00 AM	40	37	64	42	9	5	65	213	23	95	351	264	1,208					0
8:15 AM	39	28	67	46	10	4	59	212	25	65	346	253	1,154					0
8:30 AM	34	47	77	60	9	13	67	240	33	79	329	257	1,245					0
8:45 AM	38	45	96	54	12	6	74	250	27	78	331	281	1,292					0
VOLUMES	274	288	552	361	63	43	454	1,676	180	600	2,531	1,986	9,008	0	0	0	0	0
APPROACH %	25%	26%	50%	77%	13%	9%	20%	73%	8%	12%	49%	39%						
APP/DEPART	1,114	/	2,728	467	/	843	2,310	/	2,589	5,117	/	2,848	0					
BEGIN PEAK HR		8:00 AM																
VOLUMES	151	157	304	202	40	28	265	915	108	317	1,357	1,055	4,899					
APPROACH %	25%	26%	50%	75%	15%	10%	21%	71%	8%	12%	50%	39%						
PEAK HR FACTOR		0.855			0.823			0.917			0.961		0.948					
APP/DEPART	612	/	1,477	270	/	465	1,288	/	1,421	2,729	/	1,536	0					
PM																		
4:00 PM	30	14	148	98	25	20	5	388	31	70	329	35	1,193					0
4:15 PM	41	12	121	113	41	19	18	312	28	71	386	54	1,216					0
4:30 PM	56	9	118	126	49	22	7	375	35	85	403	48	1,333		1			1
4:45 PM	56	12	124	171	43	24	5	294	38	75	410	52	1,304					0
5:00 PM	47	9	144	160	37	20	5	327	25	74	361	56	1,265					0
5:15 PM	41	9	139	145	41	23	6	339	67	72	392	53	1,327					0
5:30 PM	56	10	136	134	48	15	5	302	33	73	436	75	1,323					0
5:45 PM	43	10	93	102	55	19	4	284	48	71	433	73	1,235					0
VOLUMES	370	85	1,023	1,049	339	162	55	2,621	305	591	3,150	446	10,196	0	1	0	0	1
APPROACH %	25%	6%	69%	68%	22%	10%	2%	88%	10%	14%	75%	11%						
APP/DEPART	1,478	/	586	1,550	/	1,235	2,981	/	4,693	4,187	/	3,682	0					
BEGIN PEAK HR		4:30 PM																
VOLUMES	200	39	525	602	170	89	23	1,335	165	306	1,566	209	5,229					
APPROACH %	26%	5%	69%	70%	20%	10%	2%	88%	11%	15%	75%	10%						
PEAK HR FACTOR		0.955			0.904			0.913			0.969		0.981					
APP/DEPART	764	/	271	861	/	641	1,523	/	2,462	2,081	/	1,855	0					



	PEDESTRIAN CROSSINGS					PEDESTRIAN ACTIVATIONS					BICYCLE CROSSINGS				
	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM															
7:00 AM					0					0					0
7:15 AM					0					0					0
7:30 AM					0					0					0
7:45 AM					0					0					0
8:00 AM					0					0					0
8:15 AM					0					0					0
8:30 AM					0					0					0
8:45 AM					0					0					0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM															
4:00 PM					0					0					0
4:15 PM					0					0					0
4:30 PM					0					0					0
4:45 PM					0					0					0
5:00 PM					0					0					0
5:15 PM					0					0					0
5:30 PM					0					0					0
5:45 PM					0					0					0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PACIFIC TECHNICAL DATA
TURNING MOVEMENT COUNTS

UTC

PTD16-1118-03

ALL HOURS

TOWN CENTRE (north)

TOTAL	2,017	205	402	1,410
PM	1,550	162	339	1,049
AM	467	43	63	361

TOTAL	3,314
PM	586
AM	2,728

LA JOLLA VILLAGE (west)

TOTAL		6,530
PM	3,682	
AM	2,848	

TOTAL	509	4,297	485	5,291
PM	55	2,621	305	2,981
AM	454	1,676	180	2,310

LA JOLLA VILLAGE (east)

AM	5,117	1,986	2,531	600
PM	4,187	446	3,150	591
TOTAL	9,304	2,432	5,681	1,191

AM	2,589
PM	4,693
TOTAL	7,282

TOWN CENTRE (south)

AM	274	288	552	1,114
PM	370	85	1,023	1,478
TOTAL	644	373	1,575	2,592

AM	843
PM	1,235
TOTAL	2,078

PEAK HOUR

AM 8:00 AM

PM 4:30 PM

TOWN CENTRE (north)

TOTAL	1,131	117	210	804
PM	861	89	170	602
AM	270	28	40	202

TOTAL	1,748
PM	271
AM	1,477

LA JOLLA VILLAGE (west)

TOTAL		3,391
PM	1,855	
AM	1,536	

TOTAL	288	2,250	273	2,811
PM	23	1,335	165	1,523
AM	265	915	108	1,288

LA JOLLA VILLAGE (east)

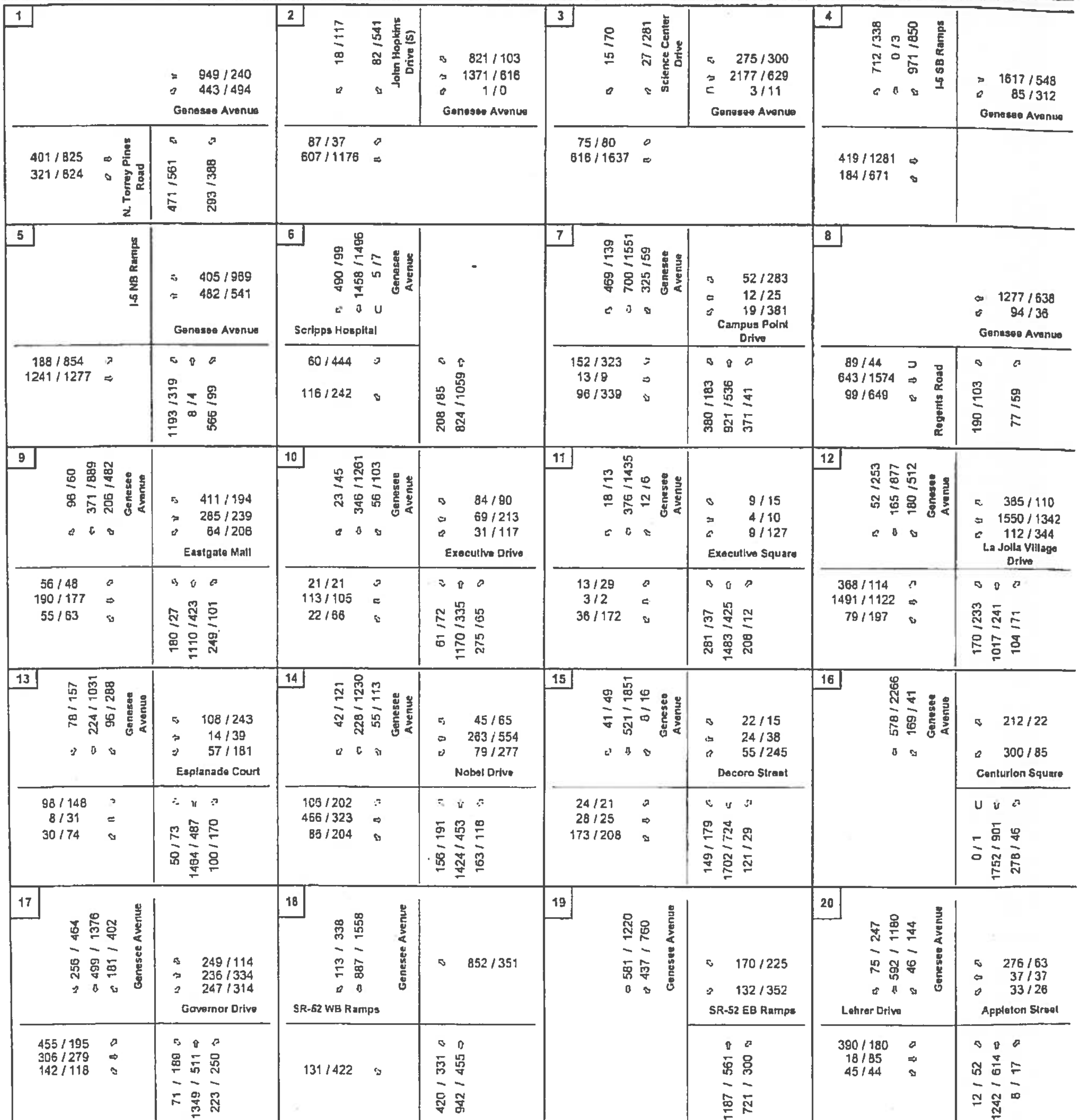
AM	2,729	1,055	1,357	317
PM	2,081	209	1,566	306
TOTAL	4,810	1,264	2,923	623

AM	1,421
PM	2,462
TOTAL	3,883

TOWN CENTRE (south)

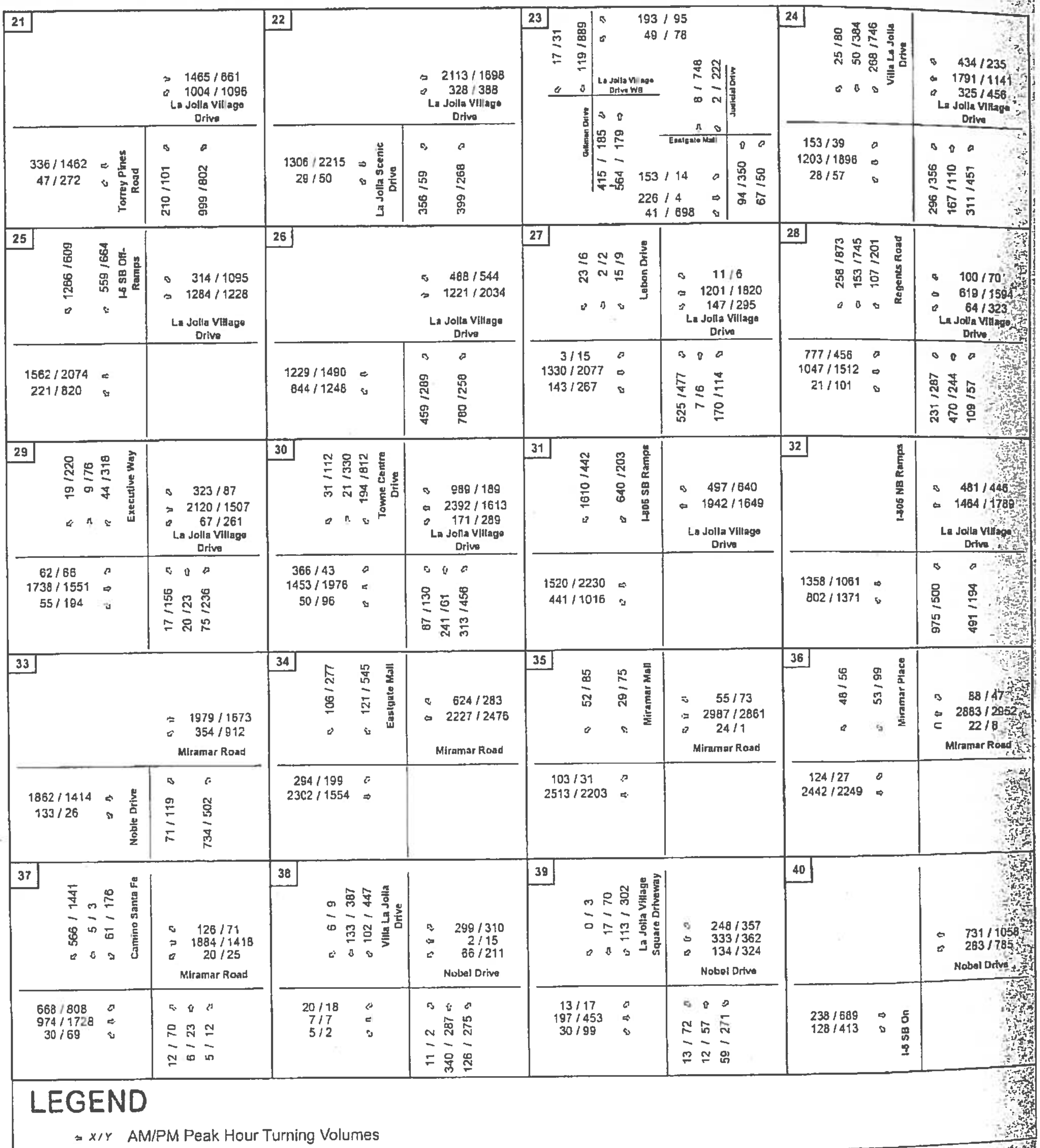
AM	151	157	304	612
PM	200	39	525	764
Total	351	196	829	1,376

AM	465
PM	641
Total	1,106



LEGEND

X / Y AM/PM Peak Hour Turning Volumes


21
1465 / 661
1004 / 1096
La Jolla Village Drive
336 / 1462
47 / 272
Torrey Pines Road
210 / 101
999 / 802
22
2113 / 1698
328 / 388
La Jolla Village Drive
1306 / 2215
29 / 50
La Jolla Scenic Drive
356 / 59
399 / 268
23
17 / 31
119 / 889
193 / 95
49 / 78
La Jolla Village Drive WB
8 / 748
2 / 222
Judicial Drive
Gilman Drive
Eastgate Mall
415 / 185
564 / 179
153 / 14
226 / 4
41 / 698
94 / 350
67 / 50
24
25 / 80
50 / 384
268 / 746
Villa La Jolla Drive
434 / 235
1791 / 1141
325 / 456
La Jolla Village Drive
153 / 39
1203 / 1896
28 / 57
296 / 356
167 / 110
311 / 451
25
1266 / 609
559 / 664
I-5 SB Off-Ramps
314 / 1095
1284 / 1228
La Jolla Village Drive
1562 / 2074
221 / 820
26
488 / 544
1221 / 2034
La Jolla Village Drive
1229 / 1490
844 / 1246
459 / 289
780 / 258
27
23 / 6
2 / 2
15 / 9
Lebon Drive
11 / 6
1201 / 1820
147 / 295
La Jolla Village Drive
3 / 15
1330 / 2077
143 / 267
525 / 477
7 / 6
170 / 114
28
258 / 873
153 / 745
107 / 201
Regents Road
100 / 70
619 / 1594
64 / 323
La Jolla Village Drive
777 / 456
1047 / 1512
21 / 101
231 / 287
470 / 244
109 / 57
29
19 / 220
9 / 76
44 / 318
Executive Way
323 / 87
2120 / 1507
67 / 261
La Jolla Village Drive
62 / 66
1738 / 1551
55 / 194
17 / 156
20 / 23
75 / 236
30
31 / 112
21 / 330
194 / 812
Towne Centre Drive
989 / 189
2392 / 1613
171 / 289
La Jolla Village Drive
366 / 43
1453 / 1976
50 / 96
87 / 130
241 / 61
313 / 456
31
1610 / 442
640 / 203
I-805 SB Ramps
497 / 640
1942 / 1649
La Jolla Village Drive
1520 / 2230
441 / 1016
32
I-805 NB Ramps
481 / 446
1464 / 1789
La Jolla Village Drive
1358 / 1061
802 / 1371
975 / 500
491 / 194
33
1979 / 1673
354 / 912
Miramar Road
1862 / 1414
133 / 26
Noble Drive
71 / 119
734 / 502
34
106 / 277
121 / 545
Eastgate Mall
624 / 283
2227 / 2476
Miramar Road
294 / 199
2302 / 1554
35
52 / 85
29 / 75
Miramar Mall
55 / 73
2987 / 2861
24 / 1
Miramar Road
103 / 31
2513 / 2203
36
48 / 56
53 / 99
Miramar Place
88 / 47
2883 / 2952
22 / 8
Miramar Road
124 / 27
2442 / 2249
37
566 / 1441
5 / 3
61 / 176
Camino Santa Fe
126 / 71
1884 / 1418
20 / 25
Miramar Road
668 / 808
974 / 1728
30 / 69
12 / 70
6 / 23
5 / 12
38
6 / 9
133 / 387
102 / 447
Villa La Jolla Drive
299 / 310
2 / 15
86 / 211
Nobel Drive
20 / 18
7 / 7
5 / 2
11 / 2
340 / 287
126 / 275
39
0 / 3
17 / 70
113 / 302
La Jolla Village Square Driveway
248 / 357
333 / 362
134 / 324
Nobel Drive
13 / 17
197 / 453
30 / 99
13 / 72
12 / 57
59 / 271
40
731 / 1058
283 / 785
Nobel Drive
238 / 689
128 / 413
I-5 SB On
LEGEND
X / Y AM/PM Peak Hour Turning Volumes

INTERSECTION: EASTGATE MALL @ GENESEE AVE

233 Program

Group Assignment:
Field Master Assignment:
System Reference Number:

N/S St: Genesee Ave
E/W Street: Eastgate Mall

Timing sheets by: KT
Approved by: FIG
Timing Implemented on:
Drawing Number: 35450-36-D

Phase Numbers--->	1 (Genesee)	2 (Genesee)	3 (Eastgate Mall)	4 (Eastgate Mall)	5 (Genesee)	6 (Genesee)	7 (Eastgate Mall)	8 (Eastgate Mall)
Ped Walk		7		7		7		7
Ped FDW		19		27		20		27
Min Green	4	10	4	7	4	10	4	7
Type 3 Disconnect								
Added per Vehicle								
Veh Extension	2.0	4.2	2.0	2.0	2.0	4.3	2.0	2.0
Max Gap	2.0	4.2	2.0	2.0	2.0	4.3	2.0	2.0
Min Gap	2.0	0.2	2.0	2.0	2.0	0.2	2.0	2.0
Max Limit	30	60	30	40	30	60	30	40
Max Limit 2								
Adv. / Delay Walk								
PE Min Ped FDW								
Cond Serv Check								
Reduce Every		0.7				0.7		
Yellow Change	3.4	4.7	3.4	3.9	3.4	4.7	3.4	4.1
Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Phase Timing - Bank 1 <F/1+Phase+Row>

	E
RR-1 Delay	
RR-1 Clear	
EV-A Delay	0
EV-A Clear	0
EV-B Delay	0
EV-B Clear	0
EV-C Delay	0
EV-C Clear	0
EV-D Delay	0
EV-D Clear	0
RR-2 Delay	
RR-2 Clear	
View EV Delay	---
View EV Clear	---
View RR Delay	---
View RR Clear	---

Preempt Timing <F/1+E+Row>

	F
Permit	12345678
Red Lock	
Yellow Lock	
Min Recall	
Ped Recall	
View Set Peds	2 4 6 8
Rest In Walk	
Red Rest	
Double Entry	
Max Recall	
Soft Recall	2 6
Max 2	
Cond. Service	
Man Cntrl Calls	
Yellow Start	2 6
First Phases	3 7

Phase Functions <F/1+F+Row>

Current Calculated Cycle Length: C/0 + B + F

	---	---	---	---	---
Phase 1					
Phase 2					
Phase 3					
Phase 4					
Phase 5					
Phase 6					
Phase 7					
Phase 8					
Max Initial					
Alternate Walk					
Alternate FDW					
Alternate Initial					
Alternate Extension					

Alternate Timing <F/1+Column+Phase>

Drop Number	8	<C/0+0+0>
Zone Number	8	<C/0+0+1>
Area Number	4	<C/0+0+2>
Area Address	63	<C/0+0+3>
QuicNet Channel	COM47	(QuicNet)

Communication Addresses

Flash Start	0	<F/1+0+E>
Red Revert	5.0	<F/1+0+F>
All Red Start	0.0	<F/1+C+0>

Start / Revert Times

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

(Outputs specified in Assignable Outputs at E/127+A+E & F)

Exclusive Walk	0	<F/1+0+0>
Exclusive FDW	0	<F/1+0+1>
All Red Clear	0.0	<F/1+0+2>

Exclusive Ped Phase

Manual Plan	0	<C/0+A+1>
Manual Offset	0	<C/0+B+1>

Manual Selection

Notes: U-turns allowed for SB Genesee Ave
5 section-head (Overlap) is deactivated for WB Eastgate Mall

Free Lag	2 4 6 8	<C/1+F+0>

How to Set Page Access Code:
F/1 – C + 0 + F = 1

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Version: 233 RV
Rivision: San Diego 1

INTERSECTION: EASTGATE MALL @ GENESEE AVE

233 Program

Row		Overlap 1	2	3	4	5	6	7	8
0	Load Switch Number								
1	Veh Set 1 - Phases								
2	Veh Set 2 - Phases								
3	Veh Set 3 - Phases								
4	Neg Veh Phases								
5	Neg Ped Phases								
6	Green Omit Phases								
7	Green Clear Omit Phs.								
8									
9									
A									
B									
C									
D	Green Clear								
E	Yellow Change								
F	Red Clear								

Overlap Assignments <E/29+Column+Row>

	F	Row
Fast Green Flash Phase		0
Green Flash Phases		1
Flashing Walk Phases		2
Guaranteed Passage		3
Simultaneous Gap Term	12345678	4
Sequential Timing		5
Advance Walk Phases		6
Delay Walk Phases		7
External Recall		8
Start-up Overlap Green		9
Max Extension		A
Inhibit Ped Reservice		B
Semi-Actuated		C
Start-up Overlap Yellow		D
Start-up Vehicle Calls	12345678	E
Start-up Ped Calls	12345678	F

Specials <F/2+F+Row>

Row		E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	
5	Flash to PE Circuits	
6	Flash Entry Phases	
7	Disable Yellow Range	
8	Disable Ovp Yel Range	
9	Overlap Yellow Flash	
A	EV-A Phases	2 5
B	EV-B Phases	4 7
C	EV-C Phases	1 6
D	EV-D Phases	3 8
E	Extra 1 Config. Bits	1 345
F	IC Select (Interconnect)	2

Configuration <E/125+E+Row>

	F
Ext. Permit 1 Phases	
Ext. Permit 2 Phases	
Exclusive Ped Assign	
Preempt Non-Lock	12345678
Ped for 2P Output	2
Ped for 6P Output	6
Ped for 4P Output	4
Ped for 8P Output	8
Yellow Flash Phases	
Low Priority A Phases	
Low Priority B Phases	
Low Priority C Phases	
Low Priority D Phases	
Restricted Phases	
Extra 2 Config. Bits	

Configuration <E/125+F+Row>

	C	Row
EV-A		0
EV-B		1
EV-C		2
EV-D		3
RR-1 *	---	4
RR-2 *	---	5
SE-1	0	6
SE-2	0	7
		8
		9
		A
		B
		C
		D
		E
		F

<E/125+C+Row>

Preemption Priority
(* RR-1 is always Highest, and RR-2 is always Second Highest)

	2	Row
Phase 1	0	0
Phase 2	0	1
Phase 3	0	2
Phase 4	0	3
Phase 5	0	4
Phase 6	0	5
Phase 7	0	6
Phase 8	0	7
		8
		9
		A
		B
		C
		D
		E
		F

<C/5+2+Row>

Coordination Transition Minimums

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = EV Advance
5 = Extended Status
6 = International Ped
7 = Flash - Clear Outputs
8 = Split Ring

IC Select Flags
1 =
2 = Modem
3 = 7-Wire Slave
4 = Flash / Free
5 =
6 = Simplex Master
7 = 7-Wire Master
8 = Offset Interrupter

Extra 2 Flags
1 = AWB During Initial
2 = LMU Installed
3 = Disable Min Walk
4 = QuicNet/4 System
5 = Ignore P/P on EV
6 =
7 = Reserved
8 =

Flash to PE & PE Non-Lock
1 = EV A 5 = RR 1
2 = EV B 6 = RR 2
3 = EV C 7 = SE 1
4 = EV D 8 = SE 2

8-0 Hour, Minute, Day-of-Week
8-1 Day-of-Month, Year, Month
8-F Seconds

Time and Date

Begin Month	0	<C/5+2+A>
Begin Week	0	<C/5+2+B>
End Month	0	<C/5+2+C>
End Week	0	<C/5+2+D>

Daylight Savings Time

Daylight Savings Date:
If set to all zeros, standard dates will be used.

Detector Assignments

Row	Detector Name	C1 Pin Number	Attributes (0)	Phase(s) (1)	Assign (2)	(3)	Delay (1)	Carry-Over (3)
0	2I2U	39	45 7	2	123			1.8
1	6J2U	40	45 7	6	123			1.8
2		41	45 7	4	123			
3	8J6U	42	45 7	8	123		12.0	
4	2I2L	43	45 7	2	123			1.8
5	6J2L	44	45 7	6	123			1.8
6		45	45 7	4	123			
7		46	45 7	8	123			
8		47	67	2	123			
9		48	67	6	123			
A		49	67	4	123			
B		50	67	8	123			
C		55	45 7	5	123			
D		56	45 7	1	123			
E		57	45 7	7	123			
F		58	45 7	3	123			

Row	Detector Name	C1 Pin Number	Attributes (4)	Phase(s) (5)	Assign (6)	(7)	Delay (2)	Carry-Over (4)
0		59	45 7	5	123			
1		60	45 7	1	123			
2		61	45 7	7	123			
3		62	45 7	3	123			
4	2I3U	63	45 7	2	123			1.8
5	6J3U	64	45 7	6	123			1.8
6		65	45 7	4	123			
7		66	45 7	8	123			
8		67	2	2	123			
9		68	2	6	123			
A		69	2	4	123			
B		70	2	8	123			
C		76	45 7	2	123			
D	Bike J3L	77	45 7	6	123			1.8
E		78	45 7	4	123			
F		79	45 7	8	123			

Detector Assignments <E/126+Column+Row> <D/0+Column+Row>

Detector Attributes
1 = Full Time Delay
2 = Ped Call
3 =
4 = Count
5 = Extension
6 = Type 3
7 = Calling
8 = Alternate

Det. Assignments
1 = Det. Set 1
2 = Det. Set 2
3 = Det. Set 3
4 =
5 =
6 = Failure - Min Recall
7 = Failure - Max Recall
8 = Report on Failure

Program Type:

Redirect Phase Outputs

	Ped / Phase / Overlap 1	2	3	4	5	6	7	8	Row
Walk									0
Don't Walk									1
Phase Green									2
Phase Yellow									3
Phase Red									4
Overlap Green									5
Overlap Yellow									6
Overlap Red									7

Redirect Phase Outputs <E/127+Column+Row>

Cabinet Type	30

<E/125+D+0>

Enable Redirection
(Enable Redirection = 30)

Max OFF (minutes)	5	<D/0+0+1>
Max ON (minutes)	60	<D/0+0+2>

Detector Failure Monitor

	D	Row
		0
Output Port 1		1
Output Port 2		2
Output Port 3		3
Output Port 4		4
Output Port 5		5
Output Port 6		6
Output Port 7		7

Dimming <E/125+D+Row>

	D
Number of Digits	
1 st Digit	
2 ed Digit	
3 ed Digit	
4 th Digit	
5 th Digit	
6 th Digit	
7 th Digit	
8 th Digit	
9 th Digit	
10 th Digit	
11 th Digit	
12 th Digit	
13 th Digit	
14 th Digit	
15 th Digit	

<C/5+D+Row>

Dial-Back Telephone Number

Disable Alarms
1 = Stop Time
2 = Flash Sense
3 = Keyboard Entry
4 = Manual Plan
5 = Police Control
6 = External Alarm
7 = Detector Failure
8 =

	B	Row
DELAY-A	1	A
DELAY-B	1	B
DELAY-C	0	C
DELAY-D	0	D
DELAY-E	0	E
DELAY-F	0	F

<D/0+B+Row> (seconds)

Delay Logic Times

Omit Alarm	

<C/5+F+0>

Disable Alarm Reporting

Time	0

<C/5+C+0>

Redial Time (minutes)
(View Redial Timer at E/2+D+6)

INTERSECTION: EASTGATE MALL @ GENESEE AVE

233 Program

Row	Time	Plan	Offset	Day of Week
0	06 : 30	5	A	_23456_
1	10 : 00	6	A	_23456_
2	15 : 00	7	A	_23456_
3	18 : 30	E	A	1234567
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Coordination <9/0.1+Row>
(Bank 1)

Row	Time	Func.	Day of Week
0			
1			
2			
3			
4			
5			
6			
7			
8			
9			
A			
B			
C			
D			
E			
F			

TOD Function <7/0.1+Row>

Row	Column 4 Phases/Bits
0	
1	
2	
3	
4	
5	
6	
7	
8	
9	
A	
B	
C	
D	
E	
F	

<E/27+4+Row>

Row	Day	Year	Month	Holiday Type
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

Holiday Dates <8/1.1+Row>
(Bank 1)

Row	Time	Plan	Offset	Holiday Type
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

Holiday Events <9/1.1+Row>
(Bank 1)

Row	Time	Plan	Offset	Day of Week
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Coordination <9/0.2+Row>
(Bank 2)

Row	Time	Func.	Holiday Type
0			
1			
2			
3			
4			
5			
6			
7			
8			
9			
A			
B			
C			
D			
E			
F			

Holiday TOD Function <7/0.2+Row>

Row	Column 4 Phases/Bits
0	
1	
2	
3	
4	
5	
6	
7	
8	
9	
A	
B	
C	
D	
E	
F	

<E/28+Row>

Row	Day	Year	Month	Holiday Type
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

Holiday Dates <8/1.2+Row>
(Bank 2)

Row	Time	Plan	Offset	Holiday Type
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

Holiday Events <9/1.2+Row>
(Bank 2)

T.O.D. Functions:
0 =
1 = Red Lock
2 = Yellow Lock
3 = Veh Min Recall
4 = Ped Recall
5 =
6 = Rest In Walk
7 = Red Rest
8 = Double Entry
9 = Veh Max Recall
A = Veh Soft Recall
B = Maximum 2
C = Conditional Service
D = Free Lag Phases
E = Bit 1 - Local Override
Bit 4 - Disable Detector OFF Monitor
Bit 7 - Detector Count Monitor
Bit 8 - Real Time Split Monitor
F = Output Bits 1 thru 8

Plan Select:
1 thru 9 = Coordination Plan 1 thru 9
14 or E = Free
15 or F = Flash

Month Select:
1 = January
2 = February
3 = March
4 = April
5 = May
6 = June
7 = July
8 = August
9 = September
A = October
B = November
C = December

Cycle Timer:
Master: C/0 + A + 0
Ring A: C/0 + B + 0
Ring B: C/0 + D + 0

Interval Timer:
Ring A: F/0 + A + Interval Row
Ring B: F/0 + B + Interval Row

Master Plan: C/0 + A + 2
Current Plan: C/0 + A + 3
TOD Plan: C/0 + A + 5

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Version: 233 RV2
Revision: San Diego 1

INTERSECTION: EASTGATE MALL @ GENESEE AVE

233 Program

Row	Plan Name --->	1	2	3	4	5	6	7	8	9
						AM	MID	PM		
0	Cycle Length					132	128	132		
1	Phase 1 - ForceOff					112	98	114		
2	Phase 2 - ForceOff					24	16	18		
3	Phase 3 - ForceOff					47	39	39		
4	Phase 4 - ForceOff					86	78	78	KT	
5	Phase 5 - ForceOff					~~27~~ 30	~~18~~ 18	~~18~~ 20	6/22/15	
6	Phase 6 - ForceOff					0	0	0		
7	Phase 7 - ForceOff					42	34	34		
8	Phase 8 - ForceOff					86	78	78		
9	Ring Offset									
A	Offset 1					101	93	58		
B	Offset 2									
C	Offset 3									
D	Perm 1 - End					24	16	18		
E	Hold Release					124 ~~255~~	255	255		
F	Zone Offset									

Coordination - Timing Plans <C/1+Plan+Row>

Coord Extra
1 = Programmed WALK Time for Sync Phases
2 = Always Terminate Sync Phase Peds

		E	Row
0			0
1	Plan 1 - Sync		1
2	Plan 2 - Sync		2
3	Plan 3 - Sync		3
4	Plan 4 - Sync		4
5	Plan 5 - Sync	6	5
6	Plan 6 - Sync	6	6
7	Plan 7 - Sync	6	7
8	Plan 8 - Sync		8
9	Plan 9 - Sync		9
A	NEMA Sync		A
B	NEMA Hold		B
C			C
D			D
E	Coord Extra		E
F			F

Sync Phases <C/1+E+Row>

Row		1	2	3	4	5	6	7	8	9
0	Ped Adjustment									
1	Perm 2 - Start									
2	Perm 2 - End									
3	Perm 3 - Start									
4	Perm 3 - End									
5	Reservice Time									
6	Reservice Phases									
7										
8	Pretimed Phases									
9	Max Recall									
A	Perm 1 Veh Phase									
B	Perm 1 Ped Phase									
C	Perm 2 Veh Phase									
D	Perm 2 Ped Phase									
E	Perm 3 Veh Phase									
F	Perm 3 Ped Phase									

Coordination - Parameters <C/2+Plan+Row>

	F	Row
Free Lag		0
Plan 1 - Lag		1
Plan 2 - Lag		2
Plan 3 - Lag		3
Plan 4 - Lag		4
Plan 5 - Lag	_2_45__8	5
Plan 6 - Lag	_2_45__8	6
Plan 7 - Lag	_2_45__8	7
Plan 8 - Lag		8
Plan 9 - Lag		9
External Lag		A
		B
		C
		D
		E
		F

