ASSESSMENT OF ENVIRONMENTAL NOISE

3060 BROADWAY NOISE REPORT

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By

Veneklasen Associates, Inc.
1711 16th Street
Santa Monica, CA 90404

Contents

1.0 INTRODUCTION 1
1.1 Project Description 1
1.2 Characteristics of Noise 2
1.3 Characteristics of Vibration 5

2.0 REGULATORY FRAMEWORK 6
2.1 Applicable State Noise Standards 6
2.1.1 Residential 6
2.2 City of San Diego Noise Element & Municipal Code – Noise Ordinance 6
2.3 City of San Diego Significance Determination Thresholds 7
2.4 California Green Building Code (CALGreen) 8
2.5 City of San Diego – Ground-Borne Vibration 9
2.6 Project Requirements 10

3.0 IMPACTS AND SIGNIFICANCE 11
3.1 Checklist Questions 11
3.2 Impact 1. Noise levels in excess of standards 12
3.2.1 Methodology 12
3.2.2 Existing Ambient Monitored Noise Levels 12
3.2.3 Future Project Noise Levels 13
3.3 Impact 2. Excessive ground-borne vibration 14
3.4 Impact 3. Permanent increase in ambient noise levels 15
3.4.1 Increase due to Project Traffic 15
3.4.2 Operational Noise 15
3.5 Impact 4. Temporary increase in ambient noise levels 15
3.6 Impact 5. Airport noise exposure 18
3.7 Impact 6. Private airstrip noise exposure 18

4.0 SUMMARY 18
4.1 Summary of Mitigation Measures 18

ASSESSMENT OF ENVIRONMENTAL NOISE

1.0 INTRODUCTION

This report evaluates potential impacts associated with the construction and operation noise of the 3060 Broadway project in San Diego, California.

1.1 Project Description

The proposed project consists of a 3-story multi-family residential development over basement. The project site is bounded by Broadway Street to the south, and existing residential developments to the north, east, and west.

Figure 1 – Site Plan

1.2 Characteristics of Noise

Noise is usually defined as unwanted sound and can be an undesirable by-product of society's normal day-to-day activities. Sound becomes unwanted when it interferes with normal activities, causes actual physical harm, or has an adverse effect on health.

People judge the relative magnitude of sound sensation in subjective terms such as "noisiness" or "loudness." However, the sound pressure magnitude can be objectively measured and quantified using a logarithmic ratio of pressures which yields the level of sound, utilizing the measurement scale of decibels (dB). The decibel is generally adjusted to the A-weighted level (dBA) which de-emphasizes very low frequencies to better approximate the human ear's range of sensitivity. In practice, the noise level of a sound source is measured using a sound level meter that includes an electronic filter corresponding to the A-weighting curve. Table A.1 in Appendix A of this report defines the decibel along with other technical terms used in this analysis.

Even though the A-weighted scale accounts for the relative loudness perceived by the human ear and, therefore, is commonly used to quantify individual events or general community sound levels, the degree of annoyance or other response effects also depends on several other perceptibility factors, including:

- Ambient (background) sound level
- Magnitude of the event sound level relative to the background noise
- Spectral (frequency) composition (e.g. presence of tones)
- Duration of the sound event
- Number of event occurrences, repetitiveness, and intermittency
- Time of day the event occurs.

In determining the daily level of environmental noise, it is important to account for the difference in human responses to daytime and nighttime noises. At night, exterior background noise levels are generally lower than daytime levels. However, most household noise also decreases at night, and exterior noise may become increasingly noticeable. Further, most people sleep at night and have greater sensitivity to noise intrusion. To account for human sensitivity to nighttime noise levels, a 24-hour descriptor, the Community Noise Equivalent Level (CNEL) has been developed. The CNEL divides the 24-hour day into a daytime period of 7:00 a.m. to 7:00 p.m., an evening period from 7:00 p.m. to 10:00 p.m., and a nighttime period of 10:00 p.m. to 7:00 a.m. In determining the CNEL, noise levels occurring during the evening period are increase by 5 dB, while noise levels occurring during the nighttime period are increased by 10 dB to account for the greater sensitivity during the evening and nighttime periods.

The effects of noise on people fall into three general categories:

- Subjective effects of annoyance and nuisance

- Interference with activities such as speech, sleep and learning
- Physiological effects such as hearing loss

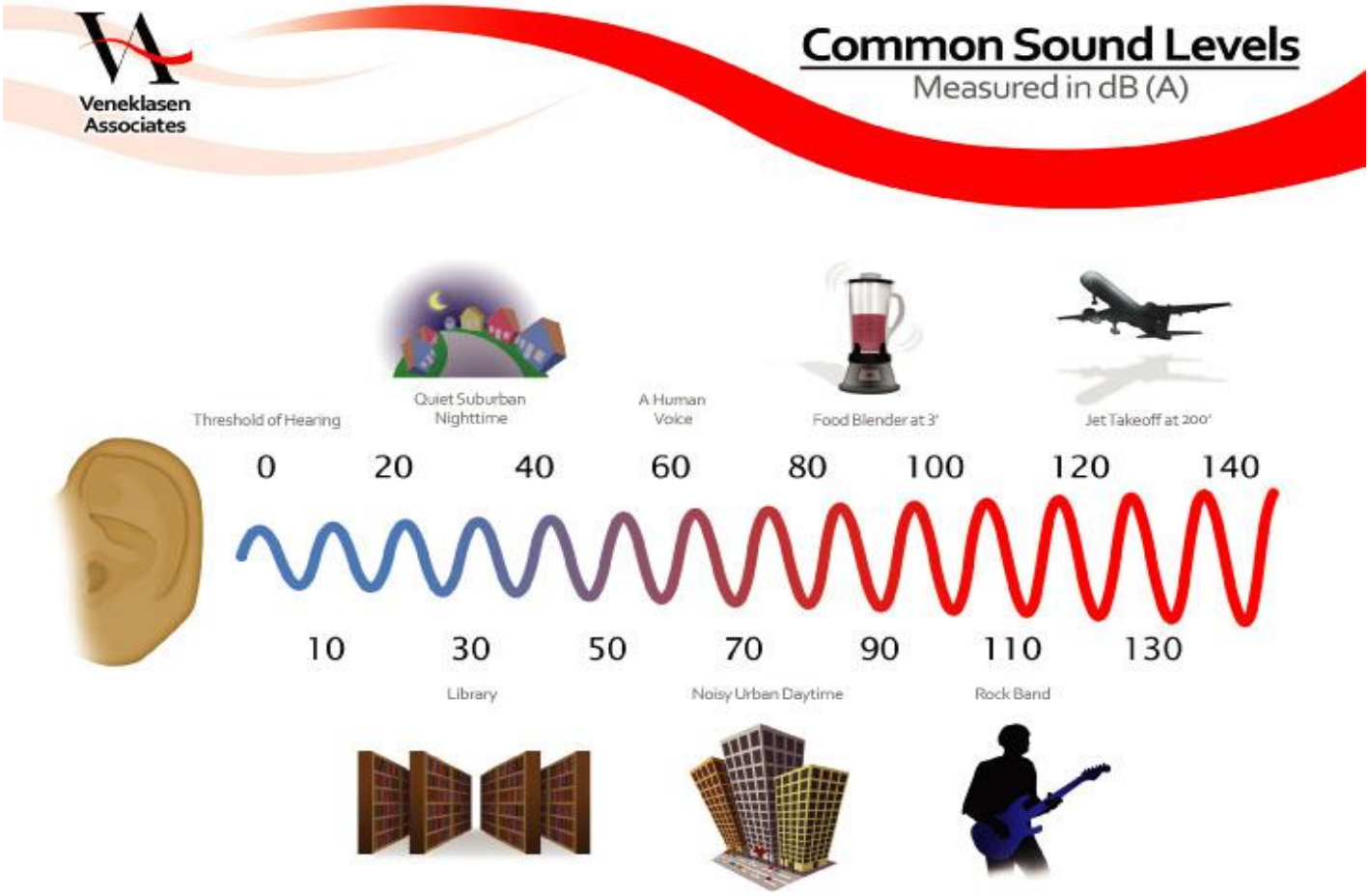
In most cases, the levels associated with environmental noise produce effects only in the first two categories. However, workers in industrial plants may experience noise effects in the last category. There is no completely effective way to measure the subjective effects of noise or the corresponding reactions of annoyance, because of the wide variation in individual thresholds of annoyance and degrees to which people become acclimated to noise. Thus, an important way of determining a person's subjective reaction to a new noise source is by comparison to the existing environment to which they are accustomed (the “ambient environment”). In general, the more the level of a noise event exceeds the prevailing ambient noise level, the less acceptable the noise source will be to those exposed to it.

With regard to increases in A-weighted noise levels, the following relationships are applicable to this analysis:

- Except in carefully controlled laboratory experiments, a 1 dB change cannot be perceived.
- Outside of a laboratory, a 3 dBA change will be generally perceivable by most people.
- A change in level of at least 5 dBA is considered a noticeable change by most people.
- A 10 dBA change will result in the perception of doubling or halving the loudness of the noise.

Common noise levels associated with various activities are shown in **Figure 2**.

Figure 2 - Common Noise Levels



Noise sources are either "point sources", such as stationary equipment or individual motor vehicles, or "line sources", such as a roadway with a large number of mobile point sources (motor vehicles). Sound generated by a stationary point source typically diminishes (attenuates) at a rate of 6 dBA for each doubling of distance from the source to the receptor at acoustically "hard" sites, and at a rate of 7.5 dBA at acoustically "soft" sites.[1] For example, a 60 dBA noise level measured at 50 feet from a point source at an acoustically hard site would be 54 dBA at 100 feet from the source and it would be 48 dBA at 200 feet from the source. Sound generated by a line source typically attenuates at a rate of 3 dBA and 4.5 dBA per doubling of distance from the source to the receptor for hard and soft sites, respectively.[2] Man-made or natural barriers can also attenuate sound levels.

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1 U.S. Department of Transportation, Federal Highway Administration, *Highway Noise Fundamentals*, (Springfield, Virginia: U.S. Department of Transportation, Federal Highway Administration, September 1980), p. 97. A "hard" or reflective site does not provide any excess ground-effect attenuation and is characteristic of asphalt, concrete, and very hard packed soils. An acoustically "soft" or absorptive site is characteristic of normal earth and most ground with vegetation.

2 U.S. Department of Transportation, Federal Highway Administration, *Highway Noise Fundamentals*, (Springfield, Virginia: U.S. Department of Transportation, Federal Highway Administration, September 1980), p. 97.

The minimum attenuation of exterior to interior noise provided by typical structures is provided in **Table 1, Outside to Inside Noise Attenuation**.

Table 1
Outside to Inside Noise Attenuation (dBA)

Building Type	Open Windows	Closed Windows[1]
Residences	17	25
Schools	17	25
Churches	20	30
Hospitals/Convalescent Homes	17	25
Offices	17	25
Theaters	20	30
Hotels/Motels	17	25

Source: Transportation Research Board, National Research Council, Highway Noise: A Design Guide for Highway Engineers*, National Cooperative Highway Research Program Report 117.*
[1] *As shown, structures with closed windows can attenuate exterior noise by a minimum of 25 to 30 dBA.*

1.3 Characteristics of Vibration

Vibration is minute variation in pressure through structures and the earth, whereas, noise is minute variation in pressure through air. Some vibration effects can be caused by noise; e.g., the rattling of windows from truck pass-bys. This phenomenon is related to the coupling of the acoustic energy at frequencies that are close to the resonant frequency of the material being vibrated. Ground-borne vibration attenuates rapidly as distance from the source of the vibration increases. Vibration amplitude can be measured as peak particle velocity (PPV), the maximum instantaneous peak amplitude in inches per second, or root-mean-square (RMS) velocity in inches per second or as vibration level in decibels (VdB) referenced to 1 micro-inch per second. The ratio between the PPV and the maximum RMS amplitude is termed the "crest factor." According to the Federal Transit Administration (FTA), the PPV level for construction equipment is typically 1.7 to 6 times greater than the RMS vibration level. The FTA uses a crest factor of 4 for the conversion of PPV levels to RMS vibration levels. For the purposes of ground-borne vibration analysis of impacts to existing structures, vibration velocity is described in terms of PPV. For the analysis of the human response to vibration, VdB is utilized.

The vibration velocity threshold of perception for humans is approximately 65 VdB, and a vibration velocity of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels for many people[3]. Most perceptible indoor vibration is caused by sources within buildings such as operation of mechanical equipment, movement of people, or the slamming of doors. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. Common ground-induced vibrations related to roadway traffic and construction activities pose no threat to buildings or structures. If a roadway is

[3] – U.S. Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, (Washington, DC: U.S. Department of Transportation, Federal Transit Administration, May 2006), p. 7-8.

smooth, the ground-borne vibration from traffic is barely perceptible. The range of interest is from approximately 50 VdB, which is typically the background vibration velocity, to 94 VdB. This 94 VdB vibration level corresponds to 0.2 PPV, which is the general threshold where minor damage can occur in non-engineered timber and masonry buildings.

2.0 REGULATORY FRAMEWORK

Many government agencies have established noise regulations and policies to protect citizens from potential hearing damage and various other adverse physiological and social effects associated with noise and ground-borne vibration. The City of San Diego has adopted the Noise Element, which is based in part on Federal and State regulations, is intended to control, minimize, or mitigate environmental noise effects. The regulations and policies that are relevant to project construction and operation noise are discussed below.

2.1 Applicable State Noise Standards

2.1.1 Residential

The California Environmental Quality Act (CEQA) Guidelines ask whether the project would result in:

1. Exposure of persons to or generation of noise levels in excess of standards established in the local General Plan or Noise Ordinance or applicable standards of other agencies.

2. Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels.

3. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

4. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

5. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

6. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

2.2 City of San Diego Noise Element & Municipal Code – Noise Ordinance

The City of San Diego Noise Element establishes noise/land use compatibility criteria. For Residential multi-family uses, noise levels up to 60 CNEL can be considered compatible. Noise levels up to 70 CNEL are conditionally

compatible. At outdoor use areas, feasible noise mitigation techniques should be analyzed and incorporated to make the outdoor activities acceptable. According to Table NE-3, the acceptable exterior noise limit at outdoor use areas is 60 CNEL. Noise levels above 70 CNEL are incompatible and new construction should not be undertaken. Although generally not considered compatible, the City conditionally allows multi-family uses up to 75 CNEL in areas affected primarily by motor vehicle noise with existing residential uses.

For areas with airport influence, the City requires that residential uses be limited to areas outside of the 65 CNEL airport noise contour, except for multiple-unit, mixed-use, and live-work residential uses within the San Diego International Airport influence area, in areas with existing residential uses, and where community plan and the Airport Land Use Compatibility Plan allow future residential uses. Given the geographic extent of the areas above the 65 CNEL contour and the desire to maintain and enhance the character of these neighborhoods, the City conditionally allows future single unit, multi-unit, and mixed-use residential uses in the areas above the 65 CNEL contour. Although not generally considered compatible with aircraft noise, the City conditionally allows multi-unit and mixed-use residential uses above the 65 CNEL contour only in areas with existing residential uses. Any future residential use above 65 CNEL must include noise attenuation measures to ensure an interior noise level of 45 CNEL, provision of an avigation easement, and be located in an area where a community plan and the ALUCP allow residential uses. Additionally, outdoor uses are discouraged in areas where people could be exposed to prolonged periods of high aircraft noise levels greater than the 65 CNEL airport noise contour and the amount of outdoor space should be limited.

For multi-family residential, Article 9.5 of the San Diego Municipal Code states that the one-hour average sound level cannot exceed 55 dBA between 7:00 A.M. and 7:00 P.M., 50 dBA between 7:00 P.M. and 10:00 P.M., and 45 dBA between 10:00 P.M. and 7:00 A.M. The noise subject to these limits is that part of the total noise at the specified location that is due solely to the action of said person.

This section also states that it shall be unlawful to conduct construction activities between 7:00 P.M. and 7:00 A.M., or on legal holidays, that would create disturbing, excessive, or offensive noise unless a permit has been applied for and granted beforehand. Additionally, it shall be unlawful to conduct construction activity so as to cause, at or beyond the property lines of residential property, an average sound level greater than 75 dBA during daytime hours.

2.3 City of San Diego Significance Determination Thresholds

The following significance thresholds have been established by the City of San Diego:

1. Interior and Exterior Noise Impacts from Traffic-Generated Noise. For multi-family residential, interior sound levels are significant if they exceed 45 dB. Sound levels at exterior usable space is significant if they exceed 65 dB. Metric is understood to be CNEL. Note that impacts from traffic noise are not included

significant in outdoor areas if the existing ambient is near the threshold and the increase in sound level is less than 3 dB.

2. Airport Noise Impacts. Structures within an AEOZ are not considered to have significant impacts from aircraft noise. However, interior noise levels from aircraft activity cannot exceed 45 CNEL within residential developments.

3. Noise from Adjacent Stationary Uses (Noise Generators). A project which generates noise levels at the property line which exceeds the City's Noise Ordinance Standards is potentially significant. Examples given include a car wash or projects operating generators/noisy equipment.

4. Impacts to Sensitive Wildlife. Sound levels in excess of 60 dBA or existing ambient sound level, during breeding season of protected species, if present.

5. Temporary Construction Noise. Noise which exceeds 75 dBA Leq at a sensitive receptor is considered significant.

6. Noise/Land Use Compatibility. Refer to Table K-4. No significance threshold established.

Table K-4
City of San Diego Noise Land Use Compatibility Chart

	Land Use	*Annual Community Noise Equivalent Level in Decibels*					
		50	55	60	65	70	75
1	Outdoor amphitheaters						
2	Schools, libraries						
3	Nature preserves, wildlife preserves						
4	Residential single-family, multi-family, mobile homes, transient housing						

2.4 California Green Building Code (CALGreen)

Section 5.507.4.2 of the 2013 California Green Building Code stipulates that for buildings exposed to a noise level of 65 dB or more when measured as a 1-hour Equivalent Sound Level (Leq), the building façade, including walls, windows, and roofs, shall provide enough sound insulation so that the interior sound level from exterior sources does not exceed 50 dBA during any hour of operation. This applies to non-residential spaces such as retail space, leasing, and amenities.

2.5 City of San Diego – Ground-Borne Vibration

The City of San Diego does not establish criteria for maximum vibration thresholds.

The Federal Transit Administration (FTA) provides standards and guidelines for perceptibility and annoyance for ground-borne vibration as well as construction vibration impact criteria for building damage. As discussed in the *Characteristics of Vibration* section above, in most circumstances common ground-induced vibrations related to roadway traffic and construction activities pose no threat to buildings or structures, and for smooth roadways, the ground-borne vibration from traffic is barely perceptible.

The FTA has published a technical manual titled, "Transit Noise and Vibration Impacts Assessment," that provides ground-borne vibration impact criteria with respect to building damage and human response during construction activities. As discussed above, building vibration damage is measured in peak particle velocity described in the unit of inches per second. Table 2, below, provides the Federal Transit Administration vibration criteria applicable to construction activities. According to Federal Transit Administration guidelines, a vibration criterion of 0.20 inch per second should be considered as the significant impact level for non-engineered timber and masonry buildings. Furthermore, structures or buildings constructed of reinforced-concrete, steel, or timber, have vibration damage criteria of 0.50 inch per second pursuant to the FTA guidelines.

Table 2 - Federal Transit Administration Construction Vibration Impact Criteria for Building Damage

Building Category	Peak Particle Velocity (inch per second)
I. Reinforced-concrete, steel or timber (no plaster)	0.5
II. Engineered concrete and masonry (no plaster)	0.3
III. Non-engineered timber and masonry buildings	0.2
IV. Buildings extremely susceptible to vibration damage	0.12

Source: Federal Transit Administration, 2006.

Impacts for the human response to vibration levels are given in VdB by the FTA in Table 8-1 of the *Transit Noise and Vibration Impact Assessment* manual[4], as shown in Table 3 below. The FTA Land Use Category 1 impact criteria is intended for vibration-sensitive research and manufacturing facilities, hospitals with vibration-sensitive equipment, and university research operations. These Category 1 impact criteria vibration levels are well below those associated with human annoyance, but are equal to the threshold of perceptibility. The FTA vibration criteria for Category 2, residential impact, indicate impacts occur at a 72 VdB vibration level for frequent events occurring more than 70

[4] U.S. Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, (Washington, DC: U.S. Department of Transportation, Federal Transit Administration, May 2006), p. 8-3

times per day, at 75 VdB for occasional events occurring between 30 and 70 times per day, and at 80 VdB for infrequent events occurring less than 30 times per day.

Table 3
Federal Transit Administration Ground-Borne Vibration Impact Criteria for General Assessment

Land Use Category	**GBV Impact Levels** (VdB re 1 micro-inch /sec)		
	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]
Category 1: Buildings where vibration would interfere with interior operations	65 VdB[4]	65 VdB[4]	65 VdB[4]
Category 2: Residences and buildings where people normally sleep	72 VdB	75 VdB	80 VdB
Category 3: Institutional land uses with primarily daytime use	75 VdB	78 VdB	83 VdB

Notes:
1. "Frequent Events" is defined as more than 70 vibration events of the same source per day. Most rapid transit projects fall into this category.
2. “Occasional Events” is defined as between 30 and 70 vibration events of the same source per day. Most commuter trunk lines have this many operations.
3. "Infrequent Events" is defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail branch lines.
4. This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.
Source: Federal Transit Administration, 2006.

2.6 Project Requirements

The above requirements are summarized in the following Table 4.

Table 4
Project Requirements

Activity	Standard
Exterior Noise at Multi-Family Residences	60 CNEL where feasible. Conditionally Acceptable up to 75 CNEL when affected by traffic noise.
Interior Noise at Multi-Family Residences	45 CNEL
Interior Noise at Non-Residential Spaces (CALGreen)	50 dBA during any hour of operation
Construction Noise	Limited to the hours of: 7:00am – 7:00pm Maximum of 75 dBA at Residential Property Line during construction hours.
Operational Noise	At multi-family residential property, one-hour average sound level: 55 dBA from 7:00 a.m. to 7:00 p.m. 50 dBA from 7:00 p.m. to 10:00 p.m. 45 dBA from 10:00 p.m. to 7:00 a.m.
Vibration	At residences where people normally sleep: 72 VdB – greater than 70 events per day. 75 VdB – between 30-70 events per day. 80 VdB – less than 30 events per day.

3.0 IMPACTS AND SIGNIFICANCE

3.1 Checklist Questions

The following questions are used in this report to evaluate the significance of the project noise impacts:

- Project would expose persons to or generate noise levels in excess of standards established in the City's Noise Element or Noise Ordinance.
- Project would result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project. A substantial permanent increase in traffic noise would occur if the project would result in an increase of 3 dBA CNEL or more.
- Project would result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. Construction noise would be considered significant if it would take place outside of the allowable hours set forth in Table 4.

3.2 Impact 1. Noise levels in excess of standards

Would the project result in exposure of persons to or generation of noise levels in excess of standards established in the local General Plan or Noise Ordinance or applicable standards of other agencies?