Lag Phases <C/1+F+Row>

Coordination Timing B KT

INTERSECTION: EASTGATE MALL @ GENESEE AVE

Row	Column 9		Column A		Column B		Column C		Column D		Column E		Column F		Row
0	Spec. Funct. 1		NOT-3		Max 2		Pretimed		Set Monday		Dial 2 (7-Wire)		Sim Term		0
1	Spec. Funct. 2		NOT-4		System Det 1		Plan 1		Ext. Perm 1		Dial 3 (7-Wire)		EV-A	71	1
2	Spec. Funct. 3		OR-4 (a)		System Det 2		Plan 2		Ext. Perm 2		Offset 1 (7-Wire)		EV-B	72	2
3	Spec. Funct. 4		OR-4 (b)		System Det 3		Plan 3		Dimming		Offset 2 (7-Wire)		EV-C	73	3
4	NAND-3 (a)		OR-5 (a)		System Det 4		Plan 4		Set Clock		Offset 3 (7-Wire)		EV-D	74	4
5	NAND-3 (b)		OR-5 (b)		System Det 5		Plan 5		Stop Time	82	Free (7-Wire)		RR-1	51	5
6	NAND-4 (a)		OR-6 (a)		System Det 6		Plan 6		Flash Sense	81	Flash (7-Wire)		RR-2	52	6
7	NAND-4 (b)		OR-6 (b)		System Det 7		Plan 7		Manual Enable		Excl. Ped Omit		Spec. Event 1		7
8	OR-7 (a)		Fig 3 Diamond		System Det 8		Plan 8		Man. Advance		NOT-1		Spec. Event 2		8
9	OR-7 (b)		Fig 4 Diamond		Max Inhibit (nema)		Plan 9		External Alarm		NOT-2		External Lag		9
A	OR-7 (c)		AND-4 (a)		Force A (nema)		DELAY-A		Phase Bank 2		OR-1 (a)		AND-1 (a)		A
B	OR-7 (d)		AND-4 (b)		Force B (nema)		DELAY-B		Phase Bank 3		OR-1 (b)		AND-1 (b)		B
C	OR-8 (a)		NAND-1 (a)		C.N.A. (nema)		DELAY-C		Overlap Set 2		OR-2 (a)		AND-2 (a)		C
D	OR-8 (b)		NAND-1 (b)		Hold (nema)		DELAY-D		Overlap Set 3		OR-2 (b)		AND-2 (b)		D
E	OR-8 (c)		NAND-2 (a)		Max Recall		DELAY-E		Detector Set 2		OR-3 (a)		AND-3 (a)		E
F	OR-8 (d)		NAND-2 (b)		Min Recall		DELAY-F		Detector Set 3		OR-3 (b)		AND-3 (b)		F

Assignable Inputs <E/126+Column+Row>

Row	Column 9		Column A		Column B		Column C		Column D		Column E		Column F		Row
0	Phase ON - 1		Preempt Fail		Flasher 0		Free		NOT-1		TOD Out 1		Dial 2 (7-Wire)		0
1	Phase ON - 2		Sp Evnt Out 1		Flasher 1		Plan 1		OR-1		TOD Out 2		Dial 3 (7-Wire)		1
2	Phase ON - 3		Sp Evnt Out 2		Fast Flasher		Plan 2		OR-2		TOD Out 3		Offset 1 (7-Wire)		2
3	Phase ON - 4		Sp Evnt Out 3		Fig 3 Diamond		Plan 3		OR-3		TOD Out 4		Offset 2 (7-Wire)		3
4	Phase ON - 5		Sp Evnt Out 4		Fig 4 Diamond		Plan 4		AND-1		TOD Out 5		Offset 3 (7-Wire)		4
5	Phase ON - 6		Sp Evnt Out 5				Plan 5		AND-2		TOD Out 6		Free (7-Wire)		5
6	Phase ON - 7		Sp Evnt Out 6				Plan 6		AND-3		TOD Out 7		Flash (7-Wire)		6
7	Phase ON - 8		Sp Evnt Out 7				Plan 7		NOT-2		TOD Out 8		Preempt		7
8	Ph. Check - 1		Sp Evnt Out 8		NOT-3		Plan 8		EV-A		Adv. Warn - 1		Low Priority A		8
9	Ph. Check - 2				NOT-4		Plan 9		EV-B		Adv. Warn - 2		Low Priority B		9
A	Ph. Check - 3		Detector Fail		OR-4		Spec. Funct. 3		EV-C		DELAY-A		Low Priority C		A
B	Ph. Check - 4		Spec. Funct. 1		OR-5		Spec. Funct. 4		EV-D		DELAY-B		Low Priority D		B
C	Ph. Check - 5		Spec. Funct. 2		OR-6		NAND-3		RR-1		DELAY-C				C
D	Ph. Check - 6		Central Control		AND-4		NAND-4		RR-2		DELAY-D				D
E	Ph. Check - 7		Excl. Ped DW		NAND-1		OR-7		Spec. Event 1		DELAY-E				E
F	Ph. Check - 8		Excl. Ped WK		NAND-2		OR-8		Spec. Event 2		DELAY-F				F

Assignable Outputs <E/127+Column+Row>

INTERSECTION: EASTGATE MALL & TOWNE CENTRE DR

233 Program

Group Assignment:
Field Master Assignment:
System Reference Number:

N/S Street: Towne Centre Dr
E/W Street: Eastgate Mall

Last Database Change:
Timing sheets by: JMV
Approved by:
Timing implemented on: 9/15/2010

N

Row	Phase Numbers--->	1	2	3	4	5	6	7	8
			Eastgate Mall		Towne Centre Dr		Eastgate Mall		Towne Centre Dr
0	Ped Walk		7		7		7		7
1	Ped FDW		20		19		19		19
2	Min Green	4	7	4	7	4	7	4	7
3	Type 3 Disconnect								
4	Added per Vehicle								
5	Veh Extension	2.0	5.1	2.0	4.7	2.0	4.8	2.0	4.7
6	Max Gap	2.0	5.1	2.0	4.7	2.0	4.8	2.0	4.7
7	Min Gap	2.0	0.2	2.0	0.2	2.0	0.2	2.0	0.2
8	Max Limit	30	60	30	40	30	60	30	40
9	Max Limit 2								
A	Adv. / Delay Walk								
B	PE Min Ped FDW								
C	Cond Serv Check								
D	Reduce Every		0.6		0.7		0.7		0.7
E	Yellow Change	3.4	3.9	3.4	4.2	3.4	4.7	3.4	4.2
F	Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Phase Timing - Bank 1 <F/1+Phase+Row>

	E
RR-1 Delay	
RR-1 Clear	
EV-A Delay	0
EV-A Clear	0
EV-B Delay	0
EV-B Clear	0
EV-C Delay	0
EV-C Clear	0
EV-D Delay	0
EV-D Clear	0
RR-2 Delay	
RR-2 Clear	
View EV Delay	---
View EV Clear	---
View RR Delay	---
View RR Clear	---

Preempt Timing <F/1+E+Row>

	F	Row
Permit	12345678	0
Red Lock		1
Yellow Lock		2
Min Recall		3
Ped Recall		4
View Set Peds		5
Rest In Walk		6
Red Rest		7
Double Entry		8
Max Recall		9
Soft Recall	_2__6__	A
Max 2		B
Cond. Service		C
Man Cntrl Calls		D
Yellow Start	_2__6__	E
First Phases	___4__8	F

Phase Functions <F/1+F+Row>

Current Calculated Cycle Length: C/0 + B + F

	9	A	B	C	D
	---	---	---	---	---
Phase 1					
Phase 2					
Phase 3					
Phase 4					
Phase 5					
Phase 6					
Phase 7					
Phase 8					
Max Initial					
Alternate Walk					
Alternate FDW					
Alternate Initial					
Alternate Extension					

Alternate Timing <F/1+Column+Phase>

Drop Number		<C/0+0+0>
Zone Number		<C/0+0+1>
Area Number		<C/0+0+2>
Area Address		<C/0+0+3>
QuicNet Channel		(QuicNet)

Communication Addresses

(Outputs specified in Assignable Outputs at E/127+A+E & F)

Exclusive Walk	0	<F/1+0+0>
Exclusive FDW	0	<F/1+0+1>
All Red Clear	0.0	<F/1+0+2>

Exclusive Ped Phase

Flash Start	0	<F/1+0+E>
Red Revert	6.0	<F/1+0+F>
All Red Start	0.0	<F/1+C+0>

Start / Revert Times

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

Manual Plan	14	<C/0+A+1>
Manual Offset	0	<C/0+B+1>

Manual Selection

Notes: 34681-8-D

Free Lag	_2_4_6_8	<C/1+F+0>

How to Set Page Access Code:
F/1 – C + 0 + F = 1
F + 9 + E = 1

5

Version: 233 RV
Rivision: San Diego 1

INTERSECTION: EASTGATE MALL & TOWNE CENTRE DR

233 Program

Row		Overlap 1	2	3	4	5	6	7	8
0	Load Switch Number								
1	Veh Set 1 - Phases								
2	Veh Set 2 - Phases								
3	Veh Set 3 - Phases								
4	Neg Veh Phases								
5	Neg Ped Phases								
6	Green Omit Phases								
7	Green Clear Omit Phs.								
8									
9									
A									
B									
C									
D	Green Clear								
E	Yellow Change								
F	Red Clear								

Overlap Assignments <E/29+Column+Row>

	F	Row
Fast Green Flash Phase		0
Green Flash Phases		1
Flashing Walk Phases		2
Guaranteed Passage		3
Simultaneous Gap Term		4
Sequential Timing		5
Advance Walk Phases		6
Delay Walk Phases		7
External Recall		8
Start-up Overlap Green		9
Max Extension		A
Inhibit Ped Reservice		B
Semi-Actuated		C
Start-up Overlap Yellow		D
Start-up Vehicle Calls		E
Start-up Ped Calls		F

Specials <F/2+F+Row>

Row		E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	
5	Flash to PE Circuits	
6	Flash Entry Phases	
7	Disable Yellow Range	
8	Disable Ovp Yel Range	
9	Overlap Yellow Flash	
A	EV-A Phases	2 5
B	EV-B Phases	4 7
C	EV-C Phases	1 6
D	EV-D Phases	3 8
E	Extra 1 Config. Bits	1 345
F	IC Select (Interconnect)	2

Configuration <E/125+E+Row>

	F
Ext. Permit 1 Phases	
Ext. Permit 2 Phases	
Exclusive Ped Assign	
Preempt Non-Lock	12345678
Ped for 2P Output	2
Ped for 6P Output	6
Ped for 4P Output	4
Ped for 8P Output	8
Yellow Flash Phases	
Low Priority A Phases	
Low Priority B Phases	
Low Priority C Phases	
Low Priority D Phases	
Restricted Phases	
Extra 2 Config. Bits	

Configuration <E/125+F+Row>

	C	Row
EV-A		0
EV-B		1
EV-C		2
EV-D		3
RR-1 *	- - -	4
RR-2 *	- - -	5
SE-1	0	6
SE-2	0	7
		8
		9
		A
		B
		C
		D
		E
		F

<E/125+C+Row>

Preemption Priority

(* RR-1 is always Highest, and RR-2 is always Second Highest)

	2	Row
		0
Phase 1	0	1
Phase 2	0	2
Phase 3	0	3
Phase 4	0	4
Phase 5	0	5
Phase 6	0	6
Phase 7	0	7
Phase 8	0	8
		9
		A
		B
		C
		D
		E
		F

<C/5+2+Row>

Coordination Transition Minimums

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = EV Advance
5 = Extended Status
6 = International Ped
7 = Flash - Clear Outputs
8 = Split Ring

IC Select Flags
1 =
2 = Modem
3 = 7-Wire Slave
4 = Flash / Free
5 =
6 = Simplex Master
7 = 7-Wire Master
8 = Offset Interrupter

Extra 2 Flags
1 = AWB During Initial
2 = LMU Installed
3 = Disable Min Walk
4 = QuicNet/4 System
5 = Ignore P/P on EV
6 =
7 = Reserved
8 =

Flash to PE & PE Non-Lock
1 = EV A 5 = RR 1
2 = EV B 6 = RR 2
3 = EV C 7 = SE 1
4 = EV D 8 = SE 2

8-0 Hour, Minute, Day-of-Week
8-1 Day-of-Month, Year, Month
8-F Seconds

Time and Date

Begin Month	0	<C/5+2+A>
Begin Week	0	<C/5+2+B>
End Month	0	<C/5+2+C>
End Week	0	<C/5+2+D>

Daylight Savings Time

Daylight Savings Date:
If set to all zeros, standard dates will be used.

INTERSECTION: EASTGATE MALL & TOWNE CENTRE DR — 233 Program

		0	1	2	3	1	3
Row	Detector Name	C1 Pin Number	Attributes	Phase(s)	Assign	Delay	Carry-Over
0	2I2U	39					1.8
1	6J2U	40					1.8
2	4 I6U	41					1.8
3	8 J6U	42					1.8
4		43					
5		44					
6		45					
7		46					
8		47					
9		48					
A		49					
B		50					
C		55					
D		56					
E		57					
F		58					

		4	5	6	7	2	4
Row	Detector Name	C1 Pin Number	Attributes	Phase(s)	Assign	Delay	Carry-Over
0		59					
1		60					
2		61					
3		62					
4		63					
5		64					
6		65					
7		66					
8		67					
9		68					
A		69					
B		70					
C		76					
D		77					
E		78					
F		79					

Detector Assignments <E/126+Column+Row> <D/0+Column+Row>

Program Type:

Detector Attributes
1 = Full Time Delay
2 = Ped Call
3 =
4 = Count
5 = Extension
6 = Type 3
7 = Calling
8 = Alternate

Det. Assignments
1 = Det. Set 1
2 = Det. Set 2
3 = Det. Set 3
4 =
5 =
6 = Failure - Min Recall
7 = Failure - Max Recall
8 = Report on Failure

	Ped / Phase / Overlap								
	1	2	3	4	5	6	7	8	Row
Walk									0
Don't Walk									1
Phase Green									2
Phase Yellow									3
Phase Red									4
Overlap Green									5
Overlap Yellow									6
Overlap Red									7

Redirect Phase Outputs <E/127+Column+Row>

Cabinet Type	0

<E/125+D+0>

Enable Redirection
(Enable Redirection = 30)

Max OFF (minutes)	20	<D/0+0+1>
Max ON (minutes)	60	<D/0+0+2>

Detector Failure Monitor

	D	Row
		0
Output Port 1		1
Output Port 2		2
Output Port 3		3
Output Port 4		4
Output Port 5		5
Output Port 6		6
Output Port 7		7

Dimming <E/125+D+Row>

	D
Number of Digits	
1 st Digit	
2 ed Digit	
3 ed Digit	
4 th Digit	
5 th Digit	
6 th Digit	
7 th Digit	
8 th Digit	
9 th Digit	
10 th Digit	
11 th Digit	
12 th Digit	
13 th Digit	
14 th Digit	
15 th Digit	

<C/5+D+Row>

Dial-Back Telephone Number

Disable Alarms
1 = Stop Time
2 = Flash Sense
3 = Keyboard Entry
4 = Manual Plan
5 = Police Control
6 = External Alarm
7 = Detector Failure
8 =

	B	Row
DELAY-A	1	A
DELAY-B	1	B
DELAY-C	0	C
DELAY-D	0	D
DELAY-E	0	E
DELAY-F	0	F

<D/0+B+Row> (seconds)

Delay Logic Times

Omit Alarm	#NAME?

<C/5+F+0>

Disable Alarm Reporting

Time	0	<C/5+C+0>

Redial Time (minutes)
(View Redial Timer at E/2+D+6)

Row	Column 9		Column A		Column B		Column C		Column D		Column E		Column F		Row
0	Spec. Funct. 1		NOT-3		Max 2		Pretimed		Set Monday		Dial 2 (7-Wire)		Slm Term		0
1	Spec. Funct. 2		NOT-4		System Det 1		Plan 1		Ext. Perm 1		Dial 3 (7-Wire)		EV-A		1
2	Spec. Funct. 3		OR-4 (a)		System Det 2		Plan 2		Ext. Perm 2		Offset 1 (7-Wire)		EV-B		2
3	Spec. Funct. 4		OR-4 (b)		System Det 3		Plan 3		Dimming		Offset 2 (7-Wire)		EV-C		3
4	NAND-3 (a)		OR-5 (a)		System Det 4		Plan 4		Set Clock		Offset 3 (7-Wire)		EV-D		4
5	NAND-3 (b)		OR-5 (b)		System Det 5		Plan 5		Stop Time		Free (7-Wire)		RR-1		5
6	NAND-4 (a)		OR-6 (a)		System Det 6		Plan 6		Flash Sense	81	Flash (7-Wire)		RR-2		6
7	NAND-4 (b)		OR-6 (b)		System Det 7		Plan 7		Manual Enable		Excl. Ped Omit		Spec. Event 1		7
8	OR-7 (a)		Fig 3 Diamond		System Det 8		Plan 8		Man. Advance		NOT-1		Spec. Event 2		8
9	OR-7 (b)		Fig 4 Diamond		Max Inhibit (nema)		Plan 9		External Alarm		NOT-2		External Lag		9
A	OR-7 (c)		AND-4 (a)		Force A (nema)		DELAY-A		Phase Bank 2		OR-1 (a)		AND-1 (a)		A
B	OR-7 (d)		AND-4 (b)		Force B (nema)		DELAY-B		Phase Bank 3		OR-1 (b)		AND-1 (b)		B
C	OR-8 (a)		NAND-1 (a)		C.N.A. (nema)		DELAY-C		Overlap Set 2		OR-2 (a)		AND-2 (a)		C
D	OR-8 (b)		NAND-1 (b)		Hold (nema)		DELAY-D		Overlap Set 3		OR-2 (b)		AND-2 (b)		D
E	OR-8 (c)		NAND-2 (a)		Max Recall		DELAY-E		Detector Set 2		OR-3 (a)		AND-3 (a)		E
F	OR-8 (d)		NAND-2 (b)		Min Recall		DELAY-F		Detector Set 3		OR-3 (b)		AND-3 (b)		F

Assignable Inputs <E/126+Column+Row>

Row	Column 9		Column A		Column B		Column C		Column D		Column E		Column F		Row
0	Phase ON - 1		Preempt Fail		Flasher 0		Free		NOT-1		TOD Out 1		Dial 2 (7-Wire)		0
1	Phase ON - 2		Sp Evnt Out 1		Flasher 1		Plan 1		OR-1		TOD Out 2		Dial 3 (7-Wire)		1
2	Phase ON - 3		Sp Evnt Out 2		Fast Flasher		Plan 2		OR-2		TOD Out 3		Offset 1 (7-Wire)		2
3	Phase ON - 4		Sp Evnt Out 3		Fig 3 Diamond		Plan 3		OR-3		TOD Out 4		Offset 2 (7-Wire)		3
4	Phase ON - 5		Sp Evnt Out 4		Fig 4 Diamond		Plan 4		AND-1		TOD Out 5		Offset 3 (7-Wire)		4
5	Phase ON - 6		Sp Evnt Out 5				Plan 5		AND-2		TOD Out 6		Free (7-Wire)		5
6	Phase ON - 7		Sp Evnt Out 6				Plan 6		AND-3		TOD Out 7		Flash (7-Wire)		6
7	Phase ON - 8		Sp Evnt Out 7				Plan 7		NOT-2		TOD Out 8		Preempt		7
8	Ph. Check - 1		Sp Evnt Out 8		NOT-3		Plan 8		EV-A		Adv. Warn - 1		Low Priority A		8
9	Ph. Check - 2				NOT-4		Plan 9		EV-B		Adv. Warn - 2		Low Priority B		9
A	Ph. Check - 3		Detector Fail		OR-4		Spec. Funct. 3		EV-C		DELAY-A		Low Priority C		A
B	Ph. Check - 4		Spec. Funct. 1		OR-5		Spec. Funct. 4		EV-D		DELAY-B		Low Priority D		B
C	Ph. Check - 5		Spec. Funct. 2		OR-6		NAND-3		RR-1		DELAY-C				C
D	Ph. Check - 6		Central Control		AND-4		NAND-4		RR-2		DELAY-D				D
E	Ph. Check - 7		Excl. Ped DW		NAND-1		OR-7		Spec. Event 1		DELAY-E				E
F	Ph. Check - 8		Excl. Ped WK		NAND-2		OR-8		Spec. Event 2		DELAY-F				F

Assignable Outputs <E/127+Column+Row>

INTERSECTION: TOWNE CENTER & EXECUTIVE

Group Assignment: NONE
Field Master Assignment: NONE
System Reference Number: 632

N/S Street Name: TOWNE CENTER
E/W Street Name: EXECUTIVE

Last Database Change: 8/6/2012 14:07

Change Record					
Change	By	Date	Change	By	Date
SUPERLOOP		5/12			

Notes:

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

Drop Number	7	<C/0+0+0>
Zone Number	7	<C/0+0+1>
Area Number	4	<C/0+0+2>
Area Address	47	<C/0+0+3>
QuicNet Channel	COM46:	(QuicNet)

Communication Addresses

Manual Plan		<C/0+A+1>
Manual Offset		<C/0+B+1>

Manual Selection

Flash Start	0	<F/1+0+E>
Red Revert	5.0	<F/1+0+F>
All Red Start	5.0	<F/1+C+0>

Start / Revert Times

Exclusive Walk	0	<F/1+0+0>
Exclusive FDW	0	<F/1+0+1>
All Red Clear	0.0	<F/1+0+2>

Exclusive Ped Phase
(Outputs specified in Assignable Outputs at E/127+A+E & F)

Row	Column Numbers —>	1	2	3	4	5	6	7	8
	Phase Names —>	PPLT				PPLT			
0	Ped Walk	0	7	0	7	0	7	0	7
1	Ped FDW	0	20	0	20	0	19	0	21
2	Min Green	4	7	4	4	4	7	4	7
3	Type 3 Disconnect	0	0	0	0	0	0	0	0
4	Added per Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Veh Extension	2.0	3.8	2.0	5.3	2.0	3.8	2.0	5.4
6	Max Gap	2.0	3.8	2.0	5.3	2.0	3.8	2.0	5.4
7	Min Gap	2.0	0.2	2.0	0.2	2.0	0.2	2.0	0.2
8	Max Limit	30	60	30	40	30	60	30	40
9	Max Limit 2	0	0	0	0	0	0	0	0
A	Adv. / Delay Walk	0	0	0	0	0	0	0	0
B	PE Min Ped FDW	0	1	0	1	0	1	0	1
C	Cond Serv Check	0	0	0	0	0	0	0	0
D	Reduce Every	0.0	0.8	0.0	0.6	0.0	0.8	0.0	0.6
E	Yellow Change	3.4	3.9	3.4	3.9	3.4	4.3	3.4	3.9
F	Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Phase Timing - Bank 1 <C+0+F=1>

	9 Max Initial	A Alternate Walk	B Alternate FDW	C Alternate Initial	D Alternate Extension
	---	---	---	---	---
Phase 1	0	0	0	0	0.0
Phase 2	20	0	0	0	0.0
Phase 3	0	0	0	0	0.0
Phase 4	20	0	0	0	0.0
Phase 5	0	0	0	0	0.0
Phase 6	20	0	0	0	0.0
Phase 7	0	0	0	0	0.0
Phase 8	20	0	0	0	0.0

Alternate Timing <C+0+F=1>

	E
RR-1 Delay	0
RR-1 Clear	0
EV-A Delay	0
EV-A Clear	0
EV-B Delay	0
EV-B Clear	0
EV-C Delay	0
EV-C Clear	0
EV-D Delay	0
EV-D Clear	0
RR-2 Delay	0
RR-2 Clear	0
View EV Delay	---
View EV Clear	---
View RR Delay	---
View RR Clear	---

Preempt Timing

	F	Row
Permit	12345678	0
Red Lock		1
Yellow Lock		2
Min Recall	2 6	3
Ped Recall		4
View Set Peds	-----	5
Rest In Walk		6
Red Rest		7
Dual Entry		8
Max Recall		9
Soft Recall		A
Max 2		B
Cond. Service		C
Man Cntrl Calls		D
Yellow Start	2 6	E
First Phases	3 7	F

Phase Functions <C+0+F=1>

Overlap Assignments <C+0+E=29>

Row	Column Numbers → / Overlap Name →	Overlap 1	2	3	4	5	6	7	8
0	Load Switch Number	0	0	0	0	0	0	0	0
1	Veh Set 1 - Phases								
2	Veh Set 2 - Phases								
3	Veh Set 3 - Phases								
4	Neg Veh Phases								
5	Neg Ped Phases								
6	Green Omit Phases								
7	Green Clear Omit Phs.								
8									
9									
A									
B									
C									
D	Green Clear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
E	Yellow Change	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
F	Red Clear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = Solid FDW on EV
5 = Extended Status
6 = International Ped
7 = Flash - Clear Outputs
8 = Split Ring

Extra 2 Flags
1 = AWB During Initial
2 = LMU Installed
3 = Disable Min Walk
4 = QuicNet/4 System
5 = Ignore P/P on EV
6 =
7 = Reserved
8 =

Preempt Priority <C+0+E=125>

	C	Row
EV-A	0	0
EV-B	0	1
EV-C	0	2
EV-D	0	3
RR-1 *	---	4
RR-2 *	---	5
SE-1	0	6
SE-2	0	7

(* RR-1 is always Highest, and RR-2 is always Second Highest)

Configuration <C+0+E=125>

Row	Column Numbers →	E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	1 5
5	Flash to PE Circuits	
6	Flash Entry Phases	
7	Disable Yellow Range	
8	Disable Ovp Yel Range	
9	Overlap Yellow Flash	
A	EV-A Phases	2 5
B	EV-B Phases	4 7
C	EV-C Phases	1 6
D	EV-D Phases	3 8
E	Extra 1 Config. Bits	1 345
F	IC Select (Interconnect)	2

Configuration <C+0+E=125>

	F
Ext. Permit 1 Phases	
Ext. Permit 2 Phases	
Exclusive Ped Assign	
Preempt Non-Lock	12345678
Ped for 2P Output	2
Ped for 6P Output	6
Ped for 4P Output	4
Ped for 8P Output	8
Yellow Flash Phases	
Low Priority A Phases	
Low Priority B Phases	
Low Priority C Phases	
Low Priority D Phases	
Restricted Phases	
Extra 2 Config. Bits	3

Specials <C+0+F=2>

	F
Fast Green Flash Phase	
Green Flash Phases	
Flashing Walk Phases	
Guaranteed Passage	
Simultaneous Gap Term	12345678
Sequential Timing	
Advance Walk Phases	
Delay Walk Phases	
External Recall	
Start-up Overlap Green	
Max Extension	
Inhibit Ped Reservice	
Semi-Actuated	
Start-up Overlap Yellow	
Start-up Vehicle Calls	12345678
Start-up Ped Calls	12345678

Flash to PE & PE Non-Lock
1 = EV A 5 = RR 1
2 = EV B 6 = RR 2
3 = EV C 7 = SE 1
4 = EV D 8 = SE 2

IC Select Flags
1 =
2 = Modem
3 = 7-Wire Slave
4 = Flash / Free
5 =
6 = Simplex Master
7 = 7-Wire Master
8 = Offset Interrupter

Coordination Transition Minimums <C+0+C=5>

	2	Row
		0
Phase 1	10	1
Phase 2	10	2
Phase 3	10	3
Phase 4	10	4
Phase 5	10	5
Phase 6	10	6
Phase 7	10	7
Phase 8	10	8

Row	Column Numbers —>	1	2	3	4	5	6	7	8	9	Row
	Plan Name —>										
0	Cycle Length	100	100	100	100	100	100	100	100	100	0
1	Phase 1 - ForceOff	55	55	55	55	55	55	55	55	55	1
2	Phase 2 - ForceOff	0	0	0	0	0	0	0	0	0	2
3	Phase 3 - ForceOff	20	20	20	20	20	20	20	20	20	3
4	Phase 4 - ForceOff	40	40	40	40	40	40	40	40	40	4
5	Phase 5 - ForceOff	55	55	55	55	55	55	55	55	55	5
6	Phase 6 - ForceOff	0	0	0	0	0	0	0	0	0	6
7	Phase 7 - ForceOff	20	20	20	20	20	20	20	20	20	7
8	Phase 8 - ForceOff	40	40	40	40	40	40	40	40	40	8
9	Ring Offset	0	0	0	0	0	0	0	0	0	9
A	Offset 1	0	0	0	0	0	0	0	0	0	A
B	Offset 2	0	0	0	0	0	0	0	0	0	B
C	Offset 3	0	0	0	0	0	0	0	0	0	C
D	Perm 1 - End	15	15	15	15	15	15	15	15	15	D
E	Hold Release	255	255	255	255	255	255	255	255	255	E
F	Zone Offset	0	0	0	0	0	0	0	0	0	F

Coordination - Bank 1 <C+0+C=1>

Coord Extra
1 = Programmed WALK Time for Sync Phases
2 = Always Terminate Sync Phase Peds

Row		E	Row
0			0
1	Plan 1 - Sync	2 6	1
2	Plan 2 - Sync	2 6	2
3	Plan 3 - Sync	2 6	3
4	Plan 4 - Sync	2 6	4
5	Plan 5 - Sync	2 6	5
6	Plan 6 - Sync	2 6	6
7	Plan 7 - Sync	2 6	7
8	Plan 8 - Sync	2 6	8
9	Plan 9 - Sync	2 6	9
A	NEMA Sync		A
B	NEMA Hold		B
C			C
D			D
E	Coord Extra		E
F			F

Sync Phases <C+0+C=1>

Row		1	2	3	4	5	6	7	8	9	Row
0	Ped Adjustment	0	0	0	0	0	0	0	0	0	0
1	Perm 2 - Start	0	0	0	0	0	0	0	0	0	1
2	Perm 2 - End	0	0	0	0	0	0	0	0	0	2
3	Perm 3 - Start	0	0	0	0	0	0	0	0	0	3
4	Perm 3 - End	0	0	0	0	0	0	0	0	0	4
5	Reservice Time	0	0	0	0	0	0	0	0	0	5
6	Reservice Phases										6
7											7
8	Pretimed Phases										8
9	Max Recall										9
A	Perm 1 Veh Phase	12345678	12345678	12345678	12345678	12345678	12345678	12345678	12345678	12345678	A
B	Perm 1 Ped Phase	12345678	12345678	12345678	12345678	12345678	12345678	12345678	12345678	12345678	B
C	Perm 2 Veh Phase										C
D	Perm 2 Ped Phase										D
E	Perm 3 Veh Phase										E
F	Perm 3 Ped Phase										F

Coordination - Bank 2 <C+0+C=2>

Row			Row
0	Free Lag	2 4 6 8	0
1	Plan 1 - Lag	2 4 6 8	1
2	Plan 2 - Lag	2 4 6 8	2
3	Plan 3 - Lag	2 4 6 8	3
4	Plan 4 - Lag	2 4 6 8	4
5	Plan 5 - Lag	2 4 6 8	5
6	Plan 6 - Lag	2 4 6 8	6
7	Plan 7 - Lag	2 4 6 8	7
8	Plan 8 - Lag	2 4 6 8	8
9	Plan 9 - Lag	2 4 6 8	9
A	External Lag		A
B			B
C			C
D			D
E			E
F			F

Lag Phases <C+0+C=1>

Row	Column 9		Column A		Column B		Column C		Column D		Column E		Column F		Row
0	Spec. Funct. 1	0	NOT-3	0	Max 2	0	Pretimed	0	Set Monday	0	Dial 2 (7-Wire)	0	Sim Term	0	0
1	Spec. Funct. 2	0	NOT-4	0	System Det 1	0	Plan 1	0	Ext. Perm 1	0	Dial 3 (7-Wire)	0	EV-A	71	1
2	Spec. Funct. 3	0	OR-4 (a)	0	System Det 2	0	Plan 2	0	Ext. Perm 2	0	Offset 1 (7-Wire)	0	EV-B	72	2
3	Spec. Funct. 4	0	OR-4 (b)	0	System Det 3	0	Plan 3	0	Dimming	0	Offset 2 (7-Wire)	0	EV-C	73	3
4	NAND-3 (a)	0	OR-5 (a)	0	System Det 4	0	Plan 4	0	Set Clock	0	Offset 3 (7-Wire)	0	EV-D	74	4
5	NAND-3 (b)	0	OR-5 (b)	0	System Det 5	0	Plan 5	0	Stop Time	82	Free (7-Wire)	0	RR-1	51	5
6	NAND-4 (a)	0	OR-6 (a)	0	System Det 6	0	Plan 6	0	Flash Sense	81	Flash (7-Wire)	0	RR-2	52	6
7	NAND-4 (b)	0	OR-6 (b)	0	System Det 7	0	Plan 7	0	Manual Enable	0	Excl. Ped Omit	0	Spec. Event 1	0	7
8	OR-7 (a)	0	Fig 3 Diamond	0	System Det 8	0	Plan 8	0	Man. Advance	0	NOT-1	0	Spec. Event 2	0	8
9	OR-7 (b)	0	Fig 4 Diamond	0	Max Inhibit (nema)	0	Plan 9	0	External Alarm	0	NOT-2	0	External Lag	0	9
A	OR-7 (c)	0	AND-4 (a)	0	Force A (nema)	0	DELAY-A	0	Phase Bank 2	0	OR-1 (a)	0	AND-1 (a)	0	A
B	OR-7 (d)	0	AND-4 (b)	0	Force B (nema)	0	DELAY-B	0	Phase Bank 3	0	OR-1 (b)	0	AND-1 (b)	0	B
C	OR-8 (a)	0	NAND-1 (a)	0	C.N.A. (nema)	0	DELAY-C	0	Overlap Set 2	0	OR-2 (a)	0	AND-2 (a)	0	C
D	OR-8 (b)	0	NAND-1 (b)	0	Hold (nema)	0	DELAY-D	0	Overlap Set 3	0	OR-2 (b)	0	AND-2 (b)	0	D
E	OR-8 (c)	0	NAND-2 (a)	0	Max Recall	0	DELAY-E	0	Detector Set 2	0	OR-3 (a)	0	AND-3 (a)	0	E
F	OR-8 (d)	0	NAND-2 (b)	0	Min Recall	0	DELAY-F	0	Detector Set 3	0	OR-3 (b)	0	AND-3 (b)	0	F

Assignable Inputs <C+0+E=126>

Row	Column 9		Column A		Column B		Column C		Column D		Column E		Column F		Row
0	Phase ON - 1	0	Preempt Fail	0	Flasher 0	0	Free	0	NOT-1	0	TOD Out 1	0	Dial 2 (7-Wire)	0	0
1	Phase ON - 2	0	Sp Evnt Out 1	0	Flasher 1	0	Plan 1	0	OR-1	0	TOD Out 2	0	Dial 3 (7-Wire)	0	1
2	Phase ON - 3	0	Sp Evnt Out 2	0	Fast Flasher	0	Plan 2	0	OR-2	0	TOD Out 3	0	Offset 1 (7-Wire)	0	2
3	Phase ON - 4	0	Sp Evnt Out 3	0	Fig 3 Diamond	0	Plan 3	0	OR-3	0	TOD Out 4	0	Offset 2 (7-Wire)	0	3
4	Phase ON - 5	0	Sp Evnt Out 4	0	Fig 4 Diamond	0	Plan 4	0	AND-1	0	TOD Out 5	0	Offset 3 (7-Wire)	0	4
5	Phase ON - 6	0	Sp Evnt Out 5	0			Plan 5	0	AND-2	0	TOD Out 6	0	Free (7-Wire)	0	5
6	Phase ON - 7	0	Sp Evnt Out 6	0			Plan 6	0	AND-3	0	TOD Out 7	0	Flash (7-Wire)	0	6
7	Phase ON - 8	0	Sp Evnt Out 7	0			Plan 7	0	NOT-2	0	TOD Out 8	0	Preempt	0	7
8	Ph. Check - 1	0	Sp Evnt Out 8	0	NOT-3	0	Plan 8	0	EV-A	0	Adv. Warn - 1	0	Low Priority A	0	8
9	Ph. Check - 2	0			NOT-4	0	Plan 9	0	EV-B	0	Adv. Warn - 2	0	Low Priority B	0	9
A	Ph. Check - 3	0	Detector Fail	0	OR-4	0	Spec. Funct. 3	0	EV-C	0	DELAY-A	0	Low Priority C	0	A
B	Ph. Check - 4	0	Spec. Funct. 1	0	OR-5	0	Spec. Funct. 4	0	EV-D	0	DELAY-B	0	Low Priority D	0	B
C	Ph. Check - 5	0	Spec. Funct. 2	0	OR-6	0	NAND-3	0	RR-1	0	DELAY-C	0			C
D	Ph. Check - 6	0	Central Control	0	AND-4	0	NAND-4	0	RR-2	0	DELAY-D	0			D
E	Ph. Check - 7	0	Excl. Ped DW	0	NAND-1	0	OR-7	0	Spec. Event 1	0	DELAY-E	0			E
F	Ph. Check - 8	0	Excl. Ped WK	0	NAND-2	0	OR-8	0	Spec. Event 2	0	DELAY-F	0			F

Assignable Outputs <C+0+E=127>

Row	Column Numbers --->	1	2	3	4	5	6	7	8
	Phase Names --->								
0	Ped Walk	0	7	0	7	0	7	0	7
1	Ped FDW	0	15	0	15	0	15	0	15
2	Min Green	4	7	4	4	4	7	4	4
3	Type 3 Disconnect	0	20	0	20	0	20	0	20
4	Added per Vehicle	0.0	2.0	0.0	2.0	0.0	2.0	0.0	2.0
5	Veh Extension	2.0	4.0	2.0	2.5	2.0	4.0	2.0	2.5
6	Max Gap	3.0	6.0	3.0	3.0	3.0	6.0	3.0	3.0
7	Min Gap	0.5	2.0	0.5	1.5	0.5	2.0	0.5	1.5
8	Max Limit	20	30	20	25	20	30	20	25
9	Max Limit 2	30	50	30	40	30	50	30	40
A	Adv. / Delay Walk	0	0	0	0	0	0	0	0
B	PE Min Ped FDW	7	7	7	7	7	7	7	7
C	Cond Serv Check	10	10	10	10	10	10	10	10
D	Reduce Every	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
E	Yellow Change	3.0	4.0	3.0	3.0	3.0	4.0	3.0	3.0
F	Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Phase Timing - Bank 2 <C+0+F=2>

	9 (Max Initial)	A (Alternate Walk)	B (Alternate FDW)	C (Alternate Initial)	D (Alternate Extension)
	---	---	---	---	---
Phase 1	0	0	0	0	0.0
Phase 2	20	0	0	0	0.0
Phase 3	0	0	0	0	0.0
Phase 4	20	0	0	0	0.0
Phase 5	0	0	0	0	0.0
Phase 6	20	0	0	0	0.0
Phase 7	0	0	0	0	0.0
Phase 8	20	0	0	0	0.0

Alternate Timing

Row		1	2	3	4	5	6	7	8
0	Ped Walk	0	7	0	7	0	7	0	7
1	Ped FDW	0	15	0	15	0	15	0	15
2	Min Green	4	7	4	4	4	7	4	4
3	Type 3 Disconnect	0	20	0	20	0	20	0	20
4	Added per Vehicle	0.0	2.0	0.0	2.0	0.0	2.0	0.0	2.0
5	Veh Extension	2.0	4.0	2.0	2.5	2.0	4.0	2.0	2.5
6	Max Gap	3.0	6.0	3.0	3.0	3.0	6.0	3.0	3.0
7	Min Gap	0.5	2.0	0.5	1.5	0.5	2.0	0.5	1.5
8	Max Limit	20	30	20	25	20	30	20	25
9	Max Limit 2	30	50	30	40	30	50	30	40
A	Adv. / Delay Walk	0	0	0	0	0	0	0	0
B	PE Min Ped FDW	7	7	7	7	7	7	7	7
C	Cond Serv Check	10	10	10	10	10	10	10	10
D	Reduce Every	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
E	Yellow Change	3.0	4.0	3.0	3.0	3.0	4.0	3.0	3.0
F	Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Phase Timing - Bank 3 <C+0+F=3>

	9 (Max Initial)	A (Alternate Walk)	B (Alternate FDW)	C (Alternate Initial)	D (Alternate Extension)
	---	---	---	---	---
Phase 1	0	0	0	0	0.0
Phase 2	20	0	0	0	0.0
Phase 3	0	0	0	0	0.0
Phase 4	20	0	0	0	0.0
Phase 5	0	0	0	0	0.0
Phase 6	20	0	0	0	0.0
Phase 7	0	0	0	0	0.0
Phase 8	20	0	0	0	0.0

Alternate Timing

Transition Type
0.X = Shortway
1.X = Lengthen
X.1 thru X.4 = Number of cycles when lengthing

Transition Type	0.3	<C/5+1+9>

TBC Transition

Lag Hold Phases		<C/5+1+A>

Coordinated Lag Hold Phases

Sync Output Time	0.0	<C/5+1+C>

7-Wire Master

Daylight Savings Date
If set to all zeros, standard dates will be used.

Begin Month	3	<C/5+2+A>
Begin Week	2	<C/5+2+B>
End Month	11	<C/5+2+C>
End Week	1	<C/5+2+D>

Daylight Savings Time

Time B4 Yellow	0.0	<F/1+C+E>
Phase Number	0	<F/1+C+F>

Advance Warning Beacon - Sign 1

Time B4 Yellow	0.0	<F/1+D+E>
Phase Number	0	<F/1+D+F>

Advance Warning Beacon - Sign 2

Long Failure	0.7	<F/1+0+6>
Short Failure	0.7	<F/1+0+7>

Power Cycle Correction (Default = 0.7)

Row	Detector Name	C1 Pin Number (0)	Attributes (1)	Phase(s) (2)	Assign (3)	Delay (1)	Carry-over (3)
0	I-2-U	39	45_7	2	123 8	0.0	1.8
1	J-2-U	40	45_7	6	123 8	0.0	1.8
2	I-6-U	41	45_7	4	123 8	0.0	1.8
3	J-6-U	42	45_7	8	123 8	0.0	1.8
4	I-2-L	43	45_7	2	123 8	0.0	0.0
5	J-2-L	44	45_7	6	123 8	0.0	0.0
6	I-6-L	45	45_7	4	123 8	0.0	0.0
7	J-6-L	46	45_7	8	123 8	0.0	0.0
8	I-4	47	67	2	123 8	0.0	0.0
9	J-4	48	67	6	123 8	0.0	0.0
A	I-8	49	67	4	123 8	0.0	0.0
B	J-8	50	67	8	123 8	0.0	0.0
C	J-1	55	45_7	5	123 8	0.0	0.0
D	I-1	56	45_7	1	123 8	0.0	0.0
E	J-5	57	45_7	7	123 8	2.0	0.0
F	I-5	58	45_7	3	123 8	2.0	0.0

Row	Detector Name	C1 Pin Number (4)	Attributes (5)	Phase(s) (6)	Assign (7)	Delay (2)	Carry-over (4)
0	J-9-U	59	45_7	5	123 8	0.0	0.0
1	I-9-U	60	45_7	1	123 8	0.0	0.0
2	J-9-L	61	45_7	7	123 8	0.0	0.0
3	I-9-L	62	45_7	3	123 8	0.0	0.0
4	I-3-U	63	45_7	2	123 8	0.0	0.0
5	J-3-U	64	45_7	6	123 8	0.0	0.0
6	I-7-U	65	45_7	4	123 8	0.0	0.0
7	J-7-U	66	45_7	8	123 8	0.0	0.0
8	I-12-U (Ped)	67	2	2	123 8	0.0	0.0
9	I-13-U (Ped)	68	2	6	123 8	0.0	0.0
A	I-12-L (Ped)	69	2	4	123 8	0.0	0.0
B	I-13-L (Ped)	70	2	8	123 8	0.0	0.0
C	I-3-L	76	45_7	2	123 8	0.0	0.0
D	J-3-L	77	45_7	6	123 8	0.0	0.0
E	I-7-L	78	45_7	4	123 8	0.0	0.0
F	J-7-L	79	45_7	8	123 8	0.0	0.0

Detector Assignments <C+0+E=126> <C+0+D=0>

Detector Attributes
1 = Full Time Delay
2 = Ped Call
3 =
4 = Count
5 = Extension
6 = Type 3
7 = Calling
8 = Alternate

Det. Assignments
1 = Det. Set 1
2 = Det. Set 2
3 = Det. Set 3
4 =
5 =
6 = Failure - Min Recall
7 = Failure - Max Recall
8 = Report on Failure

	Ped / Phase / Overlap 1	2	3	4	5	6	7	8	Row
Walk	0	0	0	0	0	0	0	0	0
Don't Walk	0	0	0	0	0	0	0	0	1
Phase Green	0	0	0	0	0	0	0	0	2
Phase Yellow	0	0	0	0	0	0	0	0	3
Phase Red	0	0	0	0	0	0	0	0	4
Overlap Green	0	0	0	0	0	0	0	0	5
Overlap Yellow	0	0	0	0	0	0	0	0	6
Overlap Red	0	0	0	0	0	0	0	0	7

Redirect Phase Outputs <C+0+E=127>

Cabinet Type	0

<E/125+D+0>

Enable Redirection
(Enable Redirection = 30)

Max OFF (minutes)	20	<D/0+0+1>
Max ON (minutes)	7	<D/0+0+2>

Detector Failure Monitor

	D	Row
		0
Output Port 1		1
Output Port 2		2
Output Port 3		3
Output Port 4		4
Output Port 5		5
Output Port 6		6
Output Port 7		7

Dimming <C+0+E=125>

	D
Number of Digits	0
1 st Digit	0
2 ed Digit	0
3 ed Digit	0
4 th Digit	0
5 th Digit	0
6 th Digit	0
7 th Digit	0
8 th Digit	0
9 th Digit	0
10 th Digit	0
11 th Digit	0
12 th Digit	0
13 th Digit	0
14 th Digit	0
15 th Digit	0

<C+0+C=5>

Dial-Back Telephone Number

Disable Alarms
1 = Stop Time
2 = Flash Sense
3 = Keyboard Entry
4 = Manual Plan
5 = Police Control
6 = External Alarm
7 = Detector Failure
8 =

	E	Row
DELAY-A	0	A
DELAY-B	0	B
DELAY-C	0	C
DELAY-D	0	D
DELAY-E	0	E
DELAY-F	0	F

Delay Logic Times
<C+0+D=0> (seconds)

Omit Alarm	

<C/5+F+0>

Disable Alarm Reporting

Time	10

<C/5+C+0>

Redial Time (minutes)
(View Redial Timer at E/2+D+6)

TOD Coordination <C+0+9=0.1> (Bank 1)

Row	Time	Plan	Offset	Day of Week
0	00 : 00	0	0	
1	00 : 00	0	0	
2	00 : 00	0	0	
3	00 : 00	0	0	
4	00 : 00	0	0	
5	00 : 00	0	0	
6	00 : 00	0	0	
7	00 : 00	0	0	
8	00 : 00	0	0	
9	00 : 00	0	0	
A	00 : 00	0	0	
B	00 : 00	0	0	
C	00 : 00	0	0	
D	00 : 00	0	0	
E	00 : 00	0	0	
F	00 : 00	0	0	

TOD Function <C+0+7=0.1> / Column 4 <C+0+E=27>

Time	Funct.	Day of Week	Column 4 Phases/Bits
00 : 00	0		
00 : 00	0		
00 : 00	0		
00 : 00	0		
00 : 00	0		
00 : 00	0		
00 : 00	0		
00 : 00	0		
00 : 00	0		
00 : 00	0		
00 : 00	0		
00 : 00	0		
00 : 00	0		
00 : 00	0		
00 : 00	0		
00 : 00	0		

Holiday Dates <C+0+8=1.1> (Bank 1)

Day	Year	Month	Holiday Type
00	00	0	
00	00	0	
00	00	0	
00	00	0	
00	00	0	
00	00	0	
00	00	0	
00	00	0	
00	00	0	
00	00	0	
00	00	0	
00	00	0	
00	00	0	
00	00	0	
00	00	0	
00	00	0	

Holiday Events <C+0+9=1.1> (Bank 1)

Time	Plan	Offset	Holiday Type
00 : 00	0	0	
00 : 00	0	0	
00 : 00	0	0	
00 : 00	0	0	
00 : 00	0	0	
00 : 00	0	0	
00 : 00	0	0	
00 : 00	0	0	
00 : 00	0	0	
00 : 00	0	0	
00 : 00	0	0	
00 : 00	0	0	
00 : 00	0	0	
00 : 00	0	0	
00 : 00	0	0	
00 : 00	0	0	

TOD Coordination <C+0+9=0.2> (Bank 2)

Row	Time	Plan	Offset	Day of Week
0	00 : 00	0	0	
1	00 : 00	0	0	
2	00 : 00	0	0	
3	00 : 00	0	0	
4	00 : 00	0	0	
5	00 : 00	0	0	
6	00 : 00	0	0	
7	00 : 00	0	0	
8	00 : 00	0	0	
9	00 : 00	0	0	
A	00 : 00	0	0	
B	00 : 00	0	0	
C	00 : 00	0	0	
D	00 : 00	0	0	
E	00 : 00	0	0	
F	00 : 00	0	0	

Holiday TOD Function <C+0+7=0.2> / Column 4 <C+0+E=28>

Time	Funct.	Holiday Type	Column 4 Phases/Bits
00 : 00	0		
00 : 00	0		
00 : 00	0		
00 : 00	0		
00 : 00	0		
00 : 00	0		
00 : 00	0		
00 : 00	0		
00 : 00	0		
00 : 00	0		
00 : 00	0		
00 : 00	0		
00 : 00	0		
00 : 00	0		
00 : 00	0		
00 : 00	0		

Holiday Dates <C+0+8=1.2> (Bank 2)

Day	Year	Month	Holiday Type
00	00	0	
00	00	0	
00	00	0	
00	00	0	
00	00	0	
00	00	0	
00	00	0	
00	00	0	
00	00	0	
00	00	0	
00	00	0	
00	00	0	
00	00	0	
00	00	0	
00	00	0	
00	00	0	

Holiday Events <C+0+9=1.2> (Bank 2)

Time	Plan	Offset	Holiday Type
00 : 00	0	0	
00 : 00	0	0	
00 : 00	0	0	
00 : 00	0	0	
00 : 00	0	0	
00 : 00	0	0	
00 : 00	0	0	
00 : 00	0	0	
00 : 00	0	0	
00 : 00	0	0	
00 : 00	0	0	
00 : 00	0	0	
00 : 00	0	0	
00 : 00	0	0	
00 : 00	0	0	
00 : 00	0	0	

T.O.D. Functions

0 =
1 = Red Lock
2 = Yellow Lock
3 = Veh Min Recall
4 = Ped Recall
5 =
6 = Rest In Walk
7 = Red Rest
8 = Double Entry
9 = Veh Max Recall
A = Veh Soft Recall
B = Maximum 2
C = Conditional Service
D = Free Lag Phases
E = Bit 1 - Local Override
Bit 4 - Disable Detector OFF Monitor
Bit 5 - Disable Low Priority Preempt
Bit 7 - Detector Count Monitor
Bit 8 - Real Time Split Monitor
F = Output Bits 1 thru 8

Plan Select

1 thru 9 = Coordination Plan 1 thru 9
14 or E = Free
15 or F = Flash

Offset Select

A = Offset A
B = Offset B
C = Offset C

Month Select

1 = January
2 = February
3 = March
4 = April
5 = May
6 = June
7 = July
8 = August
9 = September
A = October
B = November
C = December

	6	7	8	9	A	B	C	D	E	F
Row	Clear	Time	Ped Call	Hold	Advance	Force Off	Vehicle Call	Permit Phases	Ped Omit	Output
0		0								
1		0								
2		0								
3		0								
4		0								
5		0								
6		0								
7		0								
8		0								
9		0								
A		0								
B		0								
C		0								
D		0								
E		0								
F		0								

Special Event Schedule -- Table 1 <C+0+E=27>

Notes:

0 <E/27+5+F>
Limited Service Interval

	6	7	8	9	A	B	C	D	E	F
Row	Clear	Time	Ped Call	Hold	Advance	Force Off	Vehicle Call	Permit Phases	Ped Omit	Output
0		0								
1		0								
2		0								
3		0								
4		0								
5		0								
6		0								
7		0								
8		0								
9		0								
A		0								
B		0								
C		0								
D		0								
E		0								
F		0								

Special Event Schedule -- Table 2 <C+0+E=28>

Notes:

0 <E/28+5+F>
Limited Service Interval

Min Time (seconds)	4	<F/1+0+8>

Min Green Before PE Force Off

Max Time (minutes)	4	<F/1+0+9>

Max Preempt Time Before Failure

Min Time (seconds)	0	<F/1+0+A>

Min Time Between Same Preempts
(Does Not Apply To Railroad Preempt)

Low Pri. Channel	______	<E/125+C+8>

Disable Low Priority Channel

Low Priority
1 = Channel A
2 = Channel B
3 = Channel C
4 = Channel D

Delay Time (seconds)	0	<F/1+A+D>

Bus Delay

Max Time (seconds)	0	<F/1+A+E>

Max Early Green

Max Time (seconds)	0	<F/1+A+F>

Max Green Extension

Row	Time	Headway	Direction	Day of Week
0	00 : 00	0	0	
1	00 : 00	0	0	
2	00 : 00	0	0	
3	00 : 00	0	0	
4	00 : 00	0	0	
5	00 : 00	0	0	
6	00 : 00	0	0	
7	00 : 00	0	0	
8	00 : 00	0	0	
9	00 : 00	0	0	
A	00 : 00	0	0	
B	00 : 00	0	0	
C	00 : 00	0	0	
D	00 : 00	0	0	
E	00 : 00	0	0	
F	00 : 00	0	0	

Headway <C+0+9=2.1>

Headway Time
(minutes)
1 thru 9 = 1 thru 9
A = 10
B = 11
C = 12
D = 13
E = 14
F = 15

Low Priority Preemption (Bus Priority)

Only available with *Program 233RV2.B* (and above)

Note: Also see "Time of Day Functions", Function E, Bit 5 (Disable Low Priority)

'NTERSECTION: LA JOLLA VILLAGE DR @ TOWNE CENT DR — 223 Pr m

Group Assignment:
Field Master Assignment:

N/S Street Name: TOWNE CENTRE
E/W Street Name: LA JOLLA VILLAGE

N

Row	Column # ---> / Phase # --->	1 (1+8) LA JOLLA VILLAGE	2 LA JOLLA VILLAGE	3 TOWNE CENTRE	4 TOWNE CENTRE	5 LA JOLLA VILLAGE	6 LA JOLLA VILLAGE	7 TOWNE CENTRE	8 TOWNE CENTRE
0	Ped Walk		7		7		7		5
1	Ped FDW		21		29		21		32
2	Min Green	4	10	4	4	4	10	4	4
3	Type 3 Limit								
4	Add/Veh								
5	Veh Extn	2.0	4.5	2.0	4.6	2.0	4.3	2.0	5.2
6	Max Gap	2.0	4.5	2.0	4.6	2.0	4.3	2.0	5.2
7	Min Gap	2.0	0.2	2.0	0.2	2.0	0.2	2.0	0.2
8	Max Limit	30	60	30	30	30	60	35	30
9	Max Limit 2								
A	Bus Adv								
B	Call to Phs								
C	Reduce By		0.1		0.1		0.1		0.1
D	Every		0.7		0.7		0.7		0.6
E	Yellow	3.4	4.5	3.4	4.3	3.4	4.3	3.4	4.0
F	Red Clear	1.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Phase Timing - Bank 1
F + Phase + Row
<F Page>

	E
RR-1 Delay	
RR-1 Clear	
EV-A Delay	0
EV-A Clear	0
EV-B Delay	0
EV-B Clear	0
EV-C Delay	0
EV-C Clear	0
EV-D Delay	0
EV-D Clear	0
RR-2 Delay	
RR-2 Clear	
View EV Delay	---
View EV Clear	---
View RR Delay	---
View RR Clear	---

F + E + Row

	F	Row
Permit	12345678	0
Red Lock		1
Yellow Lock		2
Min Recall	_2___6__	3
Ped Recall		4
Peds (View)	_2_4_6_8	5
Rest In Walk		6
Red Rest		7
Dbl Entry		8
Max Recall		9
Soft Recall		A
Max 2		B
Cond Serv		C
Ped Lock	12345678	D
Yellow Start	_2___6__	E
1st Phases	___3___7_	F

F + F + Row

Max Initial	0	F + 0 + E
Red Revert	5.0	F + 0 + F
All Red Start	0.0	F + C + 0

Start / Revert Times

Drop Number	5	C + 0 + 0
Zone Number	5	C + 0 + 1
Area Number	4	C + 0 + 2
Area Address	45	C + 0 + 3
QuicNet Channel	COM 46	(QuicNet)

Communication Addresses

C + F + 0		Row
Free Lag	_2_45__8	0

Lag Phases <C Page>

Overlap Timing

	Row	Green Clear	Yellow Change	Red Clear	Load-Switch #
Overlap A	A				
Overlap B	B				
Overlap C	C				
Overlap D	D				

<F Page> F + COLOR +
<D Page> D + 0 + OVERLAP

Manual Plan	0	C + A + 1
Manual Offset	0	C + B + 1

Manual Selection

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

Downtime Flash	255	(minutes)

Downtime Before Auto Manual Flash
F + 0 + 8

Disable Ports	_234____

Disable Communication Ports
D + D + 9

Timing Sheet By: M2S
Approved By: FLG
Drawing Number: 29562-3-D
Timing Implemented On: 04/23/10

9

INTERSECTION: LA JOLLA VILLAGE DR @ TOWNE CENTRE DR — 223 Program

Row	Time	Function	Day of Week	Column F Phases/Bits
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Function — 7 + ROW

<D Page> D + F + ROW

T.O.D. Functions
0 = Permitted Phases
1 = Red Lock
2 = Yellow Lock
3 = Veh Min Recall
4 = Ped Recall
5 =
6 = Rest In Walk
7 = Red Rest
8 = Double Entry
9 = Veh Max Recall
A = Veh Soft Recall
B = Maximum 2
C = Conditional Service
D = Free Lag Phases
E = Bit 1 - Local Override
Bit 2 - Phase Bank 2
Bit 3 - Phase Bank 3
Bit 4 - Disable Detector OFF Monitor
Bit 7 - Detector Count Monitor
Bit 8 - Real Time Split Monitor
F = Output Bits 1 thru 4

Row		F
0		
1	RR Overlap A - Phases	
2	RR Overlap B - Phases	
3	RR Overlap C - Phases	
4	RR Overlap D - Phases	
5	Ped 2P	2
6	Ped 6P	6
7	Ped 4P	4
8	Ped 8P	8
9	Yellow Flash Phases	
A	Overlap A - Phases	1 8
B	Overlap B - Phases	
C	Overlap C - Phases	
D	Overlap D - Phases	
E	Restricted Phases	
F	Assign 5 Outputs	1

Configuration — <E Page> E + F + ROW

Day of Week
1 = Sunday
2 = Monday
3 = Tuesday
4 = Wednesday
5 = Thursday
6 = Friday
7 = Saturday

Assign 5 Outputs
1 = Right Turn Overlap
2 = TOD Outputs
3 = EV Beacon - Steady
4 = EV Beacon - Flashing
5 = Special Event Outputs
6 = Phase 3 & 7 Ped
7 = Advanced Warning Sign
8 = Bus Advance

Row		E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	
5	Overlap A - Green Omit	8
6	Overlap B - Green Omit	
7	Overlap C - Green Omit	
8	Overlap D - Green Omit	
9	Overlap Yellow Flash	
A	EV-A Phases	2 5
B	EV-B Phases	4 7
C	EV-C Phases	1 6
D	EV-D Phases	3 8
E	Extra 1 Config. Bits	1 345
F	IC Select (Interconnect)	2

Configuration
E + E + ROW

For access, set F + 9 + E = 1

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = EV Advance
5 = Remote Download
6 = Special Event
7 = Pretimed Operation
8 = Split Ring Operation

IC Select Flags
1 =
2 = Modem
3 = 7-Wire Slave
4 = Flash / Free
5 =
6 = Simplex Master
7 = 7-Wire Master
8 = Offset Interrupter

Time and Date
8-0 Hour, Minute, Day-of-Week
8-1 Day-of-Month, Year, Month
8-F Seconds

Disable Parity	0	D+B+0

Dial-Up Telephone Communications
(If set to a non-zero value, parity will be disabled)

Program Information
C + C + 0 = program
C + C + F = version

Remote Download
C + 0 + 4 = 1 -255
w/ E + E + E bit 5 on

TERSECTION: LA JOLLA VILLAGE DR @ TOWN CENTRE DR — 223 Program

Row	1 Delay	3 Carry-over
0		
1		1.8
2		
3		
4		
5		
6		
7		1.8
8		
9		
A		
B		
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	1I1	14
	2I2U	1
	2I2L	5
	2I3U	21
	2I3L	25
	2I4	9
	3I5	16
	4I6U	3
	4I6L	7
	4I7U	23
	4I7L	27
	4I8	11
	1I9U	18
	3I9L	20
---	---	---
---	---	---

Row	2 Delay	4 Carry-over
0		
1		1.8
2		
3		
4		
5		
6		
7		1.8
8	10.0	
9		
A		
B		
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	5J1	13
	6J2U	2
	6J2L	6
	6J3U	22
	6J3L	26
	6J4	10
	7J5	15
	8J6U	4
	8J6L	8
	8J7U	24
	8J7L	28
	8J8	12
	5J9U	17
	7J9L	19
---	---	---
---	---	---

Detector Delay & Carryover <D Page>

D + X (across) + ROW

Row	Detector Numbers	E
A	1 2 3 4 5 6 7 8	12345678
B	9 10 11 12 – – – –	1234____
C	13 14 15 16 17 18 19 20	12345678
D	– – – – 21 22 23 24	____5678
E	– – – – – – – –	1234____
F	– 25 26 27 28 – – –	_2345___

Active Detectors <D Page>

Row		0 Detector #
0		
1	System Det. # 1	
2	System Det. # 2	
3	System Det. # 3	
4	System Det. # 4	
5	System Det. # 5	
6	System Det. # 6	
7	System Det. # 7	
8	System Det. # 8	

System Detectors <D Page>

Max ON (min)	5	D+A+E
Max OFF (min)	60	D+A+F

Detector Failure Monitor

Phase Number		F+C+1
Time Before Yellow		F+C+3

Advance Warning Beacon - Sign 1

Phase Number		F+D+1
Time Before Yellow		F+D+3

Advance Warning Beacon - Sign 2

Long Failure	0.5	F+0+6
Short Failure	0.5	F+0+7

Power Cycle Correction (Default = 0.5)

INTERSECTION: LA JOLLA VILLAGE DR @ TOWNE CENTRE DR

223 Program

Coordination Timing By: KH&A
Implemented On: 10/13/2009

Row	Column # --->	Plan 1	Plan 2	Plan 3	Plan 4	Plan 5	Plan 6	Plan 7	Plan 8	Plan 9
	Plan Name --->		MID			AM	PM			
0	Cycle Length		146			140	150			
1	Phase 1 - ForceOff		111			102	96			
2	Phase 2 - ForceOff		0			0	0			
3	Phase 3 - ForceOff		32			33	21			
4	Phase 4 - ForceOff		77			77	67			
5	Phase 5 - ForceOff		16			18	82			
6	Phase 6 - ForceOff		0			0	0			
7	Phase 7 - ForceOff		40			37	67			
8	Phase 8 - ForceOff		77			77	36			
9	Ring Offset									
A	Offset A		140			13	93			
B	Offset B									
C	Offset C									
D	Permissive		17			17	17			
E	Hold Release		255			255	255			
F	Ped Shift		0			0	6			

Coordination <C Page>
C + Plan + ROW

FOR OBSERVATION ONLY

Master Plan	C + A + 2
Current Plan	C + A + 3
Next Plan	C + A + 4
T.O.D. Plan	C + A + 5
Master Cycle	C + A + 0
Ring A Cycle	C + B + 0
Ring B Cycle	C + D + 0
Min Cycle	C + A + E
Max Cycle	C + B + E

Row	Time	Plan	Offset	Day of Week
0	06 : 30	5	A	_23456_
1	10 : 00	2	A	_23456_
2	15 : 00	6	A	_23456_
3	19 : 00	E	A	1234567
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Coordination
<9 Key with C+0+9=1>

	E	Row		F
		0	Free Lag	
Plan 1		1	Plan 1 - Lag	
Plan 2	_2__6__	2	Plan 2 - Lag	_2_45__8
Plan 3		3	Plan 3 - Lag	
Plan 4		4	Plan 4 - Lag	
Plan 5	_2__6__	5	Plan 5 - Lag	_2_45__8
Plan 6	_2__6__	6	Plan 6 - Lag	_2_4_67_
Plan 7		7	Plan 7 - Lag	
Plan 8		8	Plan 8 - Lag	
Plan 9		9	Plan 9 - Lag	
Coord Ped*		A	Coord Max *	
NEMA Hold		B	Coord Lag *	
		C		
		D		
		E		
		F		

Sync Phases — C + E + FUNCTION #
Lag Phases <C Page> — C + F + FUNCTION #

Plan Select
1 thru 9 = Coordination
Plan 1 thru 9
14 or E = Free
15 or F = Flash

Transition Type	0

TBC Transition
C + D + D

Transition Type
0 = Shortway
Non-zero = Lengthen

LOCATION: RTE 805 SB @ LA JOLLA VILLAGE DRIVE

CALTRANS C8 Version 3 DATE: 3/2/2015

F PAGE

	INTERVAL	PHASE TIMING									PRE-EMPTION		F									
		1	2	3	4	5	6	7	8	9	E		FLAGS	1	2	3	4	5	6	7	8	
0	WALK	1	1	1	1	1	7	1	1	CLK RST	EV SEL	0	PERMIT	1	2	3	4	5	6	7	8	0
1	DONT WALK	1	1	1	1	1	37	1	1		RR1 CLR	5	RED LOCK				4					1
2	MIN GREEN	1	15	1	5	5	15	1	1		EVA DLY	0	YEL LOCK									2
3	TYPE 3 DET	0	0	0	0	0	0	0	0		EVA CLR	5	V RECALL		2				6			3
4	ADD/VEH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		EVB DLY	0	P RECALL									4
5	PASSAGE	0.9	2.0	0.9	2.0	1.0	2.0	0.9	0.9		EVB CLR	5	PED PHASES						6			5
6	MAX GAP	0.9	2.0	0.9	2.0	1.0	2.0	0.9	0.9		EVC DLY	0	RT OLA									6
7	MIN GAP	0.9	2.0	0.9	2.0	1.0	2.0	0.9	0.9		EVC CLR	5	RT OLB									7
8	MAX EXT	9	45	9	45	20	45	9	9		EVD DLY	0	DBL ENTRY									8
9	MAX 2									YR	EVD CLR	5	MAX 2 PHASES									9
A	MAX 3									MO	MAX EV	255	LAG PHASES	READ ONLY								A
B										DAY	RR2 CLR	5	RED REST									B
C	REDUCE BY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	DOW			REST-IN-WALK									C
D	EVERY	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	HR			MAX 3 PHASES									D
E	YELLOW	3.7	5.5	3.0	4.1	3.7	5.5	3.0	3.0	MIN			YEL START UP		2				6			E
F	RED	1.0	2.0	1.0	1.5	1.0	2.0	1.0	1.0	SEC			FIRST PHASE				4					F
	PED XING FT						130							1	2	3	4	5	6	7	8	
	BIKE XING FT		52				140															

FOC LONG FAILURE	
FOD SHORT FAILURE	
FOE	0
FOF	5

FC0	3
FC1	3
FC2	10
FCA	0.0
FCB	0.0
FCC	0.0
FCD	0.0

FD0 TB SELECT	1
FD3 PED SELECT	0
FD4 7 WIRE	0
FD5 PERMISSIVE	0
FD8 OS SEEKING	1

C05 FLASH TYPE	1
CC2 DOWNLOAD	1

NOTES:

ENTRIES IN THESE LOCATIONS CAN BE CHANGED IN CC1 FLASH ONLY

LOCATION: RTE 805 SB @ LA JOLLA VILLAGE DRIVE

CALTRANS C8 Version 3 DATE: 3/2/2015

C PAGE

		CONTROL PLANS									Y-COORD			LAG PHASE	FLAGS									
		1	2	3	4	5	6	7	8	9		C	D	E	F	1	2	3	4	5	6	7	8	
0	CYCLE LENGTH	120	120	138											LAG FZ FREE		2		4		6		8	0
1	FZ1 GRN FCTR	0	0	0										GAPOUT CP1	LAG FZ CP 1		2		4		6		8	1
2														GAPOUT CP2	LAG FZ CP 2		2		4		6		8	2
3	FZ3 GRN FCTR	0	0	0										GAPOUT CP3	LAG FZ CP 3		2		4		6		8	3
4	FZ4 GRN FCTR	45	30	30							PERM TIME			GAPOUT CP4	LAG FZ CP 4									4
5	FZ5 GRN FCTR	20	15	15							LAG OFFSET			GAPOUT CP5	LAG FZ CP 5									5
6											FORCE OFF			GAPOUT CP6	LAG FZ CP 6									6
7	FZ7 GRN FCTR	0	0	0							LONG GRN			GAPOUT CP7	LAG FZ CP 7									7
8	FZ8 GRN FCTR	0	0	0							NO GREEN			GAPOUT CP8	LAG FZ CP 8									8
9	MULTI CYCLE	0	0	0										GAPOUT CP9	LAG FZ CP 9									9
A	OFFSET A	10	0	0							OFFSET				LAG C COORD									A
B	OFFSET B														LAG D COORD									B
C	OFFSET C														COORD FAZES		2				6			C
D	FZ 3 EXT																							D
E	FZ 7 EXT																							E
F	OFFSET INTRPT																							F
																1	2	3	4	5	6	7	8	

CO1 MANUAL CP
CO2 MASTER CP
CO3 CURRENT CP *SYSTEM MASTER:*
CO4 LAST CP
CO7 TRNSMT CP
COD MANUAL OFFSET
CAO LOCAL CYCLE TIMER
CBO MASTER CYCLE TIMER
CAA LOCAL OFFSET
CBA MASTER OFFSET

FEATURE	OFF	ON
1		
2		
3		
4		
5		
6		
7		
8		

LOCATION	OFF	ON
1		
2		1
3		
4		
5		
6		
7		
8		

COO = 2

CCB/CDB OFFSET TIMER
CCC/CDC LAG GREEN TIMER
CCD/CDD FORCE OFF TIMER
CCE/CDE LONG GREEN TIMER
CCF/CDF NO GREEN TIMER

LOCATION: RTE 805 SB @ LA JOLLA VILLAGE DRIVE

CALTRANS C8 Version 3 DATE: ########

D PAGE

	D	FLAGS								E	FLAGS								F	FLAGS							
	MAX	1	2	3	4	5	6	7	8	MIN	1	2	3	4	5	6	7	8	PED	1	2	3	4	5	6	7	8
0	RCL									RCL									RCL								
1	CP 1									CP 1									CP 1								
2	CP 2									CP 2									CP 2								
3	CP 3									CP 3									CP 3								
4	CP 4									CP 4									CP 4								
5	CP 5									CP 5									CP 5								
6	CP 6									CP 6									CP 6								
7	CP 7									CP 7									CP 7								
8	CP 8									CP 8									CP 8								
9	CP 9									CP 9									CP 9								
A																			RCL 1								
B																			RCL 2								
C																											
D																											
E																											
F																											
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8

E PAGE

	E	FLAGS								F	FLAGS								
	FUNCTION	1	2	3	4	5	6	7	8	FUNCTION	1	2	3	4	5	6	7	8	
0										CODE 4									0
1										CODE 5									1
2										C-RECALL									2
3										D-RECALL									3
4										EXCLUSIVE									4
5										2 PED		2							5
6										6 PED						6			6
7										4 PED				4					7
8										8 PED								8	8
9																			9
A	OLA NOT									OLA ON									A
B	OLB NOT									OLB ON									B
C	OLC NOT									OLC ON									C
D	OLD NOT									OLD ON									D
E																			E
F																			F
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8	

LAST POWER FAILURE REGISTER

HOUR = D-A-E
MINUTE = D-B-E
DAY = D-C-E

LAST FLASH TIME REGISTER

HOUR = D-A-F
MINUTE = D-B-F
DAY = D-C-F

RCL 1 = TIME OF DAY MAX RECALL (1ST SELECT) PHASES
(CALL ACTIVE LIGHTS)

RCL 2 = TIME OF DAY MAX RECALL (2ND SELECT) PHASES
(CALL ACTIVE LIGHTS)

D-E-E = C8 VERSION NUMBER

D-E-F = LITHIUM BATTERY CONDITION

84 = BAD

85 = GOOD

LOCATION: RTE 805 SB @ LA JOLLA VILLAGE DRIVE

CALTRANS C8 Version 3 DATE: ########

7 PAGE

TIME OF DAY ACTIVITY TABLE											
7+EVENT+HR+MIN+ACT+"E"+ON/OFF+DOW LTS											
				ON/	S	M	T	W	T	F	S
	HR	MIN	ACT	OFF	1	2	3	4	5	6	7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

9 PAGE C09 = 0 or 1

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
					S	M	T	W	T	F	S
	HR	MIN	CP	OS	1	2	3	4	5	6	7
0	06	30	1	A		2	3	4	5	6	
1	09	15	2	A		2	3	4	5	6	
2	15	30	3	A		2	3	4	5	6	
3	18	30	E			2	3	4	5	6	
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

9 PAGE C09 = 2

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
					S	M	T	W	T	F	S
	HR	MIN	CP	OS	1	2	3	4	5	6	7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

ACTIVITY CODE

1 TYPE OF MAX TERMINATION
2 MAX 2
3 MAX 3
4 COND SERV (1ST SELECT)
5 COND SERV (2ND SELECT)
6 ENERGIZE AUX OUTPUT-RED

7 ENERGIZE AUX OUTPUT-GREEN

8 ENERGIZE AUX OUTPUT-YELLOW

9 TIME OF DAY MAX RECALL (1ST SELECT)
A TRAFFIC ACT. MAX 2 OPERATION
B TIME OF DAY MAX RECALL (2ND SELECT)
C YELLOW YIELD COORDINATION
D YELLOW YIELD COORDINATION
E TIME OF DAY FREE OPERATION
F FLASHING OPERATION

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
11	SD	805	40.6/42.4	437	567

09-09-09
REGISTERED CIVIL ENGINEER DATE

6-14-10
PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER ANDREW P. SCHLAEFLI No. 55964 Exp. 6/30/11 CIVIL STATE OF CALIFORNIA

URBAN SYSTEMS ASSOCIATES INC. 4540 KEARNEY VILLA Rd, Ste 106 SAN DIEGO, CA 92123-1573

CITY OF SAN DIEGO 1010 SECOND AVENUE, SUITE 1200 SAN DIEGO, CA 92101

Caltrans Metric

POLE AND EQUIPMENT SCHEDULE

Loc	STANDARD			PLACEMENT DIMENSIONS		SIGNAL MOUNTING AND PLACEMENT				LUMINAIRE HPS	REMARKS
						VEHICLE		PEDESTRIAN			
	TYPE	SMA	LMA	A	B	POLE	MAST ARM	SIGNAL	PPB		
A	26-4-161	12.2	4.6	2.0	4.6	SV-1-T	2-MAS	SP-1-T	-	310 W	-
B	1-A (3.05)	-	-	0.9	4.5	TV-1-T	-	-	Ø6P	-	-
C	15TS	-	4.6	2.0	4.6	-	-	-	Ø6P	310 W	-
D	1-A (3.05)	-	-	0.9	4.6	TV-1-T	-	SP-1-T	-	-	-
E	24-4-161	10.7	4.6	0.9	STA 48+70	SV-2-T	2-MAS	-	-	310 W	-
F	19-4-161	9.1	4.6	0.9	STA 48+32	SV-1-T	1-MAS	-		310 W	-
G	MODEL 170 CONTROLLER ASSEMBLY [1] [8] [6]										

CONDUIT AND CONDUCTOR SCHEDULE

AWG	PHASE	CIRCUIT	53C (1)	78C (2)	78C (3)	78C (4)	53C (5)	2-78C (6)
3CSC / 12CSC		POLE A	- / -	- / -	/ -	- / 1	- / -	- / 1
		POLE B	- / -	- / -	1 / 1	1 / 1	- / -	1 / 1
		POLE C	1 / -	1 / -	- / -	1 / -	- / -	1 / -
		POLE D	- / -	- / 1	- / -	- / 1	- / -	- / 1
		POLE E	- / -	- / -	- / -	- / -	- / 1	- / 1
		POLE F	- / -	- / -	- / -	- / -	- / -	- / 1
TOTAL CABLES - 3CSC / 12CSC			1 / 1	1 / 1	1 / 1	2 / 3	- / 1	2 / 5
#6		LTG	2	2	-	2	2	-
DLC TYPE B	2	DLC	-	-	-	-	-	-
	6	DLC	-	4	-	4	-	4
	4	DLC	-	-	2	2	-	2
	OLB	DLC	-	-	2	2	-	2
		TOTAL DLC	-	4	4	8		8
VIDEO HARNESS	VIDEO CAMERA #1		-	-	-	-	1	1
	VIDEO CAMERA #2		-	-	-	-	-	1
	VIDEO CAMERA #3		-	-	-	1	-	1
		TOTAL	-	-	-	1	1	3
	EVD		-	-	-	1	1	3
#4	SERVICE		-	-	-	-	-	-
INTERCONNECT CABLE- SIC			-	-	-	-	-	-
TOTAL CONDUCTORS/CABLES			4	12	10	26	6	32

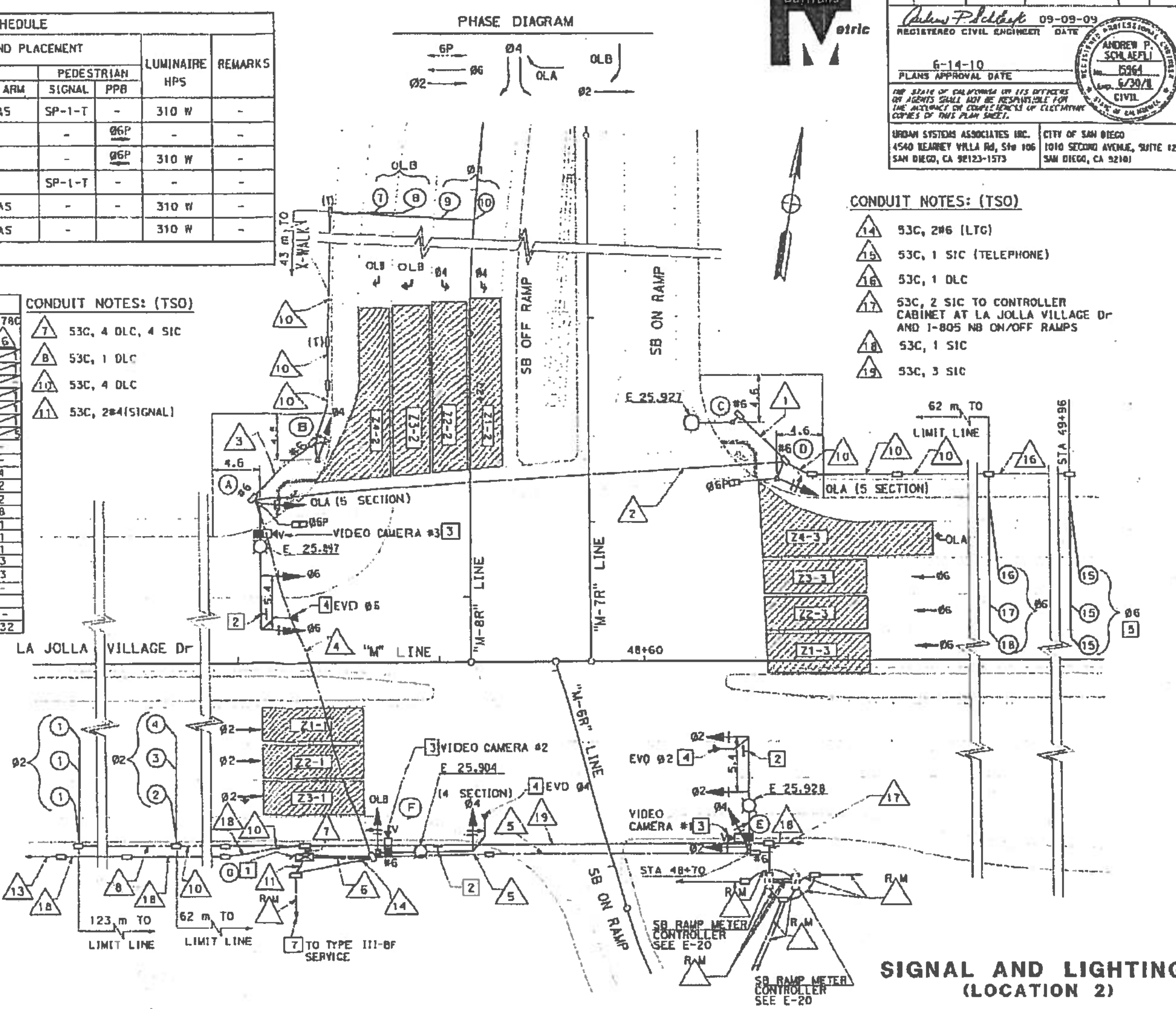
CONDUIT NOTES: (TSO)

(7) 53C, 4 DLC, 4 SIC

(8) 53C, 1 DLC

(10) 53C, 4 DLC

(11) 53C, 2#4(SIGNAL)



CONDUIT NOTES: (TSO)

(14) 53C, 2#6 (LTG)

(15) 53C, 1 SIC (TELEPHONE)

(16) 53C, 1 DLC

(17) 53C, 2 SIC TO CONTROLLER CABINET AT LA JOLLA VILLAGE Dr AND I-805 NB ON/OFF RAMPS

(18) 53C, 1 SIC

(19) 53C, 3 SIC

NOTES:

[1] INSTALL VIDEO DETECTION UNITS (VDU) COMMUNICATION CARD AND VIDEO DISPLAY IN MODEL 332 CABINET.

[2] DETAIL "U" ES-7N REQUIRED. SEE SIGNING PLANS.

[3] INSTALL VIDEO IMAGE SENSORS (VIS).

[4] INSTALL EMERGENCY VEHICLE DETECTOR (EVD) PER STANDARD PLANS ES-4E.

[5] SEE BRIDGE PLANS FOR DETAILS.

[6] BDS BATTERIES AND EXTERNAL CABINET. CONSTRUCT FOUNDATION PER E-25.

[7] FOR TYPE III-BF SERVICE EQUIPMENT ENCLOSURE SEE E-21.

[8] INSTALL MODEL 262 DISCRIMINATOR.

CONDUIT NOTES: (TSO)

(13) 53C, 1 SIC TO CONTROLLER CABINET AT LA JOLLA VILLAGE Dr AND TOWN CENTER Dr

THIS PLAN IS ACCURATE FOR ELECTRICAL WORK ONLY.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SIGNAL AND LIGHTING (LOCATION 2)

SCALE 1:200

E-13

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

CONSULTANT FUNCTIONAL SUPERVISOR F.A. CLARK FERNOW

CALCULATED-DESIGNED BY / CHECKED BY

MORT VAHABZADEH / SAM P. KAD, II

REVISED BY / DATE REVISED

BORDER LAST REVISED 3/1/2007

RELATIVE BORDER SCALE IS IN MILLIMETERS

USERNAME => s122444
DGN FILE => bd8975ua013.dgn

CU 11223

EA 089751

DATE PLOTTED => 17-MAY-2011 TIME PLOTTED => 13:49

LAST REVISION 11-04-09

LOCATION: RTE 805 NB @ MIRAMAR RD / LA JOLLA VILLAGE

CALTRANS C8 Version 3 DATE: 3/2/2015

F PAGE

	INTERVAL	PHASE TIMING									PRE-EMPTION		F									
		1	2	3	4	5	6	7	8	9	E		FLAGS	1	2	3	4	5	6	7	8	
0	WALK	1	1	1	1	1	7	1	1	CLK RST	EV SEL	0	PERMIT	1	2	3	4	5	6	7	8	0
1	DONT WALK	1	1	1	1	1	10	1	1		RR1 CLR	5	RED LOCK									1
2	MIN GREEN	5	16	1	1	1	15	1	5		EVA DLY	0	YEL LOCK									2
3	TYPE 3 DET	0	0	0	0	0	0	0	0		EVA CLR	5	V RECALL		2				6			3
4	ADD/VEH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		EVB DLY	0	P RECALL									4
5	PASSAGE	2.0	2.0	0.9	0.9	0.9	2.0	0.9	2.0		EVB CLR	5	PED PHASES						6			5
6	MAX GAP	2.0	2.0	0.9	0.9	0.9	2.0	0.9	2.0		EVC DLY	0	RT OLA									6
7	MIN GAP	2.0	2.0	0.9	0.9	0.9	2.0	0.9	2.0		EVC CLR	5	RT OLB									7
8	MAX EXT	30	45	9	9	9	45	9	40		EVD DLY	0	DBL ENTRY									8
9	MAX 2									YR	EVD CLR	5	MAX 2 PHASES									9
A	MAX 3									MO	MAX EV	255	LAG PHASES	READ ONLY								A
B										DAY	RR2 CLR	5	RED REST									B
C	REDUCE BY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	DOW			REST-IN-WALK									C
D	EVERY	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	HR			MAX 3 PHASES									D
E	YELLOW	3.7	5.5	3.0	3.0	3.0	5.5	3.0	4.1	MIN			YEL START UP		2				6			E
F	RED	1.0	2.0	1.0	1.0	1.0	2.0	1.0	1.5	SEC			FIRST PHASE								8	F
	PED XING FT						30							1	2	3	4	5	6	7	8	
	BIKE XING FT		145				49															

FOC LONG FAILURE	
FOD SHORT FAILURE	
FOE	0
FOF	5

FC0	3
FC1	3
FC2	10
FCA	0.0
FCB	0.0
FCC	0.0
FCD	0.0

FD0 TB SELECT	1
FD3 PED SELECT	0
FD4 7 WIRE	0
FD5 PERMISSIVE	0
FD8 OS SEEKING	1

CO5 FLASH TYPE	1
CC2 DOWNLOAD	1

NOTES:

ENTRIES IN THESE LOCATIONS CAN BE CHANGED IN CC1 FLASH ONLY

LOCATION: RTE 805 NB @ MIRAMAR RD / LA JOLLA VILLAGE

CALTRANS C8 Version 3 DATE: 10/21/2011

C PAGE

		CONTROL PLANS									Y-COORD			LAG PHASE	FLAGS									
		1	2	3	4	5	6	7	8	9		C	D	E	F	1	2	3	4	5	6	7	8	
0	CYCLE LENGTH	120	120	138											LAG FZ FREE		2		4		6		8	0
1	FZ1 GRN FCTR	20	15	25										GAPOUT CP1	LAG FZ CP 1		2		4		6		8	1
2														GAPOUT CP2	LAG FZ CP 2		2		4		6		8	2
3	FZ3 GRN FCTR	0	0	0										GAPOUT CP3	LAG FZ CP 3		2		4		6		8	3
4	FZ4 GRN FCTR	0	0	0							PERM TIME			GAPOUT CP4	LAG FZ CP 4									4
5	FZ5 GRN FCTR	0	0	0							LAG OFFSET			GAPOUT CP5	LAG FZ CP 5									5
6											FORCE OFF			GAPOUT CP6	LAG FZ CP 6									6
7	FZ7 GRN FCTR	0	0	0							LONG GRN			GAPOUT CP7	LAG FZ CP 7									7
8	FZ8 GRN FCTR	40	30	45							NO GREEN			GAPOUT CP8	LAG FZ CP 8									8
9	MULTI CYCLE													GAPOUT CP9	LAG FZ CP 9									9
A	OFFSET A										OFFSET				LAG C COORD									A
B	OFFSET B														LAG D COORD									B
C	OFFSET C														COORD FAZES		2				6			C
D	FZ 3 EXT																							D
E	FZ 7 EXT																							E
F	OFFSET INTRPT																							F
																1	2	3	4	5	6	7	8	

CO1 MANUAL CP
CO2 MASTER CP
CO3 CURRENT CP ***SYSTEM MASTER:***
CO4 LAST CP
CO7 TRNSMT CP
COD MANUAL OFFSET
CAO LOCAL CYCLE TIMER
CBO MASTER CYCLE TIMER
CAA LOCAL OFFSET
CBA MASTER OFFSET

FEATURE	OFF	ON
1		
2		
3		
4		
5		
6		
7		
8		

LOCATION	OFF	ON
1		1
2		
3		
4		
5		
6		
7		
8		

COO = 1

CCB/CDB OFFSET TIMER
CCC/CDC LAG GREEN TIMER
CCD/CDD FORCE OFF TIMER
CCE/CDE LONG GREEN TIMER
CCF/CDF NO GREEN TIMER

LOCATION: RTE 805 NB @ MIRAMAR RD / LA JOLLA VILLAGE

CALTRANS C8 Version 3 DATE: 6/27/2011

D PAGE

	D MAX RCL	1	2	3	4	5	6	7	8	E MIN RCL	1	2	3	4	5	6	7	8	F PED RCL	1	2	3	4	5	6	7	8
0																											
1	CP 1									CP 1									CP 1								
2	CP 2									CP 2									CP 2								
3	CP 3									CP 3									CP 3								
4	CP 4									CP 4									CP 4								
5	CP 5									CP 5									CP 5								
6	CP 6									CP 6									CP 6								
7	CP 7									CP 7									CP 7								
8	CP 8									CP 8									CP 8								
9	CP 9									CP 9									CP 9								
A																			RCL 1								
B																			RCL 2								
C																											
D																											
E																											
F																											
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8

E PAGE

	E FUNCTION	1	2	3	4	5	6	7	8	F FUNCTION	1	2	3	4	5	6	7	8	
0										CODE 4									0
1										CODE 5									1
2										C-RECALL									2
3										D-RECALL									3
4										EXCLUSIVE									4
5										2 PED		2							5
6										6 PED						6			6
7										4 PED				4					7
8										8 PED								8	8
9																			9
A	OLA NOT									OLA ON									A
B	OLB NOT									OLB ON									B
C	OLC NOT									OLC ON									C
D	OLD NOT									OLD ON									D
E																			E
F																			F
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8	

LAST POWER FAILURE REGISTER

HOUR = D-A-E

MINUTE = D-B-E

DAY = D-C-E

RCL 1 = TIME OF DAY MAX RECALL (1ST SELECT) PHASES

(CALL ACTIVE LIGHTS)

RCL 2 = TIME OF DAY MAX RECALL (2ND SELECT) PHASES

(CALL ACTIVE LIGHTS)

LAST FLASH TIME REGISTER

HOUR = D-A-F

MINUTE = D-B-F

DAY = D-C-F

D-E-E = C8 VERSION NUMBER

D-E-F = LITHIUM BATTERY CONDITION

84 = BAD

85 = GOOD

LOCATION: RTE 805 NB @ MIRAMAR RD / LA JOLLA VILLAGE

CALTRANS C8 Version 3 DATE: 6/27/2011

7 PAGE

TIME OF DAY ACTIVITY TABLE											
7+EVENT+HR+MIN+ACT+"E"+ON/OFF+DOW LTS											
				ON/	S	M	T	W	T	F	S
	HR	MIN	ACT	OFF	1	2	3	4	5	6	7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

ACTIVITY CODE

1 TYPE OF MAX TERMINATION
2 MAX 2
3 MAX 3
4 COND SERV (1ST SELECT)
5 COND SERV (2ND SELECT)
6 ENERGIZE AUX OUTPUT-RED

7 ENERGIZE AUX OUTPUT-GREEN

9 PAGE C09 = 0 or 1

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
					S	M	T	W	T	F	S
	HR	MIN	CP	OS	1	2	3	4	5	6	7
0	06	30	1	A		2	3	4	5	6	
1	09	15	2	A		2	3	4	5	6	
2	15	30	3	A		2	3	4	5	6	
3	18	30	E			2	3	4	5	6	
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

8 ENERGIZE AUX OUTPUT-YELLOW

9 TIME OF DAY MAX RECALL (1ST SELECT)
A TRAFFIC ACT. MAX 2 OPERATION
B TIME OF DAY MAX RECALL (2ND SELECT)
C YELLOW YIELD COORDINATION
D YELLOW YIELD COORDINATION
E TIME OF DAY FREE OPERATION
F FLASHING OPERATION

9 PAGE C09 = 2

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
					S	M	T	W	T	F	S
	HR	MIN	CP	OS	1	2	3	4	5	6	7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	40.6/42.4	436	567

09-09-09
REGISTERED CIVIL ENGINEER DATE

6-14-10
PLANS APPROVAL DATE

ANDREW P. SCHLAEFLI
No. 15964
Exp. 6/30/11
CIVIL
REGISTERED PROFESSIONAL ENGINEER
STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

URBAN SYSTEMS ASSOCIATES INC.
4540 KEARNEY VILLA Rd, Ste 106
SAN DIEGO, CA 92123-1573

CITY OF SAN DIEGO
1010 SECOND AVENUE, SUITE 1200
SAN DIEGO, CA 92101

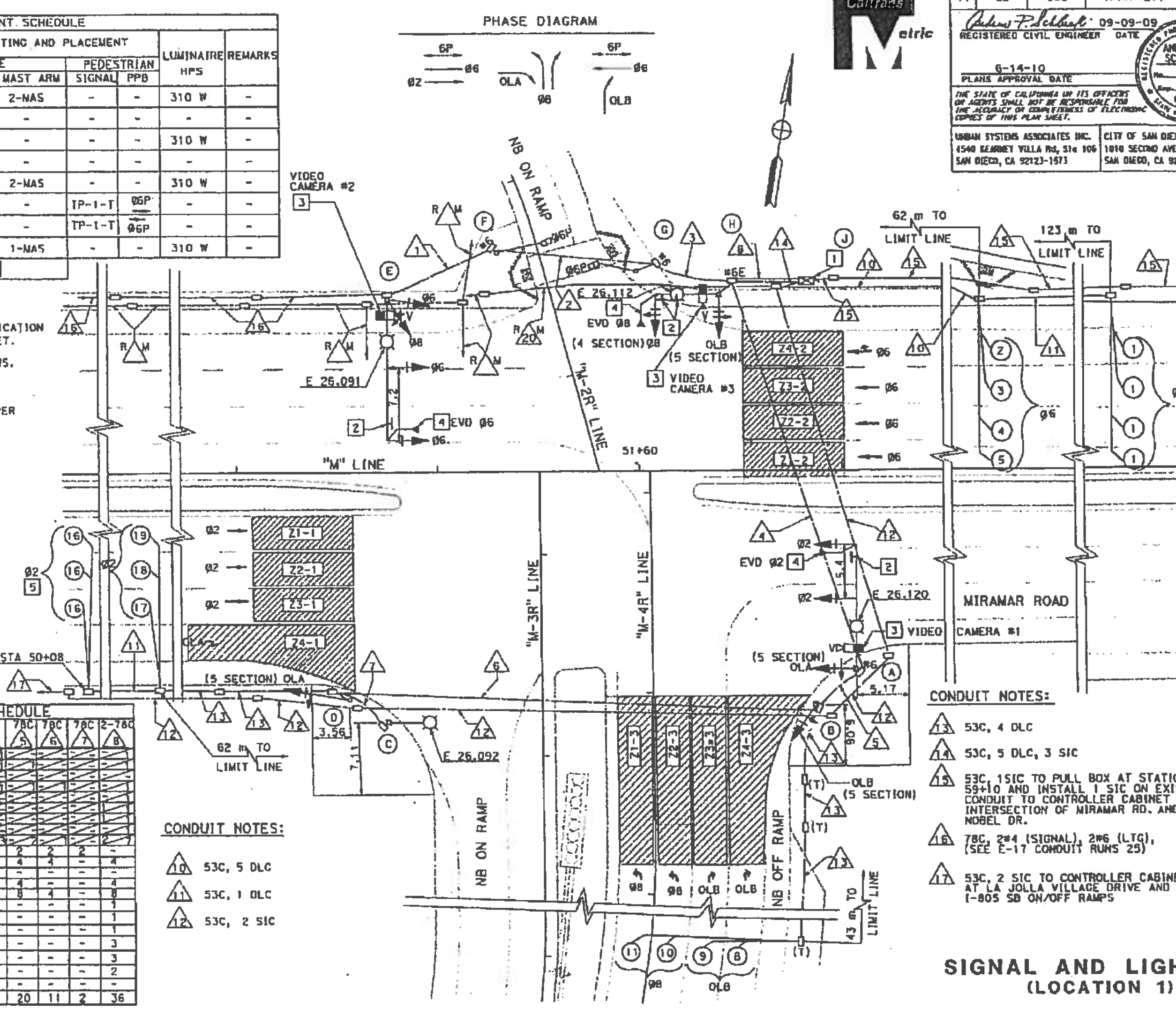
Caltrans Metric

POLE AND EQUIPMENT SCHEDULE

LOC	STANDARD TYPE	SMA	LMA	PLACEMENT DIMENSIONS A	PLACEMENT DIMENSIONS B	VEHICLE POLE	VEHICLE MAST ARM	PEDESTRIAN SIGNAL	PEDESTRIAN PPB	LUMINAIRE HPS	REMARKS
A	26-4-161	12.2	4.6	1.0	5.17	SV-1-T	2-MAS	-	-	310 W	-
B	1-A (3.05)	-	-	0.9	6.06	TV-1-T	-	-	-	-	-
C	15TS	-	4.6	0.9	7.11	-	-	-	-	310 W	-
D	1-A (3.05)	-	-	0.9	3.56	TV-1-T	-	-	-	-	-
E	26-4-161	13.7	4.6	0.9	STA 51+35	SV-2-TD	2-MAS	-	-	310 W	-
F	1-A (2.13)	-	-	2.8	-	-	-	TP-1-T	Ø6P	-	-
G	1-A (2.13)	-	-	0.9	.25	-	-	TP-1-T	Ø6P	-	-
H	17-3-161	6.1	4.6	1.2	-.96	SV-1-T	1-MAS	-	-	310 W	-
J	MODEL 170 CONTROLLER ASSEMBLY 1 7 6										

NOTES:

1. INSTALL VIDEO DETECTION UNITS (VDU) COMMUNICATION CARD AND VIDEO DISPLAY IN MODEL 332 CABINET.
2. DETAIL "U" ES-7A REQUIRED. SEE SIGNING PLANS.
3. INSTALL VIDEO IMAGE SENSORS (VIS).
4. INSTALL EMERGENCY VEHICLE DETECTOR (EVD) PER STANDARD PLANS ES-4E.
5. SEE BRIDGE PLANS FOR DETAILS.
6. BBS BATTERIES AND EXTERNAL CABINET. CONSTRUCT FOUNDATION PER E-25.
7. INSTALL MODEL 262 DISCRIMINATOR.



CONDUIT NOTES:

10. 53C, 5 DLC
11. 53C, 1 DLC
12. 53C, 2 SIC

CONDUIT AND CONDUCTOR SCHEDULE

AWG	PHASE	CIRCUIT	78C 1	78C 2	78C 3	78C 4	78C 5	78C 6	78C 7	2-78C 8
3CSC / 12CSC		POLE A	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
		POLE B	-/-	-/-	-/-	-/-	-/1	-/-	-/-	-/-
		POLE C	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
		POLE D	-/-	-/-	-/-	-/1	-/1	-/1	-/-	-/-
		POLE E	-/1	-/1	-/-	-/-	-/-	-/-	-/-	-/-
		POLE F	-/-	1/-	1/-	-/-	-/-	-/-	-/-	1/-
		POLE G	-/-	-/-	1/-	-/-	-/-	-/-	-/-	1/-
		POLE H	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
TOTAL CABLES - 3CSC / 12CSC			-/1	2/2	-/1	-/3	-/2	-/1	-/-	2/7
#6		LTG	2	2	2	2	2	2	2	-
DLC TYPE B	2	DLC	-	-	-	4	4	4	-	4
	6	DLC	-	-	-	-	-	-	-	-
	8	DLC	-	-	-	4	4	-	-	4
		TOTAL DLC	-	-	-	8	8	4	-	8
VIDEO HARNESS		VIDEO CAMERA #1	-	-	-	1	-	-	-	1
		VIDEO CAMERA #2	1	1	1	-	-	-	-	1
		VIDEO CAMERA #3	-	-	-	-	-	-	-	1
		TOTAL	1	1	1	1	-	-	-	3
	EVD		1	1	1	1	-	-	-	3
#4	SERVICE		2	2	2	-	-	-	-	2
INTERCONNECT CABLE- SIC			-	-	-	-	-	-	-	-
TOTAL CONDUCTORS/CABLES			8	10	12	24	20	11	2	36

THIS PLAN IS ACCURATE FOR ELECTRICAL WORK ONLY.