3.2.1 Methodology

Analysis of the existing and future noise environments presented in this section is based on technical reports, noise monitoring, and noise prediction modeling. Noise modeling procedures involved the calculation of existing and future vehicular noise levels along individual roadway segments. This was accomplished using the Federal Highway Administration Highway Noise Prediction Model (TNM Version 2.5). The California Department of Transportation (Caltrans) published the "Technical Noise Supplement (TeNS)" in October of 1998 which defines how to predict traffic noise for projects in California. The TeNS, Section N-5520 requires that any traffic noise study conducted after March 30, 2000 utilize the calculation methods used by Federal Highway Administration (FHWA) TNM. This model calculates the average noise level at specific locations based on traffic volumes, average speeds, roadway geometry, and site conditions. The off-site traffic noise is analyzed on an increase in CNEL basis to determine the project's impact.

Traffic volumes utilized as data inputs to the noise prediction model will be calculated based on information provided by the San Diego Association of Governments (SANDAG) Traffic Forecast Information Center.

3.2.2 Existing Ambient Monitored Noise Levels

Vehicular traffic on Broadway Street and the 94 Freeway and Aircraft overflight associated with San Diego Airport are the primary noise sources around the project site. The land uses surrounding the project are mainly multi-family residential.

To establish existing ambient noise levels in areas surrounding the project site, a field monitoring study was conducted. Measurements were performed on the project site (see Figure 3, below) for documenting the ambient conditions. A Bruel & Kjaer Model 2270 Sound Level Meter, which satisfies the American National Standards Institute (ANSI) for general environmental noise measurement instrumentation, was located at several positions on the project site on Tuesday, March 7, 2017.

Table 5 – Measured Sound Levels

Location	Average Sound Level, Leq dBA
Position 1	70
Position 2	64

Figure 3 – Project Site and Noise Monitoring Location

3.2.3 Future Project Noise Levels

3.2.3.1 Traffic Noise Evaluation

It was determined that the project would generate approximately 168 ADT, using the rate of 6 ADT/dwelling unit, with 13 morning peak hour trips and 15 evening peak hour trips. The existing traffic volume on Broadway is 17,700 ADT. The increase of traffic due to the project is less than 1%. This increase would result in an increase in sound level of less than 1 CNEL, which is below the 3 CNEL threshold that defines a significant impact. Therefore, the impact is less than significant.

3.2.3.2 Operational Noise Evaluation

The project will include mechanical equipment, including split-system outdoor condensing units. The mechanical equipment schedule is not yet available; therefore, calculations based on published sound power data for units of typical residential size (Carrier CA15NA-042, 3.5 ton unit). According to the sound power data provided by the manufacturer, the resulting sound pressure levels at the closest property line were calculated. Calculations were completed with the assumption that half of the units would be operating simultaneously, with the result of approximately 51 dBA Leq. Since the units cycle on and off during the day, the existing CNEL would not increase.

The proposed project will not result in new uses or traffic generation that would significantly increase noise levels in the vicinity. This impact is less than significant.

This impact is less than significant. No mitigation required.

3.3 Impact 2. Excessive ground-borne vibration

Would the project result in exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels?

Construction equipment associated with building the project would be the only vibration-generating sources introduced by the project, as there are no vibration sources from operations that will introduce vibration into the environment. Vibration generated by construction equipment, unless specified otherwise through permitting, would only occur during approved work hours per the City of San Diego, 7:00am – 7:00pm seven days a week, excluding holidays. Please see Table 6 for a list of representative construction equipment and associated vibration amplitudes. Criteria for building damage thresholds are listed in Table 2.

Table 6 – Vibration Source Amplitudes for Typical Construction Equipment

Equipment	Reference Peak Particle Velocity (PPV) at 25 ft. (in/sec)
Vibratory roller	0.210
Large bulldozer	0.089
Caisson drilling	0.089
Loaded Trucks	0.076
Jackhammer	0.035
Small bulldozer	0.003
Source: Federal Transit Administration (except Hanson 2001 for vibratory rollers), 1995.	

Considering this representative construction equipment list with respect to Table 2, per FTA, adjacent sensitive receptors (so long as they are not historic structures) should not experience significant impacts due to vibration generated by construction equipment. Therefore, the impact is less than significant and no mitigation is required.

3.4 Impact 3. Permanent increase in ambient noise levels

Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

3.4.1 Increase due to Project Traffic

A substantial permanent increase in traffic noise would occur if the project would result in an increase of 3 dBA CNEL or more. It was determined that the project would generate approximately 168 ADT, using the rate of 6 ADT/dwelling unit, with 13 morning peak hour trips and 15 evening peak hour trips. The existing traffic volume on Broadway is 17,700 ADT. The increase of traffic due to the project is less than 1%. This increase would result in an increase in sound level of less than 1 CNEL, which is below the 3 CNEL threshold that defines a significant impact. Therefore, the impact is less than significant.

3.4.2 Operational Noise

The project will include mechanical equipment, including split-system outdoor condensing units. The mechanical equipment schedule is not yet available; therefore, calculations based on published sound power data for units of typical residential size (Carrier CA15NA-042, 3.5 ton unit). According to the sound power data provided by the manufacturer, the resulting sound pressure levels near the project site were calculated. Calculations were completed with the assumption that 3 units would be operating simultaneously. This operational use does not generate the type of noise that the City identifies as a potentially significant impact.

This impact is less than significant.

Table 7
Condensing Unit Noise Levels

Condensing Unit	Sound Power Level	Number of Units Operating	Sound Pressure Level at 25 ft.
Carrier CA15NA-042, 3.5 ton unit	75 dBA	3	44 dBA

3.5 Impact 4. Temporary increase in ambient noise levels

Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Construction Activity will result in a temporary increase in ambient noise levels in the vicinity of the project. Construction noise analysis follows the procedures of the Federal Highway Administration utilizing acoustic factors such as the construction equipment reference noise levels, the usage factor of the equipment, the site conditions and the distance to each receptor. The types and locations of specific equipment were not provided so VA has estimated the equipment usage for each construction phase on the project site. Parameters used for the analysis of construction phases are included in Appendix B.

The construction of the proposed project would increase noise levels in the area. The construction noise impacts were analyzed for long-term noise exposure due to all anticipated construction equipment operating during each phase of construction as well as for short-term noise exposure from equipment operating along the project site perimeter. Typical construction equipment utilized for each type of activity is indicated in Appendix B. The equipment noise level for all equipment listed for each activity was predicted for each phase in the proposed construction schedule at various locations around the project site. The noise levels predicted include the short-term noise levels while construction activity occurs along the project site boundaries.

The nearest off-site sensitive receivers are located to the north, west, and east of the project site. The property lines of the nearest sensitive receivers are approximately 10 feet from the perimeter of the project site. The maximum predicted hourly average noise levels at these sensitive receptors due to construction operations are shown in Table 9 below.

Table 8 - Construction Noise Levels

Receptor	Existing Noise Level at Project Site Boundaries, Leq dBA	Construction Noise Level at Project Site Boundaries, Leq dBA
Building Demolition	55-65	88
Site Preparation	55-65	88
Grading	55-65	89
Utility Trenching & Installation	55-65	87
Building Construction	55-65	85
Architectural Coating	55-65	74

According to Table 9, construction of the project would potentially generate noise levels up to 89 dBA at the sensitive receptors. This will exceed the City's Municipal Code noise limit of 75 dBA.

During some construction phases noise levels could exceed the 75 dBA construction noise level limit set forth by the Municipal Code. As shown in the table, the highest noise levels occur during the excavation and grading phases (site preparation). Therefore, these activities should be scheduled so as to limit the number of heavy construction machines operating simultaneously. Additionally, a temporary construction noise barrier is required at the northern, western, and eastern property lines of the project site in order to reduce the noise impacts to the residential uses. The barrier should block the line of sight from the noise source to the receiver and have no holes or gaps. The minimum density should be 2 lbs./sq. ft.

Mitigation 3. The impact is less than significant with mitigation. The following measures are identified to reduce the potential effects of construction noise on adjacent properties.

- Limit construction activity to the hours listed in Table 4 (7:00 am to 7:00 pm).
- Schedule highest noise-generating activity and construction activity away from noise-sensitive land uses.
- Equip internal combustion engine-driven equipment with original factory (or equivalent) intake and exhaust mufflers which are maintained in good condition.
- Prohibit and post signs prohibiting unnecessary idling of internal combustion engines.
- Locate all stationary noise-generating equipment such as air compressors and portable generators as far as practicable from noise-sensitive land uses.
- Utilize "quiet" air compressors and other stationary equipment where feasible and available.
- Designate a noise disturbance coordinator who would respond to neighborhood complaints about construction noise by determining the cause of the noise complaints and require implementation of reasonable measures to correct the problem. Conspicuously post a telephone number for the disturbance coordinator at the construction site.

- Install a temporary noise barrier that breaks the line of sight between the nearest noise-sensitive land uses and the project's construction activities. The noise barrier shall be solid with no gaps or holes and have a minimum density of 2 lbs./sq. ft.

3.6 Impact 5. Airport noise exposure

For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

The project is approximately 3 miles east of San Diego International Airport and is located within the Airport Influence Area. According to the Airport Noise Contour Map of the 3rd quarter of 2016, the project site has an aircraft noise exposure of approximately 64 CNEL. As described previously, the City requires that residential uses be limited to areas outside of the 65 CNEL noise contour.

According to the ALUCP, the project site is within the Conditionally Compatible Zone (65-70 CNEL), meaning use is permitted subject to the condition that the building is capable of attenuating exterior noise to 45 CNEL. This can be achieved with the incorporation of sound-rated dual-glazed windows as well as mechanical, or other means, of ventilation.

The impact is less than significant with the implementation of specific project features described above.

The impact is less than significant. As a condition of project approval, the project will implement specific features as required by the General Plan land use classifications, such as sound-rated windows and/or doors, as well as mechanical, or other means, of ventilation, in order to comply with California Code of Regulations Title 24 for a maximum interior sound level of 45 CNEL.

3.7 Impact 6. Private airstrip noise exposure

For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

The project is not within the vicinity of a private airstrip. Therefore, there is no impact.

4.0 SUMMARY

4.1 Summary of Mitigation Measures

Mitigation 3. The impact is less than significant with mitigation. The following measures are identified to reduce the potential effects of construction noise on adjacent properties.

- Limit construction activity to the hours listed in Table 4 (7:00 am to 7:00 pm).
- Schedule highest noise-generating activity and construction activity away from noise-sensitive land uses.
- Equip internal combustion engine-driven equipment with original factory (or equivalent) intake and exhaust mufflers which are maintained in good condition.
- Prohibit and post signs prohibiting unnecessary idling of internal combustion engines.
- Locate all stationary noise-generating equipment such as air compressors and portable generators as far as practicable from noise-sensitive land uses.
- Utilize “quiet” air compressors and other stationary equipment where feasible and available.
- Designate a noise disturbance coordinator who would respond to neighborhood complaints about construction noise by determining the cause of the noise complaints and require implementation of reasonable measures to correct the problem. Conspicuously post a telephone number for the disturbance coordinator at the construction site.
- Install a temporary noise barrier that breaks the line of sight between the nearest noise-sensitive land uses and the project’s construction activities. The noise barrier shall be solid with no gaps or holes and have a minimum density of 2 lbs./sq. ft.

The impact is less than significant. As a condition of project approval, the project will implement specific features as required by the General Plan land use classifications, such as sound-rated windows and/or doors, as well as mechanical, or other means, of ventilation, in order to comply with California Code of Regulations Title 24 for a maximum interior sound level of 45 CNEL.

APPENDIX A

Table A.1 – Definitions of Noise-Related Terms

Term	Definition
Decibel, dB	A unit describing the amplitude of sound equivalent to 20 times the logarithm, to the base 10, of the ratio of the pressure of the sound to the reference pressure of 20 μPa.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured in an A-weighting filter network. The A-weighting de-emphasizes the very low frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are in the A-weighted scale.
L_0 (L_{max}), L_2, L_8, L_{25}, L_{50}	The A-weighted noise levels that are exceeded 0 percent (maximum noise level), 2 percent, 8 percent, 25 percent, and 50 percent of the time during the measurement period.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the stated measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 P.M. to 10:00 P.M., and after addition of 10 decibels to noise levels in the night between 10:00 P.M. and 7:00 A.M.
Day-Night Noise Level, DNL, Ldn	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 P.M. and 7:00 A.M.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Impulsive Noise	Sound of short duration. Typically associated with an abrupt onset and rapid decay (i.e., gun-shots, etc.).
Pure Tones	A sound wave, residing over a small range of frequencies, which has a sinusoidal behavior over time.
VdB	Unit of measurement used by FHWA to describe ground-borne vibration. Equivalent to 20 times the logarithm, to the base 10, of the ratio of the root mean square ground-borne velocity to the reference of reference of $1x10^{-6}$ in/sec.

APPENDIX B

Table B.1 - Typical Construction Equipment Noise

Equipment Type	FHWA Lmax @ 50 ft.	Usage Factor (%)
Excavator	81	40
Loader	79	40
Water Truck	90	40
Grinder	80	40
Rubber Tired Dozer	82	40
Tractor/Loader/Backhoe	84	40
Grader	85	40
Crane	81	16
Forklifts	84	40
Generator Sets	81	50
Welder	74	40
Paver	77	50
Paving Equipment	82	20
Rollers	80	20
Air Compressors	78	40

Table B.2 – Calculated Construction Noise Impacts by Phase

Phase	Equipment Type	Unit Amount	Hours/Day	Calculated Noise Level at Nearest Sensitive Receptors (Hourly Leq, dBA)
Building Demolition	Excavator	1	8	88
	Loader	1	8	
	Skid Loader	1	8	
	Crusher	1	8	
	Water Truck	1	-	
Site Preparation	Rubber Tired Dozer	1	8	88
	Tractor/Loader/Backhoe	1	8	
	Water Truck	1	-	
Grading	Excavator	1	8	89
	Grader	1	8	
	Rubber Tired Dozer	1	8	
	Tractor/Loader/Backhoe	1	8	
	Water Truck	1	-	
Utility Trenching & Installation	Excavator	1	8	87
	Water Truck	1	-	
Building Construction	Crane	1	7	85
	Forklifts	1	8	
	Generator Sets	1	8	
	Tractor/Loader/Backhoe	1	7	
	Welder	1	8	
Asphalt Paving	Paver	1	8	79
	Paving Equipment	1	8	
	Rollers	1	8	
Architectural Coating	Air Compressors	1	6	74

REPORT OF PRELIMINARY GEOTECHNICAL INVESTIGATION AND INFILTRATION TESTING

Proposed 4-Story Residential Building
3060 Broadway
San Diego, California

JOB NO. 16-11320
17 March 2017

Prepared for:

Little Point LLC

Geotechnical Exploration, Inc.

SOIL AND FOUNDATION ENGINEERING ● GROUNDWATER ● ENGINEERING GEOLOGY

17 March 2017

Little Point LLC
c/o Cabochon
7647 Girard Avenue
San Diego, CA 92307
Attn: Mr. Jerry Rudick

Job No. 16-11320

Subject: **Report of Preliminary Geotechnical Investigation and Infiltration Testing**
Proposed 4-Story Residential Building
3060 Broadway
San Diego, California

Dear Mr. Rudick:

In accordance with your request ***Geotechnical Exploration, Inc***. has performed a preliminary geotechnical investigation and infiltration testing for the subject project in San Diego, California. The fieldwork was performed on February 24, 2017.

If the conclusions and recommendations presented in this report are incorporated into the design and construction of the proposed development, it is our opinion that the site is suitable for the project.

This opportunity to be of service is sincerely appreciated. Should you have any questions concerning the following report, please do not hesitate to contact us. Reference to our **Job No. 16-11320** will expedite a response to your inquiries.

Respectfully submitted,

GEOTECHNICAL EXPLORATION, INC.

Wm. D. Hespeler, G.E. 396
Senior Geotechnical Engineer

Jonathan A. Browning
C.E.G. 2615/P.G. 9012
Senior Project Geologist

7420 TRADE STREET ● SAN DIEGO, CA. 92121 ● (858) 549-7222 ● FAX: (858) 549-1604 ● EMAIL: geotech@gei-sd.com

TABLE OF CONTENTS

		PAGE
I.	PROJECT SUMMARY AND SCOPE OF SERVICES	1
II.	SITE DESCRIPTION AND HISTORY	2
III.	FIELD INVESTIGATION	2
IV.	LABORATORY TESTS	5
V.	SOIL DESCRIPTION	6
VI	GROUNDWATER	7
VII.	GEOLOGIC HAZARDS AND SEISMIC CONSIDERATIONS	8
VIII.	CONCLUSION AND RECOMMENDATIONS	9
IX.	GRADING NOTES	24
X.	LIMITATIONS	25

FIGURES

I. Vicinity Map
IIa. City of San Diego Topographic Map
III. Site Plan
IVa-f. Exploratory Boring Logs
V. Geologic Hazards Map
VI. Geologic Map
VIIa-e. Geologic Cross Sections

APPENDICES

A. Unified Soil Classification System
B. Percolation Test Results and Infiltration Rate Conversions

REPORT OF PRELIMINARY GEOTECHNICAL INVESTIGATION AND INFILTRATION TESTING

Proposed 4-Story Residential Building
3060 Broadway
San Diego, California

JOB NO. 16-11320

The following report presents the findings and recommendations of ***Geotechnical Exploration, Inc.*** for the subject project.

I. PROJECT SUMMARY AND SCOPE OF SERVICES

Based on our review of preliminary plans provided us, the project will consist of a 4-story residential building with parking on the ground floor which will be below grade. We anticipate that maximum combined dead plus live column and wall loads will be on the order of 200 kips and 10 kips per lineal foot, respectively. Grading to achieve the desired elevations will include raising the lower eastern half of the site and lowering the western half of the site. To achieve the proposed grades will require shoring along the northern and western property boundaries

Based on the preceding, the scope of work performed for this investigation included a site reconnaissance and subsurface exploration program including percolation testing, laboratory testing, geotechnical engineering analysis of the field and laboratory data, and the preparation of this report. The data obtained and the analyses performed were for the purpose of providing design and construction criteria for the project earthwork, building foundations, slab on-grade floors, basement walls, temporary shoring, and storm water infiltration BMPs.

II. SITE DESCRIPTION AND HISTORY

The site of the proposed residential building is located on the north side of Broadway about 370 feet east of 30th Street (see Vicinity Map, Figure No. I). The property is currently occupied by a church and apartment building in the western half of the site and AC pavement in the eastern half. The rectangular-shaped property has a plan area of 0.32-acre and is bounded to the south by Broadway, to the east and west by existing residential structures, and to the north by an alley. Elevations across the site range from about elevation +209 feet above MSL at the northwest corner to elevation +184 feet above MSL at the southeast corner. Based on our review of a City of San Diego Metropolitan Topographic Survey Map (Sheet 198-1725), 1954 edition (see Figure No. II), the eastern portion of the site was on the western flank of a southerly trending drainage. Review of the 1976 edition (see Figure No. IIa) indicates that, during that time interval, the lower eastern portion of the site had been filled to the current elevations. There is likely no documentation regarding that grading and the grading may well have occurred prior to current compaction standards.

III. FIELD INVESTIGATION

A. Subsurface Investigation

The field investigation consisted of a surface reconnaissance and a subsurface exploration program utilizing a truck-mounted, continuous-flight auger drill rig. Six exploratory borings were drilled in the eastern portion of the site on February 24, 2017, to depths of 3½ to 17½ feet. The soils encountered in the borings were continuously logged in the field by our geologist and described in accordance with

the Unified Soil Classification System (refer to Appendix A). The approximate locations of the borings are shown on the Site Plan, Figure No. III.

Representative samples were obtained from the exploratory borings at selected depths appropriate to the investigation. All samples were returned to our laboratory for evaluation and testing. Standard penetration resistance blow counts were obtained by driving a 2-inch O.D. split spoon sampler with a 140-pound hammer dropping through a 30-inch free fall. The sampler was driven a maximum of 18 inches and the number of blows for each 6-inch interval was recorded. The blows per foot indicated on the boring logs represent the accumulated number of blows that were required to drive the last 12 inches or portion thereof. Samples contained in liners were recovered by driving a 3.0-inch O.D. modified California sampler 18 inches into the soil using a 140-pound hammer.

Boring logs have been prepared on the basis of our observations and laboratory test results. Logs of the borings are attached as Figure Nos. IVa-f. The following chart provides an in-house correlation between the number of blows and the relative density of the soil for the Standard Penetration Test and the 3-inch sampler.

SOIL	***DENSITY DESIGNATION***	***2-INCH O.D. SAMPLER BLOWS/FOOT***	***3-INCH O.D. SAMPLER BLOWS/FOOT***
Sand and Nonplastic Silt	Very loose	0-4	0-7
	Loose	5-10	8-20
	Medium	11-30	21-53
	Dense	31-50	54-98
	Very Dense	Over 50	Over 98

SOIL	DENSITY DESIGNATION	2-INCH O.D. SAMPLER BLOWS/FOOT	3-INCH O.D. SAMPLER BLOWS/FOOT
Clay and Plastic Silt	Very soft	0-2	0-2
	Soft	3-4	3-4
	Firm	5-8	5-9
	Stiff	9-15	10-18
	Very stiff	16-30	19-45
	Hard	31-60	46-90
	Very Hard	Over 60	Over 90

B. Infiltration Testing

In addition to the exploratory borings, we drilled two infiltration testing borings in the lower southern portion of the site on February 24, 2017, for evaluation of storm water infiltration BMPs, per the requirements of the City of San Diego's Storm Water Standards, BMP Design Manual in accordance with the Guidelines for Geotechnical Reports (Appendix C), and Approved Infiltration Rate Assessment Methods (Appendix D). The location of the infiltration test holes are indicated on Figure No. III. The soils encountered in the test holes consisted of clayey sand to sandy clay existing fill soils.

We performed percolation tests in both borings and converted the percolation rates to infiltration rates utilizing the Porchet equation. The results of the infiltration testing indicated infiltration rates of 0.0035- and 0.0075-inch per hour with a factor of safety of 2. It is our understanding that infiltration rates of less than 0.01-inch per hour are not considered suitable for partial infiltration. The test data and a completed Worksheet C.4-1 are presented in the attached Appendix B.

IV. LABORATORY TESTS

Laboratory tests were performed on samples of the soils encountered in order to evaluate their index, strength, expansion, and compressibility properties. The following tests were conducted on the sampled soils:

1. *Laboratory Compaction Characteristics (ASTM D1557-12)*
2. *Determination of Percentage of Particles Smaller than No. 200 Sieve (ASTM D1140-14)*
3. *Expansion Index Test (ASTM D4829-11)*

Laboratory compaction tests establish the laboratory maximum dry density and optimum moisture content of the tested soils and are also used to aid in evaluating the strength characteristics of the soils. The test results are presented on the boring logs at the appropriate sample depths.

The particle size smaller than a No. 200 sieve analysis aids in classifying the tested soils in accordance with the Unified Soil Classification System and provides qualitative information related to engineering characteristics such as expansion potential, permeability, and shear strength. The test results are presented on the boring logs at the appropriate sample depths.

The expansion potential of soils are evaluated, when necessary, utilizing the Standard Test Method for Expansion Index of Soils (ASTM D4829-11). The test results are presented on the boring logs at the appropriate sample depths. In accordance with the UBC (Table 18-1-B), potentially expansive soils are classified as follows:

EXPANSION INDEX	***EXPANSION POTENTIAL***
0 to 20	Very low
21 to 50	Low
51 to 90	Medium
91 to 130	High
Above 130	Very high

Based on the test results, the more clayey on-site materials have a low to medium potential for expansion with a measured Expansion Index value of 60.