CONDUIT NOTES:

13. 53C, 4 DLC
14. 53C, 5 DLC, 3 SIC
15. 53C, 1SIC TO PULL BOX AT STATION 59+10 AND INSTALL 1 SIC ON EXISTING CONDUIT TO CONTROLLER CABINET AT INTERSECTION OF MIRAMAR RD. AND NOBEL DR.
16. 78C, 2#4 (SIGNAL), 2#6 (LTG), (SEE E-17 CONDUIT RUNS 25)
17. 53C, 2 SIC TO CONTROLLER CABINET AT LA JOLLA VILLAGE DRIVE AND I-805 SB ON/OFF RAMPS

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SIGNAL AND LIGHTING
(LOCATION 1)

SCALE 1:200

E-12

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

CONSULTANT FUNCTIONAL SUPERVISOR: F.R. CLARK FERNON
CALCULATED-DESIGNED BY: MORT VAHABZADEH
CHECKED BY: SAM P. KAD, II
REVISED BY
DATE REVISED

LAST REVISION 11-04-09
DATE PLOTTED => 11-MAY-2011
TIME PLOTTED => 13:46

Appendix D

UC Community Plan Excerpts
Subarea 12 Map
City of San Diego Bike Master Plan Existing Bikeways Map

UNIVERSITY COMMUNITY PLAN

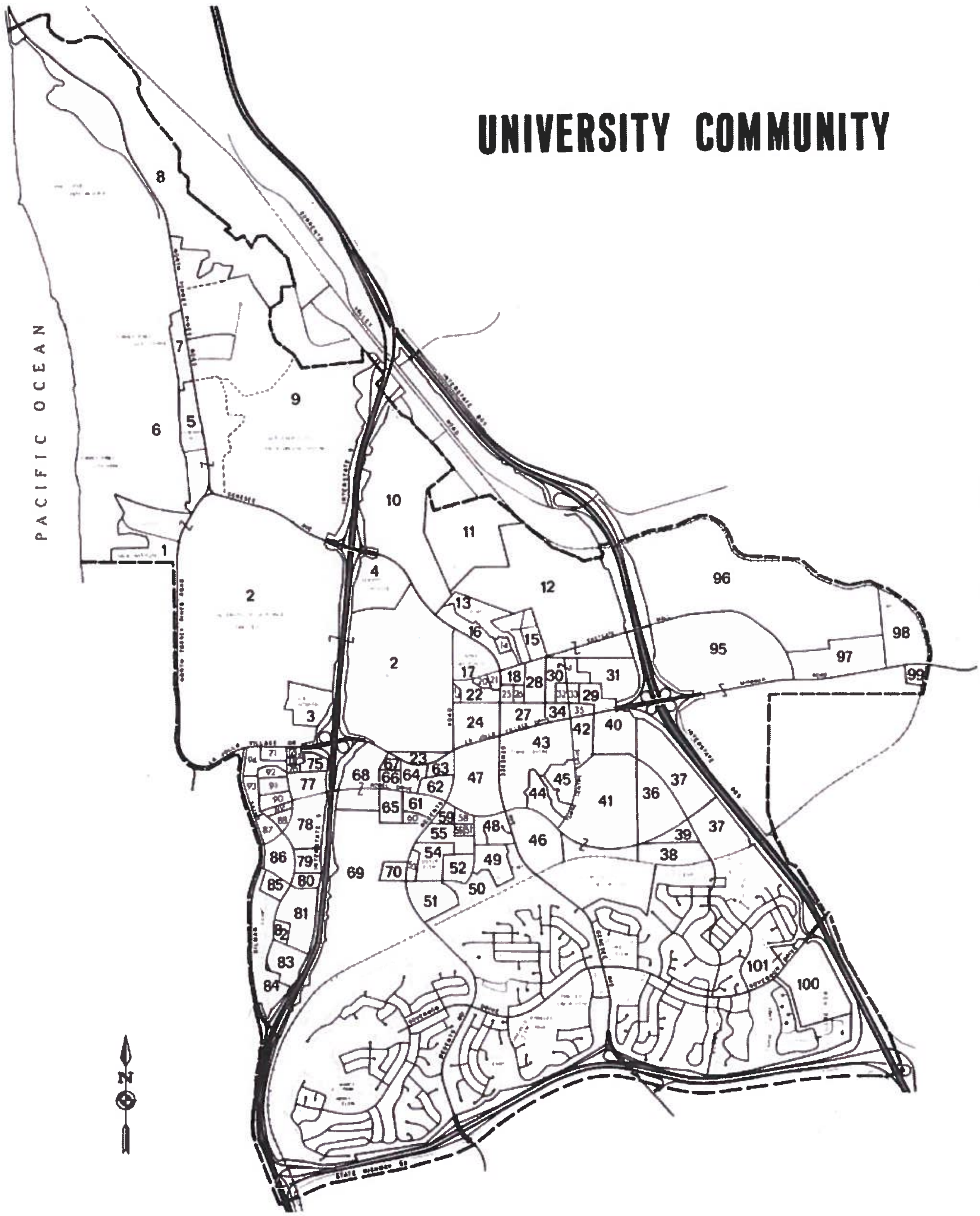
University

Community Plan

Prepared by

The University Community Planning Group
and
City of San Diego Planning Department
202 C Street, MS 4A
San Diego, CA 92101

Printed on recycled paper.



Land Use and Development Intensity Subarea Map
University Community Plan
26
FIGURE

TABLE 3
LAND USE AND DEVELOPMENT INTENSITY

Any changes to this table for properties in the Coastal Zone shall require an amendment to the Local Coastal Program

Subarea/Name	Gross Acres	Land Use and Development Intensity
1. Salk Institute	26.88	500,000 SF - Scientific Research
2. UCSD	915.00	UCSD Long Range Development Plan (110,000 ADT)
3. VA Hospital	29.95	725 Beds
4. Scripps Memorial Hospital Medical Offices	41.38	682 Beds 31,500 SF - Scientific Research 793,580 SF - Medical Office
5. Scripps Clinic	25.17	320 Beds 567,000 SF - Scientific Research 404,000 SF - Medical Office 52,000 SF - Aerobics Center
6. Torrey Pines Golf Course/ City Park/State Reserve	728.05 (1)	
7. Sheraton Hotel Lodge at Torrey Pines	11.38 6.00 (1)	400 Rooms - Hotel 175 Rooms - Hotel
8. Torrey Pines State Reserve	233.92	
9. Chevron Scallop Nuclear (Gentry) Torrey Pines Science Park Signal/Hutton Torrey Pines Business and Research Park La Jolla Cancer Research State Park	303.60 56.41 145.74 25.79 15.89 4.87 14.25	20,000 SF/AC - Scientific Research (2) Existing or approved development, Exceptions: Spin Physics - 550,000 SF Lot 10B (2.7 AC) - 15,500 SF/AC 23,000 SF/AC (2) Scientific Research Open Space
10. Campus Point	158.78	Existing or approved development, Exceptions: IVAC and SAIC – 30,000 SF/AC (3) and Lot 7 (3.6 AC) -18,000 SF/AC - Scientific Research 25.00 Open Space
11. Private Ownership City Ownership	55.93 47.48	18,000 SF/AC - Scientific Research (4) (Development intensity transferred from Subarea 37 for all of Subarea 11)
12. Eastgate Technology Park (PID) (4a)	218.50	2,356,990 SF - Scientific Research

(1) A minimum of 187 public parking spaces is to be retained on public land for golf course uses; in addition, at the adjacent Lodge at Torrey Pines, there are 40 parking spaces reserved daily for golfers and 94 parking spaces reserved during tournaments.

(2) Chevron, Scallop Nuclear, and La Jolla Cancer Research Foundation shall be required to mitigate their peak-hour trip generation rate to a level equal to or less than that which would be generated by a project of 18,000 SF/AC. Mitigation shall be achieved through a Transportation System Management (TSM) program to be approved by the City Council and the California Coastal Commission as a Local Coastal Program amendment. The proposed TSM program must specify the maximum development intensity of the project site and include supported findings. This Plan encourages the development of these parcels through a master plan.

(3) SAIC and IVAC shall be required to mitigate their peak-hour trip generation rate to a level equal to or less than that which would be generated by a project of 18,000 SF/AC. Mitigation shall be achieved through a Transportation System management (TSM) program to be approved by the City Council.

(4) This Plan encourages the development of this subarea through a master plan

(4a) ADT's from Irvine Company owned parcels 343-122-40-43, 45-52, & 60-64 Subarea 12 (PID) 90-0892) have been shifted to La Jolla Centre III Subarea 29 APN 345-012-10.

TABLE 3 (continued)
LAND USE AND DEVELOPMENT INTENSITY

Any changes to this table for properties in the Coastal Zone shall require an amendment to the Local Coastal Program.

Subarea/Name	Gross Acres	Land Use and Development Intensity
13. Open Space Easement	26.00	
14. Utility/SDGE	2.89	
15. Condominiums	25.26	365 DU
16. Apartments/Condominiums	17.95	481 DU (PRD required)
17. La Jolla Country Day School	23.98	School (5)
18. Churches	6.16	2 Institutions (5)
19. Pacific Telephone	1.66	22,480 SF
20. Fire/Police	3.20	23,400 SF
21. La Jolla Eastgate Office Park	1.97	46,000 SF
22. Neighborhood Park Jewish Community Center (CUP)	10.49	92,700 SF
23. La Jolla Village Tennis Club Condominiums	7.64	120 DU
24. Regents Park (PCD)	27.46	360 Rooms - Hotel 574 DU 30,200 SF - Neighborhood Commercial 754,000 SF - Office
25. La Jolla Bank and Trust	3.63	156,000 SF - Office
26. Park Plaza (PCD)	3.07	69,764 SF - Office
27. The Plaza (PCD)	16.85	841,300 SF - Office 8,700 SF - Restaurant
28. Chancellor Park	16.61	542,000 SF - Office
29. Goodwin/Smith, etc. (6,7) (PCD) (La Jolla Commons)	16.85	11.85 AC – Commercial 1,000,000 SF Office
La Jolla Centre III(7a) (PDP)	5.00	340,000 SF – Business Park
30. Nexus Specific Plan	22.50	Specific Plan
31. Private Ownership	23.79	20,000 SF/AC - Scientific Research
Biomed Innovation Center	7.07	35,500 SF/AC - Scientific Research
32. Devonshire Woods (PRD)	3.98	95 DU
33. La Jolla Centre II (PCD)	4.67	133,750 SF - Office 4,500 SF - Retail 3,500 SF - Athletic Facility
34. Embassy Suites (PCD)	4.90	335 Suites - Hotel 4,400 SF - Restaurant

(5) Expansion of these uses is permitted, subject to discretionary review.

(6) This Plan encourages the development of Subareas 29 and 40 through a master plan.

(7) ADT was transferred from Regents Park to La Jolla Commons (Goodwin/Smith PCD). Up to 100-400 hotel rooms may be developed in place or in combination with office square footage in accordance with the La Jolla Commons PDP. Residential use may be developed in place of or in combination with hotel and/or office use subsequent to amending the La Jolla Commons PDP and additional environmental review.

TABLE 3 (continued)
LAND USE AND DEVELOPMENT INTENSITY

Any changes to this table for properties in the Coastal Zone shall require an amendment to the Local Coastal Program.

Subarea/Name	Gross Acres	Land Use and Development Intensity
35. La Jolla Centre I (PCD) [7b]	3.17	143,400 SF - Office
36. Neighborhood Park	30.00	
37. City Ownership	87.40 14.45	18,000 SF/AC - Scientific Research (Development approval not to be granted until 1995 for Subareas 36 and 37. Development intensity for this area is reduced by transfer to Subarea 11 of 18,000 SF/AC)
38. Towne Centre Apartments (PRD)	23.79	256 DU
39. City Ownership	7 – 8	30 DU/AC
40. La Jolla Crossroads [8]	33.80	33.8 AC - Residential, 1,809 DU
41. Renaissance La Jolla (PDR & PCD)	112.96	2,500 DU 50,000 SF - Neighborhood Commercial
Open Space Easement	15.06	
42. La Jolla Gateway (PCD)7c	14.17	396,305 SF - Office
Congregation Beth Israel 7c		2,165SF – Chapel 62,931 SF – Sanctuary/Temple School
43. University Towne Centre	75.35	1,811,409 SF - Regional Commercial GLA 300 DU[9]
44. Vista La Jolla/University Pines	12.26	257 DU
45. Vista La Jolla	14.84	56 DU
46. Nobel Terrace (PRD)	41.05	716 DU
47. Costa Verde Specific Plan [8]	54.00	178,000 SF - Neighborhood/Community Commercial 2740 DU
48. La Jolla Highlands Torrey Heights La Jolla Pines Village Green	17.42	474 DU
49. Genesee Highlands Unit 2	17.87	246 DU
50. Genesee Highlands Unit 3 Open Space Easement	8.61 13.60	211 DU

(7a) ADT's from Irvine Company owned parcels 343-122-40-43, 45-52, & 60-64, Subarea 12 (PID 90-0892);345-012-09, Subarea 35 (PCD 83-0131); 345-011-15, 16-, & 23, Subarea 42 (PCD 82-0707); and 345-120-17, Subarea 67 (PRD 96-0638) have been shifted to La Jolla Centre III Subarea 29, APN 345-012-10.

(7b) ADT's from Irvine Company owned parcel 345-012-09, Subarea 35 (PCD 83-0131) have been shifted to La Jolla Centre III Subarea 29, APN 345-012-10.

(7c) ADT's from Irvine Company owned parcels 345-011-15 & 16 Subarea 42 (PCD 82-0707) have been shifted to La Jolla Centre III Subarea 29, APN 345-012-10. Congregation Beth Israel not a part of ADT Shift.

(8) After 558 ADT transferred from Subarea 47 to Subarea 40, La Jolla Crossroads, 2,602 unused ADT remain with CostaVerde Specific Plan Area.

(9) This property is subject to an approved Master Planned Development Permit (MPDP), which permits adjustment to the levels of retail and residential development (up to 300 units) within the intensity envelope for the property defined by the MPDP.

TABLE 3 (continued)
LAND USE AND DEVELOPMENT INTENSITY

Any changes to this table for properties in the Coastal Zone shall require an amendment to the Local Coastal Program.

Subarea/Name	Gross Acres	Land Use and Development Intensity
51. Genesee Highlands Unit 4	26.02	340 DU
52. Playmoor Terrace	11.89	168 DU
53. Genesee Highlands Unit 6	4.78	72 DU
54. Doyle Elementary School School Expansion	12.73 5.88	1000 Students
55. Doyle Community Park	12.63 2.97 4.29	
56.	2.50	50 DU
57.	2.11	139 DU
58. Genesee Highlands Unit 1 Whispering Pines	2.06	60 DU
59. Lincoln La Jolla	4.54	251 DU(10)
60. The Pines (PRD)	5.72	248 DU
61. (PRD)	10.08	368 DU
62. La Jolla Village Park (PRD)	12.00	333 DU
63. La Jolla Village Park (PRD)		(included in 62)
64. Fredericks La Jolla Village Park (PRD)	6.83	302 DU
65. La Jolla International Gardens (PRD)	11.43	774 DU
66. La Jolla Garden Villas (PRD)	4.08	277 DU
67. La Jolla Apartments (10a)	4.70	232 DU
68. University Center/Aventine	37.59	400 Rooms - Hotel 40,500 SF - Retail 550,000 - Office 685 DU
69. La Jolla Colony	158.50	3,594 DU
70. La Jolla Colony	7.02	72,645 SF - Neighborhood Commercial
71. La Jolla Professional Center	6.78	168,383 SF - Office/Bank 21,533 SF - Restaurant
72. Gas Station	1.06	4,900 SF
73.	1.00	3,400 SF - Bank 25,674 SF - Office
74.	2.00	97,689 SF - Office

(10) The land use designation for this property has been revised from 30-45 du/acre to 45-75 du/acre although no more than 251 units are permitted on the site which occupies 3.71 net acres.

(10a) ADT's from Irvine Company owned parcel 345-120-17, Subarea 67 (PRD 96-0638) have been shifted to La Jolla Centre III Subarea 29, APN 345-012-10.

TABLE 3 (continued)
LAND USE AND DEVELOPMENT INTENSITY

Any changes to this table for properties in the Coastal Zone shall require an amendment to the Local Coastal Program.

Subarea/Name	Gross Acres	Land Use and Development Intensity
75. La Jolla Village Inn	7.89	400 Rooms - Hotel
76. Neighborhood Commercial (PCD)	1.50	16,570 SF - Neighborhood Commercial 3,500 SF - Bank
77. Ralphs Shopping Center (PCD)	15.46	150,000 SF - Community Commercial
78. La Jolla Village Square (PCD) Residential	27.47 2.83	1,002,000 SF - Regional Commercial 108 DU
79. Cape La Jolla	12.10	(included in 78) Regional Commercial/52 DU
80. The Woodlands	6.60	125 DU
81. Woodlands/West/East Bluff/La Jolla Park Villas	34.09	679 DU
82. Villa La Jolla Neighborhood Park	5.60	
83. La Jolla Village Townhomes	23.21	291 DU
84. La Jolla Village Townhomes Open Space	17.18 31.45	106 DU
85. La Jolla Village	6.84	204 DU
86. Villa La Jolla	18.29	548 DU
87. J.W. Jones	10.85	456 DU
88. Villas Mallorca	7.04	136 DU
89. Villas Mallorca Phase II		(included in 88)
90. Woodlands North	5.93	120 DU
91. Cambridge	5.24	112 DU
92. Boardwalk La Jolla	8.35	216 DU
93. Broadmoor	10.37	156 DU
94. The Residence Inn	8.50	288 Suites - Hotel
95. Miramar Marine Corps Air Station	176.31	
96.	305.35	Restricted Industrial (see Table 4)
97.	43.22	Restricted Industrial (see Table 4)
98.	41.20	Restricted Industrial (see Table 4)
99. Longpre Auto Sales	6.47	33,650 SF - Auto Sales
100. Governor Park	55.00	913,728 SF - Office
101. City Ownership Private Ownership	.82 15.00	15,250 SF/AC - Office Institutional Use (School, Church, etc.)

TABLE 4
DEVELOPMENT INTENSITIES - RESTRICTED INDUSTRIAL

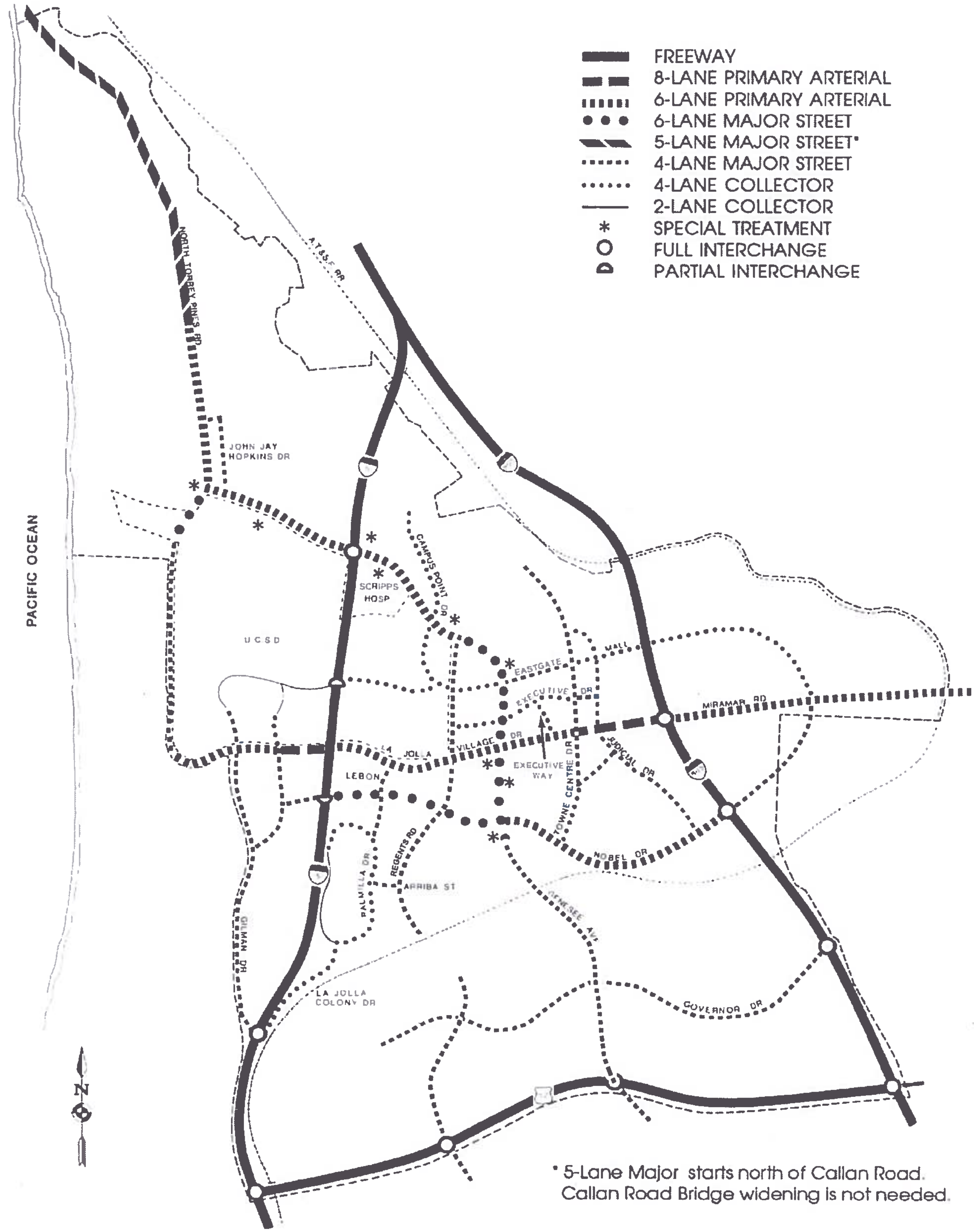
The development intensity of this area as indicated below is based on 130 ADT/AC. Development intensities of 131 – 150 ADT/AC may be approved subject to a 25 percent increase in FBA fees.

Subareas 96, 97, 98 – Restricted Industrial (1)	
Large Industrial/Scientific Research	16,250 SE/AC
Small Industrial	9,300 SF/AC
Warehousing/Mini-storage	26,000 SF/AC
Automotive Commercial (2 and 3)	3,250 SF/AC

(1) Square footage may not exceed the Federal Government easement where applicable or that permitted by the underlying zone.

(2) Automotive commercial users are permitted only in Subarea 97.

(3) The 13.2-acre Midway Miramar site may be developed with automotive commercial at 350 ADT/AC.



* 5-Lane Major starts north of Callan Road.
Callan Road Bridge widening is not needed.

Recommeded Street Network (Based on Community Plan Build-Out Land Uses/Development Intesities)

University Community Plan

20
FIGURE

Impact: The widening of North Torrey Pines Road will result in the removal of mature Eucalyptus trees adjacent to and northerly of the Sheraton Hotel. The quaint, existing road (and bridge) with its rural character will also disappear.

Mitigation (s): It is recommended to retain the existing five-lane North Torrey Pines Road north of the Callan Road bridge where development intensities are lower. This would allow the preservation of the existing Eucalyptus trees and attractive road image.

LA JOLLA VILLAGE DRIVE

Section A: La Jolla Village Drive: Villa La Jolla Drive to I-5 (see **Figure 8**)

Street Classification: Six-lane primary arterial with an eight-lane section from Villa La Jolla Drive to I-5.

Description of Existing/Proposed Improvements: La Jolla Village Drive is characterized by contiguous five-foot sidewalks and sporadic landscaped medians. Much of the widening of this road is in progress or has already been completed. No bicycle lanes are planned for this road.

Impact: The already accomplished widening of the majority of La Jolla Village Drive has created a freeway effect through the community. The additional widening to eight lanes west of I-5 will decrease the existing median width and require additional right-of-way, possibly resulting in the reduction of landscaping on this road.

Mitigation (s): Landscaping on medians and street edges, and special nighttime illumination as discussed later in this Urban Design element.

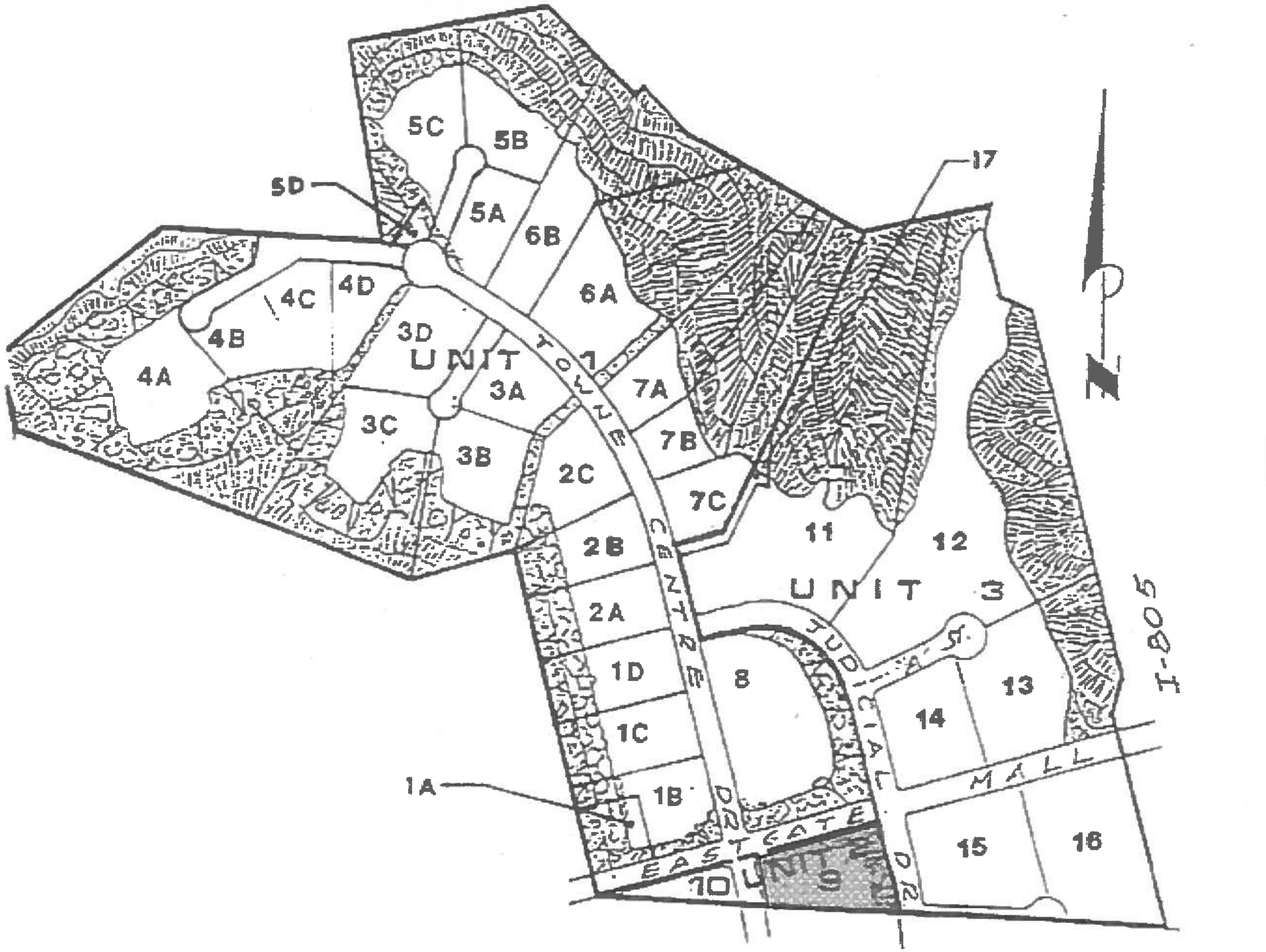
Section B: La Jolla Village Drive: Judicial Drive to I-805 (see **Figure 8**)

Street Classification: Eight-lane primary.

Description of Existing/Proposed Improvements: This portion of La Jolla Village Drive is proposed to be widened to eight lanes by reducing the median and acquiring additional right-of-way

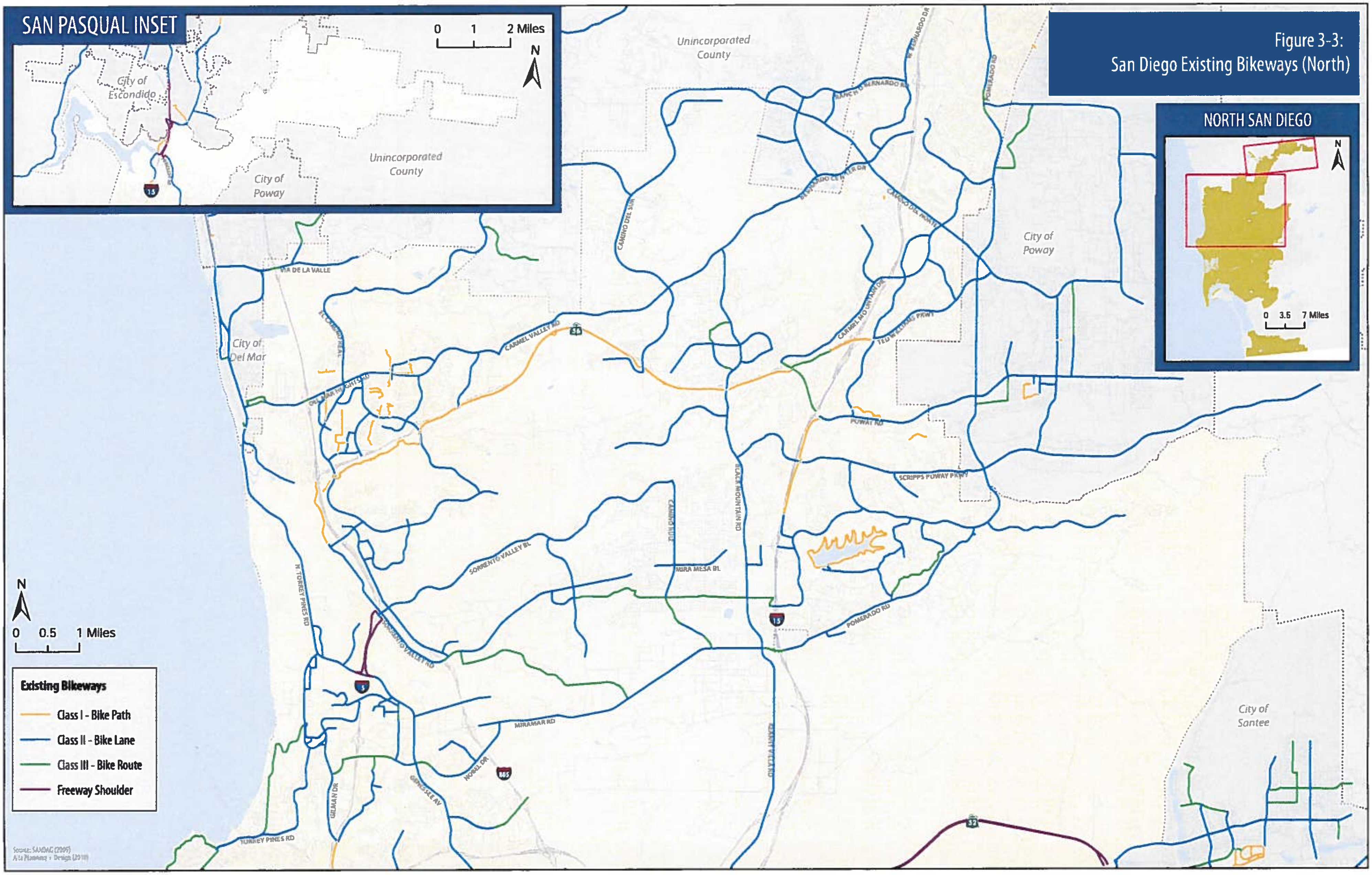
Impact: The existing landscaped median and part of the landscaping on the northern edge of the Gateway Project would be eliminated to accommodate this widening.

Mitigation (s): It is recommended to widen La Jolla Village Drive east of Judicial Drive only in order to preserve the existing landscaping adjacent to the Gateway office project.



EASTGATE TECHNOLOGY PARK

Figure 3-3:
San Diego Existing Bikeways (North)



Appendix E

9775 Existing Building Calculations

LEGAL DESCRIPTION

The land referred to herein is situated in the State of California, County of San Diego, City of San Diego and described as follows:

Parcel A:

Parcels 1, 2 and 4 of Parcel Map No. 16828, in the City of San Diego, County of San Diego, State of California, as per the Map thereof filed in the Office of the County recorder of San Diego County, April 23, 1992 as file no. 1992-0239394 of Official Records.

APN: # 343-121-20,21 &23

PARCEL B:

Parcel 1 of Parcel Map No. 15937, in the City of San Diego, County of San Diego, State of California, filed in the Office of the County Recorder of San Diego County, January 4, 1990 as File/Page No. 90-006036 of Official Records.

Excepting therefrom all oil, gas, hydrocarbon substances and minerals of every kind and character lying more than 500 feet below the surface, together with the right to drill into, through, and to use and occupy all parts of the site lying more than 500 feet below the surface thereof for any and all purposes incidental to the exploration for any production of oil, gas, hydrocarbon, substances or mineral from the site, but without, however, any right to use or disturb either the surface of the site or any portion thereof within 500 feet of the surface or purposes whatsoever, as reserved in deed from the City of San Diego recorded September 11, 1989 as Instr. # 89-0488383 of official records.

APN: 343-121-14

APN: 343-121-20-00, 343-121-21-00, 343-121-23-00, and 343-121-14-00
(End of Legal Description)

(R-89-1645 REV.1)

RESOLUTION NUMBER R- 273267

ADOPTED ON APR 17 1989

BE IT RESOLVED, by the Council of The City of San Diego, that the City Manager is hereby authorized to execute an Agreement for Sale, Development and Use of Real Property ("Agreement") for Lot 6, Eastgate Technology Park, for the appraised value of $4,636,000, under the terms and conditions set forth in that Agreement on file in the office of the City Clerk as Document No. RR- 273267.

BE IT FURTHER RESOLVED, that the Mayor and City Clerk are hereby authorized to execute a deed conveying 7.34 net acres to WESTERRA PACIFIC ASSOCIATES.

BE IT FURTHER RESOLVED, that proceeds of the sale in the amount of $1,710,684 are hereby authorized to be retained in an escrow and that amount is hereby authorized to be expended for reacquisition of that portion of said Lot 6 identified in said Agreement as Parcel B, which Parcel B shall result from a lot split as specified in said Agreement.

BE IT FURTHER RESOLVED, that the Mayor and the City Clerk are hereby authorized to execute a standard form quitclaim deed reconveying said Parcel B to WESTERRA PACIFIC ASSOCIATES in the event WESTERRA exercises its option to reacquire Parcel B in accordance with the terms of said Agreement.

BE IT FURTHER RESOLVED, that the costs of the sale and the repurchase of Lot B are hereby authorized to be paid from the proceeds of the sale.

Corrected copy 4/17/89

2

BE IT FURTHER RESOLVED, that no broker's commission shall be paid in connection with this transaction.

APPROVED: JOHN W. WITT, City Attorney

By ______________________
Harold O. Valderhaug
Deputy City Attorney

HOV:df:ps
02/23/89
04/13/89 REV.1
04/17/89 COR.COPY
Or.Dept:Prop.
R-89-1645
Form=r.none

1476

Passed and adopted by the Council of The City of San Diego on April 17, 1989 by the following vote:

YEAS: Wolfsheimer, Roberts, McColl, Pratt, Struiksma, Henderson, McCarty, Filner, O'Connor.

NAYS: None.

NOT PRESENT: None.

AUTHENTICATED BY:

MAUREEN O'CONNOR
Mayor of The City of San Diego, California

CHARLES G. ABDELNOUR
City Clerk of The City of San Diego, California

(SEAL)

By: ELLEN BOVARD, Deputy

I HEREBY CERTIFY that the above and foregoing is a full, true and correct copy of RESOLUTION NO. R- 273267, passed and adopted by the Council of The City of San Diego, California on APR 17 1989.

CHARLES G. ABDELNOUR
City Clerk of The City of San Diego, California

(SEAL)

By: Ellen Bovard, Deputy

OFFICIAL RECORDS, SAN DIEGO COUNTY, VERA L. LYLE, RECORDER

PAGE 2

and aisles shall conform to Planning Department standards. Parking areas shall be marked. Five percent of the parking located nearest to building entrances shall be designated as preferred parking for ridesharers. This parking shall be indicated on development plans, to be approved by the Planning Director.

12. The maximum floor area allowable on each lot is as follows:

Lot Number	Maximum Floor Area (Square Feet)
1	218,600
2	185,700
3	296,100
4	253,800
5	204,500
6	164,500
7	115,200
8	164,600
9	56,400
10	14,100
11	131,600
12	150,400
13	272,600
14	103,400
15	171,600
16	101,100
Total	2,604,200

Any variance from the above maxima must be approved by the Planning Director after a public hearing as a formal amendment of this PID.

13. Each development plan package shall become a part of Exhibit "A," on file in the office of the Planning Department. The cumulative total floor area and proposed parking spaces for each phase shall be monitored to ensure that all conditions of the PID permit are met.

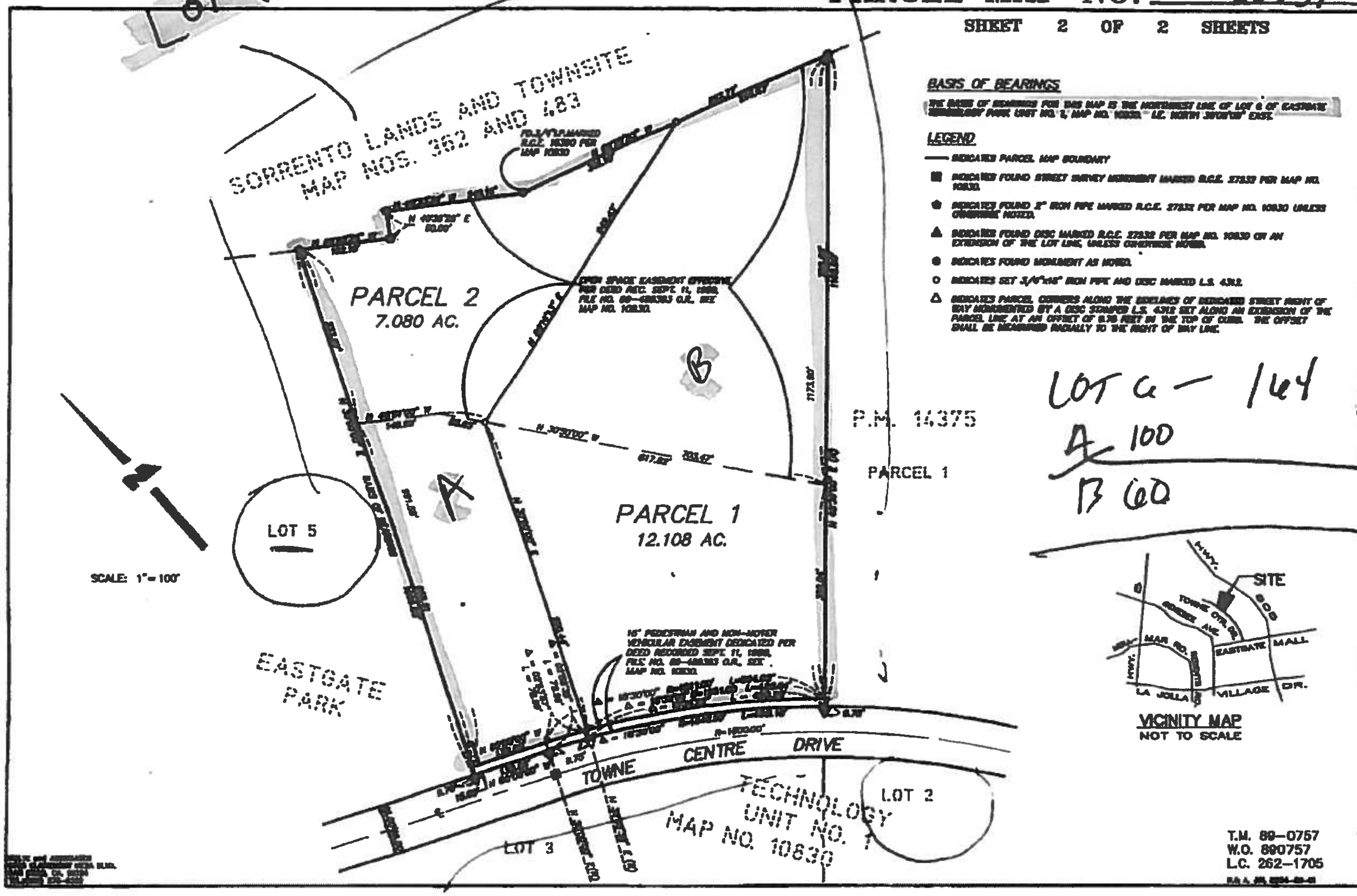
14. All uses shall be conducted within an enclosed building. Outdoor storage of material is permitted, provided the storage area is completely enclosed by walls, fences, buildings, landscape screening or a combination thereof. Walls or fences shall be solid and not less than six feet in height; no merchandise, material or equipment shall be stored to a height greater than any screening. Landscape screening proposals shall require approval of the Planning Director or, on appeal, the Planning Commission.

83-16
№ 463841

Zone	Lot No.	Approx. Net PAD Acres	Maximum Building Area (Sq.Ft.)	Max. % Footprint
SR	1A	0.79	8,500	25
SR	1B	2.15	52,000	25
SR	1C	2.52	61,000	25
SR	1D	2.47	60,000	25
SR	2A	2.20	54,000	40
SR	2B	2.40	59,000	40
SR	2C	2.80	68,000	40
SR	3A	2.20	54,000	40
SR	3B	2.70	66,000	40
SR	3C	3.30	81,000	40
SR	3D	3.30	81,000	40
SR	4A	3.43	51,000	40
SR	4B	1.90	46,000	40
SR	4C	2.25	55,000	40
SR	4D	2.21	54,000	40
SR	5A	2.20	53,000	40
SR	5B	2.80	68,000	40
SR	5C	3.30	73,000	40
Open Sp.	5D	0.40 gross	N/A	0
SR	6A	5.40	100,000	40
SR	6B	3.10	64,500	40
SR	7A	1.70	42,000	40
SR	7B	1.70	42,000	40
SR	7C	1.20	41,000	40
M-LI	8	6.90	167,000	25
SR	9	2.60	45,000	25
M-LI	10	0.86	14,100	40
M-LI	11	7.30	170,000	25
M-LI	12	13.20	322,000	25
M-LI	13	5.30	129,000	25
M-LI	14	3.60	88,000	25
M-LI	15	5.20	128,000	25
M-LI	16	6.00	146,555	25
Open Sp.	17	0.81 gross	N/A	0

PARCEL MAP NO. 15937

SHEET 2 OF 2 SHEETS



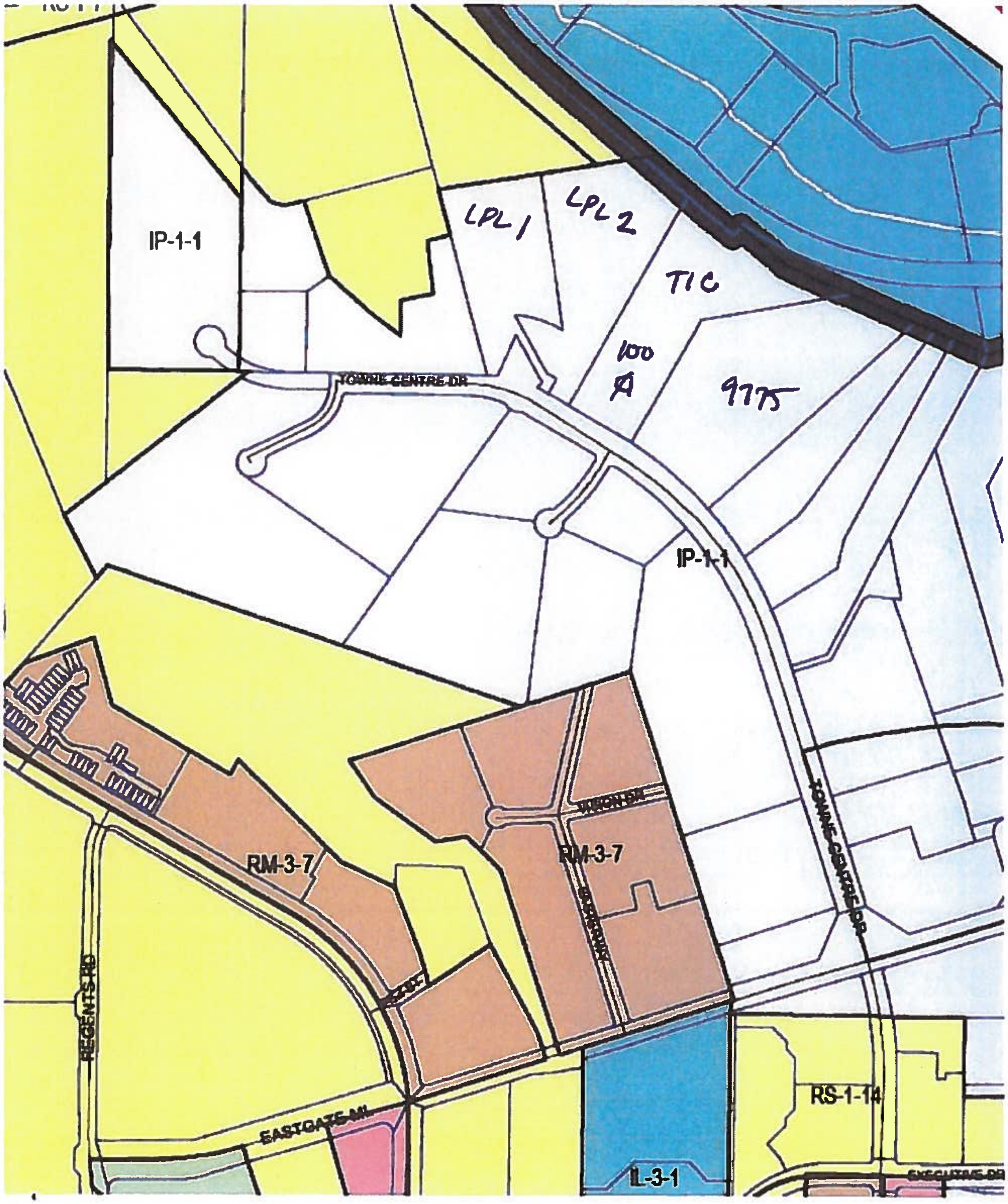
Tracy Murphy

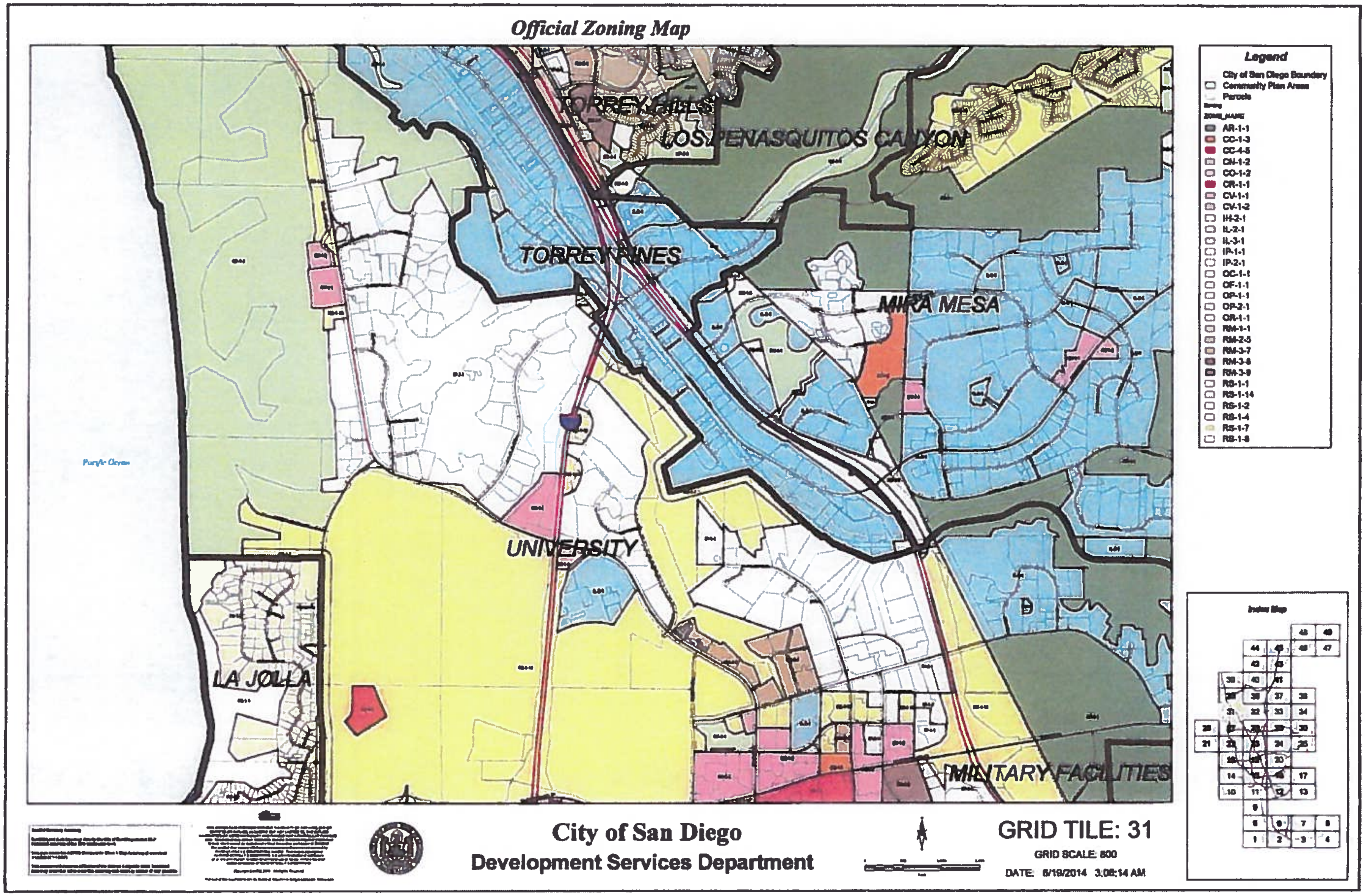
Tracy Murphy
Vice President, San Diego Market Lead

BioMed Realty
17190 Bernardo Center Drive, San Diego, CA 92128
d 858 207 5931 c 858 212 2311

www.biomedrealty.com

Tracy Murphy





Official Zoning Map
TORREY HILLS
LOS PENASQUITOS CANYON
TORREY PINES
MIRA MESA
UNIVERSITY
LA JOLLA
MILITARY FACILITIES
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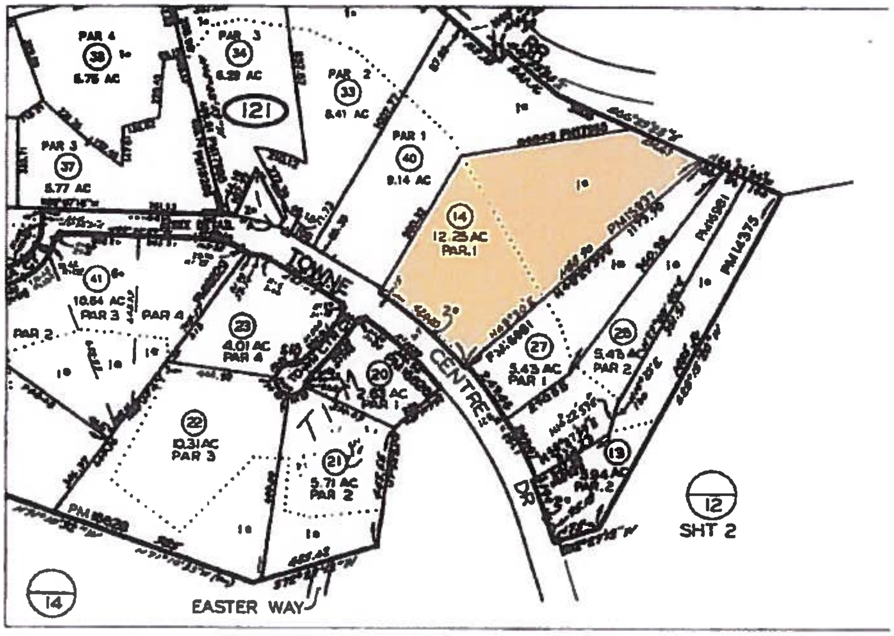
City of San Diego
Development Services Department
GRID TILE: 31
GRID SCALE: 800
DATE: 6/19/2014 3:08:14 AM

9775 Towne Centre Dr

Bldg 4-Towne Centre Tech Park



BioMed Realty

Appendix F

Existing Synchro Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	207	55	65	287	412	180	1110	259	218	371	96
Future Volume (vph)	56	207	55	65	287	412	180	1110	259	218	371	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9	4.9	4.4	5.1	4.4	4.4	5.7		4.4	5.7	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91		0.97	0.91	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1536	1770	1863	1541	1770	4921		3433	4894	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1536	1770	1863	1541	1770	4921		3433	4894	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	62	230	61	72	319	458	200	1233	288	242	412	107
RTOR Reduction (vph)	0	0	49	0	0	41	0	23	0	0	29	0
Lane Group Flow (vph)	62	230	12	72	319	417	200	1498	0	242	490	0
Confl. Peds. (#/hr)			10			21			5			4
Confl. Bikes (#/hr)			6			6			3			5
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	6.9	26.5	26.5	7.8	27.2	40.7	19.2	64.8		13.5	59.1	
Effective Green, g (s)	6.9	26.5	26.5	7.8	27.2	40.7	19.2	64.8		13.5	59.1	
Actuated g/C Ratio	0.05	0.20	0.20	0.06	0.21	0.31	0.15	0.49		0.10	0.45	
Clearance Time (s)	4.4	4.9	4.9	4.4	5.1	4.4	4.4	5.7		4.4	5.7	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	4.2		2.0	4.3	
Lane Grp Cap (vph)	92	374	308	104	383	475	257	2415		351	2191	
v/s Ratio Prot	0.04	0.12		c0.04	0.17	c0.09	c0.11	c0.30		0.07	0.10	
v/s Ratio Perm			0.01			0.18						
v/c Ratio	0.67	0.61	0.04	0.69	0.83	0.88	0.78	0.62		0.69	0.22	
Uniform Delay, d1	61.4	48.1	42.5	60.9	50.2	43.3	54.3	24.6		57.2	22.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	14.2	2.1	0.0	14.8	13.7	16.2	12.7	1.2		4.5	0.2	
Delay (s)	75.7	50.2	42.5	75.8	64.0	59.5	67.0	25.8		61.7	22.6	
Level of Service	E	D	D	E	E	E	E	C		E	C	
Approach Delay (s)		53.4			62.5			30.6			35.0	
Approach LOS		D			E			C			D	

Intersection Summary			
HCM 2000 Control Delay	41.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	19.6
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	168	211	89	51	579	147	211	528	160	20	62	19
Future Volume (vph)	168	211	89	51	579	147	211	528	160	20	62	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9		4.4	5.7		4.4	5.2		4.4	5.2	
Lane Util. Factor	0.97	0.95		1.00	0.95		0.97	0.95		0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.97		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3381		1770	3422		3433	3405		3433	3402	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	3381		1770	3422		3433	3405		3433	3402	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	187	234	99	57	643	163	234	587	178	22	69	21
RTOR Reduction (vph)	0	37	0	0	17	0	0	22	0	0	17	0
Lane Group Flow (vph)	187	296	0	57	789	0	234	743	0	22	73	0
Confl. Peds. (#/hr)						1			1			4
Confl. Bikes (#/hr)						1			1			
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	14.8	40.6		6.3	30.8		11.4	28.4		1.3	18.3	
Effective Green, g (s)	14.8	40.6		6.3	30.8		11.4	28.4		1.3	18.3	
Actuated g/C Ratio	0.15	0.43		0.07	0.32		0.12	0.30		0.01	0.19	
Clearance Time (s)	4.9	4.9		4.4	5.7		4.4	5.2		4.4	5.2	
Vehicle Extension (s)	5.1	5.1		2.0	4.8		2.0	4.7		2.0	4.7	
Lane Grp Cap (vph)	532	1437		116	1103		409	1012		46	651	
v/s Ratio Prot	c0.05	0.09		c0.03	c0.23		c0.07	c0.22		0.01	0.02	
v/s Ratio Perm												
v/c Ratio	0.35	0.21		0.49	0.72		0.57	0.73		0.48	0.11	
Uniform Delay, d1	36.1	17.3		43.1	28.5		39.7	30.2		46.8	31.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.2		1.2	2.7		1.2	3.3		2.8	0.1	
Delay (s)	36.9	17.5		44.2	31.2		40.9	33.4		49.6	32.0	
Level of Service	D	B		D	C		D	C		D	C	
Approach Delay (s)		24.5			32.0			35.2			35.5	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	31.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	95.5	Sum of lost time (s)	20.2
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	116	36	54	79	36	296	780	344	24	152	53
Future Volume (vph)	74	116	36	54	79	36	296	780	344	24	152	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.4	4.9	4.9	4.4	5.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.95		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3396		1770	3373		1770	3539	1560	1770	3390	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3396		1770	3373		1770	3539	1560	1770	3390	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	82	129	40	60	88	40	329	867	382	27	169	59
RTOR Reduction (vph)	0	33	0	0	34	0	0	0	118	0	31	0
Lane Group Flow (vph)	82	136	0	60	94	0	329	867	264	27	197	0
Confl. Peds. (#/hr)			5						2			1
Confl. Bikes (#/hr)			3						1			
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	8.8	16.7		6.4	14.3		22.9	54.6	54.6	3.7	35.0	
Effective Green, g (s)	8.8	16.7		6.4	14.3		22.9	54.6	54.6	3.7	35.0	
Actuated g/C Ratio	0.09	0.17		0.06	0.14		0.23	0.55	0.55	0.04	0.35	
Clearance Time (s)	4.4	4.9		4.4	4.9		4.4	4.9	4.9	4.4	5.3	
Vehicle Extension (s)	2.0	5.3		2.0	5.4		2.0	3.8	3.8	2.0	3.8	
Lane Grp Cap (vph)	155	567		113	482		405	1932	851	65	1186	
v/s Ratio Prot	c0.05	c0.04		0.03	0.03		c0.19	c0.24		0.02	0.06	
v/s Ratio Perm									0.17			
v/c Ratio	0.53	0.24		0.53	0.19		0.81	0.45	0.31	0.42	0.17	
Uniform Delay, d1	43.6	36.1		45.3	37.8		36.5	13.7	12.4	47.1	22.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.5	0.5		2.4	0.5		11.2	0.8	0.9	1.6	0.3	
Delay (s)	45.1	36.6		47.7	38.2		47.7	14.4	13.4	48.7	22.7	
Level of Service	D	D		D	D		D	B	B	D	C	
Approach Delay (s)		39.4			41.3			21.1			25.5	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	25.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑↑	↱	↰↰	↑↑↑	↱↱	↰↰	↑↑	↱↱	↰↰	↑↑	↱
Traffic Volume (vph)	266	915	108	317	1357	1088	151	159	304	206	40	28
Future Volume (vph)	266	915	108	317	1357	1088	151	159	304	206	40	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	14	14	14	14	14	14	14	14	14	14	14
Total Lost time (s)	4.4	5.5	5.5	4.9	5.3	5.3	4.4	5.0	4.9	4.4	5.3	5.3
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	0.88	0.97	0.95	0.88	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.96	1.00	1.00	0.99	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3662	5424	1666	3662	5424	2843	3662	3775	2939	3662	3775	1642
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3662	5424	1666	3662	5424	2843	3662	3775	2939	3662	3775	1642
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	280	963	114	334	1428	1145	159	167	320	217	42	29
RTOR Reduction (vph)	0	0	57	0	0	380	0	0	45	0	0	25
Lane Group Flow (vph)	280	963	57	334	1428	765	159	167	275	217	42	4
Confl. Peds. (#/hr)			1			9			6			12
Confl. Bikes (#/hr)						1			1			1
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	15.3	72.7	72.7	17.5	75.6	75.6	13.8	23.3	40.8	12.7	21.9	21.9
Effective Green, g (s)	15.3	72.7	72.7	17.5	75.6	75.6	13.8	23.3	40.8	12.7	21.9	21.9
Actuated g/C Ratio	0.10	0.50	0.50	0.12	0.52	0.52	0.09	0.16	0.28	0.09	0.15	0.15
Clearance Time (s)	4.4	5.5	5.5	4.9	5.3	5.3	4.4	5.0	4.9	4.4	5.3	5.3
Vehicle Extension (s)	2.0	4.5	4.5	2.0	4.3	4.3	2.0	5.2	2.0	2.0	4.6	4.6
Lane Grp Cap (vph)	383	2700	829	438	2808	1472	346	602	821	318	566	246
v/s Ratio Prot	0.08	0.18		c0.09	0.26		0.04	0.04	c0.04	c0.06	0.01	
v/s Ratio Perm			0.03			c0.27			0.05			0.00
v/c Ratio	0.73	0.36	0.07	0.76	0.51	0.52	0.46	0.28	0.33	0.68	0.07	0.02
Uniform Delay, d1	63.4	22.4	19.0	62.2	23.0	23.2	62.6	53.9	41.8	64.7	53.3	52.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.1	0.4	0.2	6.9	0.7	1.3	0.4	0.6	0.1	4.8	0.1	0.1
Delay (s)	69.4	22.7	19.2	69.2	23.7	24.5	62.9	54.5	41.9	69.4	53.4	52.9
Level of Service	E	C	B	E	C	C	E	D	D	E	D	D
Approach Delay (s)		32.1			29.3			50.3			65.4	
Approach LOS		C			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	34.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	146.0	Sum of lost time (s)	20.1
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↑↑↑↱			↑↑↑	↱	↰↰		↱↱		
Traffic Volume (vph)	0	1520	44	0	1955	497	640	0	1617	0	0
Future Volume (vph)	0	1520	44	0	1955	497	640	0	1617	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	14	14	14	12	13	13	12	12
Total Lost time (s)		7.5			7.5	5.6	5.6		5.6		
Lane Util. Factor		0.91			0.91	1.00	0.97		0.88		
Frt		1.00			1.00	0.85	1.00		0.85		
Flt Protected		1.00			1.00	1.00	0.95		1.00		
Satd. Flow (prot)		5064			5424	1689	3433		2880		
Flt Permitted		1.00			1.00	1.00	0.95		1.00		
Satd. Flow (perm)		5064			5424	1689	3433		2880		
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.92	0.92
Adj. Flow (vph)	0	1567	45	0	2015	512	660	0	1667	0	0
RTOR Reduction (vph)	0	2	0	0	0	128	0	0	21	0	0
Lane Group Flow (vph)	0	1610	0	0	2015	384	660	0	1646	0	0
Turn Type		NA			NA	pm+ov	Prot		custom		
Protected Phases		2 6			6	4	4		4 2		
Permitted Phases						6					
Actuated Green, G (s)		62.9			45.9	89.9	44.0		59.1		
Effective Green, g (s)		62.9			45.9	89.9	44.0		59.1		
Actuated g/C Ratio		0.52			0.38	0.75	0.37		0.49		
Clearance Time (s)					7.5	5.6	5.6				
Vehicle Extension (s)					3.0	3.0	3.0				
Lane Grp Cap (vph)		2654			2074	1265	1258		1418		
v/s Ratio Prot		0.32			c0.37	0.11	0.19		c0.57		
v/s Ratio Perm						0.12					
v/c Ratio		0.61			0.97	0.30	0.52		1.16		
Uniform Delay, d1		19.9			36.4	4.9	29.8		30.4		
Progression Factor		1.00			0.80	3.17	1.00		1.00		
Incremental Delay, d2		0.4			11.5	0.1	1.6		80.6		
Delay (s)		20.3			40.7	15.6	31.4		111.1		
Level of Service		C			D	B	C		F		
Approach Delay (s)		20.3			35.6			88.5		0.0	
Approach LOS		C			D			F		A	

Intersection Summary

HCM 2000 Control Delay	50.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.6
Intersection Capacity Utilization	105.3%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations											
Traffic Volume (vph)	0	1358	802	0	1464	48	988	0	491	0	0
Future Volume (vph)	0	1358	802	0	1464	48	988	0	491	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	16	12	12	12	12	12	12	12	12
Total Lost time (s)		7.5	5.6		7.5		5.6		5.6		
Lane Util. Factor		0.91	1.00		0.86		0.97		0.88		
Frt		1.00	0.85		1.00		1.00		0.85		
Flt Protected		1.00	1.00		1.00		0.95		1.00		
Satd. Flow (prot)		5085	1794		6377		3433		2787		
Flt Permitted		1.00	1.00		1.00		0.95		1.00		
Satd. Flow (perm)		5085	1794		6377		3433		2787		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.92	0.92
Adj. Flow (vph)	0	1429	844	0	1541	51	1040	0	517	0	0
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	21	0	0
Lane Group Flow (vph)	0	1429	844	0	1588	0	1040	0	496	0	0
Turn Type		NA	custom		NA		Prot		custom		
Protected Phases		2	8		2 6		8		8 6		
Permitted Phases			2 6								
Actuated Green, G (s)		40.0	106.9		65.5		41.4		66.9		
Effective Green, g (s)		40.0	99.4		65.5		41.4		59.4		
Actuated g/C Ratio		0.33	0.83		0.55		0.34		0.49		
Clearance Time (s)		7.5	5.6				5.6				
Vehicle Extension (s)		3.0	3.0				3.0				
Lane Grp Cap (vph)		1695	1569		3480		1184		1379		
v/s Ratio Prot		c0.28	c0.19		0.25		c0.30		0.18		
v/s Ratio Perm			0.28								
v/c Ratio		0.84	0.54		0.46		0.88		0.36		
Uniform Delay, d1		37.1	3.2		16.5		36.9		18.6		
Progression Factor		1.04	1.00		1.00		1.00		1.00		
Incremental Delay, d2		4.4	0.3		0.1		9.4		0.2		
Delay (s)		42.9	3.5		16.6		46.3		18.8		
Level of Service		D	A		B		D		B		
Approach Delay (s)		28.3			16.6			37.2		0.0	
Approach LOS		C			B			D		A	

Intersection Summary

HCM 2000 Control Delay	27.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.6
Intersection Capacity Utilization	64.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	179	63	215	254	204	27	423	102	483	889	60
Future Volume (vph)	48	179	63	215	254	204	27	423	102	483	889	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9	4.9	4.4	5.1	4.4	4.4	5.7		4.4	5.7	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91		0.97	0.91	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1535	1770	1863	1546	1770	4917		3433	5026	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1535	1770	1863	1546	1770	4917		3433	5026	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	53	199	70	239	282	227	30	470	113	537	988	67
RTOR Reduction (vph)	0	0	57	0	0	76	0	25	0	0	5	0
Lane Group Flow (vph)	53	199	13	239	282	151	30	558	0	537	1050	0
Confl. Peds. (#/hr)			10			21			5			4
Confl. Bikes (#/hr)			6			6			3			5
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	7.0	23.8	23.8	21.3	37.9	61.9	4.2	43.5		24.0	63.3	
Effective Green, g (s)	7.0	23.8	23.8	21.3	37.9	61.9	4.2	43.5		24.0	63.3	
Actuated g/C Ratio	0.05	0.18	0.18	0.16	0.29	0.47	0.03	0.33		0.18	0.48	
Clearance Time (s)	4.4	4.9	4.9	4.4	5.1	4.4	4.4	5.7		4.4	5.7	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	4.2		2.0	4.3	
Lane Grp Cap (vph)	93	335	276	285	534	724	56	1620		624	2410	
v/s Ratio Prot	0.03	c0.11		c0.14	0.15	0.04	0.02	0.11		c0.16	c0.21	
v/s Ratio Perm			0.01			0.06						
v/c Ratio	0.57	0.59	0.05	0.84	0.53	0.21	0.54	0.34		0.86	0.44	
Uniform Delay, d1	61.0	49.7	44.7	53.7	39.5	20.6	62.9	33.5		52.4	22.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.7	1.9	0.0	18.2	0.4	0.1	4.9	0.6		11.3	0.6	
Delay (s)	65.7	51.5	44.7	71.9	40.0	20.7	67.8	34.0		63.7	23.2	
Level of Service	E	D	D	E	D	C	E	C		E	C	
Approach Delay (s)		52.4			44.3			35.7			36.8	
Approach LOS		D			D			D			D	