V. SOIL DESCRIPTION

The materials encountered below the existing AC pavement in all the borings consisted of loose to medium dense, clayey sand existing fill soils containing some gravel and cobbles. The materials encountered below the fill soils in Borings 1, 2, 4, and 5, consisted of medium dense to dense formational clayey and silty sands and very stiff sandy clay (Very Old Paralic deposits) to the depths explored of 3½ to 17.5 feet. Drilling refusal was met on cobbles in Borings 1, 3, and 6 at depths of 3.5 to 12.3 feet.

The exploratory boring logs and related information depict subsurface conditions only at the specific locations shown on the site plan and on the particular date designated on the logs. Subsurface conditions at other locations may differ from conditions occurring at these boring locations. Also, the passage of time may result in changes in the subsurface conditions due to environmental changes.

VI. GROUNDWATER

Free groundwater was not encountered in the exploratory borings. It must be noted, however, that fluctuations in the level of groundwater may occur due to variations in ground surface topography, subsurface stratification, rainfall, and other possible factors which may not have been evident at the time of our field investigation.

It should be kept in mind that grading operations can change surface drainage patterns and/or reduce permeabilities due to the densification of compacted soils. Such changes of surface and subsurface hydrologic conditions, plus irrigation of landscaping or significant increases in rainfall, may result in the appearance of surface or near-surface water at locations where none existed previously. The appearance of such water is expected to be localized and cosmetic in nature, if good positive drainage is implemented, as recommended in this report, during and at the completion of construction.

It must be understood that unless discovered during initial site exploration or encountered during site grading operations, it is extremely difficult to predict if or where perched or true groundwater conditions may appear in the future. When site fill or formational soils are fine-grained and of low permeability, water problems may not become apparent for extended periods of time.

Water conditions, where suspected or encountered during construction, should be evaluated and remedied by the project civil and geotechnical consultants. The project developer and property owner, however, must realize that post-construction appearances of groundwater may have to be dealt with on a site-specific basis.

VII. GEOLOGIC HAZARDS AND SEISMIC CONSIDERATIONS

Our review of some available published information including the City of San Diego Seismic Safety Study, Geologic Hazards and Faults Map, Sheet 17 (see attached Figure No. V), indicates that the site is located in a low risk geologic hazard area designated as Category 52. Category 52 is defined as "Other l*evel areas, gently sloping to steep terrain, favorable geologic structure, low risk."* Reference to the geologic map of the area, "*Geologic Map of San Diego, 30'x60' Quadrangle,*" (Kennedy and Tan, 2008) Figure No. VI, indicates that the site is underlain by Pleistocene-age Very Old Paralic deposit ($Qvop_8$) formational materials. Refer to Figure No. VII for geologic cross sections. Based on the Geologic Map of San Diego and the City of San Diego Seismic Safety Study, Geologic Hazards Map No. 17, there are no faults mapped on the site.

The San Diego area, as most of California, is located in a seismically active region. The San Diego area has been referred to as the eastern edge of the Southern California Continental Borderland, an extension of the Peninsular Ranges Geomorphic Province. The borderland is part of a broad tectonic boundary between the North American and Pacific Plates. The plate boundary is dominated by a complex system of active major strike-slip (right lateral), northwest-trending faults extending from the San Andreas Fault about 70 miles east, to the San Clemente Fault, about 50 miles west of the San Diego metropolitan area.

The prominent fault zones generally considered having the most potential for earthquake damage in the vicinity of the site are the active Rose Canyon and Coronado Bank fault zones mapped approximately 2 and 15 miles southwest of the site, respectively, and the active Elsinore and San Jacinto fault zones mapped approximately 41 and 62 miles northeast of the site, respectively.

Although research on earthquake prediction has greatly increased in recent years, geologists and seismologists have not yet reached the point where they can predict when and where an earthquake will occur. Nevertheless, on the basis of current technology, it is reasonable to assume that the site may be subject to the effects of at least one moderate to major earthquake during the design life of the project. During such an earthquake, the danger from fault offset through the site is remote, but relatively strong ground shaking is likely to occur.

Strong ground shaking not only can cause structures to shake, but it also has the potential for including other phenomena that can indirectly cause substantial ground movements or other hazards resulting in damage to structures. These phenomena include seismically induced waves such as tsunamis and seiches, inundation due to dam or embankment failure, soil liquefaction, landsliding, lateral spreading, differential compaction and ground cracking. Available information indicates that the location of and geotechnical conditions at the site are not conducive to any of these phenomena.

VIII. CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are based on the field investigation conducted by our firm, our laboratory test results, our analysis of the field and laboratory data, and our experience with similar soils and formational materials. The primary feature of concern at the site is the presence of undocumented existing fill soils which are not considered suitable for support of the proposed structure and associated improvements. Accordingly, adequate support for the proposed structure will require either removal and recompaction of all existing fill soils or supporting the proposed structure (including floor/parking slabs) on end bearing piers founded on the underlying formational materials.

The opinions, conclusions, and recommendations presented in this report are contingent upon ***Geotechnical Exploration, Inc.*** being retained to review the final plans and specifications as they are developed and to observe the site earthwork and installation of foundations. Accordingly, we recommend that the following paragraph be included on the grading and foundation plans for the project.

> *If the geotechnical consultant of record is changed for the project, the work shall be stopped until the replacement has agreed in writing to accept responsibility within their area of technical competence for approval upon completion of the work. It shall be the responsibility of the permittee to notify the City Engineer in writing of such change prior to the recommencement of grading and/or foundation installation work.*

A. Preparation of Soils for Site Development

1. *Clearing and Stripping:* The site should be cleared of the existing buildings, pavements and utilities to be abandoned and any miscellaneous debris that may be present at the time of construction and stripped of all vegetation. The cleared and stripped materials should be properly disposed of off-site.

2. *Excavation:* Based on the results of our exploratory borings, as well as our experience with similar materials, it is our opinion that the existing fill soils and natural formational materials can be excavated utilizing ordinary heavy earthmoving equipment. Contractors should not, however, be relieved of making their own independent evaluation of the excavatability of the on-site materials prior to submitting their bids.

3. *Removal and Recompaction of Existing Fill Soils:* If it is desired to support the proposed building (including floor/parking slabs) and associated improvements on conventional shallow footing foundations and slabs on grade, all existing fill soils should be removed and recompacted to a minimum degree of compaction of 93 percent.

4. *Subgrade Preparation:* After the site has been cleared, stripped, and the required excavations made, the exposed subgrade soils in areas to receive fill and/or building improvements should be scarified to a depth of 8 inches, moisture conditioned to at least 2 percent above the laboratory optimum, and compacted to the requirements for structural fill.

5. *Material for Fill:* All existing on-site soils with an organic content of less than 3 percent by volume are in general suitable for use as fill. Both existing on-site soils, however, and any required imported fill materials should not contain rocks or lumps more than 6 inches in greatest dimension, not more than 15 percent larger than 2½ inches, and no more than 25 percent of the fill should be larger than ¼-inch. All materials for use as fill should be approved by our representative prior to filling.

6. *Fill Compaction:* All fill should in general be compacted to a minimum degree of compaction of 90 percent at a moisture content at least 2 percent above the optimum based upon ASTM D1557-12. All structural fill, however, to be utilized for support of conventional shallow footing foundations should be compacted to a minimum degree of compaction of 93 percent at a moisture content at least 2 percent above the optimum based upon ASTM D1557-12. Before compaction begins, the fill should be brought to a moisture content that will permit proper compaction by either: (1) aerating and drying the fill

if it is too wet, or (2) moistening the fill with water if it is too dry. Each lift should be thoroughly mixed before compaction to ensure a uniform distribution of moisture.

7. *Permanent Slopes:* We recommend that any required permanent cut and fill slopes be constructed to an inclination no steeper than 2.0:1.0 (horizontal to vertical). The project plans and specifications should contain all necessary design features and construction requirements to prevent erosion of the on-site soils both during and after construction. Slopes and other exposed ground surfaces should be appropriately planted with a protective groundcover.

   Fill slopes should be constructed to assure that the recommended minimum degree of compaction is attained out to the finished slope face. This may be accomplished by "backrolling" with a sheepsfoot roller or other suitable equipment as the fill is raised. Placement of fill near the tops of slopes should be carried out in such a manner as to assure that loose, uncompacted soils are not sloughed over the tops and allowed to accumulate on the slope face.

8. *Temporary Slopes:* Based on our subsurface investigation work, laboratory test results, and engineering analysis, temporary cut slopes up to 15 feet in height in the formational materials should be safe against mass instability at an inclination of 1.0:1.0 (horizontal to vertical).

   Some localized sloughing or ravelling of the soils exposed on the slopes, however, may occur. Since the stability of temporary construction slopes will depend largely on the contractor's activities and safety precautions (storage

and equipment loadings near the tops of cut slopes, surface drainage provisions, etc.), it should be the contractor's responsibility to establish and maintain all temporary construction slopes at a safe inclination appropriate to the methods of operation.

9. *Shoring:* Shoring will be required for the planned cuts along the north and west boundaries of the proposed structure as well as along the east and south boundaries if removal and recompaction of the existing fill is to be performed. We recommend that the shoring along the north and west boundaries, which will be made in the very old Paralic deposit formational soils be designed using an angle of internal friction of 32 degrees and a unit soil weight of 120 pounds per cubic foot. We recommend that the shoring along the south and east boundaries, which will be made in the existing undocumented fill soils be designed using an angle of internal friction of 28 degrees and a unit soil weight of 120 pounds per cubic foot. If needed, additional recommendations could be provided to the shoring design consultant.

10. *Trench and Retaining/Basement Wall Backfill:* All backfill soils placed in utility trenches or behind retaining/basement walls should be compacted to a minimum degree of compaction of 90 percent. Backfill material should be placed in lift thicknesses appropriate to the type of compaction equipment utilized and compacted to a minimum degree of 90 percent by mechanical means. In pavement areas, that portion of the trench backfill within the pavement section should conform to the material and compaction requirements of the adjacent pavement section.

Our experience has shown that even shallow, narrow trenches, such as for irrigation and electrical lines, that are not properly compacted can result in problems, particularly with respect to shallow groundwater accumulation and migration.

11. *Surface Drainage:* Positive surface gradients should be provided adjacent to the building and roof gutters and downspouts should be installed so as to direct water away from foundations and slabs toward suitable discharge facilities. Ponding of surface water should not be allowed anywhere on the site. Appropriate erosion control measures should be taken at all times during and after construction to prevent surface runoff waters from entering footing excavations or ponding on finished building pad areas.

B. ***Foundation Recommendations***

12. *Footings:* Provided all existing fill soils are removed and recompacted as recommended in Items 3 through 6 above, we recommend that the proposed building be supported on conventional, individual-spread and/or continuous footing foundations bearing on undisturbed formational materials and/or recompacted fill soils. All footings should be founded at least 24 inches below the lowest adjacent finished grade.

At the recommended depths, footings may be designed for allowable bearing pressures of 4,000 pounds per square foot (psf) for combined dead and live loads and 5,300 psf for all loads, including wind or seismic. The footings should, however, have a minimum width of 18 inches.

13. *General Criteria for All Footings*: Footings located adjacent to the tops of slopes should be extended sufficiently deep so as to provide at least 10 feet of horizontal cover or 1½ times the width of the footing, whichever is greater, between the slope face and outside edge of the footing at the footing bearing level. Footings located adjacent to utility trenches should have their bearing surfaces situated below an imaginary 1.5 to 1.0 plane projected upward from the bottom edge of the adjacent utility trench.

    All continuous footings should contain top and bottom reinforcement to provide structural continuity and to permit spanning of local irregularities. We recommend that a minimum of two No. 5 top and two No. 5 bottom reinforcing bars be provided in the footings. A minimum clearance of 3 inches should be maintained between steel reinforcement and the bottom or sides of the footing. In order for us to offer an opinion as to whether the footings are founded on soils of sufficient load bearing capacity, it is essential that our representative inspect the footing excavations prior to the placement of reinforcing steel or concrete.

    NOTE: The project Civil/Structural Engineer should review all reinforcing schedules. The reinforcing minimums recommended herein are not to be construed as structural designs, but merely as minimum reinforcement to reduce the potential for cracking and separations.

14. *Drilled End-Bearing Piers*: An alternative to the removal and recompaction of all existing fill soils would be to support the proposed structure (including floor/parking slabs) on end bearing piers founded in the formational materials underlying the site. The end-bearing piers should be embedded at least 6 feet into undisturbed formational material or twice the pier diameter

below the adjacent finish grade, whichever is deeper. At the recommended depth, the piers may be designed for an allowable end-bearing pressure of 8,000 pounds per square foot (psf) for combined dead and live loads with a one-third increase for wind and/or seismic loads.

When drilling excavations for piers utilizing end-bearing support, it is important to limit the amount of loose material at the bottom of the excavation. Therefore, we recommend that the piers be designed with a minimum diameter of 2 feet in order to facilitate observation of the excavations and allow ease of material removal at the bottom. No slough over 1 inch in thickness should remain at the bottom of the excavation before concrete placement. The drilling contractor should provide an appropriate cleaning tool to satisfy this requirement. Otherwise, casing and hand-tool cleaning (or another acceptable option) will be required.

15. *Seismic Design Criteria:* Site-specific seismic design criteria for the proposed structure are presented in the following table in accordance with the 2016 CBC, which incorporates by reference ASCE 7-10 for seismic design. We have determined the mapped spectral acceleration values for the site, based on a latitude of 32.716 degrees and longitude of -117.128 degrees, utilizing a tool provided by the USGS, which provides a solution for ASCE 7-10 (2016 CBC) utilizing digitized files for the Spectral Acceleration maps. We have assigned a Site Soil Classification of C.

TABLE I
Mapped Spectral Acceleration Values and Design Parameters

S_s	S_1	F_a	F_v	S_{ms}	S_{m1}	S_{ds}	S_{d1}
1.136g	0.436g	1.000	1.364	1.136g	0.595g	0.758g	0.397g

16. *Lateral Loads:* Lateral load resistance for the structure supported on footing foundations may be developed in friction between the foundation bottoms and the supporting subgrade. An allowable friction coefficient of 0.35 is considered applicable. An additional allowable passive resistance equal to an equivalent fluid weight of 350 pounds per cubic foot (pcf) acting against the foundations may be used in design provided the footings are poured neat against the adjacent undisturbed compacted fill or formational materials. These lateral resistance values assume a level surface in front of the footing for a minimum distance of three times the embedment depth of the footing and any shear keys.

    Lateral load resistance for the drilled piers may be developed by passive resistance of the fill and/or formational soil materials they are embedded in. We recommend an allowable lateral resistance utilizing an equivalent fluid weight of 600 pounds per cubic foot against the projected area of the shafts.

17. *Settlement:* Settlements under building loads are expected to be within tolerable limits for the proposed structures. For footings or drilled piers designed in accordance with the recommendations presented in the preceding paragraphs, we anticipate that total settlements should not exceed 1 inch and that post-construction differential settlements should be less than ¼-inch in 25 feet.

18. *Retaining/Basement Walls*: Retaining walls must be designed to resist lateral earth pressures and any additional lateral pressures caused by surcharge loads on the adjoining retained surface. We recommend that unrestrained (cantilever) walls with level backfill be designed for an equivalent fluid pressure of 35 pcf. We recommend that restrained walls (i.e., basement

walls or any walls with angle points that restrain them from rotation) with level backfill be designed for an equivalent fluid pressure of 35 pcf plus an additional uniform lateral pressure of 8H pounds per square foot, where H is equal to the height of backfill above the top of the wall footing in feet. Wherever walls will be subjected to surcharge loads, they should also be designed for an additional uniform lateral pressure equal to one-third the anticipated surcharge pressure in the case of unrestrained walls and one-half the anticipated surcharge pressure in the case of restrained walls.

For seismic design of unrestrained walls, we recommend that the seismic pressure increment be taken as a fluid pressure distribution utilizing an equivalent fluid weight of 11 pcf. For restrained walls we recommend that the seismic pressure increment be taken as a fluid pressure distribution utilizing an equivalent fluid weight of 17 pcf added to the active static fluid pressure utilizing an equivalent fluid weight of 35 pcf.

The preceding design pressures assume that the walls are backfilled with low expansion potential materials (Expansion Index less than 50) and that there is sufficient drainage behind the walls to prevent the build-up of hydrostatic pressures from surface water infiltration. We recommend that drainage be provided by a composite drainage material such as J-Drain 200/220 and J-Drain SWD, or equivalent. No perforated pipes are utilized with the J-Drain system. The drain material should terminate 12 inches below the finish surface where the surface is covered by slabs or 18 inches below the finish surface in landscape areas.

Backfill placed behind the walls should be compacted to a minimum degree of compaction of 90 percent using light compaction equipment. If heavy equipment is used, the walls should be appropriately temporarily braced.

C. ***Concrete Slab-on-grade Criteria***

19. *Minimum Floor Slab Thickness and Reinforcement for Slabs on Recompacted Fill/Formational Material:* Based on our experience, we have found that, for various reasons, floor slabs occasionally crack, causing brittle surfaces such as ceramic tiles to become damaged. Therefore, we recommend that all slabs-on-grade contain at least a minimum amount of reinforcing steel to reduce the separation of cracks, should they occur.

19.1 Interior floor slabs should be a minimum of 5 inches actual thickness and be reinforced with No. 4 bars on 24-inch centers, both ways, placed at midheight in the slab. Slab subgrade soil should be verified by a ***Geotechnical Exploration, Inc.*** representative to have the proper moisture content within 48 hours prior to placement of the vapor barrier and pouring of concrete.

19.2 Following placement of any concrete floor slabs, sufficient drying time must be allowed prior to placement of floor coverings. Premature placement of floor coverings may result in degradation of adhesive materials and loosening of the finish floor materials.

20. *Concrete Isolation Joints:* We recommend the project Civil/Structural Engineer incorporate isolation joints and sawcuts to at least one-fourth the thickness of the slab in any floor designs. The joints and cuts, if properly

placed, should reduce the potential for and help control floor slab cracking. We recommend that concrete shrinkage joints be spaced no farther than approximately 20 feet apart, and also at re-entrant corners. However, due to a number of reasons (such as base preparation, construction techniques, curing procedures, and normal shrinkage of concrete), some cracking of slabs can be expected.

21. *Slab Moisture Protection and Vapor Barrier Membrane:* Although it is not the responsibility of geotechnical engineering firms to provide moisture protection recommendations, as a service to our clients we provide the following discussion and suggested minimum protection criteria. Actual recommendations should be provided by the architect and waterproofing consultants.

Soil moisture vapor can result in damage to moisture-sensitive floors, some floor sealers, or sensitive equipment in direct contact with the floor, in addition to mold and staining on slabs, walls and carpets. The common practice in Southern California is to place vapor retarders made of PVC, or of polyethylene. PVC retarders are made in thickness ranging from 10- to 60-mil. Polyethylene retarders, called visqueen, range from 5- to 10-mil in thickness. These products are no longer considered adequate for moisture protection and can actually deteriorate over time.

Specialty vapor retarding products possess higher tensile strength and are more specifically designed for and intended to retard moisture transmission into and through concrete slabs. The use of such products is highly recommended for reduction of floor slab moisture emission.

The following American Society for Testing and Materials (ASTM) and American Concrete Institute (ACI) sections address the issue of moisture transmission into and through concrete slabs: ASTM E1745-97 (2009) Standard Specification for Plastic Water Vapor Retarders Used in Contact Concrete Slabs; ASTM E154-88 (2005) Standard Test Methods for Water Vapor Retarders Used in Contact with Earth; ASTM E96-95 Standard Test Methods for Water Vapor Transmission of Materials; ASTM E1643-98 (2009) Standard Practice for Installation of Water Vapor Retarders Used in Contact Under Concrete Slabs; and ACI 302.2R-06 Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.

21.1 Based on the above, we recommend that the vapor barrier consist of a minimum 15-mil extruded polyolefin plastic (no recycled content or woven materials permitted). Permeance as tested before and after mandatory conditioning (ASTM E1745 Section 7.1 and sub-paragraphs 7.1.1-7.1.5) should be less than 0.01 perms (grains/square foot/hour in Hg) and comply with the ASTM E1745 Class A requirements. Installation of vapor barriers should be in accordance with ASTM E1643. The basis of design is 15-mil StegoWrap vapor barrier placed per the manufacturer's guidelines. Reef Industries Vapor Guard membrane has also been shown to achieve a permeance of less than 0.01 perms. We recommend that the slab be poured directly on the vapor barrier, which is placed directly on the prepared subgrade soil.

21.2 Common to all acceptable products, vapor retarder/barrier joints must be lapped and sealed with mastic or the manufacturer's recommended tape or sealing products. In actual practice, stakes are often driven through the retarder material, equipment is dragged or rolled across

the retarder, overlapping or jointing is not properly implemented, etc. All these construction deficiencies reduce the retarder's effectiveness. In no case should retarder/barrier products be punctured or gaps be allowed to form prior to or during concrete placement.

21.3 Vapor retarders/barriers do not provide full waterproofing for structures constructed below free water surfaces. They are intended to help reduce or prevent vapor transmission and/or capillary migration through the soil and through the concrete slabs. Waterproofing systems must be designed and properly constructed if full waterproofing is desired. The owner and project designers should be consulted to determine the specific level of protection required.

21.4 Following placement of concrete floor slabs, sufficient drying time must be allowed prior to placement of any floor coverings. Premature placement of floor coverings may result in degradation of adhesive materials and loosening of the finish floor materials.

22. *Exterior Slab Thickness and Reinforcement:* As a minimum for protection of on-site improvements, we recommend that all exterior pedestrian concrete slabs be 4½ inches thick, founded on properly compacted and tested fill, and contain No. 4 bars at 24-inch centers, both ways, at the center of the slab, and contain adequate isolation and control joints. The performance of on-site improvements can be greatly affected by soil base preparation and the quality of construction. It is therefore important that all improvements are properly designed and constructed for the existing soil conditions. The improvements should not be built on loose soils or fills placed without our observation and testing.

For exterior slabs with the minimum shrinkage reinforcement, control joints should be placed at spaces no farther than 15 feet apart or the width of the slab, whichever is less, and also at re-entrant corners. Control joints in exterior slabs should be sealed with elastomeric joint sealant. The sealant should be inspected every 6 months and be properly maintained.

D. Pavements

23. *Concrete Pavement:* We recommend that concrete pavements supported on recompacted fill and/or undisturbed formational materials, including the garage slab, subject only to automobile and light truck traffic be 6 inches thick. The upper 8 inches of the subgrade below the slab should be compacted to a minimum degree of compaction of 95 percent just prior to paving. The concrete should conform to Section 201 of The Standard Specifications for Public Works Construction, 2000 Edition, for Class 560-C-3250.

In order to control shrinkage cracking, we recommend that saw-cut, weakened-plane joints be provided at about 15-foot centers both ways. The pavement slabs should be saw-cut as soon as practical but no more than 24 hours after the placement of the concrete. The depth of the joint should be one-quarter of the slab thickness and its width should not exceed 0.02-foot. Reinforcing steel is not necessary unless it is desired to increase the joint spacing recommended above.

E. General Recommendations

24. *Project Start Up Notification:* In order to minimize any work delays during site development, this firm should be contacted 24 hours prior to any need for observation of footing excavations or field density testing of compacted fill soils. If possible, placement of formwork and steel reinforcement in footing excavations should not occur prior to observing the excavations; in the event that our observations reveal the need for deepening or redesigning foundation structures at any locations, any formwork or steel reinforcement in the affected footing excavation areas would have to be removed prior to correction of the observed problem (i.e., deepening the footing excavation, recompacting soil in the bottom of the excavation, etc.).

IX. GRADING NOTES

Geotechnical Exploration, Inc. recommends that we be retained to verify the actual soil conditions revealed during site grading work and footing/pier excavations to be as anticipated in this "*Report of Preliminary Geotechnical Investigation and Infiltration Testing*" for the project. In addition, the compaction of any fill soils placed during site grading work must be observed and tested by the soil engineer. It is the responsibility of the grading contractor to comply with the requirements on the grading plans and the local grading ordinance. All retaining wall and trench backfill should be properly compacted. ***Geotechnical Exploration, Inc.*** will assume no liability for damage occurring due to improperly or uncompacted backfill placed without our observations and testing.

X. LIMITATIONS

Our conclusions and recommendations have been based on available data obtained from our document review, field investigation and laboratory analysis, as well as our experience with similar soils and formational materials located in this area of San Diego. Of necessity, we must assume a certain degree of continuity between exploratory excavations. It is, therefore, necessary that all observations, conclusions, and recommendations be verified at the time grading operations begin or when footing excavations are placed. In the event discrepancies are noted, additional recommendations may be issued, if required.

The work performed and recommendations presented herein are the result of an investigation and analysis that meet the contemporary standard of care in our profession within the City of San Diego. No warranty is provided.

This report should be considered valid for a period of two (2) years, and is subject to review by our firm following that time. If significant modifications are made to the building plans, especially with respect to the height and location of any proposed structures, this report must be presented to us for immediate review and possible revision.

It is the responsibility of the owner and/or developer to ensure that the recommendations summarized in this report are carried out in the field operations and that our recommendations for design of this project are incorporated in the structural plans. We should be retained to review the project plans once they are available, to verify that our recommendations are adequately incorporated in the plans.

This firm does not practice or consult in the field of safety engineering. We do not direct the contractor's operations, and we cannot be responsible for the safety of personnel other than our own on the site; the safety of others is the responsibility of the contractor. The contractor should notify the owner if any of the recommended actions presented herein are considered to be unsafe.

The firm of ***Geotechnical Exploration, Inc.*** shall not be held responsible for changes to the physical condition of the property, such as addition of fill soils or changing drainage patterns, which occur subsequent to issuance of this report and the changes are made without our observations, testing, and approval.

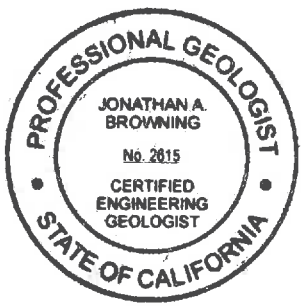
Once again, should any questions arise concerning this report, please feel free to contact the undersigned. Reference to our **Job No. 16-11320** will expedite a reply to your inquiries.

Respectfully submitted,

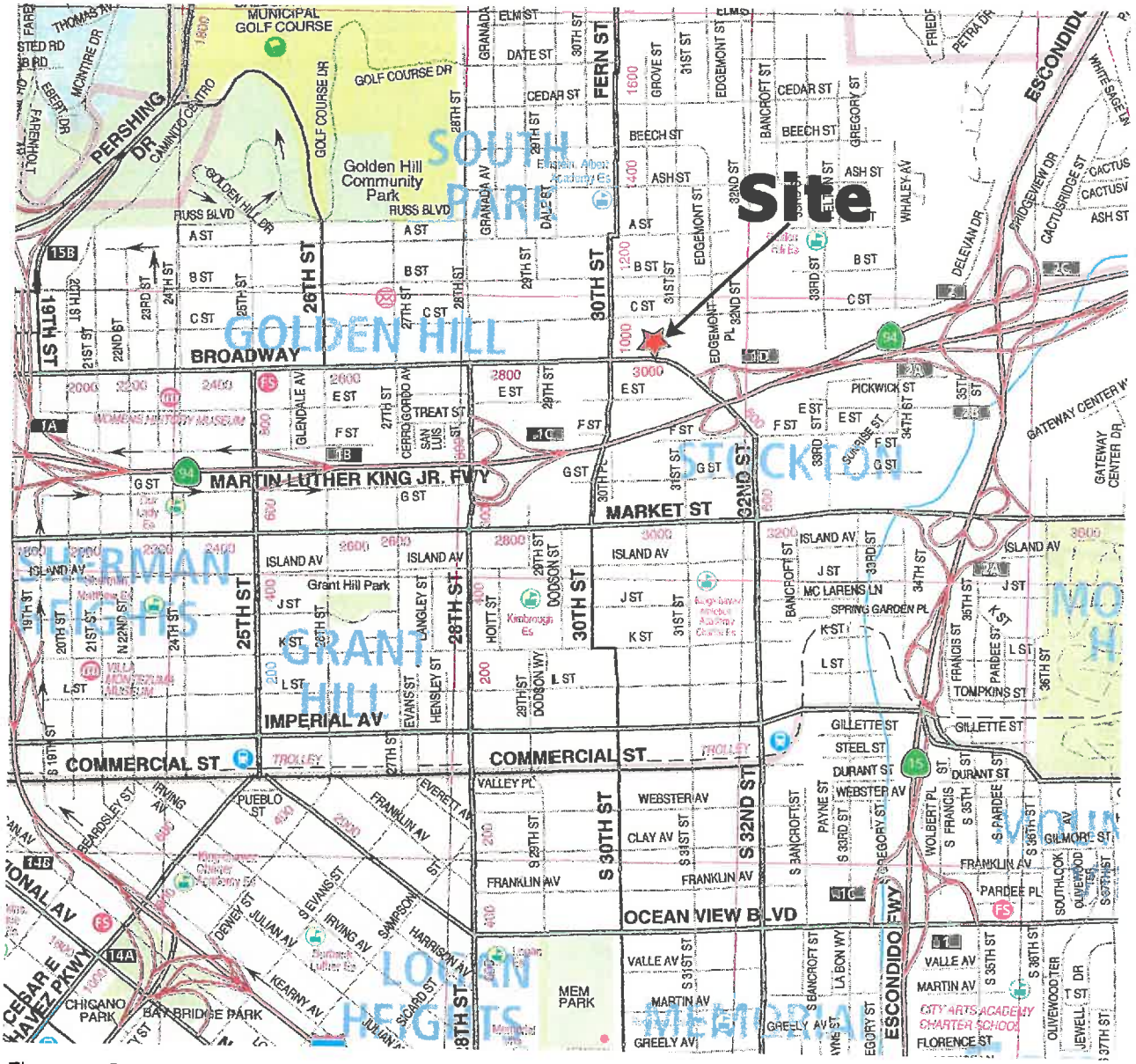
GEOTECHNICAL EXPLORATION, INC.

Wm. D. Hespeler, G.E. 396
Senior Geotechnical Engineer

Jonathan A. Browning
C.E.G. 2615/P.G. 9012
Senior Project Geologist



VICINITY MAP

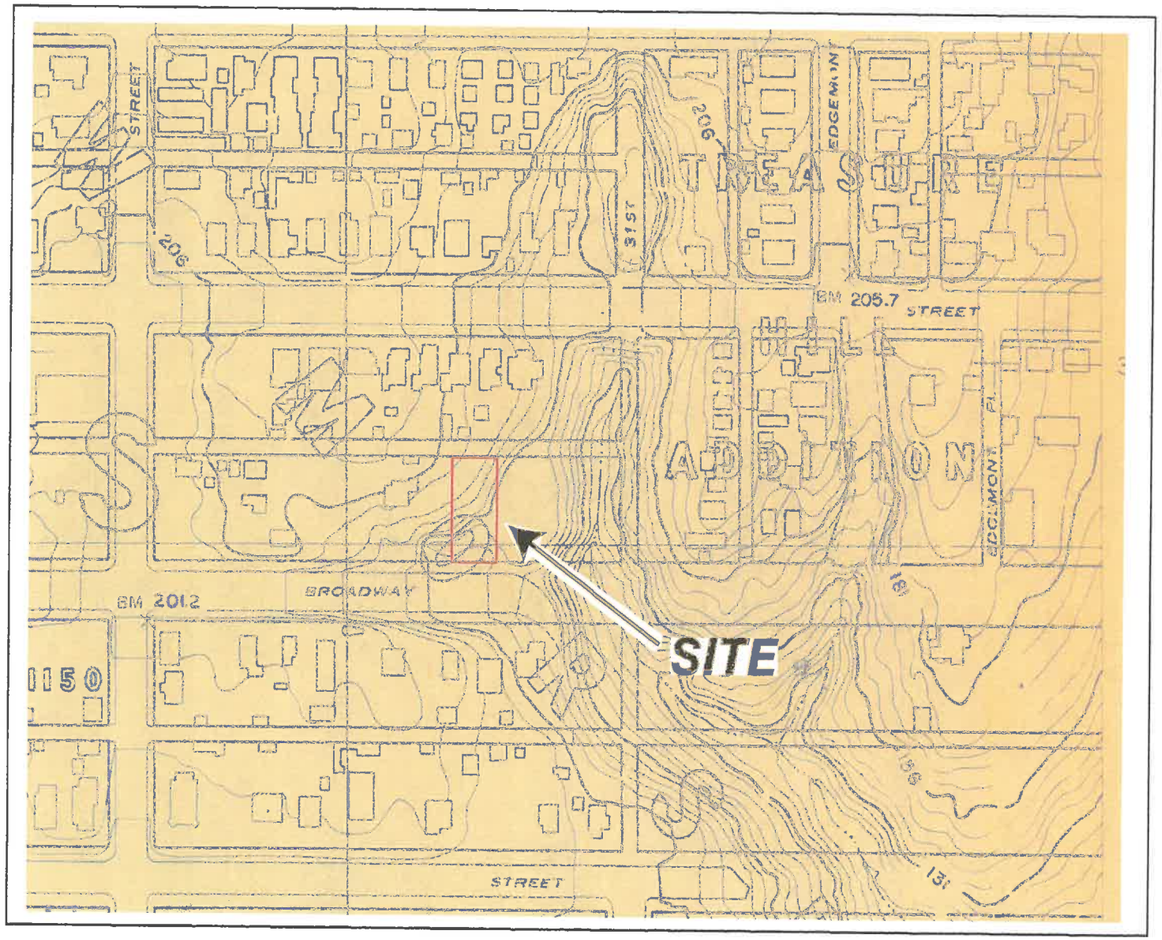


Thomas Bros Guide San Diego County pg 1289-E3

Proposed Apartment Project
3060 Broadway
San Diego, CA.

Figure No. I
Job No. 16-11320

City of San Diego
METROPOLITAN TOPOGRAPHIC SURVEY MAP
Sheet 198-1725
Edition of 1954



Scale: 1" = 200'
(approximate)

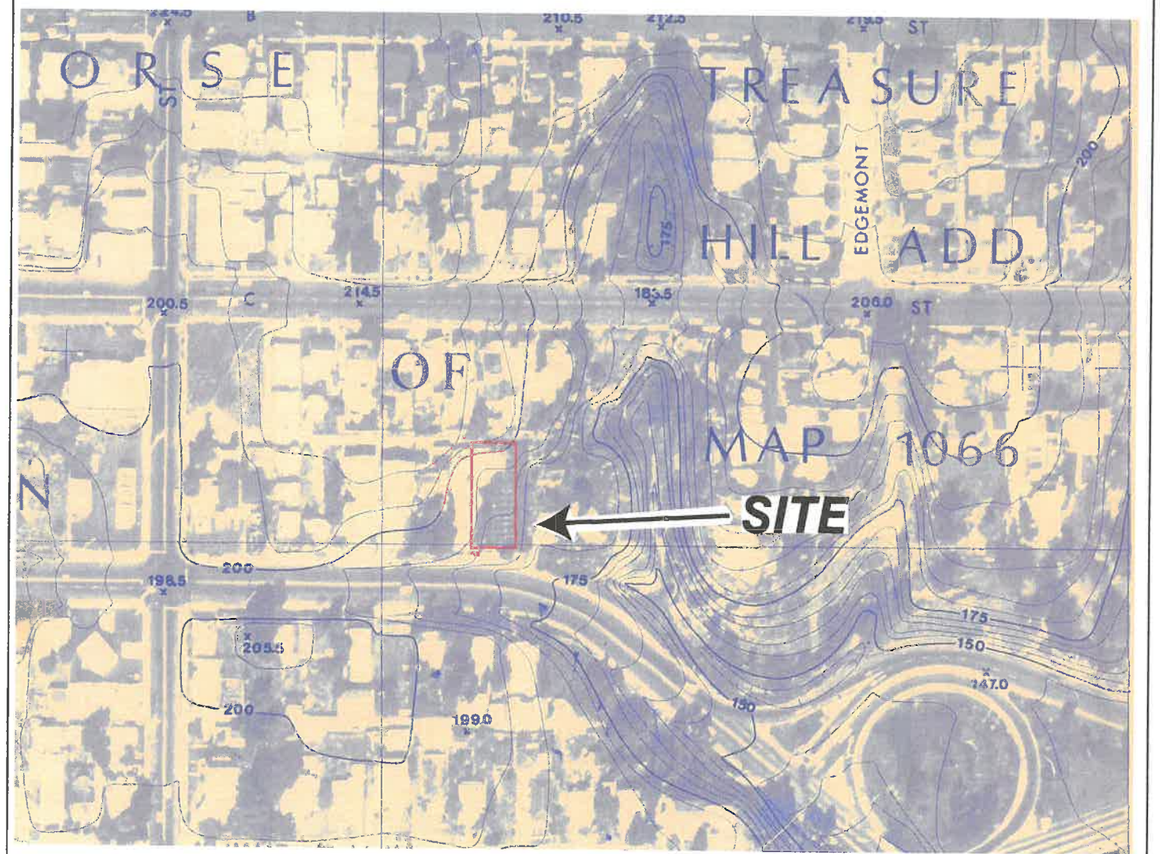
Proposed Apartment Project
3060 Broadway
San Diego, CA.
Figure No. II
Job No. 16-11320

Geotechnical Exploration, Inc.

(March 2017)

16-11320-II.ai

City of San Diego
METROPOLITAN TOPOGRAPHIC SURVEY MAP
Sheet 198-1725
Edition of 1976



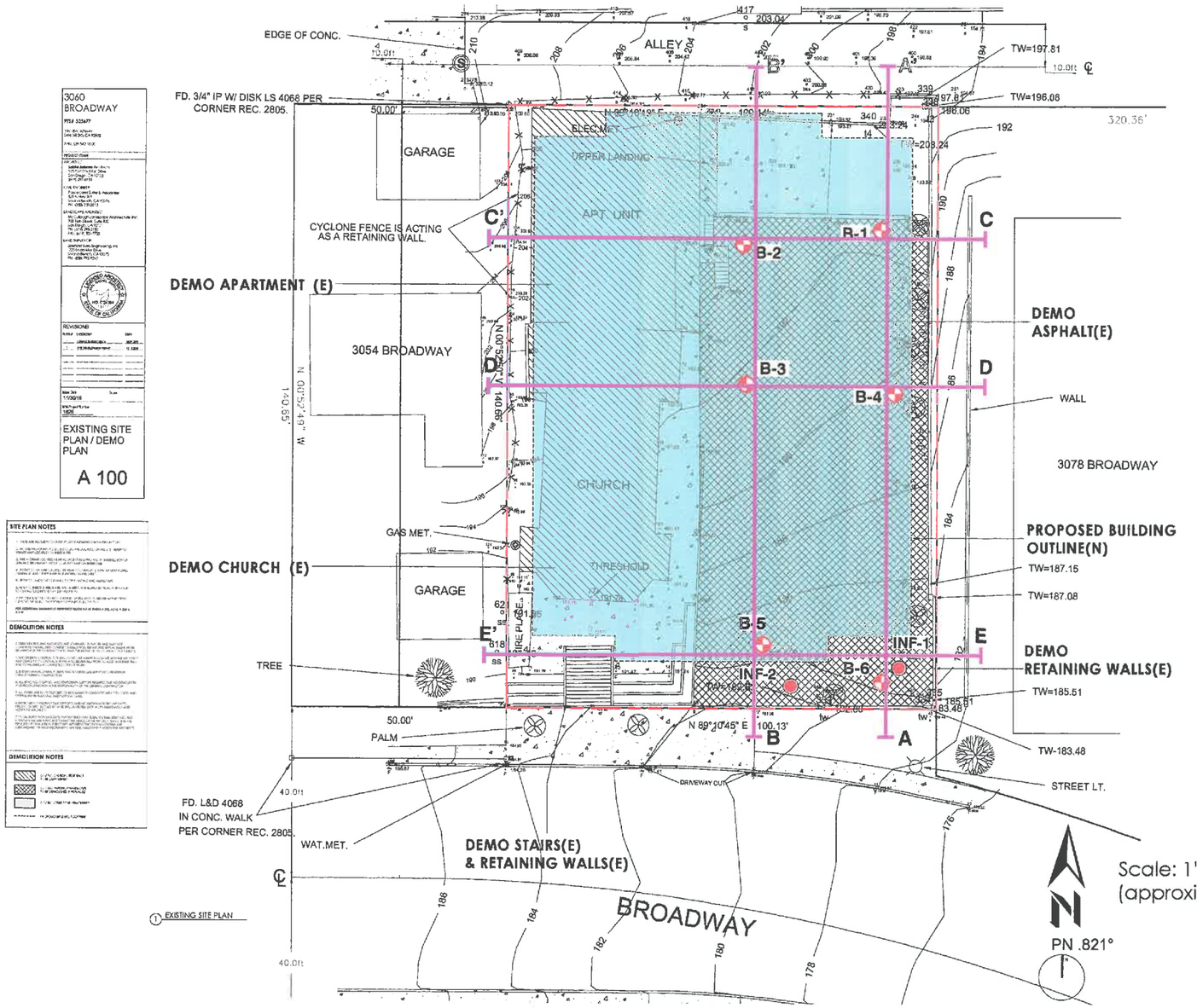
Scale: 1" = 200'
(approximate)

Proposed Apartment Project
3060 Broadway
San Diego, CA.
Figure No. IIa
Job No. 16-11320

Geotechnical Exploration, Inc.

(March 2017)

16-11320-IIa.ai



3060 BROADWAY

EXISTING SITE PLAN / DEMO PLAN

A 100

SITE PLAN NOTES

DEMOLITION NOTES

DEMOLITION NOTES

① EXISTING SITE PLAN

Scale: 1" = 30' (approximate)

LEGEND

- **B-3** Indicates Approximate Location of Exploratory Boring
- **INF-1** Indicates Approximate Location of Infiltration Test
- **E — E'** Indicates Approximate Location of Geologic Cross Section Location

NOTE: This Plot Plan is not to be used for legal purposes. Locationss and dimensions are approximate. Actual property dimensions and locations of utilities may be obtained from the Approved Building Plans or the "As-Built" Grading Plans.

REFERENCE: This Plot Plan was prepared from an existing SITE PLAN by SAFDIE RABINES ARCHITECTS dated 11/30/16 and from on-site field reconnaissance performed by GEI.

SITE PLAN

Proposed Apartment Project
3060 Broadway
San Diego, CA.
Figure No. III
Job No. 16-11320

Geotechnical Exploration, Inc.

(March 2017)

16-11320-p.ai

EQUIPMENT	DIMENSION & TYPE OF EXCAVATION	DATE LOGGED
Truck-mounted Auger Drill Rig	**8-inch diameter Boring**	**2-24-17**
SURFACE ELEVATION	**GROUNDWATER/ SEEPAGE DEPTH**	**LOGGED BY**
± 193' Mean Sea Level	**Not Encountered**	**JAB**

DEPTH (feet)	SYMBOL	SAMPLE	FIELD DESCRIPTION AND CLASSIFICATION DESCRIPTION AND REMARKS (Grain size, Density, Moisture, Color)	U.S.C.S.	IN-PLACE MOISTURE (%)	IN-PLACE DRY DENSITY (pcf)	OPTIMUM MOISTURE (%)	MAXIMUM DRY DENSITY (pcf)	DENSITY (% of M.D.D.)	EXPAN. + (%) CONSOL. -	BLOW COUNTS/FT.	SAMPLE O.D. (INCHES)
			ASPHALT PAVEMENT , 4.5" thick.									
1			**CLAYEY SAND** , fine- to coarse-grained, some subrounded gravel. Loose to medium dense. Moist. Red-brown. **FILL (Qaf)**	SC								
2			**CLAYEY SAND** , fine- to coarse-grained, some subrounded gravel. Very dense. Slightly moist. Mottled yellow-brown to light red-brown. **VERY OLD PARALIC DEPOSITS (Qvop $_8$)**	SC	11.7						78	2"
3			-- 17% passing #200 sieve.									
4			Refusal on cobbles @ 3.5'. Bottom @ 3.5'									
5												
6												

EXPLORATION LOG 11320 BROADWAY APTS.GPJ GEO_EXPL.GDT 3/15/17

- PERCHED WATER TABLE
- BULK BAG SAMPLE
- 1 IN-PLACE SAMPLE
- MODIFIED CALIFORNIA SAMPLE
- S NUCLEAR FIELD DENSITY TEST
- STANDARD PENETRATION TEST

JOB NAME
Broadway Apartments

SITE LOCATION
3060 Broadway, San Diego, CA

JOB NUMBER
16-11320

REVIEWED BY **JAB/WDH**

LOG No.
B-1

FIGURE NUMBER
IVa

Geotechnical Exploration, Inc.