Intersection Summary

HCM 2000 Control Delay	39.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	19.6
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	569	179	117	287	19	111	37	93	281	461	200
Future Volume (vph)	23	569	179	117	287	19	111	37	93	281	461	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9		4.4	5.7		4.4	5.2		4.4	5.2	
Lane Util. Factor	0.97	0.95		1.00	0.95		0.97	0.95		0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.99		1.00	0.89		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3412		1770	3503		3433	3128		3433	3362	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	3412		1770	3503		3433	3128		3433	3362	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	26	632	199	130	319	21	123	41	103	312	512	222
RTOR Reduction (vph)	0	24	0	0	3	0	0	80	0	0	37	0
Lane Group Flow (vph)	26	807	0	130	337	0	123	64	0	312	697	0
Confl. Peds. (#/hr)						1			1			4
Confl. Bikes (#/hr)						1			1			
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	11.3	31.7		12.2	31.3		8.1	22.2		14.0	28.1	
Effective Green, g (s)	11.3	31.7		12.2	31.3		8.1	22.2		14.0	28.1	
Actuated g/C Ratio	0.11	0.32		0.12	0.32		0.08	0.22		0.14	0.28	
Clearance Time (s)	4.9	4.9		4.4	5.7		4.4	5.2		4.4	5.2	
Vehicle Extension (s)	5.1	5.1		2.0	4.8		2.0	4.7		2.0	4.7	
Lane Grp Cap (vph)	391	1092		218	1107		280	701		485	954	
v/s Ratio Prot	0.01	c0.24		c0.07	0.10		0.04	0.02		c0.09	c0.21	
v/s Ratio Perm												
v/c Ratio	0.07	0.74		0.60	0.30		0.44	0.09		0.64	0.73	
Uniform Delay, d1	39.1	30.0		41.1	25.6		43.3	30.4		40.1	32.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	3.3		2.9	0.3		0.4	0.1		2.2	3.4	
Delay (s)	39.3	33.2		44.0	25.9		43.7	30.5		42.3	35.4	
Level of Service	D	C		D	C		D	C		D	D	
Approach Delay (s)		33.4			30.9			36.6			37.5	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	34.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	99.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	81	95	134	196	18	125	177	75	62	501	210
Future Volume (vph)	26	81	95	134	196	18	125	177	75	62	501	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.4	4.9	4.9	4.4	5.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.92		1.00	0.99		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3214		1770	3495		1770	3539	1560	1770	3370	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3214		1770	3495		1770	3539	1560	1770	3370	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	29	90	106	149	218	20	139	197	83	69	557	233
RTOR Reduction (vph)	0	90	0	0	8	0	0	0	44	0	37	0
Lane Group Flow (vph)	29	106	0	149	230	0	139	197	39	69	753	0
Confl. Peds. (#/hr)			5						2			1
Confl. Bikes (#/hr)			3						1			
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	3.8	15.1		11.9	23.2		11.3	47.5	47.5	6.9	42.7	
Effective Green, g (s)	3.8	15.1		11.9	23.2		11.3	47.5	47.5	6.9	42.7	
Actuated g/C Ratio	0.04	0.15		0.12	0.23		0.11	0.48	0.48	0.07	0.43	
Clearance Time (s)	4.4	4.9		4.4	4.9		4.4	4.9	4.9	4.4	5.3	
Vehicle Extension (s)	2.0	5.3		2.0	5.4		2.0	3.8	3.8	2.0	3.8	
Lane Grp Cap (vph)	67	485		210	810		200	1681	741	122	1438	
v/s Ratio Prot	0.02	0.03		c0.08	c0.07		c0.08	c0.06		0.04	c0.22	
v/s Ratio Perm									0.03			
v/c Ratio	0.43	0.22		0.71	0.28		0.69	0.12	0.05	0.57	0.52	
Uniform Delay, d1	47.0	37.3		42.4	31.6		42.7	14.6	14.1	45.1	21.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	0.5		8.6	0.5		8.2	0.1	0.1	3.5	1.4	
Delay (s)	48.7	37.8		51.0	32.0		50.9	14.7	14.3	48.6	22.5	
Level of Service	D	D		D	C		D	B	B	D	C	
Approach Delay (s)		39.2			39.3			26.6			24.6	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	1335	165	306	1566	212	200	39	525	631	172	90
Future Volume (vph)	23	1335	165	306	1566	212	200	39	525	631	172	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.5	5.5	4.9	5.3	5.3	4.4	5.0	4.9	4.4	5.3	5.3
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	0.88	0.97	0.95	0.88	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.96	1.00	1.00	0.99	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1562	3433	5085	2665	3433	3539	2764	3433	3539	1540
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1562	3433	5085	2665	3433	3539	2764	3433	3539	1540
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	23	1362	168	312	1598	216	204	40	536	644	176	92
RTOR Reduction (vph)	0	0	85	0	0	72	0	0	66	0	0	73
Lane Group Flow (vph)	23	1362	83	312	1598	144	204	40	470	644	176	19
Confl. Peds. (#/hr)			1			9			6			12
Confl. Bikes (#/hr)						1			1			1
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	3.1	64.1	64.1	19.2	80.9	80.9	12.4	12.9	32.1	30.0	30.2	30.2
Effective Green, g (s)	3.1	64.1	64.1	19.2	80.9	80.9	12.4	12.9	32.1	30.0	30.2	30.2
Actuated g/C Ratio	0.02	0.44	0.44	0.13	0.55	0.55	0.08	0.09	0.22	0.21	0.21	0.21
Clearance Time (s)	4.4	5.5	5.5	4.9	5.3	5.3	4.4	5.0	4.9	4.4	5.3	5.3
Vehicle Extension (s)	2.0	4.5	4.5	2.0	4.3	4.3	2.0	5.2	2.0	2.0	4.6	4.6
Lane Grp Cap (vph)	72	2232	685	451	2817	1476	291	312	607	705	732	318
v/s Ratio Prot	0.01	c0.27		0.09	0.31		0.06	0.01	c0.10	c0.19	0.05	
v/s Ratio Perm			0.05			0.05			0.07			0.01
v/c Ratio	0.32	0.61	0.12	0.69	0.57	0.10	0.70	0.13	0.78	0.91	0.24	0.06
Uniform Delay, d1	70.4	31.4	24.3	60.6	21.2	15.3	65.0	61.4	53.6	56.7	48.3	46.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	1.3	0.4	3.7	0.8	0.1	6.1	0.4	5.6	16.0	0.3	0.1
Delay (s)	71.3	32.6	24.6	64.3	22.0	15.5	71.1	61.8	59.2	72.7	48.6	46.6
Level of Service	E	C	C	E	C	B	E	E	E	E	D	D
Approach Delay (s)		32.3			27.5			62.4			65.5	
Approach LOS		C			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	40.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	146.0	Sum of lost time (s)	20.1
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↑↑↑↱			↑↑↑	↱	↰↰		↱↱		
Traffic Volume (vph)	0	2233	102	0	1650	640	203	0	443	0	0
Future Volume (vph)	0	2233	102	0	1650	640	203	0	443	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.5			7.5	5.6	5.6		5.6		
Lane Util. Factor		0.91			0.91	1.00	0.97		0.88		
Frt		0.99			1.00	0.85	1.00		0.85		
Flt Protected		1.00			1.00	1.00	0.95		1.00		
Satd. Flow (prot)		5052			5085	1583	3433		2787		
Flt Permitted		1.00			1.00	1.00	0.95		1.00		
Satd. Flow (perm)		5052			5085	1583	3433		2787		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.92	0.92
Adj. Flow (vph)	0	2351	107	0	1737	674	214	0	466	0	0
RTOR Reduction (vph)	0	4	0	0	0	203	0	0	19	0	0
Lane Group Flow (vph)	0	2454	0	0	1737	471	214	0	447	0	0
Turn Type		NA			NA	pm+ov	Prot		custom		
Protected Phases		2 6			6	4	4		4 2		
Permitted Phases						6					
Actuated Green, G (s)		62.9			39.9	83.9	44.0		65.1		
Effective Green, g (s)		62.9			39.9	83.9	44.0		65.1		
Actuated g/C Ratio		0.52			0.33	0.70	0.37		0.54		
Clearance Time (s)					7.5	5.6	5.6				
Vehicle Extension (s)					3.0	3.0	3.0				
Lane Grp Cap (vph)		2648			1690	1106	1258		1511		
v/s Ratio Prot		c0.49			c0.34	c0.16	0.06		0.16		
v/s Ratio Perm						0.14					
v/c Ratio		0.93			1.03	0.43	0.17		0.30		
Uniform Delay, d1		26.4			40.0	7.7	25.7		15.0		
Progression Factor		1.00			0.62	3.94	1.00		1.00		
Incremental Delay, d2		6.3			27.2	0.2	0.3		0.5		
Delay (s)		32.7			52.1	30.7	26.0		15.5		
Level of Service		C			D	C	C		B		
Approach Delay (s)		32.7			46.1			18.8		0.0	
Approach LOS		C			D			B		A	

Intersection Summary			
HCM 2000 Control Delay	36.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.6
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations											
Traffic Volume (vph)	0	1061	1374	0	1789	45	501	0	194	0	0
Future Volume (vph)	0	1061	1374	0	1789	45	501	0	194	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.5	5.6		7.5		5.6		5.6		
Lane Util. Factor		0.91	1.00		0.86		0.97		0.88		
Frt		1.00	0.85		1.00		1.00		0.85		
Flt Protected		1.00	1.00		1.00		0.95		1.00		
Satd. Flow (prot)		5085	1583		6384		3433		2787		
Flt Permitted		1.00	1.00		1.00		0.95		1.00		
Satd. Flow (perm)		5085	1583		6384		3433		2787		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.92	0.92
Adj. Flow (vph)	0	1117	1446	0	1883	47	527	0	204	0	0
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	17	0	0
Lane Group Flow (vph)	0	1117	1446	0	1927	0	527	0	187	0	0
Turn Type		NA	custom		NA		Prot		custom		
Protected Phases		2	8		2 6		8		8 6		
Permitted Phases			2 6								
Actuated Green, G (s)		30.0	106.9		55.5		51.4		76.9		
Effective Green, g (s)		30.0	99.4		55.5		51.4		69.4		
Actuated g/C Ratio		0.25	0.83		0.46		0.43		0.58		
Clearance Time (s)		7.5	5.6				5.6				
Vehicle Extension (s)		3.0	3.0				3.0				
Lane Grp Cap (vph)		1271	1385		2952		1470		1611		
v/s Ratio Prot		0.22	c0.45		0.30		0.15		0.07		
v/s Ratio Perm			0.47								
v/c Ratio		0.88	1.04		0.65		0.36		0.12		
Uniform Delay, d1		43.3	10.3		24.8		23.2		11.4		
Progression Factor		1.51	1.00		1.00		1.00		1.00		
Incremental Delay, d2		4.5	29.6		0.5		0.7		0.0		
Delay (s)		69.7	39.9		25.4		23.8		11.5		
Level of Service		E	D		C		C		B		
Approach Delay (s)		52.9			25.4			20.4		0.0	
Approach LOS		D			C			C		A	

Intersection Summary			
HCM 2000 Control Delay	38.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.6
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Appendix G

Existing With Project Synchro Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	217	55	66	288	413	180	1110	265	225	371	96
Future Volume (vph)	56	217	55	66	288	413	180	1110	265	225	371	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9	4.9	4.4	5.1	4.4	4.4	5.7		4.4	5.7	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91		0.97	0.91	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1536	1770	1863	1541	1770	4919		3433	4894	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1536	1770	1863	1541	1770	4919		3433	4894	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	62	241	61	73	320	459	200	1233	294	250	412	107
RTOR Reduction (vph)	0	0	49	0	0	41	0	24	0	0	29	0
Lane Group Flow (vph)	62	241	12	73	320	418	200	1503	0	250	490	0
Confl. Peds. (#/hr)			10			21			5			4
Confl. Bikes (#/hr)			6			6			3			5
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	6.8	26.6	26.6	7.6	27.2	41.0	19.2	64.6		13.8	59.2	
Effective Green, g (s)	6.8	26.6	26.6	7.6	27.2	41.0	19.2	64.6		13.8	59.2	
Actuated g/C Ratio	0.05	0.20	0.20	0.06	0.21	0.31	0.15	0.49		0.10	0.45	
Clearance Time (s)	4.4	4.9	4.9	4.4	5.1	4.4	4.4	5.7		4.4	5.7	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	4.2		2.0	4.3	
Lane Grp Cap (vph)	91	375	309	101	383	478	257	2407		358	2194	
v/s Ratio Prot	0.04	0.13		c0.04	0.17	c0.09	c0.11	c0.31		0.07	0.10	
v/s Ratio Perm			0.01			0.18						
v/c Ratio	0.68	0.64	0.04	0.72	0.84	0.88	0.78	0.62		0.70	0.22	
Uniform Delay, d1	61.5	48.3	42.4	61.2	50.3	43.1	54.3	24.8		57.1	22.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.4	2.8	0.0	19.3	13.9	15.8	12.7	1.2		4.7	0.2	
Delay (s)	77.0	51.2	42.4	80.5	64.2	58.9	67.0	26.0		61.8	22.5	
Level of Service	E	D	D	F	E	E	E	C		E	C	
Approach Delay (s)		54.1			62.7			30.8			35.3	
Approach LOS		D			E			C			D	

Intersection Summary			
HCM 2000 Control Delay	41.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	19.6
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↱		↰	↑↱		↰↰	↑↱		↰↰	↑↱	
Traffic Volume (vph)	190	211	89	51	579	159	211	555	160	21	65	21
Future Volume (vph)	190	211	89	51	579	159	211	555	160	21	65	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9		4.4	5.7		4.4	5.2		4.4	5.2	
Lane Util. Factor	0.97	0.95		1.00	0.95		0.97	0.95		0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.97		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3381		1770	3414		3433	3410		3433	3397	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	3381		1770	3414		3433	3410		3433	3397	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	211	234	99	57	643	177	234	617	178	23	72	23
RTOR Reduction (vph)	0	37	0	0	18	0	0	20	0	0	18	0
Lane Group Flow (vph)	211	296	0	57	802	0	234	775	0	23	77	0
Confl. Peds. (#/hr)						1			1			4
Confl. Bikes (#/hr)						1			1			
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	15.5	42.1		6.3	31.6		11.5	29.4		1.3	19.2	
Effective Green, g (s)	15.5	42.1		6.3	31.6		11.5	29.4		1.3	19.2	
Actuated g/C Ratio	0.16	0.43		0.06	0.32		0.12	0.30		0.01	0.20	
Clearance Time (s)	4.9	4.9		4.4	5.7		4.4	5.2		4.4	5.2	
Vehicle Extension (s)	5.1	5.1		2.0	4.8		2.0	4.7		2.0	4.7	
Lane Grp Cap (vph)	542	1452		113	1100		402	1023		45	665	
v/s Ratio Prot	c0.06	0.09		0.03	c0.23		c0.07	c0.23		0.01	0.02	
v/s Ratio Perm												
v/c Ratio	0.39	0.20		0.50	0.73		0.58	0.76		0.51	0.12	
Uniform Delay, d1	37.0	17.5		44.3	29.4		41.0	31.1		48.0	32.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	0.2		1.3	2.9		1.4	3.7		4.0	0.1	
Delay (s)	38.0	17.6		45.6	32.3		42.4	34.8		52.1	32.6	
Level of Service	D	B		D	C		D	C		D	C	
Approach Delay (s)		25.5			33.2			36.5			36.4	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	33.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	98.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	60.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱		↰	↑↑	↱	↰	↑↱	
Traffic Volume (vph)	77	116	36	54	79	39	296	801	344	24	154	53
Future Volume (vph)	77	116	36	54	79	39	296	801	344	24	154	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.4	4.9	4.9	4.4	5.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.95		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3396		1770	3365		1770	3539	1560	1770	3392	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3396		1770	3365		1770	3539	1560	1770	3392	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	86	129	40	60	88	43	329	890	382	27	171	59
RTOR Reduction (vph)	0	33	0	0	37	0	0	0	115	0	31	0
Lane Group Flow (vph)	86	136	0	60	94	0	329	890	267	27	199	0
Confl. Peds. (#/hr)			5						2			1
Confl. Bikes (#/hr)			3						1			
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	9.0	16.9		6.3	14.2		22.9	54.5	54.5	3.7	34.9	
Effective Green, g (s)	9.0	16.9		6.3	14.2		22.9	54.5	54.5	3.7	34.9	
Actuated g/C Ratio	0.09	0.17		0.06	0.14		0.23	0.54	0.54	0.04	0.35	
Clearance Time (s)	4.4	4.9		4.4	4.9		4.4	4.9	4.9	4.4	5.3	
Vehicle Extension (s)	2.0	5.3		2.0	5.4		2.0	3.8	3.8	2.0	3.8	
Lane Grp Cap (vph)	159	573		111	477		405	1928	850	65	1183	
v/s Ratio Prot	c0.05	c0.04		0.03	0.03		c0.19	c0.25		0.02	0.06	
v/s Ratio Perm									0.17			
v/c Ratio	0.54	0.24		0.54	0.20		0.81	0.46	0.31	0.42	0.17	
Uniform Delay, d1	43.5	36.0		45.4	37.9		36.5	13.8	12.5	47.1	22.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.0	0.5		2.9	0.5		11.2	0.8	1.0	1.6	0.3	
Delay (s)	45.5	36.5		48.3	38.4		47.7	14.6	13.5	48.7	22.8	
Level of Service	D	D		D	D		D	B	B	D	C	
Approach Delay (s)		39.5			41.5			21.1			25.5	
Approach LOS		D			D			C			C	

Intersection Summary

HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Towne Centre Dr. & La Jolla Village Dr.

Existing + Project AM
06/20/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	267	915	108	317	1357	1107	151	160	304	208	40	28
Future Volume (vph)	267	915	108	317	1357	1107	151	160	304	208	40	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	14	14	14	14	14	14	14	14	14	14	14
Total Lost time (s)	4.4	5.5	5.5	4.9	5.3	5.3	4.4	5.0	4.9	4.4	5.3	5.3
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	0.88	0.97	0.95	0.88	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.96	1.00	1.00	0.99	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3662	5424	1666	3662	5424	2843	3662	3775	2939	3662	3775	1642
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3662	5424	1666	3662	5424	2843	3662	3775	2939	3662	3775	1642
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	281	963	114	334	1428	1165	159	168	320	219	42	29
RTOR Reduction (vph)	0	0	57	0	0	381	0	0	45	0	0	25
Lane Group Flow (vph)	281	963	57	334	1428	784	159	168	275	219	42	4
Confl. Peds. (#/hr)			1			9			6			12
Confl. Bikes (#/hr)						1			1			1
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	15.1	72.5	72.5	17.5	75.6	75.6	14.0	23.4	40.9	12.8	21.9	21.9
Effective Green, g (s)	15.1	72.5	72.5	17.5	75.6	75.6	14.0	23.4	40.9	12.8	21.9	21.9
Actuated g/C Ratio	0.10	0.50	0.50	0.12	0.52	0.52	0.10	0.16	0.28	0.09	0.15	0.15
Clearance Time (s)	4.4	5.5	5.5	4.9	5.3	5.3	4.4	5.0	4.9	4.4	5.3	5.3
Vehicle Extension (s)	2.0	4.5	4.5	2.0	4.3	4.3	2.0	5.2	2.0	2.0	4.6	4.6
Lane Grp Cap (vph)	378	2693	827	438	2808	1472	351	605	823	321	566	246
v/s Ratio Prot	0.08	0.18		c0.09	0.26		0.04	0.04	c0.04	c0.06	0.01	
v/s Ratio Perm			0.03			c0.28			0.05			0.00
v/c Ratio	0.74	0.36	0.07	0.76	0.51	0.53	0.45	0.28	0.33	0.68	0.07	0.02
Uniform Delay, d1	63.6	22.5	19.2	62.2	23.0	23.4	62.4	53.9	41.7	64.6	53.3	52.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.8	0.4	0.2	6.9	0.7	1.4	0.3	0.6	0.1	4.7	0.1	0.1
Delay (s)	70.3	22.9	19.3	69.2	23.7	24.8	62.7	54.4	41.8	69.3	53.4	52.9
Level of Service	E	C	B	E	C	C	E	D	D	E	D	D
Approach Delay (s)		32.4			29.3			50.2			65.4	
Approach LOS		C			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	34.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	146.0	Sum of lost time (s)	20.1
Intersection Capacity Utilization	68.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations											
Traffic Volume (vph)	0	1520	44	0	1962	497	640	0	1621	0	0
Future Volume (vph)	0	1520	44	0	1962	497	640	0	1621	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	14	14	14	12	13	13	12	12
Total Lost time (s)		7.5			7.5	5.6	5.6		5.6		
Lane Util. Factor		0.91			0.91	1.00	0.97		0.88		
Frt		1.00			1.00	0.85	1.00		0.85		
Flt Protected		1.00			1.00	1.00	0.95		1.00		
Satd. Flow (prot)		5064			5424	1689	3433		2880		
Flt Permitted		1.00			1.00	1.00	0.95		1.00		
Satd. Flow (perm)		5064			5424	1689	3433		2880		
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.92	0.92
Adj. Flow (vph)	0	1567	45	0	2023	512	660	0	1671	0	0
RTOR Reduction (vph)	0	2	0	0	0	124	0	0	21	0	0
Lane Group Flow (vph)	0	1610	0	0	2023	388	660	0	1650	0	0
Turn Type		NA			NA	pm+ov	Prot		custom		
Protected Phases		2 6			6	4	4		4 2		
Permitted Phases						6					
Actuated Green, G (s)		62.5			46.5	90.9	44.4		58.5		
Effective Green, g (s)		62.5			46.5	90.9	44.4		58.5		
Actuated g/C Ratio		0.52			0.39	0.76	0.37		0.49		
Clearance Time (s)					7.5	5.6	5.6				
Vehicle Extension (s)					3.0	3.0	3.0				
Lane Grp Cap (vph)		2637			2101	1279	1270		1404		
v/s Ratio Prot		0.32			c0.37	0.11	0.19		c0.57		
v/s Ratio Perm						0.12					
v/c Ratio		0.61			0.96	0.30	0.52		1.18		
Uniform Delay, d1		20.2			35.9	4.6	29.5		30.8		
Progression Factor		1.00			0.79	3.05	1.00		1.00		
Incremental Delay, d2		0.4			10.1	0.1	1.5		86.7		
Delay (s)		20.6			38.6	14.1	31.0		117.4		
Level of Service		C			D	B	C		F		
Approach Delay (s)		20.6			33.6			92.9		0.0	
Approach LOS		C			C			F		A	

Intersection Summary			
HCM 2000 Control Delay	51.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.6
Intersection Capacity Utilization	105.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations											
Traffic Volume (vph)	0	1358	802	0	1464	48	995	0	491	0	0
Future Volume (vph)	0	1358	802	0	1464	48	995	0	491	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.5	5.6		7.5		5.6		5.6		
Lane Util. Factor		0.91	1.00		0.86		0.97		0.88		
Frt		1.00	0.85		1.00		1.00		0.85		
Flt Protected		1.00	1.00		1.00		0.95		1.00		
Satd. Flow (prot)		5085	1583		6377		3433		2787		
Flt Permitted		1.00	1.00		1.00		0.95		1.00		
Satd. Flow (perm)		5085	1583		6377		3433		2787		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.92	0.92
Adj. Flow (vph)	0	1429	844	0	1541	51	1047	0	517	0	0
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	20	0	0
Lane Group Flow (vph)	0	1429	844	0	1588	0	1047	0	497	0	0
Turn Type		NA	custom		NA		Prot		custom		
Protected Phases		2	8		2 6		8		8 6		
Permitted Phases			2 6								
Actuated Green, G (s)		39.0	106.9		64.5		42.4		67.9		
Effective Green, g (s)		39.0	99.4		64.5		42.4		60.4		
Actuated g/C Ratio		0.32	0.83		0.54		0.35		0.50		
Clearance Time (s)		7.5	5.6				5.6				
Vehicle Extension (s)		3.0	3.0				3.0				
Lane Grp Cap (vph)		1652	1385		3427		1212		1402		
v/s Ratio Prot		c0.28	c0.22		0.25		c0.30		0.18		
v/s Ratio Perm			0.32								
v/c Ratio		0.87	0.61		0.46		0.86		0.35		
Uniform Delay, d1		38.0	3.6		17.1		36.1		18.0		
Progression Factor		1.07	1.00		1.00		1.00		1.00		
Incremental Delay, d2		5.3	0.6		0.1		8.3		0.2		
Delay (s)		45.9	4.2		17.2		44.4		18.2		
Level of Service		D	A		B		D		B		
Approach Delay (s)		30.4			17.2			35.7		0.0	
Approach LOS		C			B			D		A	

Intersection Summary			
HCM 2000 Control Delay	28.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.6
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	180	63	220	263	210	27	423	103	484	889	60
Future Volume (vph)	48	180	63	220	263	210	27	423	103	484	889	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9	4.9	4.4	5.1	4.4	4.4	5.7		4.4	5.7	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91		0.97	0.91	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1535	1770	1863	1546	1770	4916		3433	5026	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1535	1770	1863	1546	1770	4916		3433	5026	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	53	200	70	244	292	233	30	470	114	538	988	67
RTOR Reduction (vph)	0	0	57	0	0	76	0	26	0	0	5	0
Lane Group Flow (vph)	53	200	13	244	292	157	30	558	0	538	1050	0
Confl. Peds. (#/hr)			10			21			5			4
Confl. Bikes (#/hr)			6			6			3			5
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	7.0	23.7	23.7	21.7	38.2	62.3	4.2	43.1		24.1	63.0	
Effective Green, g (s)	7.0	23.7	23.7	21.7	38.2	62.3	4.2	43.1		24.1	63.0	
Actuated g/C Ratio	0.05	0.18	0.18	0.16	0.29	0.47	0.03	0.33		0.18	0.48	
Clearance Time (s)	4.4	4.9	4.9	4.4	5.1	4.4	4.4	5.7		4.4	5.7	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	4.2		2.0	4.3	
Lane Grp Cap (vph)	93	334	275	290	539	729	56	1605		626	2398	
v/s Ratio Prot	0.03	c0.11		c0.14	0.16	0.04	0.02	0.11		c0.16	c0.21	
v/s Ratio Perm			0.01			0.06						
v/c Ratio	0.57	0.60	0.05	0.84	0.54	0.22	0.54	0.35		0.86	0.44	
Uniform Delay, d1	61.0	49.8	44.8	53.5	39.5	20.5	62.9	33.8		52.3	22.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.7	1.9	0.0	18.6	0.6	0.1	4.9	0.6		10.9	0.6	
Delay (s)	65.7	51.7	44.8	72.1	40.1	20.5	67.8	34.4		63.2	23.4	
Level of Service	E	D	D	E	D	C	E	C		E	C	
Approach Delay (s)		52.5			44.3			36.0			36.8	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	40.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	19.6
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	569	179	117	287	20	111	40	93	292	484	219
Future Volume (vph)	26	569	179	117	287	20	111	40	93	292	484	219
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9		4.4	5.7		4.4	5.2		4.4	5.2	
Lane Util. Factor	0.97	0.95		1.00	0.95		0.97	0.95		0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.99		1.00	0.89		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3412		1770	3502		3433	3136		3433	3357	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	3412		1770	3502		3433	3136		3433	3357	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	29	632	199	130	319	22	123	44	103	324	538	243
RTOR Reduction (vph)	0	24	0	0	3	0	0	79	0	0	40	0
Lane Group Flow (vph)	29	807	0	130	338	0	123	68	0	324	741	0
Confl. Peds. (#/hr)						1			1			4
Confl. Bikes (#/hr)						1			1			
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	11.4	32.1		12.3	31.7		8.1	23.1		14.5	29.5	
Effective Green, g (s)	11.4	32.1		12.3	31.7		8.1	23.1		14.5	29.5	
Actuated g/C Ratio	0.11	0.32		0.12	0.31		0.08	0.23		0.14	0.29	
Clearance Time (s)	4.9	4.9		4.4	5.7		4.4	5.2		4.4	5.2	
Vehicle Extension (s)	5.1	5.1		2.0	4.8		2.0	4.7		2.0	4.7	
Lane Grp Cap (vph)	387	1085		215	1100		275	717		493	981	
v/s Ratio Prot	0.01	c0.24		c0.07	0.10		0.04	0.02		c0.09	c0.22	
v/s Ratio Perm												
v/c Ratio	0.07	0.74		0.60	0.31		0.45	0.09		0.66	0.76	
Uniform Delay, d1	40.0	30.7		42.0	26.3		44.3	30.7		40.8	32.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	3.4		3.3	0.3		0.4	0.1		2.4	3.9	
Delay (s)	40.2	34.1		45.3	26.6		44.7	30.8		43.3	36.3	
Level of Service	D	C		D	C		D	C		D	D	
Approach Delay (s)		34.3			31.7			37.1			38.3	
Approach LOS		C			C			D			D	

Intersection Summary

HCM 2000 Control Delay	35.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.9	Sum of lost time (s)	20.2
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	81	95	134	196	18	125	179	75	64	519	212
Future Volume (vph)	26	81	95	134	196	18	125	179	75	64	519	212
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.4	4.9	4.9	4.4	5.3	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.92		1.00	0.99		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3214		1770	3495		1770	3539	1560	1770	3372	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3214		1770	3495		1770	3539	1560	1770	3372	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	29	90	106	149	218	20	139	199	83	71	577	236
RTOR Reduction (vph)	0	90	0	0	8	0	0	0	44	0	36	0
Lane Group Flow (vph)	29	106	0	149	230	0	139	199	39	71	777	0
Confl. Peds. (#/hr)			5						2			1
Confl. Bikes (#/hr)			3						1			
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	3.8	15.1		11.9	23.2		11.3	47.4	47.4	7.0	42.7	
Effective Green, g (s)	3.8	15.1		11.9	23.2		11.3	47.4	47.4	7.0	42.7	
Actuated g/C Ratio	0.04	0.15		0.12	0.23		0.11	0.47	0.47	0.07	0.43	
Clearance Time (s)	4.4	4.9		4.4	4.9		4.4	4.9	4.9	4.4	5.3	
Vehicle Extension (s)	2.0	5.3		2.0	5.4		2.0	3.8	3.8	2.0	3.8	
Lane Grp Cap (vph)	67	485		210	810		200	1677	739	123	1439	
v/s Ratio Prot	0.02	0.03		c0.08	c0.07		c0.08	c0.06		0.04	c0.23	
v/s Ratio Perm									0.03			
v/c Ratio	0.43	0.22		0.71	0.28		0.69	0.12	0.05	0.58	0.54	
Uniform Delay, d1	47.0	37.3		42.4	31.6		42.7	14.7	14.2	45.1	21.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	0.5		8.6	0.5		8.2	0.1	0.1	4.0	1.5	
Delay (s)	48.7	37.8		51.0	32.0		50.9	14.8	14.3	49.1	22.8	
Level of Service	D	D		D	C		D	B	B	D	C	
Approach Delay (s)		39.2			39.3			26.6			24.9	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	1335	165	306	1566	214	200	39	525	648	173	91
Future Volume (vph)	23	1335	165	306	1566	214	200	39	525	648	173	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.5	5.5	4.9	5.3	5.3	4.4	5.0	4.9	4.4	5.3	5.3
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	0.88	0.97	0.95	0.88	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.96	1.00	1.00	0.99	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1562	3433	5085	2665	3433	3539	2764	3433	3539	1540
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1562	3433	5085	2665	3433	3539	2764	3433	3539	1540
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	23	1362	168	312	1598	218	204	40	536	661	177	93
RTOR Reduction (vph)	0	0	86	0	0	74	0	0	66	0	0	73
Lane Group Flow (vph)	23	1362	82	312	1598	144	204	40	470	661	177	20
Confl. Peds. (#/hr)			1			9			6			12
Confl. Bikes (#/hr)						1			1			1
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	3.1	63.5	63.5	19.0	80.1	80.1	12.7	12.9	31.9	30.8	30.7	30.7
Effective Green, g (s)	3.1	63.5	63.5	19.0	80.1	80.1	12.7	12.9	31.9	30.8	30.7	30.7
Actuated g/C Ratio	0.02	0.43	0.43	0.13	0.55	0.55	0.09	0.09	0.22	0.21	0.21	0.21
Clearance Time (s)	4.4	5.5	5.5	4.9	5.3	5.3	4.4	5.0	4.9	4.4	5.3	5.3
Vehicle Extension (s)	2.0	4.5	4.5	2.0	4.3	4.3	2.0	5.2	2.0	2.0	4.6	4.6
Lane Grp Cap (vph)	72	2211	679	446	2789	1462	298	312	603	724	744	323
v/s Ratio Prot	0.01	c0.27		0.09	0.31		0.06	0.01	c0.10	c0.19	0.05	
v/s Ratio Perm			0.05			0.05			0.07			0.01
v/c Ratio	0.32	0.62	0.12	0.70	0.57	0.10	0.68	0.13	0.78	0.91	0.24	0.06
Uniform Delay, d1	70.4	31.8	24.6	60.8	21.7	15.7	64.7	61.4	53.7	56.3	47.9	46.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	1.3	0.4	3.9	0.9	0.1	5.1	0.4	6.0	15.6	0.3	0.1
Delay (s)	71.3	33.1	25.0	64.6	22.6	15.9	69.8	61.8	59.7	71.9	48.2	46.3
Level of Service	E	C	C	E	C	B	E	E	E	E	D	D
Approach Delay (s)		32.8			28.0			62.5			64.8	
Approach LOS		C			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	40.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	146.0	Sum of lost time (s)	20.1
Intersection Capacity Utilization	77.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↑↑↑↱			↑↑↑	↱	↰↰		↱↱		
Traffic Volume (vph)	0	2235	102	0	1651	640	203	0	443	0	0
Future Volume (vph)	0	2235	102	0	1651	640	203	0	443	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.5			7.5	5.6	5.6		5.6		
Lane Util. Factor		0.91			0.91	1.00	0.97		0.88		
Frt		0.99			1.00	0.85	1.00		0.85		
Flt Protected		1.00			1.00	1.00	0.95		1.00		
Satd. Flow (prot)		5052			5085	1583	3433		2787		
Flt Permitted		1.00			1.00	1.00	0.95		1.00		
Satd. Flow (perm)		5052			5085	1583	3433		2787		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.92	0.92
Adj. Flow (vph)	0	2353	107	0	1738	674	214	0	466	0	0
RTOR Reduction (vph)	0	4	0	0	0	203	0	0	19	0	0
Lane Group Flow (vph)	0	2456	0	0	1738	471	214	0	447	0	0
Turn Type		NA			NA	pm+ov	Prot		custom		
Protected Phases		2 6			6	4	4		4 2		
Permitted Phases						6					
Actuated Green, G (s)		62.9			39.9	83.9	44.0		65.1		
Effective Green, g (s)		62.9			39.9	83.9	44.0		65.1		
Actuated g/C Ratio		0.52			0.33	0.70	0.37		0.54		
Clearance Time (s)					7.5	5.6	5.6				
Vehicle Extension (s)					3.0	3.0	3.0				
Lane Grp Cap (vph)		2648			1690	1106	1258		1511		
v/s Ratio Prot		c0.49			c0.34	c0.16	0.06		0.16		
v/s Ratio Perm						0.14					
v/c Ratio		0.93			1.03	0.43	0.17		0.30		
Uniform Delay, d1		26.4			40.0	7.7	25.7		15.0		
Progression Factor		1.00			0.62	3.93	1.00		1.00		
Incremental Delay, d2		6.4			27.4	0.2	0.3		0.5		
Delay (s)		32.8			52.3	30.6	26.0		15.5		
Level of Service		C			D	C	C		B		
Approach Delay (s)		32.8			46.2			18.8		0.0	
Approach LOS		C			D			B		A	