EQUIPMENT	DIMENSION & TYPE OF EXCAVATION	DATE LOGGED
Truck-mounted Auger Drill Rig	**8-inch diameter Boring**	**2-24-17**
SURFACE ELEVATION	GROUNDWATER/ SEEPAGE DEPTH	LOGGED BY
± 193' Mean Sea Level	**Not Encountered**	**JAB**

DEPTH (feet)	SYMBOL	SAMPLE	FIELD DESCRIPTION AND CLASSIFICATION DESCRIPTION AND REMARKS (Grain size, Density, Moisture, Color)	U.S.C.S.	IN-PLACE MOISTURE (%)	IN-PLACE DRY DENSITY (pcf)	OPTIMUM MOISTURE (%)	MAXIMUM DRY DENSITY (pcf)	DENSITY (% of M.D.D.)	EXPAN. + (%) CONSOL. -	EXPANSION INDEX	BLOW COUNTS/FT.	SAMPLE O.D. (INCHES)
0			**ASPHALT PAVEMENT** , 3" thick.										
1			**CLAYEY SAND** , fine- to coarse-grained, some subrounded gravel. Loose to medium dense. Moist. Red-brown. **FILL (Qaf)**	SC									
2			**SANDY CLAY/ CLAYEY SAND** , fine- to coarse-grained, trace subrounded gravel. Very stiff/ medium dense. Moist. Red-brown. **VERY OLD PARALIC DEPOSITS (Qvop 8)**	CL/ SC	16.7							20	2"
3			-- 47% passing #200 sieve.										
4													
5			Bulk bag sample from 3'- 6'.				11.0	123.5			60		
6													
7			-- becomes **CLAYEY SAND**.										
8			-- 23% passing #200 sieve.		9.2							22	2"
9			Bottom @ 8.5'										

EXPLORATION LOG 11320 BROADWAY APTS.GPJ GEO_EXPL.GDT 3/15/17

- PERCHED WATER TABLE
- BULK BAG SAMPLE
- IN-PLACE SAMPLE
- MODIFIED CALIFORNIA SAMPLE
- NUCLEAR FIELD DENSITY TEST
- STANDARD PENETRATION TEST

JOB NAME		
Broadway Apartments		
SITE LOCATION		
3060 Broadway, San Diego, CA		
JOB NUMBER	REVIEWED BY	LOG No.
16-11320	**JAB/WDH**	**B-2**
FIGURE NUMBER	Geotechnical Exploration, Inc.	
IVb		

EQUIPMENT	DIMENSION & TYPE OF EXCAVATION	DATE LOGGED
Truck-mounted Auger Drill Rig	**8-inch diameter Boring**	**2-24-17**
SURFACE ELEVATION	GROUNDWATER/ SEEPAGE DEPTH	LOGGED BY
± 192' Mean Sea Level	**Not Encountered**	**JAB**

DEPTH (feet)	SYMBOL	SAMPLE	FIELD DESCRIPTION AND CLASSIFICATION DESCRIPTION AND REMARKS (Grain size, Density, Moisture, Color)	U.S.C.S.	IN-PLACE MOISTURE (%)	IN-PLACE DRY DENSITY (pcf)	OPTIMUM MOISTURE (%)	MAXIMUM DRY DENSITY (pcf)	DENSITY (% of M.D.D.)	EXPAN. + (%) CONSOL. -	BLOW COUNTS/FT.	SAMPLE O.D. (INCHES)
			ASPHALT PAVEMENT , 3" thick.									
1			**CLAYEY SAND** , fine- to medium-grained, some subrounded gravel, trace cobbles. Loose to medium dense. Moist. Red-brown. **FILL (Qaf)**	SC								
2												
3			-- sampler encountered cobble @ 3'. -- 17% passing #200 sieve. -- gravel in sample tip.		9.8						60/ 10"	2"
4			Refusal on cobbles @ 3.5' after 2 attempts to advance. Bottom @ 3.5'									
5												

PERCHED WATER TABLE
BULK BAG SAMPLE
1 IN-PLACE SAMPLE
MODIFIED CALIFORNIA SAMPLE
S NUCLEAR FIELD DENSITY TEST
STANDARD PENETRATION TEST

JOB NAME
Broadway Apartments

SITE LOCATION
3060 Broadway, San Diego, CA

JOB NUMBER
16-11320

REVIEWED BY **JAB/WDH**

FIGURE NUMBER
IVc

Geotechnical Exploration, Inc.

LOG No.
B-3

EXPLORATION LOG 11320 BROADWAY APTS.GPJ GEO_EXPL.GDT 3/15/17

EQUIPMENT	DIMENSION & TYPE OF EXCAVATION	DATE LOGGED
Truck-mounted Auger Drill Rig	8-inch diameter Boring	2-24-17
SURFACE ELEVATION	**GROUNDWATER/ SEEPAGE DEPTH**	**LOGGED BY**
± 189' Mean Sea Level	Not Encountered	JAB

DEPTH (feet)	SYMBOL	SAMPLE	FIELD DESCRIPTION AND CLASSIFICATION DESCRIPTION AND REMARKS (Grain size, Density, Moisture, Color)	U.S.C.S.	IN-PLACE MOISTURE (%)	IN-PLACE DRY DENSITY (pcf)	OPTIMUM MOISTURE (%)	MAXIMUM DRY DENSITY (pcf)	DENSITY (% of M.D.D.)	EXPAN. + (%) CONSOL. -	BLOW COUNTS/FT.	SAMPLE O.D. (INCHES)
			ASPHALT PAVEMENT , 3" thick.									
			CLAYEY SAND , fine- to coarse-grained, some subrounded gravel. Loose. Moist. Red-brown.	SC								
2			**FILL (Qaf)**								8	2"
4			Bulk bag sample from 3'- 8'.									
6												
8			**CLAYEY SAND** , fine- to medium-grained, some subrounded gravel. Medium dense. Moist. Dark red-brown.	SC	12.7						11	2"
10			**VERY OLD PARALIC DEPOSITS (Qvop $_8$)** -- 32% passing #200 sieve.									
12			-- becomes dense, slightly moist, light yellow-brown.								38	2"
14			Bottom @ 13.5'									

EXPLORATION LOG 11320 BROADWAY APTS.GPJ GEO_EXPL.GDT 3/15/17

- PERCHED WATER TABLE
- BULK BAG SAMPLE
- IN-PLACE SAMPLE
- MODIFIED CALIFORNIA SAMPLE
- NUCLEAR FIELD DENSITY TEST
- STANDARD PENETRATION TEST

JOB NAME	Broadway Apartments
SITE LOCATION	3060 Broadway, San Diego, CA
JOB NUMBER	16-11320
REVIEWED BY	JAB/WDH
FIGURE NUMBER	IVd
LOG No.	B-4

Geotechnical Exploration, Inc.

EQUIPMENT	DIMENSION & TYPE OF EXCAVATION	DATE LOGGED
Truck-mounted Auger Drill Rig	**8-inch diameter Boring**	**2-24-17**
SURFACE ELEVATION	GROUNDWATER/ SEEPAGE DEPTH	LOGGED BY
± 184' Mean Sea Level	**Not Encountered**	**JAB**

DEPTH (feet)	SYMBOL	SAMPLE	FIELD DESCRIPTION AND CLASSIFICATION DESCRIPTION AND REMARKS (Grain size, Density, Moisture, Color)	U.S.C.S.	IN-PLACE MOISTURE (%)	IN-PLACE DRY DENSITY (pcf)	OPTIMUM MOISTURE (%)	MAXIMUM DRY DENSITY (pcf)	DENSITY (% of M.D.D.)	EXPAN. + (%) CONSOL. -	BLOW COUNTS/FT.	SAMPLE O.D. (INCHES)
			ASPHALT PAVEMENT , 3" thick.									
2			**CLAYEY SAND** , fine- to coarse-grained, some subrounded gravel, trace cobbles. Loose to medium dense. Moist. Red-yellow.	SC								
			FILL (Qaf)								12	2"
4												
6			-- 20% passing #200 sieve.		7.4						15	2"
8												
10												
12			**CLAYEY SAND** , fine- to medium-grained, some subrounded gravel. Medium dense. Slightly moist. Red-yellow.	SC							11	2"
14			**VERY OLD PARALIC DEPOSITS (Qvop $_8$)**									
16			-- encountered cobble in sample.								50/ 5"	2"
18			Bottom @ 17.5'									

EXPLORATION LOG 11320 BROADWAY APTS.GPJ GEO_EXPL.GDT 3/15/17

PERCHED WATER TABLE
BULK BAG SAMPLE
IN-PLACE SAMPLE
MODIFIED CALIFORNIA SAMPLE
NUCLEAR FIELD DENSITY TEST
STANDARD PENETRATION TEST

JOB NAME
Broadway Apartments

SITE LOCATION
3060 Broadway, San Diego, CA

JOB NUMBER
16-11320

REVIEWED BY **JAB/WDH**

FIGURE NUMBER
IVe

Geotechnical Exploration, Inc.

LOG No.
B-5

EQUIPMENT	DIMENSION & TYPE OF EXCAVATION	DATE LOGGED
Truck-mounted Auger Drill Rig	**8-inch diameter Boring**	**2-24-17**
SURFACE ELEVATION	GROUNDWATER/ SEEPAGE DEPTH	LOGGED BY
± 184' Mean Sea Level	**Not Encountered**	**JAB**

DEPTH (feet)	SYMBOL	SAMPLE	FIELD DESCRIPTION AND CLASSIFICATION DESCRIPTION AND REMARKS (Grain size, Density, Moisture, Color)	U.S.C.S.	IN-PLACE MOISTURE (%)	IN-PLACE DRY DENSITY (pcf)	OPTIMUM MOISTURE (%)	MAXIMUM DRY DENSITY (pcf)	DENSITY (% of M.D.D.)	EXPAN. + (%) CONSOL. -	BLOW COUNTS/FT.	SAMPLE O.D. (INCHES)
			ASPHALT PAVEMENT , 3" thick.									
			CLAYEY SAND , fine- to coarse-grained, some subrounded gravel, trace cobbles. Loose to medium dense. Moist. Red-yellow.	SC								
2			**FILL (Qaf)**								6	2"
4			From 4'- 9' -- gravel and cobble layer, becomes medium dense, brown.									
6			-- no sample recovery; driving sampler on rock.								41	3"
8			Bulk bag sample from 5'- 10'.									
10											24	2"
12			-- gravel and cobble layer. Refusal on cobbles @ 12.3'.								50/ 3"	2"
			Bottom @ 12.3'									

PERCHED WATER TABLE
BULK BAG SAMPLE
IN-PLACE SAMPLE
MODIFIED CALIFORNIA SAMPLE
NUCLEAR FIELD DENSITY TEST
STANDARD PENETRATION TEST

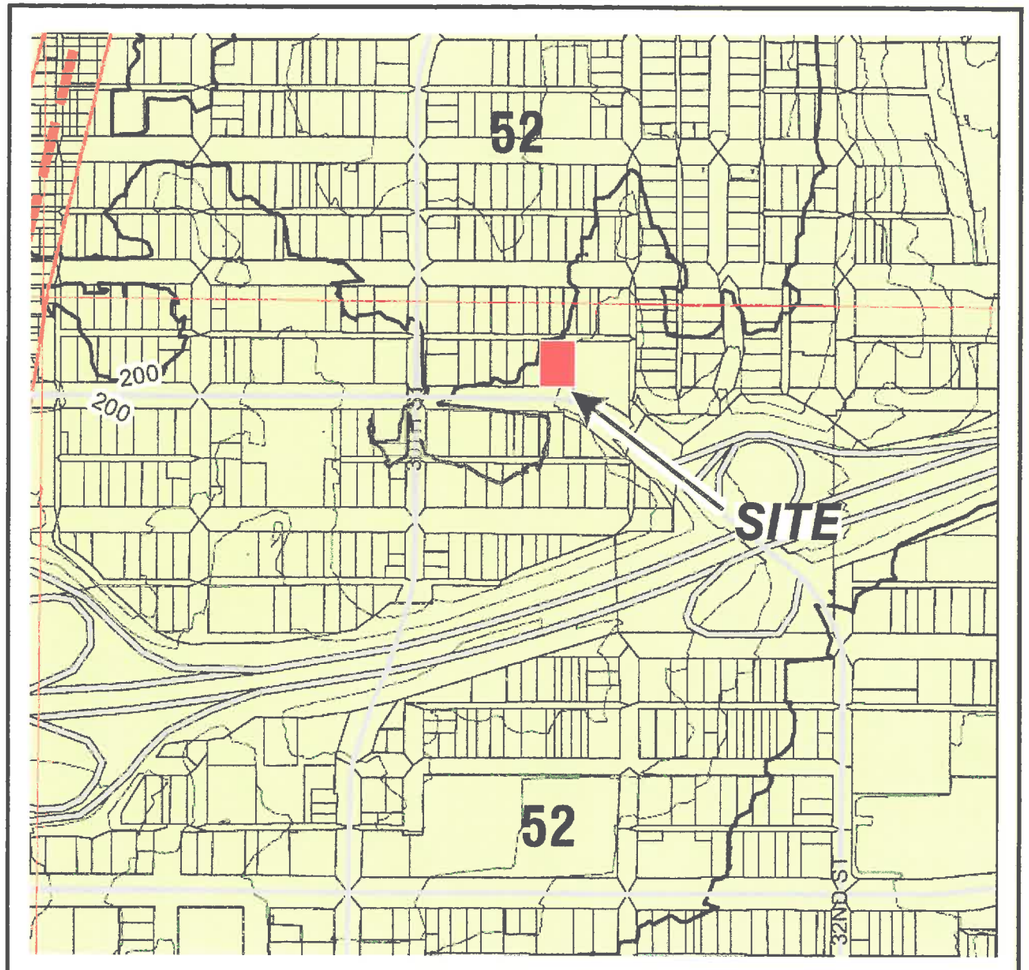
JOB NAME		
Broadway Apartments		
SITE LOCATION		
3060 Broadway, San Diego, CA		
JOB NUMBER	REVIEWED BY	LOG No.
16-11320	**JAB/WDH**	**B-6**
FIGURE NUMBER	Geotechnical Exploration, Inc.	
IVf		

EXPLORATION LOG 11320 BROADWAY APTS.GPJ GEO_EXPL.GDT 3/15/17

Geologic Hazards Map Excerpt from City of San Diego Geologic Hazards and Fault Map Sheet 17

Development Services Department

DATE: 4/3/2008



Proposed Apartment Project
3060 Broadway
San Diego, CA.

LEGEND

Geologic Hazard Categories

FAULT ZONES

- 11 Active, Alquist-Priolo Earthquake Fault Zone
- 12 Potentially Active, Inactive, Presumed Inactive, or Activity Unknown
- 13 Downtown special fault zone

LANDSLIDES

- 21 Confirmed, known, or highly suspected
- 22 Possible or conjectured

SLIDE-PRONE FORMATIONS

- 23 Friars: neutral or favorable geologic structure
- 24 Friars: unfavorable geologic structure
- 25 Ardath: neutral or favorable geologic structure
- 26 Ardath: unfavorable geologic structure
- 27 Otay, Sweetwater, and others

LIQUEFACTION

- 31 High Potential -- shallow groundwater major drainages, hydraulic fills
- 32 Low Potential -- fluctuating groundwater minor drainages

COASTAL BLUFFS

- 41 Generally unstable Numerous landslides, high steep bluffs, severe erosion, unfavorable geologic structure
- 42 Generally unstable Unfavorable bedding plains, high erosion
- 43 Generally unstable Unfavorable jointing, local high erosion
- 44 Moderately stable Mostly stable formations, local high erosion
- 45 Moderately stable Some minor landslides, minor erosion
- 46 Moderately stable Some unfavorable geologic structure, minor or no erosion
- 47 Generally stable Favorable geologic structure, minor or no erosion, no landslides
- 48 Generally stable Broad beach areas, developed harbor

OTHER TERRAIN

- 51 Level mesas -- underlain by terrace deposits and bedrock nominal risk
- 52 Other level areas, gently sloping to steep terrain, favorable geologic structure, Low risk
- 53 Level or sloping terrain, unfavorable geologic structure, Low to moderate risk
- 54 Steeply sloping terrain, unfavorable or fault controlled geologic structure, Moderate risk
- 55 Modified terrain (graded sites) Nominal risk

Water (Bays and Lakes)

FAULTS

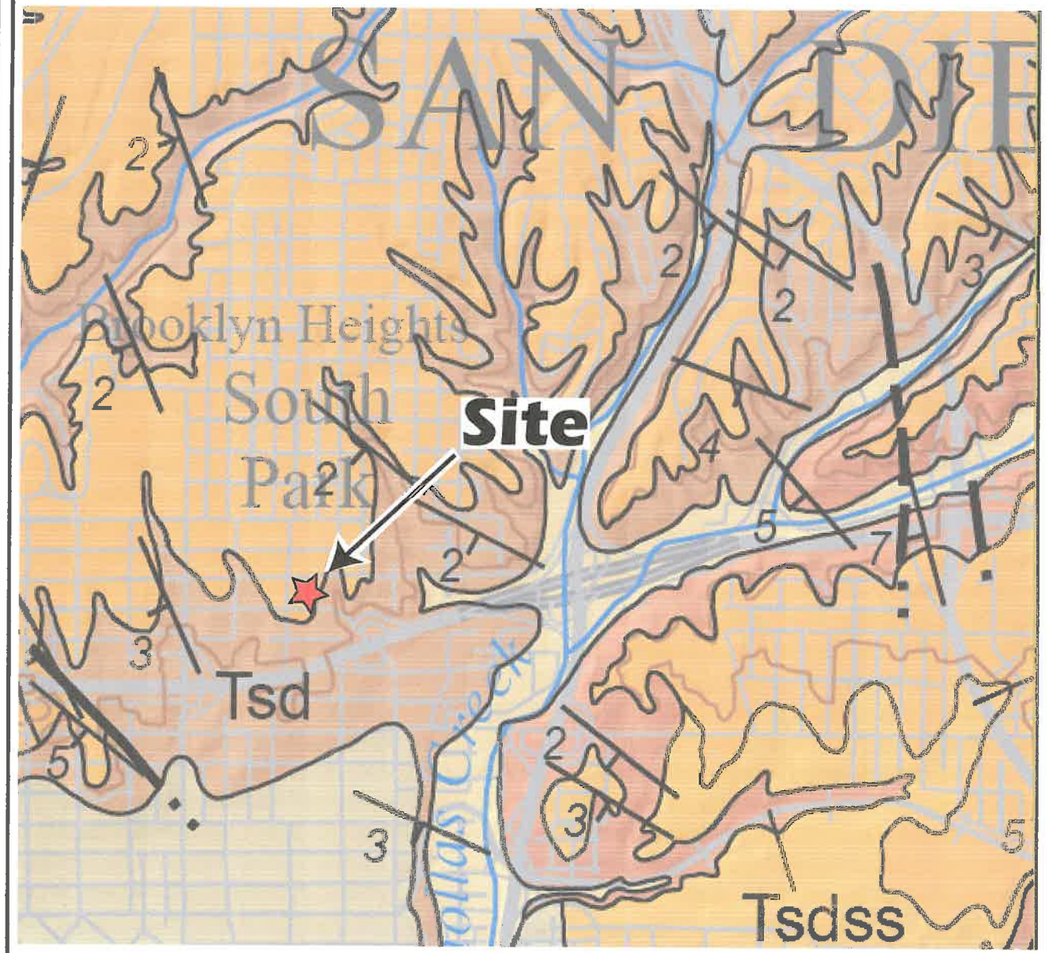
- Fault
- Inferred Fault
- Concealed Fault
- Shear Zone

Figure No.V
Job No. 16-11320

Geotechnical Exploration, Inc.

March 2017

broadway-apts-seis-combo.ai



Proposed Apartment Project
3060 Broadway
San Diego, CA.

EXCERPT FROM GEOLOGIC MAP OF THE SAN DIEGO 30' x 60' QUADRANGLE, CALIFORNIA

By
Michael P. Kennedy[1] and Siang S. Tan[1]
2008
Digital preparation by
Kelly R. Bovard[2], Anne G. Garcia[2], Diane Burns[2], and Carlos I. Gutierrez[1]
1. Department of Conservation, California Geological Survey
2. U.S. Geological Survey, Department of Earth Sciences, University of California, Riverside

ONSHORE MAP SYMBOLS

Contact - Contact between geologic units; dotted where concealed.

Fault - Solid where accurately located; dashed where approximately located; dotted where concealed. U = upthrown block, D = downthrown block. Arrow and number indicate direction and angle of dip of fault plane.

Anticline - Solid where accurately located; dashed where approximately located; dotted where concealed. Arrow indicates direction of axial plunge.

Syncline - Solid where accurately located; dotted where concealed. Arrow indicates direction of axial plunge.

Qls? Landslide - Arrows indicate principal direction of movement. Queried where existence is questionable.

Strike and dip of beds

70 Inclined

Strike and dip of igneous joints

60 Inclined

Vertical

Strike and dip of metamorphic foliation

55 Inclined

ABBREVIATED EXPLANATION

Tsdcg / Tsd / Tsdss — San Diego Formation (early Pleistocene and late Pliocene)
Tsd - undivided
Tsdcg - transitional marine and nonmarine pebble and cobble conglomerate
Tsdss - marine sandstone

Qvop8 — Unit 8 Very old paralic deposits,

Base Map
Onshore base (hypsography, hydrography, and transportation) from U.S.G.S. digital line graph (DLG) data, San Diego 30' x 60' metric quadrangle. Shaded topographic base from U.S.G.S. digital elevation models (DEM's). Offshore bathymetric contours and shaded bathymetry from N.O.A.A. single and multibeam data. Projection is UTM, zone 11, North American Datum 1927

This map was funded in part by the U.S. Geological Survey National Cooperative Geologic Mapping Program STATEMAP Award no. 98HQAG2048

Prepared in cooperation with the U.S. Geological Survey, Southern California Areal Mapping Project.

broadway-apts-combo-2008-geo.ai

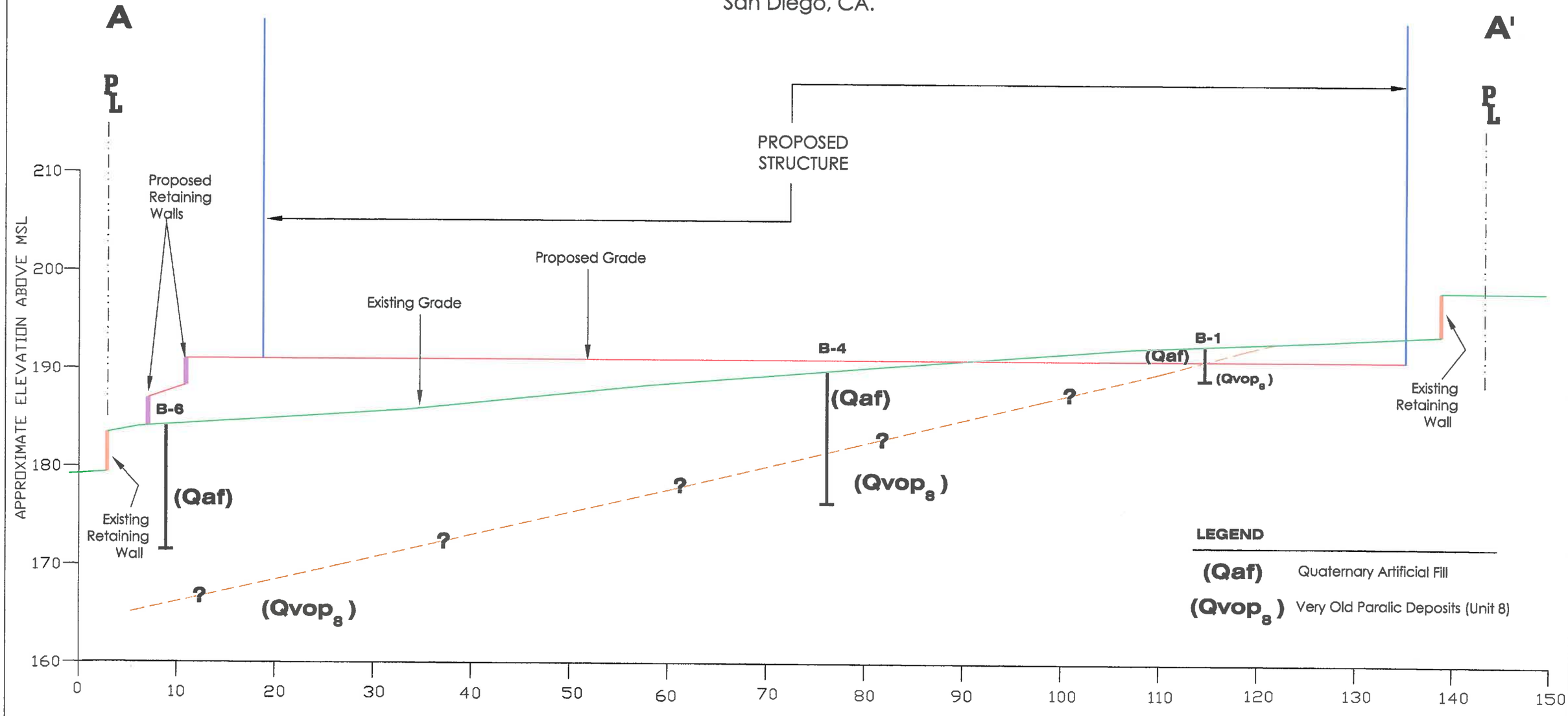
Figure No. VI
Job No. 16-11320

Geotechnical Exploration, Inc.

March 2017

CROSS SECTION A-A'

Broadway Residential Development
3060 Broadway
San Diego, CA.



LEGEND

(Qaf)	Quaternary Artificial Fill
(Qvop$_s$)	Very Old Paralic Deposits (Unit 8)

NOTE: This Cross Section is not to be used for legal purposes. Locations and dimensions are approximate. Actual property dimensions and locations of utilities may be obtained from the Approved Building Plans or the "As-Built" Grading Plans.

16-11320-AA

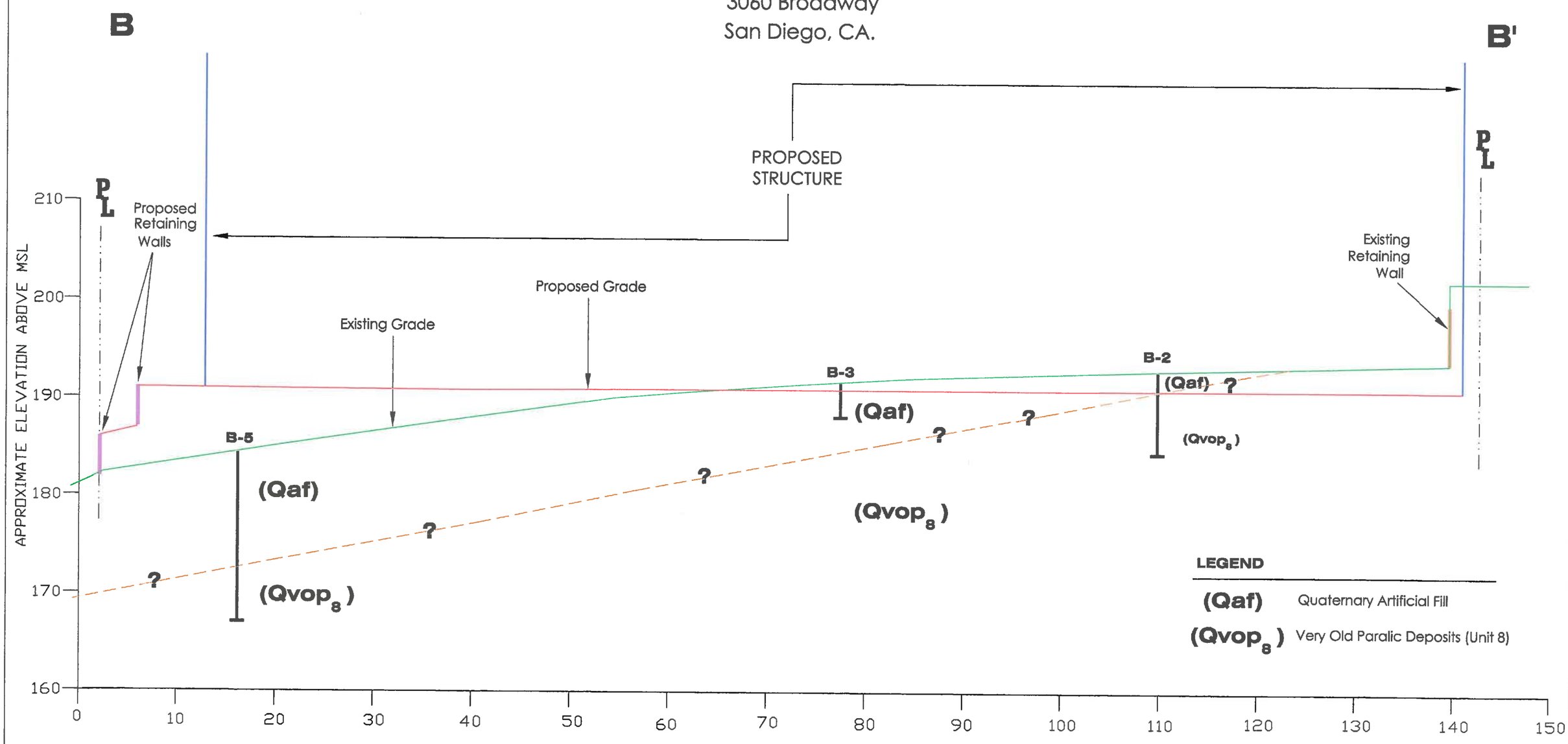
Figure No. VIIa
Job No. 16-11320

Geotechnical Exploration, Inc.

March 2017

CROSS SECTION B-B'

Broadway Residential Development
3060 Broadway
San Diego, CA.



LEGEND

(Qaf)	Quaternary Artificial Fill
(Qvop$_8$)	Very Old Paralic Deposits (Unit 8)

RELATIVE HORIZONTAL DISTANCE
SCALE: 1" = 10'

NOTE: This Cross Section is not to be used for legal purposes. Locations and dimensions are approximate. Actual property dimensions and locations of utilities may be obtained from the Approved Building Plans or the "As-Built" Grading Plans.

16-11320-BB

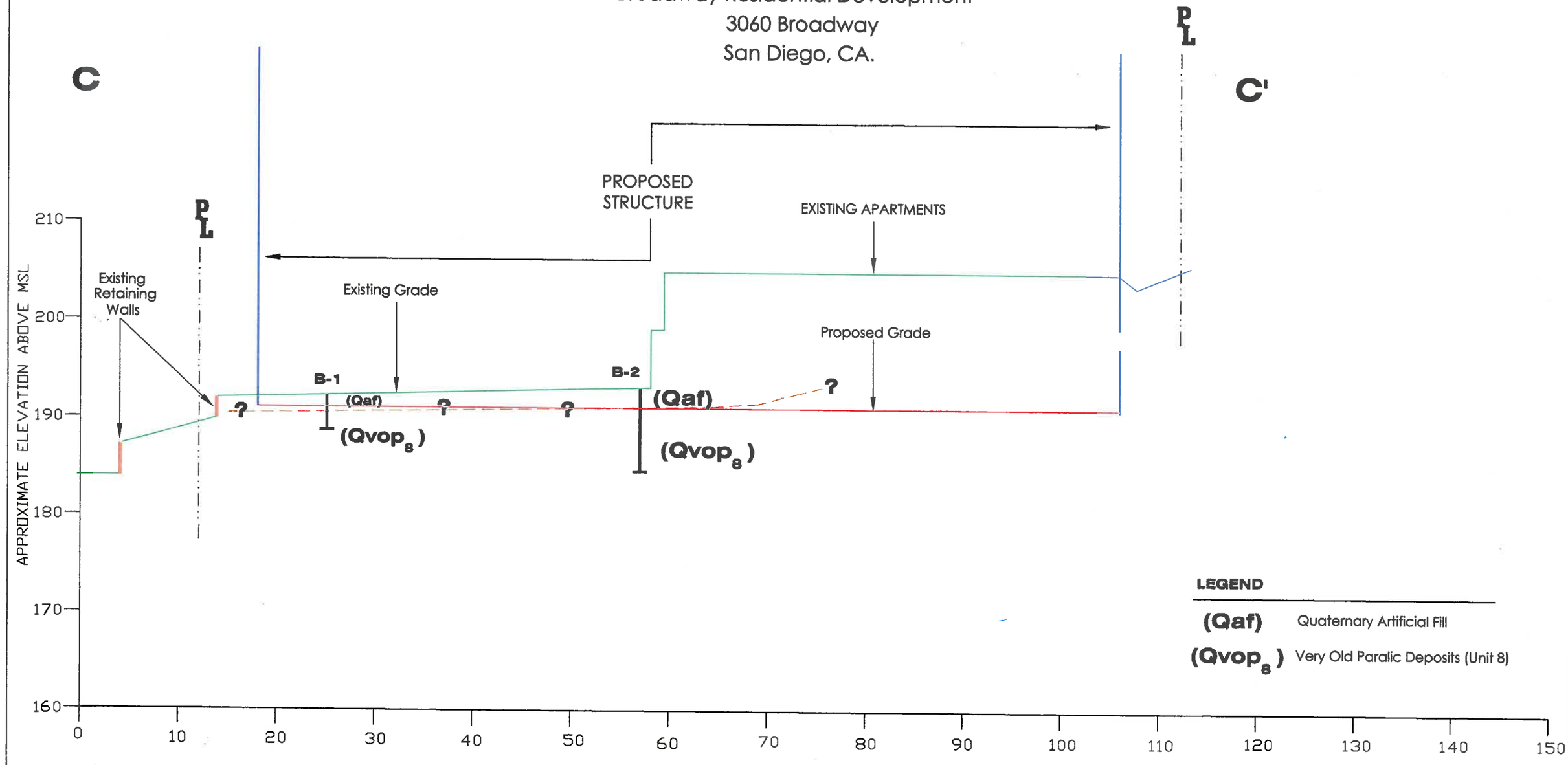
Figure No. VIIb
Job No. 16-11320

Geotechnical Exploration, Inc.

March 2017

CROSS SECTION C-C'

Broadway Residential Development
3060 Broadway
San Diego, CA.



LEGEND

(Qaf)	Quaternary Artificial Fill
(Qvop$_s$)	Very Old Paralic Deposits (Unit 8)

NOTE: This Cross Section is not to be used for legal purposes. Locations and dimensions are approximate. Actual property dimensions and locations of utilities may be obtained from the Approved Building Plans or the "As-Built" Grading Plans.

16-11320-CC

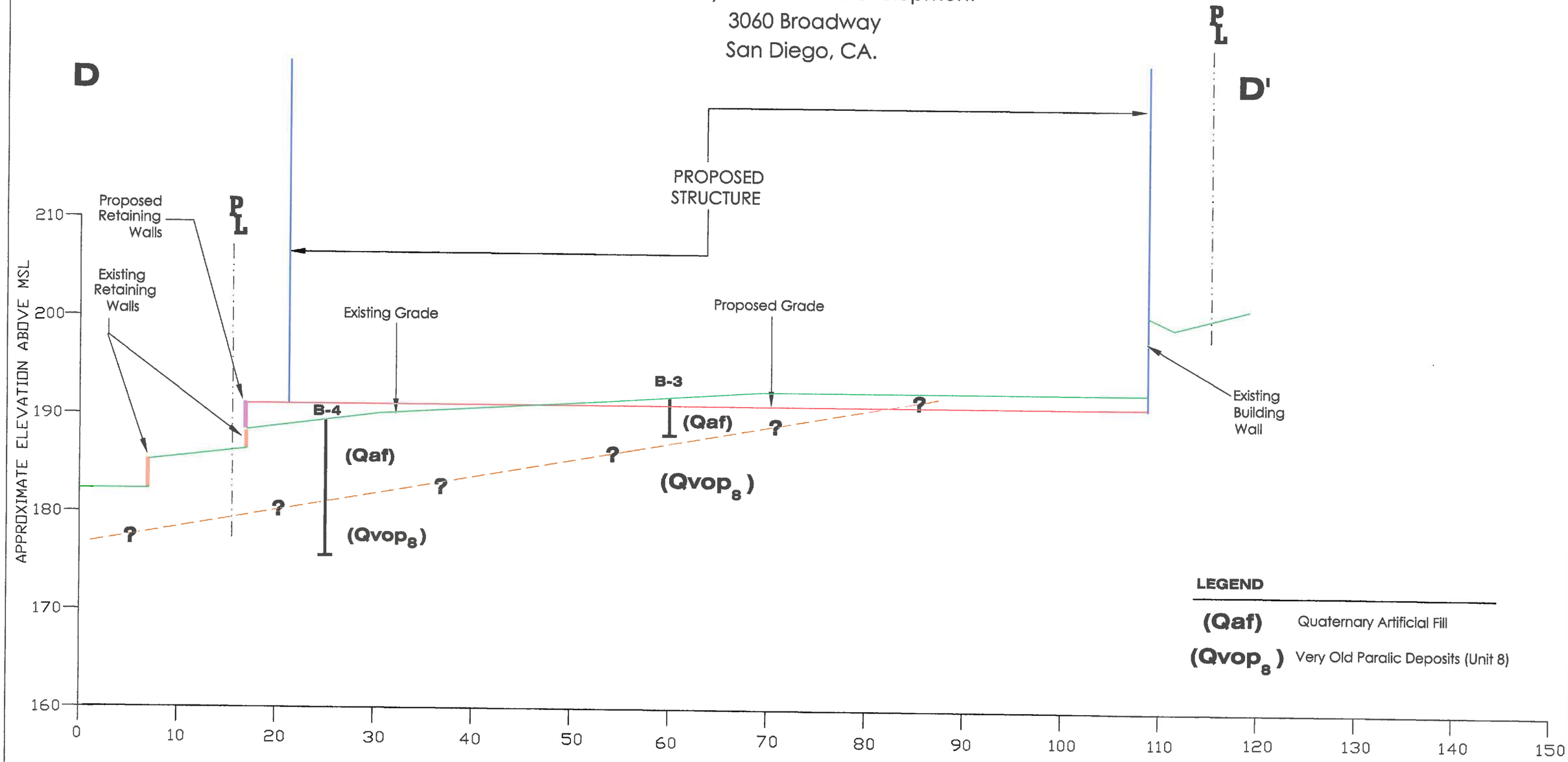
Figure No. VIIc
Job No. 16-11320

Geotechnical Exploration, Inc.

March 2017

CROSS SECTION D-D'

Broadway Residential Development
3060 Broadway
San Diego, CA.



LEGEND

(Qaf)	Quaternary Artificial Fill
(Qvop$_8$)	Very Old Paralic Deposits (Unit 8)

NOTE: This Cross Section is not to be used for legal purposes. Locations and dimensions are approximate. Actual property dimensions and locations of utilities may be obtained from the Approved Building Plans or the "As-Built" Grading Plans.

16-11320-AA

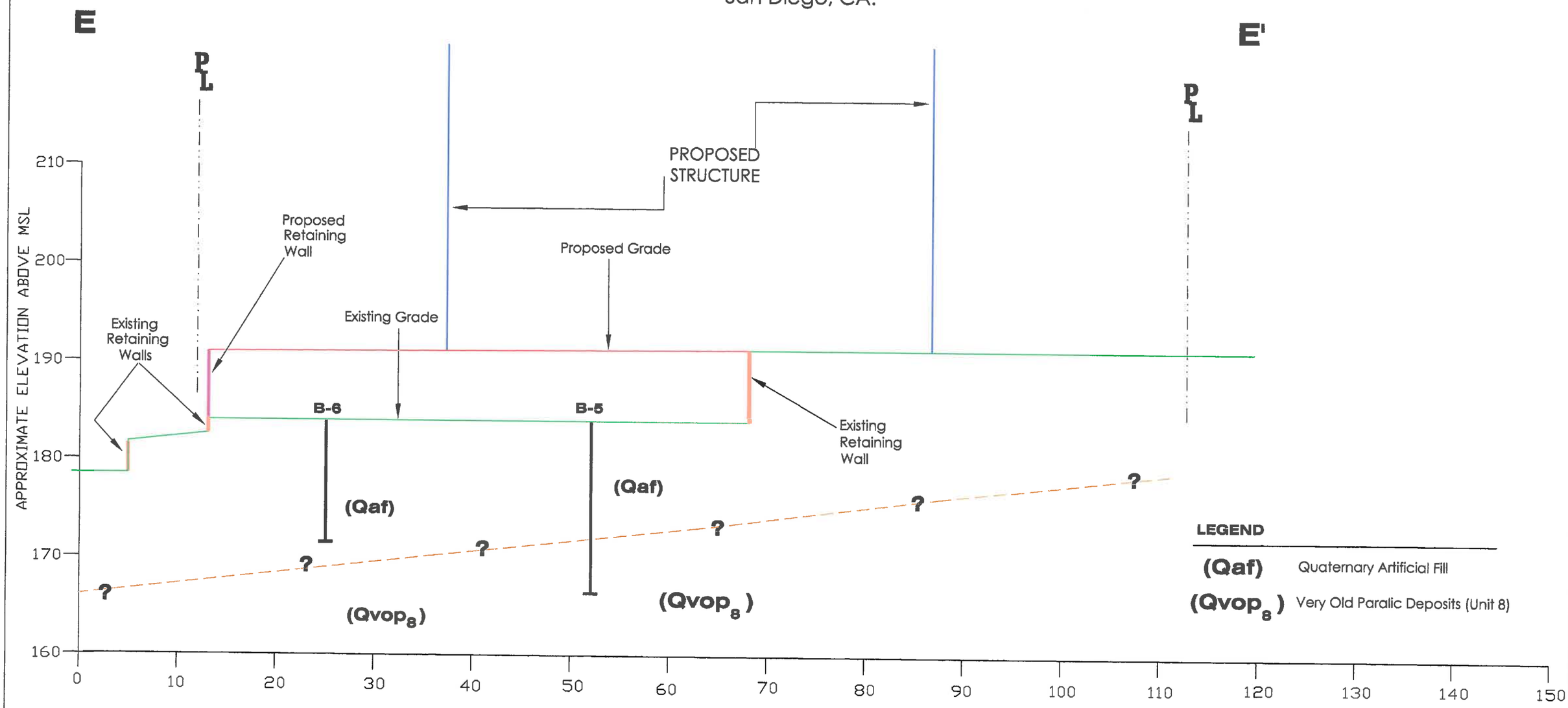
Figure No. VIId
Job No. 16-11320

Geotechnical Exploration, Inc.

March 2017

CROSS SECTION E-E'

Broadway Residential Development
3060 Broadway
San Diego, CA.



NOTE: This Cross Section is not to be used for legal purposes. Locations and dimensions are approximate. Actual property dimensions and locations of utilities may be obtained from the Approved Building Plans or the "As-Built" Grading Plans.

16-11320-EE

Figure No. VIIe
Job No. 16-11320

Geotechnical Exploration, Inc.

March 2017

APPENDIX A
UNIFIED SOIL CLASSIFICATION CHART
SOIL DESCRIPTION

Coarse-grained (More than half of material is larger than a No. 200 sieve)

GRAVELS, CLEAN GRAVELS (More than half of coarse fraction is larger than No. 4 sieve size, but smaller than 3")	GW	Well-graded gravels, gravel and sand mixtures, little or no fines.
	GP	Poorly graded gravels, gravel and sand mixtures, little or no fines.
GRAVELS WITH FINES (Appreciable amount)	GC	Clay gravels, poorly graded gravel-sand-silt mixtures
SANDS, CLEAN SANDS (More than half of coarse fraction is smaller than a No. 4 sieve)	SW	Well-graded sand, gravelly sands, little or no fines
	SP	Poorly graded sands, gravelly sands, little or no fines.
SANDS WITH FINES (Appreciable amount)	SM	Silty sands, poorly graded sand and silty mixtures.
	SC	Clayey sands, poorly graded sand and clay mixtures.

Fine-grained (More than half of material is smaller than a No. 200 sieve)

SILTS AND CLAYS

Liquid Limit Less than 50	ML	Inorganic silts and very fine sands, rock flour, sandy silt and clayey-silt sand mixtures with a slight plasticity
	CL	Inorganic clays of low to medium plasticity, gravelly clays, silty clays, clean clays.
	OL	Organic silts and organic silty clays of low plasticity.
Liquid Limit Greater than 50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
	CH	Inorganic clays of high plasticity, fat clays.
	OH	Organic clays of medium to high plasticity.
HIGHLY ORGANIC SOILS	PT	Peat and other highly organic soils

(rev. 6/05)

APPENDIX B

PERCOLATION TEST RESULTS AND INFILTRATION RATE CONVERSIONS

Percolation Test Sheet

Project Name: Broadway Apartments
Project No. 16-11320
Date Excavated: 2/24/17
Test Hole No: INF-1

Calculated By: JAB
Checked By:

Test Hole Dia: 8"

Date: 3/2/17
Date:

Soil Classification: (SC/CL)

Depth of Test Hole: 90"

	Time (minutes)	Time interval	Initial water level	Final water level (inches)	Change in water (inches)	Percolation rate (min/inches)
	835	180	50.500	52.500	2.000	90.000
	1135					
	1135	60	52.500	53.000	0.500	120.000
	1235					
	1235	90	53.000	53.500	0.500	180.000
	1405					
	1405	60	53.500	53.750	0.250	240.000
	1505					
	1505	60	53.750	53.875	0.125	480.000
	1605					

Percolation Test Sheet

Project Name: Broadway Apartments
Project No. 16-11320
Date Excavated: 2/24/17
Test Hole No: INF-2

Calculated By: JAB
Checked By:

Test Hole Dia: 8"

Date: 3/2/17
Date:

Soil Classification: (SC/CL)

Depth of Test Hole: 96"

	Time (minutes)	Time interval	Initial water level	Final water level (inches)	Change in water (inches)	Percolation rate (min/inches)
	910	120	62.500	63.625	1.125	106.667
	1110					
	1110	60	63.625	64.125	0.500	120.000
	1210					
	1210	60	64.125	64.500	0.375	160.000
	1310					
	1310	60	64.500	64.750	0.250	240.000
	1410					
	1410	60	64.750	65.000	0.250	240.000
	1510					

Percolation Rate to Infiltration Rate Conversion (Porchet Method)

Project Name: Broadway Apartments
Project No. 16-11320
Test Hole No: INF-1

Calculated By: JAB
Checked By:
Test Hole Dia: 8"

Date: 3/2/17
Date:
Depth of Test Hole: 90"

Porchet Corrections

Infiltration rate=((delta h*60r)/(delta t*(r+2 h avg))

Test No.	EB Depth (inches)	Delta T (min)	Water Depth 1	Water Depth 2	h 1 (inches)	h 2 (inches)	delta h (inches)	h avg (inches)	r (radius) (inches)	delta h*60r	delta t*(r+2 h	Infiltration rate (in/hr)
1	90	180	50.500	52.500	39.500	37.500	2.000	38.500	4	480	14580	0.033
2	90	60	52.500	53.000	37.500	37.000	0.500	37.250	4	120	4710	0.025
3	90	90	53.000	53.500	37.000	36.500	0.500	36.750	4	120	6975	0.017
4	90	60	53.500	53.750	36.500	36.250	0.250	36.375	4	60	4605	0.013
5	90	60	53.750	53.875	36.250	36.125	0.125	36.188	4	30	4582.5	0.007
6												
7												
8												
9												

Percolation Rate to Infiltration Rate Conversion (Porchet Method)

Project Name: Broadway Apartments | Calculated By: JAB | Date: 3/2/17
Project No. 16-11320 | Checked By: | Date:
Test Hole No: INF-2 | Test Hole Dia: 8" | Depth of Test Hole: 96"

Porchet Corrections

Infiltration rate=((delta h*60r)/(delta t*(r+2 h avg))

Test No.	EB Depth (inches)	Delta T (min)	Water Depth 1	Water Depth 2	h 1 (inches)	h 2 (inches)	delta h (inches)	h avg (inches)	r (radius) (inches)	delta h*60r	delta t*(r+2 h	Infiltration rate (in/hr)
1	96	120	62.500	63.625	33.500	32.375	1.125	32.938	4	270	8385	0.032
2	96	60	63.625	64.125	32.375	31.875	0.500	32.125	4	120	4095	0.029
3	96	60	64.125	64.500	31.875	31.500	0.375	31.688	4	90	4042.5	0.022
4	96	60	64.500	64.750	31.500	31.250	0.250	31.375	4	60	4005	0.015
5	96	60	64.750	65.000	31.250	31.000	0.250	31.125	4	60	3975	0.015
6												
7												
8												
9												

Worksheet C.4-1: Categorization of Infiltration Feasibility Condition

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?