Intersection Summary			
HCM 2000 Control Delay	36.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.6
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations											
Traffic Volume (vph)	0	1061	1376	0	1789	45	502	0	194	0	0
Future Volume (vph)	0	1061	1376	0	1789	45	502	0	194	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.5	5.6		7.5		5.6		5.6		
Lane Util. Factor		0.91	1.00		0.86		0.97		0.88		
Frt		1.00	0.85		1.00		1.00		0.85		
Flt Protected		1.00	1.00		1.00		0.95		1.00		
Satd. Flow (prot)		5085	1583		6384		3433		2787		
Flt Permitted		1.00	1.00		1.00		0.95		1.00		
Satd. Flow (perm)		5085	1583		6384		3433		2787		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.92	0.92
Adj. Flow (vph)	0	1117	1448	0	1883	47	528	0	204	0	0
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	17	0	0
Lane Group Flow (vph)	0	1117	1448	0	1927	0	528	0	187	0	0
Turn Type		NA	custom		NA		Prot		custom		
Protected Phases		2	8		2 6		8		8 6		
Permitted Phases			2 6								
Actuated Green, G (s)		30.0	106.9		55.5		51.4		76.9		
Effective Green, g (s)		30.0	99.4		55.5		51.4		69.4		
Actuated g/C Ratio		0.25	0.83		0.46		0.43		0.58		
Clearance Time (s)		7.5	5.6				5.6				
Vehicle Extension (s)		3.0	3.0				3.0				
Lane Grp Cap (vph)		1271	1385		2952		1470		1611		
v/s Ratio Prot		0.22	c0.45		0.30		0.15		0.07		
v/s Ratio Perm			0.47								
v/c Ratio		0.88	1.05		0.65		0.36		0.12		
Uniform Delay, d1		43.3	10.3		24.8		23.2		11.4		
Progression Factor		1.51	1.00		1.00		1.00		1.00		
Incremental Delay, d2		4.5	30.1		0.5		0.7		0.0		
Delay (s)		69.7	40.4		25.4		23.9		11.5		
Level of Service		E	D		C		C		B		
Approach Delay (s)		53.1			25.4			20.4		0.0	
Approach LOS		D			C			C		A	

Intersection Summary			
HCM 2000 Control Delay	38.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.6
Intersection Capacity Utilization	89.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

2017

WASTE MANAGEMENT PLAN

9775 TOWNE CENTRE DRIVE

MAY 2017

PREPARED BY: latitude 33 PLANNING & ENGINEERING

PREPARED FOR: BMR-APEX LP

JOB NUMBER: 1517.0

WASTE MANAGEMENT PLAN FOR

9775 TOWNE CENTRE DRIVE

CITY OF SAN DIEGO, CALIFORNIA

PTS No. 527644

MAY 2017

Prepared for:
BMR-APEX LP
17190 BERNARDO CENTER DRIVE
SAN DIEGO, CA 92128

Prepared by:
LATITUDE 33 PLANNING AND ENGINEERING
9968 Hibert Street, 2nd Floor
San Diego, California 92131
(858) 751-0633

____

Bradley D. Sager, RCE C054564 Prepared by: AB

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ATTACHMENTS

I. INTRODUCTION

According to the City of San Diego, Development Services Department, California Environmental Quality Act (CEQA) Significance Determination Thresholds (January 2011), projects that include the demolition, construction, and/or renovation of 40,000 square feet or more of building space generate 60 tons of waste or more. This amount of waste is further identified as a potentially significant cumulative impact. Cumulative impacts are mitigated by the implementation of a project-specific Waste Management Plan which identifies ways to reduce solid waste impacts to below a level of significance. The purpose of this Waste Management Plan (WMP), for the 9775 Towne Centre Drive Project, is to identify waste that will be generated by the project during Site Development, Demolition/Construction, and Occupancy and to identify measures to reduce the waste.

The following regulations apply to Site Development, Demolition/Construction and through Occupancy to assure waste is being diverted from landfills. On December 9, 1997, the City of San Diego adopted Section 142.08 of the San Diego Municipal Code, Refuse and Recyclable Materials Storage Regulations. The ordinance requires the diversion of recyclable materials from landfill disposal to conserve the capacity and extend the useful life of the Miramar landfill, and reduce greenhouse gas emissions. Section 142.08 provides for permanent, adequate, and convenient space for the storage and collection of refuse and recyclable material to encourage recycling of solid waste. On November 13, 2007, the City of San Diego adopted a Recycling Ordinance. The ordinance requires recycling of plastic and glass bottles and jars, paper, newspaper, metal containers and cardboard at private residences, commercial buildings, and at special events requiring a City permit.

Effective January of 2008, the City of San Diego adopted a Construction and Demolition (C&D) Debris Diversion Deposit Ordinance. The ordinance requires that the majority of construction, demolition, and remodeling projects requiring building, combination, and demolition permits pay a refundable C&D Debris Recycling Deposit and divert at least 50% of their debris by recycling, reusing or donating usable materials. The C&D ordinance has a provision that would require 75% of construction and demolition waste be diverted once a certified facility within San Diego reaches a 75% diversion rate within 25 miles of 202 “C” Street. The ordinance is designed to keep C&D materials out of local landfills and ensure they get recycled. The California legislature has established a minimum diversion of 75% or more statewide.

II. PROJECT DESCRIPTION

The project site is located within the City of San Diego, State of California, at 9775 Towne Centre Drive, San Diego, CA 92121. See Figure 1 below for a vicinity map. The project proposes a Planned Development Permit, Site Development Permit and Community Plan Amendment for the demolition of an existing 103,800 SF Scientific Research Industrial Building, and the construction of a 165,000 SF Scientific Research Industrial Building. Grading for the proposed project would include approximately 70,000 cubic yards of cut and 29,000 cubic yards of fill for an export 41,000 cubic yards.

FIGURE 1 – VICINITY MAP

The total project site is 12 acres, of which approximately 4.75 acres is disturbed. The site is bounded to the north and south by existing industrial developments.

The project includes the demolition of the existing onsite building and surface improvements and the construction of a new building and surface improvements.

This report has been prepared in support of Latitude 33's preliminary design for the 9775 Towne Centre Drive Project.

FIGURE 2 – EXISTING AERIAL

III. PRECONSTRUCTION

BMR-APEX LP will assign a Solid Waste Management Coordinator (SWMC) for the 9775 Towne Centre Drive project. The SWMC will have the authority to provide guidelines and procedures for contractor(s) and staff to implement waste reduction and recycling efforts. These responsibilities are, but not limited to, the following:

1. Review and understand the Waste Management Plan including responsibilities of SWMC.
2. Work with contractor(s) to estimate quantities of each type of material that will be salvaged, recycled, or disposed of as waste, then assist contractor(s) with documentation.
3. Review and update procedures as needed for material separation and verify availability of containers and bins needed to avoid delays.
4. Review and update procedures for periodic solid waste collection and transportation to recycling and disposal facilities.
5. Review and update solid waste management requirements for each trade.
6. Possess the authority to issue Stop Work Orders if proper procedures are not being followed.

From preconstruction to occupancy of the 9775 Towne Centre Drive project, the WMP will provide contractors and tenants guidelines to ensure the proper reduction, segregation, recycling, and disposal of demolition, construction, and on-going operational waste. Proper segregation of recyclable materials is required based on the type of materials generated and the availability of recycling facilities able to accept those materials. This responsibility will be under the direction of the assigned 9775 Towne Centre Drive SWMC.

The 9775 Towne Centre Drive SWMC will coordinate with ESD and/or Mitigation Monitoring staff, including regular communication and invitations to the work site. An invitation shall be extended to an ESD representative at least 7 days prior to attend each pre-construction meeting of each phase of the development.

IV. DEMOLITION AND CONSTRUCTION WASTE

In order to mitigate for any solid waste impacts identified for the 9775 Towne Centre Drive project, offsite waste disposal shall target a minimum of 75% of all Construction, Demolition, and Land-Clearing waste to be diverted by weight from landfills.

Contractor Requirements. BMR-APEX LP shall provide specific contract language for the 9775 Towne Centre Drive project to implement this Waste Management Plan. The contract language will be made available to City personnel for verification. Contract language will require that:

- Specified demolition and construction materials will be reused or recycled onsite; others will be segregated for transport to specified recycling facilities.
- The contractor hired must determine the necessary capacity of dumpsters for each material type prior to obtaining the first demolition permit.
- The contractor(s) will be required to perform daily inspections of the demolition/construction site to ensure compliance with the requirements of the WMP and all other applicable laws and ordinances and report directly to the 9775 Towne Centre Drive SWMC.
- Daily inspections will include verifying the availability and number of dumpsters based on amount of debris being generated, assuring correct labeling of dumpsters, proper sorting and segregation of materials.
- No more than 10% by volume of contamination may occur in each dumpster.

- The contractors and subcontractors will coordinate and work closely with the SWMC to minimize the over-purchasing of construction materials to lower the amount of materials taken to recycling and disposal facilities. Ways in which the project will minimize over-purchasing is to purchase pre-cut materials, work closely amongst designers, contractors, and suppliers.

It is expected that approximately 92.5% of the material generated from the 9775 Towne Centre Drive project's demolition will be diverted by salvaging or source separating the asphalt, concrete, landscape debris and other materials noted in Table 4.1. Approximately 4,974 tons of waste is expected to be generated during demolition. This is an assumption and is used as a place holder until the hired contractor can accurately assess expected demolition quantities. Approximately 4,574 tons of materials would be recycled, to include trees/shrubs, concrete, asphalt, building materials, ceiling tiles, drywall, and scrap metal. Approximately 400 tons of debris would be disposed in a landfil. Tonnage of each material is subject to change based upon the contractor's actual data. BMR-APEX LP may utilize the Certified Facilities list found in Appendix B.

TABLE 4.1 Estimated Demolition Quantities & Tons Diverted

Material	Estimated Tonnage	Handling Facility	Diversion Rate (Percent)	Tons Diverted	Tons Disposed
Asphalt/Concrete	3540	Vulcan Carol Canyon	100%	3540	0
Landscaping	20	Miramar Greenery	100%	20	0
Building Materials	170	Habitat for Humanity ReStore	100%	170	0
Carpet	80	DFS Flooring	100%	80	0
Ceiling Tiles	44	AMS, San Diego	100%	44	0
Drywall	500	EDCO Recovery & Transfer, San Diego	100%	500	0
Scrap Metal	220	Allan Company Miramar Recycling	100%	220	0
Garbage/Trash	400	Miramar Landfill	0%	0	400
Total	**4974**		**92.0%**	**4574**	**400**
Note: Portions of material type based on demolition estimates of similar industrial developments					

Construction Waste. During the construction of 9775 Towne Centre Drive, the construction debris generated is expected to include the materials listed in Table 4.2. Materials shall be source separated as indicated in Table 4.2.

The City of San Diego ESD requires projects to estimate tonnage of expected construction waste. The 9775 Towne Centre Drive project includes a total of 165,000 square feet of new construction. As provided by Environmental Services Department and for purposes of this Waste Management Plan, 9775 Towne Centre Drive utilizes the Environmental Protection Agency (EPA), 3 pounds of waste per square foot for waste generation on new construction to calculate expected tonnage as follows:

165,000 sq. ft. x 3/2,000lbs = approx. 248 tons

The approximately 248 tons is an assumption and is used as a place holder until further detail is provided and the hired contractor can accurately assess expected waste. Further, the exact quantity of each material is unknown at this time. As a place holder, the 9775 Towne Centre Drive contractors shall source separate waste materials according to the material types in Table 4.2.

TABLE 4.2 Estimated Construction Waste

Material/Type	Generated (tons)	Handling Facility	Estimated Diverted	Estimated Disposed
Clean Wood **(Forming and framing lumber)**	2.5	Miramar Greenery	2.5	0
Metals **(Pipes, rebar, flashing, steel, aluminum, copper, brass, stainless steel)**	1	Allan Company Miramar Recycling	1	0
Polystyrene	0.5	Cactus Recycling	0.5	0
Blocks, bricks	12.25	Vulcan Carol Canyon	12.25	0
Asphalt, concrete,	12.25	Vulcan Carol Canyon	12.25	0
Trash **(Treated wood)**	11.75	Miramar Landfill	0	11.75
Roofing	2.25	LEED Recycling	2.25	0
Mixed Debris **(Insulation, vinyl, doors, floor tile, plastic pipes, film, broken glass, drywall)**	202	Otay C&D/Inert Debris Processing FAcility	151.5	50.5
Cardboard	1	Allan Company Miramar Recycling	1	0
Carpet/Carpet padding	2.5	DFS Flooring	2.5	0
Total	**248**		**185.75**	**62.25**
Note: Portions of material type based on construction estimates of similar industrial developments				

Based on these estimates, and on providing segregation of these materials, the project would accomplish 74.9% diversion of construction waste. An estimated 62.25 tons would end up going to landfill disposal. When construction waste is considered together with demolition waste, 5,608 tons of demolition and construction waste would be generated, but approximately 92% is expected to be diverted from disposal. To ensure this result, contractors will be required to comply with the following methods and procedures below:

1. Construction and Land-Clearing containers will be provided for waste that is to be recycled. Containers shall be clearly labeled, with a list of acceptable and unacceptable materials. The list of acceptable materials must be the same as the materials recycled at the receiving material recovery facility or recycling processor.
2. The collection containers for recyclable Construction and Land-Clearing waste must contain no more than 10% non-recyclable materials, by volume.

3. Use detailed material estimates to reduce risk of unplanned and potentially wasteful material cuts.
4. Conduct daily visual inspections of dumpsters and recycling bins to remove contaminants.
5. Remove demolition and construction waste materials from the project site at least once every week to ensure no over-topping of waste bins. The accumulation and burning of on-site Construction, Demolition, and Land-Clearing waste materials will be prohibited.

Furthermore, 9775 Towne Centre Drive will be required to meet the following State law and City of San Diego Municipal Code requirements:

1. The City's C&D Debris Diversion Deposit Program which requires a refundable deposit based on the tonnage and value of the expected recyclable waste materials as part of the building permit requirements.
2. The City's C&D Recycling Ordinance which requires identification and sorting of demolition and construction waste materials to be diverted to the appropriate recycling facility.
3. The City's Recycling Ordinance which requires that collection of recyclable materials must be provided.
4. The City's Storage Ordinance which requires that areas for recyclable material collection must be provided.
5. This Waste Management Plan –The waste contractor will provide monthly reports regarding the amount of waste and recyclable materials to the 9775 Towne Centre Drive SWMC who will be responsible for compliance actions with the aforementioned guidelines and make adjustments as needed to maintain conformance. The name and contact information of the waste contractor and SWMC will be provided to ESD at least 10 days prior to the start of any work and updated within 5 days of any changes.

V. OCCUPANCY WASTE

The 9775 Towne Centre Drive development will be managed by BMR-APEX LP. During the Occupancy Phase, it is estimated that 280.5 tons per year will be generated by the new development (Refer to Table 5.1). The expected waste generation was calculated using the City of San Diego ESD Waste Generation Factors for Office use (Appendix C).

TABLE 5.1: Waste Generation – Occupancy Waste

Use	Intensity (sq. ft.)	Waste Generation Rate (tons/year/sq.ft.)	Estimated Waste Generated (tons/year)
Industrial Office	165,000	0.0017	280.5
Note: Based on City of San Diego Waste Generation Factors, Appendix C.			

The 9775 Towne Centre Drive project will be required to comply with City of San Diego Municipal Code section 142.0830 Refuse and Recyclable Material Storage Regulations for Residential and Non-Residential Development (Table 142.08B & 142.08C). The minimum storage amount required can be found in Table 5.2 below.

Table 5.2 Minimum Exterior Refuse and Recyclable Material Storage Areas for Non-Residential Development

Gross Floor Area per Development (square feet)	Minimum Refuse Storage Area per Development (sq. ft.)	Minimum Recyclable Material Storage Area per Development (sq. ft.)	Total Minimum Storage Area per Development (sq. ft.)
165,000	336	336	672

In order to continually reduce waste delivered to the landfill during the life of the project, trash, recycling, and green waste bins will be provided for each development. Information will be provided to residents to encourage recycling of all paper products, cardboard, glass, aluminum cans, recyclable plastics, and yard waste. Compliance with the recycling ordinance, which requires the provision of educational materials and separate recycling bins, and with the storage ordinance, which requires that sufficient space for recycling bins be provided, is estimated to reduce waste by 40%. Thus 168.4 tons per year would still be destined for disposal. Additional measures often taken to help mitigate this quantity of trash include:

- Ensuring that landscape debris is minimized, used onsite when possible, and what remains is composted.
- Surpassing the 75% waste reduction target during demolition and construction.
- Providing recyclable materials collection in outdoor and parking areas.
- Providing post-consumer content in building materials.
- Providing foodwaste collection, onsite composting, or other specialized waste reduction measures, such as recycling chutes or other design features.

VII. CONCLUSION

The 9775 Towne Centre Drive project anticipates 4,974 tons of demolition waste and 248 tons of construction waste for a total of 5,608 tons of waste. The materials in Tables 4.1 and 4.2 are expected to be diverted either by reuses or source separating and sent to the certified facilities mentioned in Chapter 4 or similar, reaching a potential 91.2% reduction of waste disposal.

The proposed industrial project of 165,000 SF of scientific research use would generate approximately 280.5 tons of waste per year and be required to provide 672 square feet of exterior refuse and recyclable material storage area.

To ensure that waste is properly managed, BMR-APEX LP shall establish waste management contract language ensuring:

- Specified demolition and construction materials will be reused or recycled onsite; others will be segregated for transport to specified recycling facilities.
- The contractor hired must determine the necessary capacity of dumpsters for each material type prior to obtaining the first demolition permit.
- The contractor(s) will be required to perform daily inspections of the demolition/construction site to ensure compliance with the requirements of the WMP and all other applicable laws and ordinances and report directly to the 9775 Towne Centre Drive SWMC.

- Daily inspections will include verifying the availability and number of dumpsters based on amount of debris being generated, assuring correct labeling of dumpsters, proper sorting and segregation of materials.
- No more than 10% by volume of contamination may occur in each dumpster.
- The contractors and subcontractors will coordinate and work closely with the SWMC to minimize the over-purchasing of construction materials to lower the amount of materials taken to recycling and disposal facilities. Ways in which the project will minimize over-purchasing is to purchase pre-cut materials, work closely amongst designers, contractors, and suppliers.

APPENDIX A: CONSTRUCTION & DEMOLITION DEBRIS – CONVERSION RATE TABLE

CITY OF SAN DIEGO

Construction & Demolition (C&D) Debris Conversion Rate Table

This worksheet lists materials typically generated from a constructionor demolition project and provides formulas for converting common units (i.e. cubic yards, square feet, and board feet) to tons. It is a tool that should be used for preparing your Waste Mangement Form - Part I, which requires that quantities be provided in tons.
Note: Weigh receipts are required for your refund request.

Step 1: Enter the estimated quantity for each applicable material in Column I, based on units

Step 2: Multiply by Tons/Unit figure listed in Column II. Enter the result for each material in Column III.
If using Excel version, column III will automatically calculate tons.

Step 3: Enter quantities for each separated material from Column III on this worksheet into the corresponding section of your Waste Management Form - Part I.

		Column I			Column II		Column III
Category	**Material**	**Volume**	**Unit**		**Tons/Unit**		**Tons**
Asphalt/Concrete	Asphalt (broken)		cy	x	0.70	=	
	Concrete (broken)		cy	x	1.20	=	
	Concrete (solid slab)		cy	x	1.30	=	
Brick/Masonry/Tile	Brick (broken)		cy	x	0.70	=	
	Brick (whole, palletized)		cy	x	1.51	=	
	Masonry Brick (broken)		cy	x	0.60	=	
	Tile		sq ft	x	0.00175	=	
Building Materials (doors, windows, cabinets, etc.)			cy	x	0.15	=	
Cardboard (flat)			cy	x	0.05	=	
Carpet	By square foot		sq ft	x	0.0005	=	
	By cubic yard		cy	x	0.30	=	
Carpet Padding/Foam			sq ft	x	0.000125	=	
Ceiling Tiles	Whole (palletized)		sq ft	x	0.0003	=	
	Loose		cy	x	0.09	=	
Drywall (new or used)	1/2" (by square foot)		sq ft	x	0.0008	=	
	5/8" (by square foot)		sq ft	x	0.00105	=	
	Demo/used (by cubic yd)		cy	x	0.25	=	
Earth	Loose/Dry		cy	x	1.20	=	
	Excavated/Wet		cy	x	1.30	=	
	Sand (loose)		cy	x	1.20	=	
Landscape Debris (brush, trees, etc)			cy	x	0.15	=	
Mixed Debris	Construction		cy	x	0.18	=	
	Demolition		cy	x	1.19	=	
Scrap metal			cy	x	0.51	=	
Shingles, asphalt			cy	x	0.22	=	
Stone (crushed)			cy	x	2.35	=	
Unpainted Wood & Pallets	By board foot		bd ft	x	0.001375	=	
	By cubic yard		cy	x	0.15	=	
Garbage/Trash			cy	x	0.18	=	
Other (estimated weight)			cy	x	estimate	=	
			cy	x	estimate	=	
			cy	x	estimate	=	
					Total All		

APPENDIX B: CONSTRUCTION & DEMOLITION RECYCLING – FACILITIES DIRECTORY

2016 Certified Construction & Demolition Recycling Facility Directory

These facilities are certified by the City of San Diego to accept materials listed in each category. Hazardous materials are not accepted. The diversion rate for these materials shall be considered 100%, except mixed C&D debris which updates quarterly. The City is not responsible for changes in facility information. Please call ahead to confirm details such as accepted materials, days and hours of operation, limitations on vehicle types, and cost. For more information visit: www.recyclingworks.com.

Please note: In order to receive recycling credit, Mixed C&D Facility and transfer station receipts must: *-be coded as construction & demolition (C&D) debris* *-have project address or permit number on receipt* **Make sure to notify weighmaster that your load is subject to the City of San Diego C&D Ordinance.* ***Note about landfills: Miramar Landfill and other landfills do not recycle mixed C&D debris.***	Mixed C&D Debris	Asphalt/Concrete	Brick/Block/Rock	Building Materials for Reuse	Cardboard	Carpet	Carpet Padding	Ceiling Tile	Ceramic Tile/Porcelain	Clean Fill Dirt	Clean Wood/Green Waste	Drywall	Industrial Plastics	Lamps/Light Fixtures	Metal	Mixed Inerts	Styrofoam Blocks
EDCO Recovery & Transfer 3660 Dalbergia St, San Diego, CA 92113 619-234-7774 | www.edcodisposal.com/public-disposal	62%											•					
EDCO Station Transfer Station & Buy Back Center 8184 Commercial St, La Mesa, CA 91942 619-466-3355 | www.edcodisposal.com/public-disposal	62%				•							•			•		
EDCO CDI Recycling & Buy Back Center 224 S. Las Posas Rd, San Marcos, CA 92078 760-744-2700 | www.edcodisposal.com/public-disposal	84%				•										•		
Escondido Resource Recovery 1044 W. Washington Ave, Escondido 760-745-3203 | www.edcodisposal.com/public-disposal	62%																
Fallbrook Transfer Station & Buy Back Center 550 W. Aviation Rd, Fallbrook, CA 92028 760-728-6114 | www.edcodisposal.com/public-disposal	62%				•										•		
Otay C&D/Inert Debris Processing Facility 1700 Maxwell Rd, Chula Vista, CA 91913 619-421-3773 | www.sd.disposal.com	75%																

	Mixed C&D Debris	Asphalt/Concrete	Brick/Block/Rock	Building Materials for Reuse	Cardboard	Carpet	Carpet Padding	Ceiling Tile	Ceramic Tile/Porcelain	Clean Fill Dirt	Clean Wood/Green Waste	Drywall	Industrial Plastics	Lamps/Light Fixtures	Metal	Mixed Inerts	Styrofoam Blocks
Ramona Transfer Station & Buy Back Center 324 Maple St, Ramona, CA 92065 760-789-0516 | www.edcodisposal.com/public-disposal	62%				•										•		
SANCO Resource Recovery & Buy Back Center 6750 Federal Blvd, Lemon Grove, CA 91945 619-287-5696 | www.edcodisposal.com/public-disposal	62%				•										•		
All American Recycling 10805 Kenney St, Santee, CA 92071 619-508-1155 (Must call for appointment)						•											
Allan Company 6733 Consolidated Wy, San Diego, CA 92121 858-578-9300 | www.allancompany.com/facilities.htm					•										•		
Allan Company Miramar Recycling 5165 Convoy St, San Diego, CA 92111 858-268-8971 | www.allancompany.com/facilities.htm					•										•		
AMS 4674 Cardin St, San Diego, CA 92111 858-541-1977 | www.a-m-s.com								•									
Armstrong World Industries, Inc. 300 S. Myrida St, Pensacola, FL 32505 877-276-7876 (Press 1, Then 8) www.armstrong.com/commceilingsna								•									
Cactus Recycling 8710 Avenida De La Fuente, San Diego, CA 92154 619-661-1283 | www.cactusrecycling.com					•								•		•		•

	Mixed C&D Debris	Asphalt/Concrete	Brick/Block/Rock	Building Materials for Reuse	Cardboard	Carpet	Carpet Padding	Ceiling Tile	Ceramic Tile/Porcelain	Clean Fill Dirt	Clean Wood/Green Waste	Drywall	Industrial Plastics	Lamps/Light Fixtures	Metal	Mixed Inerts	Styrofoam Blocks
DFS Flooring 10178 Willow Creek Road, San Diego, CA 92131 858-630-5200 | www.dfsflooring.com						•	•										
Enniss Incorporated 12421 Vigilante Rd, Lakeside, CA 92040 619-443-9024 | www.ennissinc.com		•	•						•	•							
Escondido Sand and Gravel 500 N. Tulip St, Escondido, CA 92025 760-432-4690 | www.weirasphalt.com/esg		•															
Habitat for Humanity ReStore 10222 San Diego Mission Rd, San Diego, CA 92108 619-516-5267 | www.sdhfh.org/restore.php				•													
Hanson Aggregates West – Lakeside Plant 12560 Highway 67, Lakeside, CA 92040 858-547-2141		•															
Hanson Aggregates West – Miramar 9229 Harris Plant Rd, San Diego, CA 92126 858-974-3849		•								•							
Hidden Valley Steel & Scrap, Inc. 1342 Simpson Wy, Escondido, CA 92029 760-747-6330															•		
HVAC Exchange 2675 Faivre St, Chula Vista, CA 91911 619-423-1855 | www.thehvacexchange.com															•		
IMS Recycling Services 2740 Boston Ave, San Diego, CA 92113 619-423-1564 | www.imsrecyclingservices.com					•								•				

	Mixed C&D Debris	Asphalt/Concrete	Brick/Block/Rock	Building Materials for Reuse	Cardboard	Carpet	Carpet Padding	Ceiling Tile	Ceramic Tile/Porcelain	Clean Fill Dirt	Clean Wood/Green Waste	Drywall	Industrial Plastics	Lamps/Light Fixtures	Metal	Mixed Inerts	Styrofoam Blocks
IMS Recycling Services 2697 Main St, San Diego, CA 92113 619-231-2521 | www.imsrecyclingservices.com													•		•		
Inland Pacific Resource Recovery 12650 Slaughterhouse Canyon Rd, Lakeside, CA 92040 619-390-1418											•						
Lamp Disposal Solutions 1405 30th Street, San Diego, CA 92154 858-569-1807 | www.lampdisposalsolutions.com														•			
Universal Waste Disposal 8051 Wing Avenue, El Cajon, CA 92020 619-438-1093 | www.universalwastedisposal.com														•			
Los Angeles Fiber Company 4920 S. Boyle Ave, Vernon, CA 90058 323-589-5637 | www.lafiber.com						•	•										
Miramar Greenery, City of San Diego 5180 Convoy St, San Diego, CA 92111 858-694-7000 | www.sandiego.gov/environmental-services/miramar/greenery.shtml											•						
Moody's 3210 Oceanside Blvd., Oceanside, CA 92056 760-433-3316		•								•						•	
Otay Valley Rock, LLC 2041 Heritage Rd, Chula Vista, CA 91913 619-591-4717 | www.otayrock.com		•															
Reclaimed Aggregates Chula Vista 855 Energy Wy, Chula Vista, CA 91913 619-656-1836		•														•	

	Mixed C&D Debris	Asphalt/Concrete	Brick/Block/Rock	Building Materials for Reuse	Cardboard	Carpet	Carpet Padding	Ceiling Tile	Ceramic Tile/Porcelain	Clean Fill Dirt	Clean Wood/Green Waste	Drywall	Industrial Plastics	Lamps/Light Fixtures	Metal	Mixed Inerts	Styrofoam Blocks
Reconstruction Warehouse 3650 Hancock St., San Diego, CA 92110 619-795-7326 | www.recowarehouse.com				•													
Robertson's Ready Mix 2094 Willow Glen Dr, El Cajon, CA 92019 619-593-1856		•								•						•	
Romero General Construction Corp. 8354 Nelson Wy, Escondido, CA 92026 760-749-9312 | www.romerogc.com/crushing/nelsonway.htm		•															
SA Recycling 3055 Commercial St., San Diego, CA 92113 619-238-6740 | www.sarecycling.com															•		
SA Recycling 1211 S. 32nd St., San Diego, CA 92113 619-234-6691 | www.sarecycling.com															•		
Vulcan Carol Canyon Landfill and Recycle Site 10051 Black Mountain Rd, San Diego, CA 92126 858-530-9465 | www.vulcanmaterials.com/carrollcanyon		•	•							•						•	

APPENDIX C: OCCUPANCY WASTE GENERATION FACTORS

Waste Generation Factors – Occupancy Phase

The following factors are used by the City of San Diego Environmental Services Department to estimate the expected waste generation in a new residential or commercial development.

Residential Uses
Residential Unit = 1.6 tons/year/unit
Multi-family Unit = 1.2 tons/year/unit

Example: To calculate the amount of waste that will be generated from a project with 100 new homes, multiply the number of homes by the generation factor.

100 single family homes x 1.6 = 160 tons/year
100 multi-family units x 1.2 = 120 tons/year

Commercial/Industrial Uses	
General Retail	0.0028
Restaurants & Bars	0.0122
Hotels/Motels	0.0045
Food Stores	0.0073
Auto/Service/Repair	0.0051
Medical Offices	0.0033
Hospitals	0.0055
Office	0.0017
Transp/Utilities	0.0085
Manufacturing	0.0059
Education	0.0013
Unclassified Services	0.0042

Example: To calculate the amount of waste that could be generated from a new building with 10,000 square feet for offices and 10,000 square feet for manufacturing, multiply the square footage for each use by the generation factor.

10,000 square feet x 0.0017 = 17 tons/year
10,000 square feet x 0.0059 = 59 tons per year

Total estimated waste generation for building = 76 tons/year