Note that it is not necessary to investigate each and every criterion in the worksheet if infiltration is precluded. Instead a letter of justification from a geotechnical professional familiar with the local conditions substantiating any geotechnical issues will be required.

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 must be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		X

Provide basis: The measured infiltration rates with a minimum factor of safety of 2 were 0.0035 and 0.0075 inches per hour.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

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 must be based on a comprehensive evaluation of the factors presented in Appendix C.2.		X

Provide basis:

The measured infiltration rates with a minimum factor of safety of 2 were 0.0035 and 0.0075 inches per hour.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

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 must be based on a comprehensive evaluation of the factors presented in Appendix C.3.		X
Provide basis: The measured infiltration rates with a minimum factor of safety of 2 were 0.0035 and 0.0075 inches per hour. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
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 must be based on a comprehensive evaluation of the factors presented in Appendix C.3.		X
Provide basis: The measured infiltration rates with a minimum factor of safety of 2 were 0.0035 and 0.0075 inches per hour. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
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		

*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 County staff to substantiate findings.

Worksheet C.4-1 Page 3 of 4

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 must be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		X

Provide basis: The measured infiltration rates with a minimum factor of safety of 2 were 0.0035 and 0.0075 inches per hour. It is our understanding that an infiltration rate of less than 0.01 inches per is not considered suitable for partial infiltration. Therefore the question is not applicable.

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.

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 must be based on a comprehensive evaluation of the factors presented in Appendix C.2.		X

Provide basis:

The measured infiltration rates with a minimum factor of safety of 2 were 0.0035 and 0.0075 inches per hour. It is our understanding that an infiltration rate of less than 0.01 inches per is not considered suitable for partial infiltration. Therefore the question is not applicable.

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.

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 must be based on a comprehensive evaluation of the factors presented in Appendix C.3.		x
Provide basis: The measured infiltration rates with a minimum factor of safety of 2 were 0.0035 and 0.0075 inches per hour. It is our understanding that an infiltration rate of less than 0.01 inches per is not considered suitable for partial infiltration. Therefore the question is not applicable. 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 must be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: The measured infiltration rates with a minimum factor of safety of 2 were 0.0035 and 0.0075 inches per hour. It is our understanding that an infiltration rate of less than 0.01 inches per is not considered suitable for partial infiltration. Therefore the question is not applicable. 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.			
Part 2 Result*	If all answers from row 5-8 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.**		

*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 Agency/Jurisdictions to substantiate findings

Geotechnical Exploration, Inc.

SOIL AND FOUNDATION ENGINEERING ● GROUNDWATER ● ENGINEERING GEOLOGY

20 April 2017

Little Point, LLC
c/o Cabochon
7647 Girard Avenue
La Jolla, CA 92307
Attn: Mr. Jerry Rudick

Job No. 16-11320

Subject: **Response to City Geology Reviewer-Cycle 7**
Proposed Apartment Project
3060 Broadway
San Diego, California

Dear Mr. Rudick:

In accordance with your request, ***Geotechnical Exploration, Inc***. is responding to the City reviewer's request for "a conclusion regarding if the proposed development will destabilize or result in settlement of adjacent property or the right of way."

In our opinion the proposed development will not destabilize or result in settlement of adjacent property or the right of way if the proposed cuts (both permanent or temporary if used) are properly shored as recommended in our report.

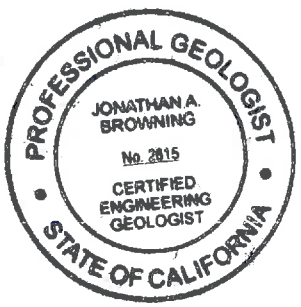
This opportunity to be of continued service is sincerely appreciated. Should you have any questions, please do not hesitate to contact us. Reference to our **Job No. 16-11320** will expedite a response to your inquiries.

Respectfully submitted,

GEOTECHNICAL EXPLORATION, INC.

Wm. D. Hespeler, G.E. 396
Senior Geotechnical Engineer

Jonathan A. Browning
C.E.G. 2615/P.G. 9012
Senior Project Geologist



7420 TRADE STREET ● SAN DIEGO, CA 92121 ● (858) 549-7222 ● FAX: (858) 549-1604 ● EMAIL: geotech@gei-sd.com

Geotechnical Exploration, Inc.

SOIL AND FOUNDATION ENGINEERING ● GROUNDWATER ● ENGINEERING GEOLOGY

29 November 2016

Little Point LLC
c/o Cabochon
7647 Girard Avenue
La Jolla, CA 92307
Attn: Mr. Jerry Rudick

Job No. 16-11320

Subject: **Anticipated Infiltraton Characteristics**
Proposed Apartment Project
3060 Broadway
San Diego, California

Dear Mr. Rudick:

In accordance with your request we have prepared this letter regarding anticipated infiltration characteristics at the subject site. Our preliminary evaluation is based on our review of USDA Soil Survey *"Map Sheet No. 62"*, and the California Geologic Survey *"Geologic Map of San Diego, 30'x60' Quadrangle, CA,"* as well as our past experience with materials similar to those anticipated at the site.

Based on our review of the noted mapping, the on-site soils are mapped as belonging to Hydrologic Group D which indicates low permeability and therefore poor infiltration characteristics. The noted geologic mapping indicates the site is underlain by Very Old Paralic Deposits ($Qvop_8$) consisting of very dense siltstone, sandstone and conglomerate. Our past experience with this type of formational materials generally indicates very low infiltration rates which may quite likely have rates of less than 0.01 inches per hour, which is less than considered feasible for even partial infiltration.

We anticipate, however, that the City will require an infiltration investigation including infiltration testing and an evaluation of potential geotechnical hazards and whether they can be reasonably mitigated.

This opportunity to be of continued service is sincerely appreciated. If you have any questions concerning this matter, please contact our office. Reference to our **Job No. 16-11320** will help to expedite a response to your inquiries.

Respectfully submitted,

GEOTECHNICAL EXPLORATION, INC.

Wm. D. Hespeler, G.E. 396
Senior Geotechnical Engineer

7420 TRADE STREET ● SAN DIEGO, CA. 92121 ● (858) 549-7222 ● FAX: (858) 549-1604 ● EMAIL: geotech@gei-sd.com

DRAINAGE STUDY

3060 BROADWAY

PTS#: 525677

APN: 539-542-18
3060 Broadway
San Diego, California 92102

Prepared By:

5/19/17

William Gregg Mack, P.E. RCE 73620 EXP: 12-31-18
Pasco Laret Suiter & Associates, Inc.
535 N. Highway 101, Suite A
Solana Beach, CA 92075

PASCO LARET SUITER & ASSOCIATES
CIVIL ENGINEERING + LAND PLANNING + LAND SURVEYING

Prepared for:
Little Point, LLC
c/o Cabochon
7647 Girard Avenue
La Jolla, CA 92037

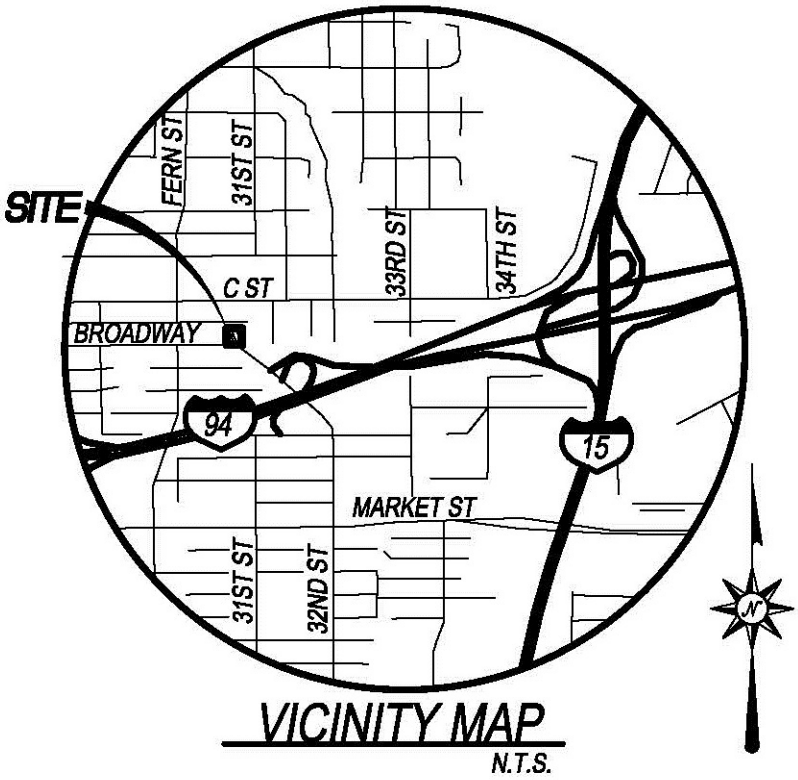
May 19, 2017

TABLE OF CONTENTS

1. INTRODUCTION 4
1.1 Project Description 4
1.2 Existing Conditions 4
1.3 Proposed Conditions 4
2. METHODOLOGY 5
2.1 Rational Method 5
2.2 Runoff Coefficient 5
2.3 Rainfall Intensity 5
2.4 Tributary Areas 6
3. CALCULATIONS/RESULTS 6
3.1 Pre & Post Development Peak Flow Comparison 6
4. CONCLUSION 7

Appendix 1 ..... Pre & Post Project Hydrology Calculations
Appendix 2 ..... Existing and Proposed Drainage Exhibits

Figure 1 Vicinity Map



1. INTRODUCTION

Project Description

The 0.32 acre project site is located at 3060 Broadway in the City of San Diego, California, APN: 539-542-18. The project site is comprised of Lots 39, 40, 41 & 42 of Block 94 of Morse's Subdivision of Pueblo Lot 1150. The existing site condition is developed and includes an existing church, apartment building and parking lot. The proposed project will remove the existing buildings and improvements and construct a new multifamily residential building along with the surface improvements around the proposed building which include concrete paving, landscape areas & stormwater treatment facilities.

Existing Conditions

The project site currently functions as a church and apartment building. The existing 0.32 acre site is 83% impervious including the existing buildings and on-site improvements (i.e. driveway, parking lot and concrete walkways). The site currently sheet flows storm water south across the site towards Broadway. The site is currently developed with 2 existing structures and a parking lot with no on-site storm drain system. The site does not have any natural drainage features through the site and does not receive any run-on from adjacent properties. The peak storm water runoff flow was calculated using the rational method, Q=CiA. The site is 83% impervious in the existing condition, therefore a runoff coefficient of 0.86 is used. The site is relatively small so the minimum 5 min time of concentration was used which generated a peak runoff Q of 1.23 CFS. The runoff is collected and conveyed in the street gutter of Broadway. It then travels east and is collected by a public storm drain inlet located on the north side of Broadway. The public storm drain system then conveys the storm water out to Chollas Creek and eventually to the San Diego Bay. Portions of the drainage path leading to the San Diego Bay are earthen unreinforced channels, therefore hydromodification management criteria will be implemented in the post-project design.

Proposed Conditions

The project proposes a new multi-family residential building with covered parking. The project will aslo improve the hardscaping around the proposed building which will include sidewalk, landscaping and concrete paving. The peak post project storm water runoff flow was calculated using the rational method, Q=CiA. The proposed site will be 77% impervious, therefore a runoff coefficient of 0.84 is used. The site is relatively small so the minimum 5 min time of concentration was used which generated a peak runoff Q of 1.19 CFS. As a result of the overall decrease in impervious area, there will be a decrease in peak runoff of 0.04 cfs from the pre-project condition. Please refer to the Storm Water Quality Management Plan (SWQMP) for 3060 Broadway, prepared by PLSA, dated March 24, 2017, for a detailed discussion and calculations of the proposed storm water treatment control facilities.

2. METHODOLOGY

The proposed project has been analyzed to determine the peak runoff flow for 100 year, 6 hour rainfall event using the Rational Method per the City of San Diego Drainage Design Manual (Section 1-102.3). The Runoff Coefficient, C, for the existing and proposed conditions were selected using Table 2 of page 82 of the City of San Diego Drainage Design Manual, Revised C Method. The time of concentration for all existing and proposed drainage areas were calculated using the minimum T_C of 5 min which yields an intensity of 6.5 inches per hour.

The proposed LID best management practices have been sized and located such that all runoff will be directed to flow through planters or through pervious areas before ultimately discharging to the downstream storm drain system.

2.1 Rational Method

As mentioned above, runoff from the project site was calculated for the 100-year storm events. Runoff was calculated using the Rational Method which is given by the following equation:
$Q = C \times I \times A$

Where:
Q = Flow rate in cubic feet per second (cfs)
C = Runoff coefficient (Determined from Table 2, P. 82, City of San Diego Drainage Design Manual)
I = Rainfall Intensity in inches per hour (in/hr)
A = Drainage basin area in acres, (ac)
Rational Method calculations were performed using the City of San Diego Drainage Design Manual (Section 1-102.3)

2.2 Runoff Coefficient

The runoff coefficients for the project were calculated using Table 2 from the City of San Diego Drainage Design Manual (April, 1984), using the Revised C Method for the proposed condition.

In the existing condition, the project site is an existing development. Per the City of San Diego Drainage Design Manual, the C value is 0.45 for pervious area and 0.95 for impervious area. The existing condition drainage characteristics are divided into one (1) drainage area. The weighted runoff factor is calculated based on the actual percentage of impervious area. Please refer to the Table 3.1 for a summary of the calculated C values.

In the proposed condition: Of the total site area of 0.32 acres, approximately 0.29 acres or 90% is impervious in the proposed condition. The post project runoff coefficient is calculated based on the actual percentage of impervious area. Please refer to table 3.1

2.3 Rainfall Intensity

Rainfall intensity was determined using the Rainfall Intensity Duration Frequency Curves from page 83 of the City of San Diego Drainage Design Manual (April, 1984). Based on a 5 min time of concentration, an intensity of 6.5 inches per hour is used.

2.4 Tributary Areas

Drainage basins are delineated in the Post Development Drainage Exhibit in Appendix 1 and graphically portray the tributary area for each drainage basin.

3. CALCULATIONS/RESULTS

3.1 Pre & Post Development Peak Flow Comparison

Below are a series of tables which summarize the calculations provided in the Appendix of this report.

SITE IMPERVIOUS AREA COMPOSITION					
	TOTAL IMPERVIOUS AREA (ACRES)	TOTAL PERVIOUS AREA (ACRES)	TOTAL PROJECT AREA (ACRES)	% IMPERVIOUS SURFACES	RUNOFF COEFFICIENT "C"
Existing	0.27	0.05	0.32	83%	0.86
Proposed	0.25	0.07	0.32	77%	0.84

Table 1. Runoff Coefficient "C" Comparison

The table above shows the difference in the runoff coefficient, "C", between the existing and proposed condition.

EXISTING DRAINAGE FLOWS			
DRAINAGE AREA	DRAINAGE AREA (ACRES)	Q_{100} (CFS)	I_{100} (IN/HR)
A–1	0.32	1.23	4.4

Table 2. Existing Condition Peak Drainage Flow Rates

Table 2 above lists the peak flow rates for the project site in the existing condition for the respective rainfall events.

Table 3. Proposed Condition Peak Drainage Flow Rates

PROPOSED DRAINAGE FLOWS			
DRAINAGE AREA	DRAINAGE AREA (ACRES)	Q_{100} (CFS)	I_{100} (IN/HR)
A–1	0.32	1.19	4.4

The table above lists the peak flow rates for the project site for the proposed condition for the respective rainfall events.

Table 4. Proposed Condition Peak Drainage Flow Rates

PEAK DRAINAGE FLOW COMPARISON			
CONDITION	DRAINAGE AREA (ACRES)	Q_{100} (CFS)	C
Existing	0.32	1.23	0.86
Proposed	0.32	1.19	0.90
Existing vs. Proposed Condition Comparison		-0.04	

Table 4 above shows a comparison between the peak flow rates for the proposed project and the existing condition for the peak project site for the proposed condition for the respective rainfall events.

As shown in Table 4, the project does not increase the peak runoff rate for the design storms analyzed when comparing the pre-project runoff coefficient to the post-project runoff coefficient, however, the comparison does not account for detention and routing through the BMP's. Therefore, the comparison is considered conservative and the actual post project runoff, accounting for routing, will be less than the post-project peak runoff value tabled above, therefore Q100 detention is not required. As a result, the post project runoff will be less than the pre-project condition.

4. CONCLUSION

As discussed previously, the proposed project's peak runoff is less than the existing condition peak runoff. The proposed project will not negatively affect downstream facilities since the overall peak flow rate will decrease when compared to the pre-project condition. It is my professional opinion that the storm drain and treatment systems as proposed in this report and on the grading plans herein is adequate to intercept, treat, contain and convey Q100.

PASCO LARET SUITER & ASSOCIATES
CIVIL ENGINEERING + LAND PLANNING + LAND SURVEYING

APPENDIX 1

PRE-PROJECT & POST-PROJECT

HYDROLGY CALCULATIONS

3060 BROADWAY
J-2639
5/16/2017

PRE-PROJECT HYDROLOGY

Drainage Area	Area Description	Total Area (Ac)	Total Area (sq-ft)	Total Impervious Area (Sq-Ft)	% Impervious	% Pervious	Weighted Runoff Coefficient	Peak Runoff Q: (CFS)	Peak Runoff Volume: (cu-ft)
A-1	**EX LOT**	0.32	14000	11564	83%	17%	0.86	1.23	2517

POST-PROJECT HYDROLOGY

BMP Location	DMA Description	Total Area (Ac)	Total Area (sq-ft)	Total Impervious Area (Sq-Ft)	% Impervious	% Pervious	Weighted Runoff Coefficient	Peak Runoff Q: (CFS)	Peak Runoff Volume: (cu-ft)
A-1	**PODIUM BMP TRIB AREA**	0.32	14000	10818	77%	23%	0.84	1.19	2439
	TOTAL:	**0.32**	**14000.00**	**10818.00**	**77%**	**23%**	**0.84**	**1.19**	**2439.38**

Note:

1. 500 sq-ft of additional impervios area was included to account for unforseen impervious areas (i.e. Pool and patio areas)

100 Yr Storm at 5 Min TC		
Intensity:	4.40	in/hr
Precip:	2.50	in

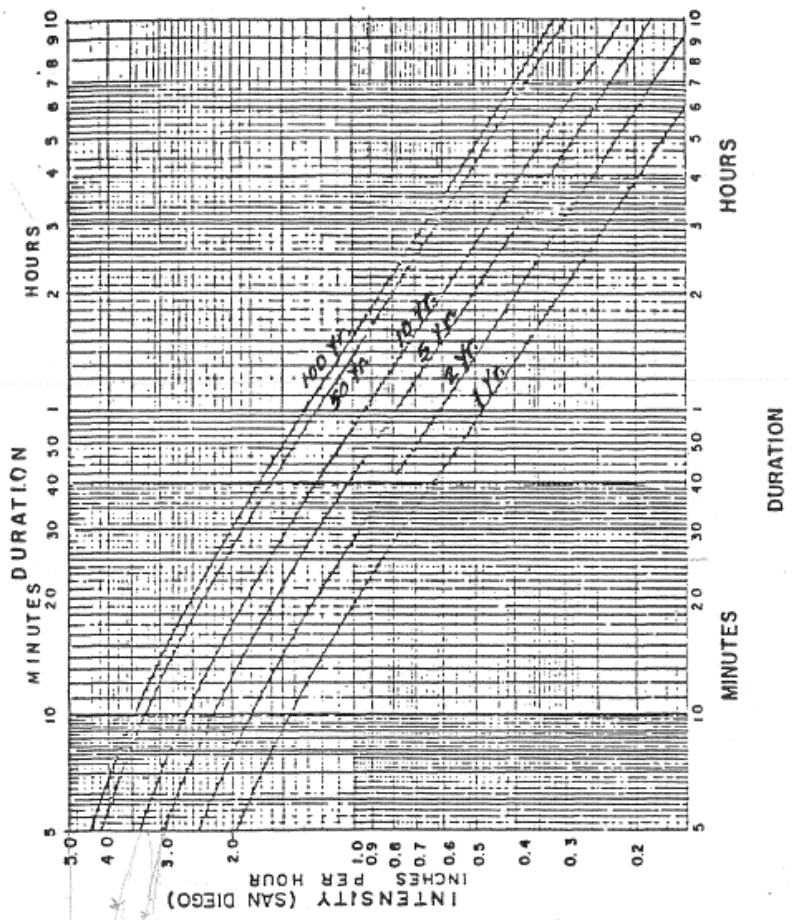
Runoff Coefficient	
Impervious	0.95
Landscape	0.45
Permeable Pavers	0.45

Detention Calculation:

Pre-Project Peak Runoff Volume:	2517	cu-ft	
Post-Project Peak Runoff Volume:	2439	cu-ft	
Delta Peak Runoff Volume (Post - Pre):	-78	cu-ft	
Volume Provided by BMP's:	942.835	cu-ft	*From SWQMP BMP sizing summary

1027 > -78 Therefore, Adequate Detention Provided

Results: The volume provided in the BMPs and the overall decrease of impervious areas results a smaller post project discharge Q
Therefore, detention is not required



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.

PASCO LARET SUITER & ASSOCIATES
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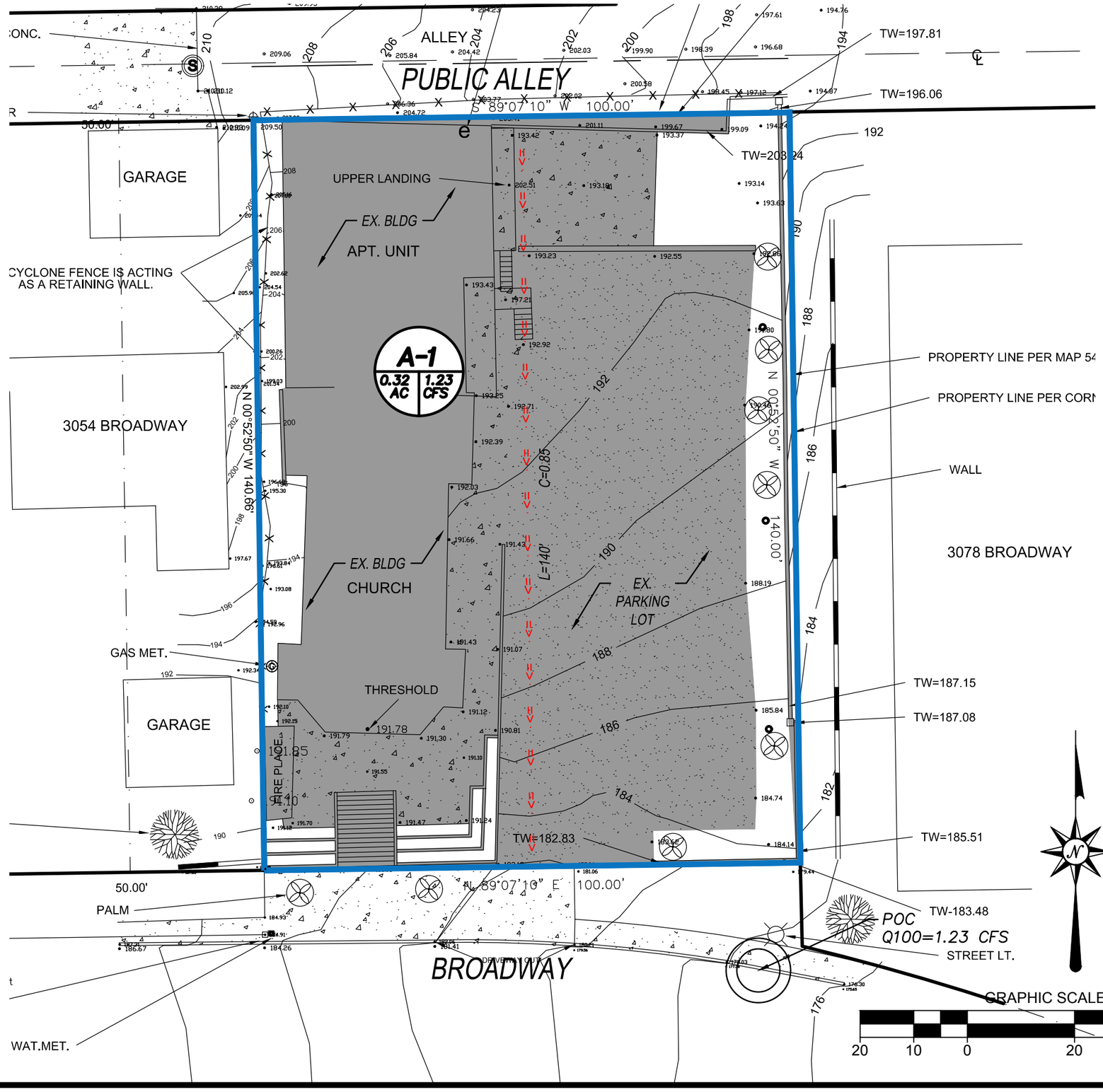
APPENDIX 2

EXISTING & PROPOSED

DRAINAGE EXHIBITS



LEGEND

DESCRIPTION	SYMBOL
LOT LINE	
EXIST. CONTOUR	300
BASIN BOUNDARY	
FLOWLINE	=>
FLOW DIRECTION	
BASIN SUMMARY Q_{100}	A-1 / X.X AC / X.X CFS
IMPERVIOUS AREA	
PERVIOUS PAVERS	
BIOFILTRATION BASIN AREA	

HYDROLOGY
PRE-PROJECT EXHIBIT

3060 BROADWAY

3060 BROADWAY, SAN DIEGO

PROJECT NUMBER: PE 2639

SCALE: 1" = 20'

DATE: MARCH 24, 2017

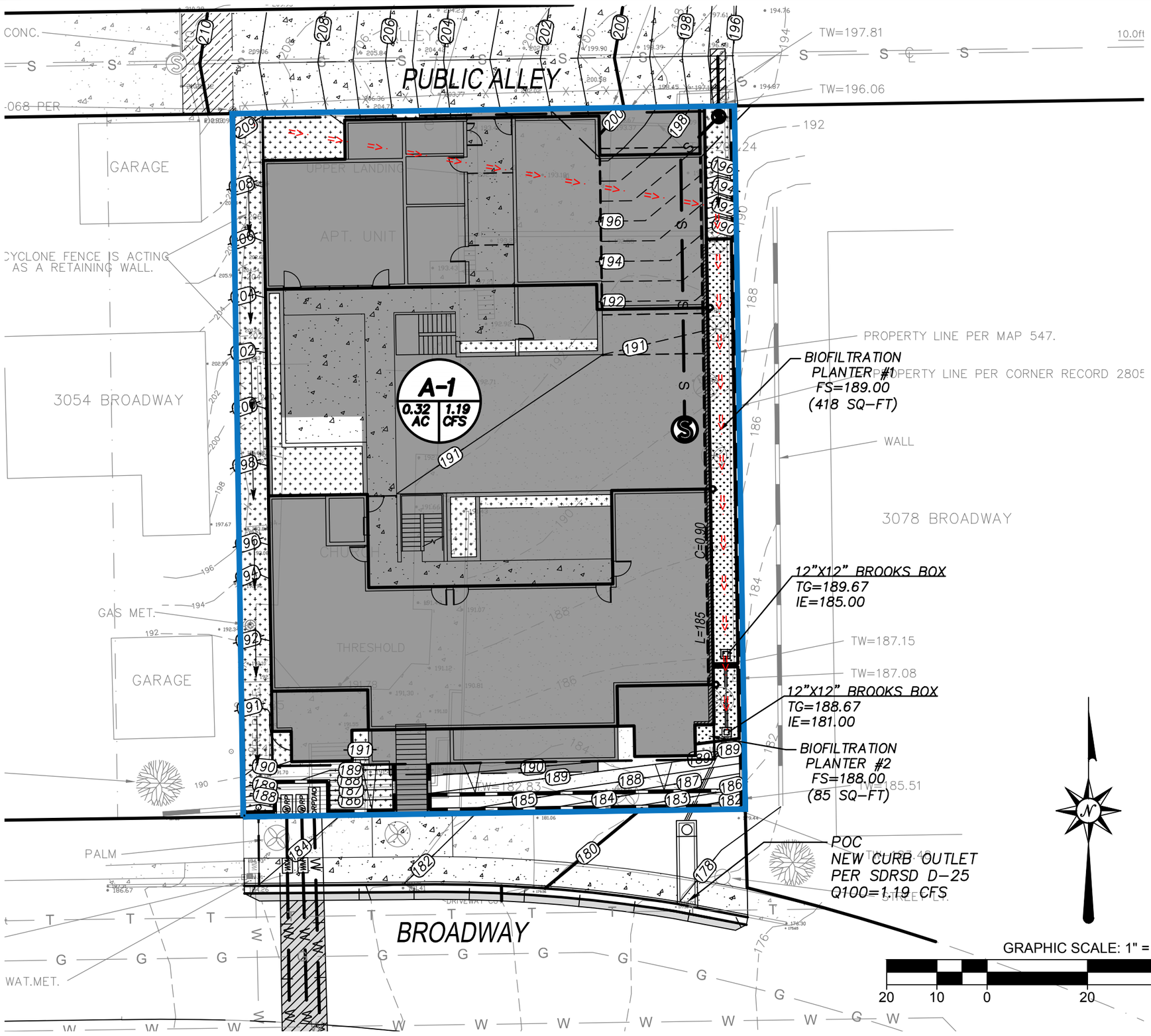
SHEET 1 OF 1

PASCO LARET SUITER & ASSOCIATES

CIVIL ENGINEERING + LAND PLANNING + LAND SURVEYING

535 North Highway 101, Ste A, Solana Beach, CA 92075

ph 858.259.8212 | fx 858.259.4812 | plsaengineering.com



LEGEND

DESCRIPTION	SYMBOL
LOT LINE	
EXIST. CONTOUR	300
PROP. CONTOUR	289
BASIN BOUNDARY	
FLOWLINE	=>
FLOW DIRECTION	
BASIN SUMMARY Q_{100}	A-1 / X.X AC / X.X CFS
IMPERVIOUS AREA	
PERVIOUS PAVERS	
BIOFILTRATION BASIN AREA	

HYDROLOGY
POST-PROJECT EXHIBIT

3060 BROADWAY

3060 BROADWAY, SAN DIEGO

PROJECT NUMBER: PE 2639

SCALE: 1" = 20'

DATE: MAY 19, 2017

SHEET 1 OF 1

PASCO LARET SUITER & ASSOCIATES

CIVIL ENGINEERING + LAND PLANNING + LAND SURVEYING

535 North Highway 101, Ste A, Solana Beach, CA 92075

ph 858.259.8212 | fx 858.259.4812 | plsaengineering.com

The City of San Diego

PRIORITY DEVELOPMENT PROJECT (PDP) STORM WATER QUALITY MANAGEMENT PLAN (SWQMP) FOR

3060 BROADWAY
PTS 525677, IO 24007115
DWG #_____

ENGINEER OF WORK:

5/19/17

William G. Mack, PE
Provide Wet Signature and Stamp Above Line

PREPARED FOR:
Little Point, LLC
c/o Cabochon
7647 Girard Avenue
La Jolla, CA 92037

PREPARED BY:

PASCO LARET SUITER & ASSOCIATES
CIVIL ENGINEERING + LAND PLANNING + LAND SURVEYING

Pasco Laret Suiter & Associates
535 N. Highway 101, Ste A
Solana Beach, CA 92175
858-259-8212

DATE:
May 19, 2017

Approved by: City of San Diego Date

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TABLE OF CONTENTS

- Acronyms
- Certification Page
- Submittal Record
- Project Vicinity Map
- FORM DS-560: Storm Water Applicability Checklist
- FORM I-1: Applicability of Permanent, Post-Construction Storm Water BMP Requirements
- FORM I-3B: Site Information Checklist for PDPs
- FORM I-4: Source Control BMP Checklist for All Development Projects
- FORM I-5: Site Design BMP Checklist for All Development Projects
- FORM I-6: Summary of PDP Structural BMPs
- FORM DS-563: Permanent BMP Construction, Self Certification Form
- Attachment 1: Backup for PDP Pollutant Control BMPs
    - Attachment 1a: DMA Exhibit
    - Attachment 1b: Tabular Summary of DMAs and Design Capture Volume Calculations
    - Attachment 1c: Harvest and Use Feasibility Screening (when applicable)
    - Attachment 1d: Categorization of Infiltration Feasibility Condition (when applicable)
    - Attachment 1e: Pollutant Control BMP Design Worksheets / Calculations
- Attachment 2: Backup for PDP Hydromodification Control Measures
    - Attachment 2a: Hydromodification Management Exhibit
    - Attachment 2b: Management of Critical Coarse Sediment Yield Areas
    - Attachment 2c: Geomorphic Assessment of Receiving Channels
    - Attachment 2d: Flow Control Facility Design
- Attachment 3: Structural BMP Maintenance Plan
    - Attachment 3a: Structural BMP Maintenance Thresholds and Actions
    - Attachment 3b: Draft Maintenance Agreement (when applicable)
- Attachment 4: Copy of Plan Sheets Showing Permanent Storm Water BMPs
- Attachment 5: Project's Drainage Report
- Attachment 6: Project's Geotechnical and Groundwater Investigation Report

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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: 3060 BROADWAY
Permit Application Number: PTS #525677

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.

5/19/17

Engineer of Work's Signature, PE Number & Expiration Date

William G Mack

Print Name

Pasco Laret Suiter & Associates

Company

May 19, 2017

Date

Engineer's Stamp

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Project Name: 3060 BROADWAY

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 plancheck comments is included. When applicable, insert response to plancheck comments.

Submittal Number	Date	Project Status	Changes
1	12/13/16	◉ Preliminary Design/Planning/CEQA ○ Final Design	Initial Submittal
2	3/24/17	◉ Preliminary Design/Planning/CEQA ○ Final Design	SDP 2nd Submittall
3	5/19/17	◉ Preliminary Design/Planning/CEQA ○ Final Design	SDP 3rd Submittal
4	Enter a date.	○ Preliminary Design/Planning/CEQA ◉ Final Design	Click here to enter text.

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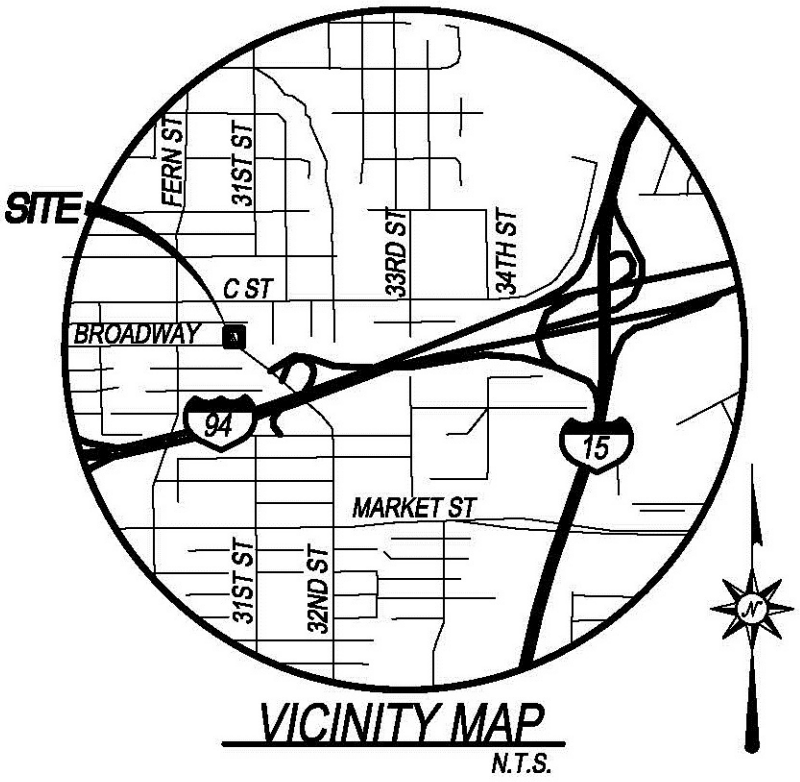
PROJECT VICINITY MAP

Project Name: MIX 30
Permit Application Number: PTS #525677



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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
October 2016

Project Address: 3060 BROADWAY, SAN DIEGO, CA 92102

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 projects 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 resulting 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 below, 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 Priority

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.

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 and check the box labeled "Priority Development Project".

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 PERMANENT 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 ☒

William Mack — Name of Owner or Agent *(Please Print)*

RCE — Title

Signature

5/19/17 — Date

Project Name: 3060 BROADWAY

Applicability of Permanent, Post-Construction Storm Water BMP Requirements (Storm Water Intake Form for all Development Permit Applications)	**Form I-1**

Project Identification	
Project Name: 3060 BROADWAY	
Permit Application Number: Insert Application Number.	Date: 12/13/16

Determination of Requirements

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.

Step	Answer	Progression
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.	◉ Yes	Go to Step 2.
	○ No	Stop. Permanent BMP requirements do not apply. No SWQMP will be required. Provide discussion below.
Discussion / justification if the project is not a "development project" (e.g., the project includes only interior remodels within an existing building): Click or tap here to enter text.		
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.	○ Standard Project	Stop. Standard Project requirements apply.
	◉ PDP	PDP requirements apply, including PDP SWQMP. Go to Step 3.
	○ PDP Exempt	Stop. Standard Project requirements apply. Provide discussion and list any additional requirements below.
Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable: Click or tap here to enter text.		

Project Name: 3060 BROADWAY

Form I-1 Page 2		
Step	Answer	Progression
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.	☐ Yes	Consult the City Engineer to determine requirements. Provide discussion and identify requirements below. Go to Step 4.
	☐ No	BMP Design Manual PDP requirements apply. Go to Step 4.
Discussion / justification of prior lawful approval, and identify requirements (not required if prior lawful approval does not apply): Click or tap here to enter text.		
Step 4. Do hydromodification control requirements apply? See Section 1.6 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	☐ Yes	PDP structural BMPs required for pollutant control (Chapter 5) and hydromodification control (Chapter 6). Go to Step 5.
	☐ No	Stop. PDP structural BMPs required for pollutant control (Chapter 5) only. Provide brief discussion of exemption to hydromodification control below.
Discussion / justification if hydromodification control requirements do not apply: Click or tap here to enter text.		
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.	☐ Yes	Management measures required for protection of critical coarse sediment yield areas (Chapter 6.2). Stop.
	☐ No	Management measures not required for protection of critical coarse sediment yield areas. Provide brief discussion below. Stop.
Discussion / justification if protection of critical coarse sediment yield areas does not apply: The project is currently 100% developed in a urban area. According to the GIS map shape provided by the San Diego WMAA, the site does not have Potential Critical Coarse Sediment Yield Areas (PCCSYAs) within the project limits. An exhibit is provided in attachment 2 showing the nearest PCCSYAs to the project site.		

Project Name: 3060 BROADWAY

Site Information Checklist For PDPs	Form I-3B
Project Summary Information	
Project Name	3060 BROADWAY
Project Address	3060 BROADWAY, SAN DIEGO, CA 92102
Assessor's Parcel Number(s) (APN(s))	539-542-18
Permit Application Number	Click here to enter text.
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 paces (9XX.XX)	Chollas, 908.22
Project Area (total area of Assessor's Parcel(s) associated with the project or total area of the right-of-way)	0.32 Acres ([SQFT] Square Feet)
Area to be disturbed by the project (Project Footprint)	0.32 Acres (14,000 Square Feet)
Project Proposed Impervious Area (subset of Project Footprint)	0.24 Acres (10,818 Square Feet)
Project Proposed Pervious Area (subset of Project Footprint)	0.07 Acres (3,182 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 of 6 %

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:
Click or tap here to enter text.

Existing Land Cover Includes (select all that apply):
☐ Vegetative Cover
☐ Non-Vegetated Pervious Areas
☒ Impervious Areas
Description / Additional Information:
Click or tap here to enter text.

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:
Click or tap here to enter text.

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:

The site currently sheet flows storm water south across the site towards Broadway. The site is currently developed with 2 existing structures and a parking lot with no on-site storm drain system. The site does not have any natural drainage features through the site and does not receive any run-on from adjacent properties. The peak storm water runoff flow was calculated using the rational method, Q=CiA. The site is 83% impervious in the existing condition, therefore a runoff coefficient of 0.86 is used. The site is relatively small so the minimum 5 min time of concentration was used which generated a peak runoff Q of 1.23 CFS. The runoff is collected and conveyed in the street gutter of Broadway. It then travels east and is collected by a public storm drain inlet located on the north side of Broadway. The public storm drain system then conveys the storm water out to Chollas Creek and eventually to the San Diego Bay. Portions of the drainage path leading to the San Diego Bay are earthen unreinforced channels, therefore hydromodification management criteria will be implemented in the post-project design.

Form I-3B Page 4 of 11
Description of Proposed Site Development and Drainage Patterns
Project Description / Proposed Land Use and/or Activities: The project proposed a new multi-family residential apartment building with covered parking. The project will aslo improve the hardscaping around the proposed building which will include sidewalk, landscaping and concrete paving. The project also proposed biofiltration planter areas designed to treat and detain post project runoff to meet the DCV treatment and Hydromodication management criteria. The project will not change or increase the runoff characteristics observed in the existing condition.
List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features): The impervious features of the project include the roof area of the proposed builing and the adjacent hardscaping which includes sidewalks and concrete paving.
List/describe proposed pervious features of the project (e.g., landscape areas): The project proposes a pervious biofiltration planter area that is designed to treat the DCV generated by the project and mitigate increased flow durations by adding flow control to meet hydromodification management criteria.
Does the project include grading and changes to site topography? ○ Yes ◉ No Description / Additional Information: The project does not propose changing the natural topography as in the existing condition. Drainage will maintained to match the existing condition.

Form I-3B Page 5 of 11

Does the project include changes to site drainage (e.g., installation of new storm water conveyance systems)?

- [x] 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:

The proposed project proposes an on-site storm drain system that will convey roof runoff to biofiltration basins located along the easter edge of the project. The storm water is then disharged from the permanent BMPs through a pvc storm drain pipe that discharges via a d-25 curb outlet located on Broadway towards the south easterly corner of the site which is also the low end of the project. The water then travels in the same manner as the existing condition.

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:

Click or tap here to enter text.

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 site currently sheet flows storm water south across the site towards Broadway. The site is currently developed with 2 existing structures and a parking lot with no on-site storm drain system. The runoff is collected and conveyed in the street gutter of Broadway east where it is collected by a public storm drain inlet located on the north side of Broadway. The public storm drain system then conveys the storm water to Chollas Creek and eventually the San Diego Bay. Portions of the drainage path leading to the San Diego Bay are earthen unreinforced channels, therefore hydromodification management criteria will be implemented in the post-project design.
Provide a summary of all beneficial uses of receiving waters downstream of the project discharge locations. The beneficial uses of Mission Bay include: COMM, EST, IND, MAR, MIGR, RARE, REC1, REC2, SHELL, SPWN & WILD.
Identify all ASBS (areas of special biological significance) receiving waters downstream of the project discharge locations. No ASBS areas downstream
Provide distance from project outfall location to impaired or sensitive receiving waters. The proejct is approximately 2.0 miles northeast of where it discharges to the San Diego Bay.
Sumarize information regarding the proximity of the permanent, post-construction storm water BMPs to the City's Multi-Habitat Planning Area and environmentally sensitive lands The project is not adjacent to environmentall sensitive areas..

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
Chollas Creek	Click or tap here to enter text.	Copper, Diazon, Bacterial,
Chollas Creek	Click or tap here to enter text.	Lead, Phosphorus, TTN, Trash
San Diego Bay	Click or tap here to enter text.	PCB's
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.

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	☐	☒	☐

Form I-3B Page 9 of 11

Hydromodification Management Requirements

Do hydromodification management requirements apply (see Section 1.6 of the BMP Design Manual)?

- [x] 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):

Click or tap here to enter text.

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
- [x] No, No critical coarse sediment yield areas to be protected based on WMAA maps

Discussion / Additional Information:

Click or tap here to enter text.

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.

The point of compliance is considered to be the south east corner of the Site along Broadway because all exsiting runoff sheet flows off the site to Broadway and the southeast corner of the project is site is the most down stream elevation of the project.

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:

Click or tap here to enter text.

Discussion / Additional Information: (optional)

Click or tap here to enter text.

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.

The project is proposing redevelopment of an existing church facility and parking lot that is mostly impervious. The proposed improvement of the site will decrease the the overall impervious area however the biofiltration planter area is designed to return post project flows below the pre-developed condition. EPA SWMM was used in order to demonstrate the proposed flow control will return flows below the required low flow thresholds.

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.

Click or tap here to enter text.

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Project Name: 3060 BROADWAY

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: Click or tap here to enter text.			
SC-2 Storm Drain Stenciling or Signage	☐ Yes	☐ No	☒ N/A
Discussion / justification if SC-2 not implemented: On site storm drain system directly connected to the public storm drain system is not proposed			
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: Click or tap here to enter text.			
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: Click or tap here to enter text.			
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: Click or tap here to enter text.			

Project Name: 3060 BROADWAY

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 all "No" answers shown above. Click or tap here to enter text.			

Project Name: 3060 BROADWAY

Site Design 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 Draiange Pathways and Hydrologic Features	☐ Yes	☐ No	☒ N/A
Discussion / justification if SD-1 not implemented: No natural drainage pathways exist within the project site and therefore has no existing natural areas to conserve.			
1-1 Are existing natural drainage pathways and hydrologic features mapped on the site map?	☐ Yes	☐ No	☒ N/A
1-2 Are street trees implemented? If yes, are they shown on the site map?	☐ Yes	☐ No	☒ N/A
1-3 Implemented street trees meet the design criteria in SD-1 Fact Sheet (e.g. soil volume, maximum credit, etc.)?	☐ Yes	☐ No	☒ N/A
1-4 Is street 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: The site is currently developed and very little area of the project is pervious, therefore there is no natural vegetation to protect.			

Form I-5 Page 2 of 4			
Site Design Requirement	Applied?		
SD-3 Minimize Impervious Area	☒ Yes	☐ No	☐ N/A
Discussion / justification if SD-3 not implemented: Click or tap here to enter text.			
SD-4 Minimize Soil Compaction	☒ Yes	☐ No	☐ N/A
Discussion / justification if SD-4 not implemented: Click or tap here to enter text.			
SD-5 Impervious Area Dispersion	☒ Yes	☐ No	☐ N/A
Discussion / justification if SD-5 not implemented: Click or tap here to enter text.			
5-1 Is the pervious area receiving runon from impervious area identified on the site map?	☒ Yes	☐ No	
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	
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	

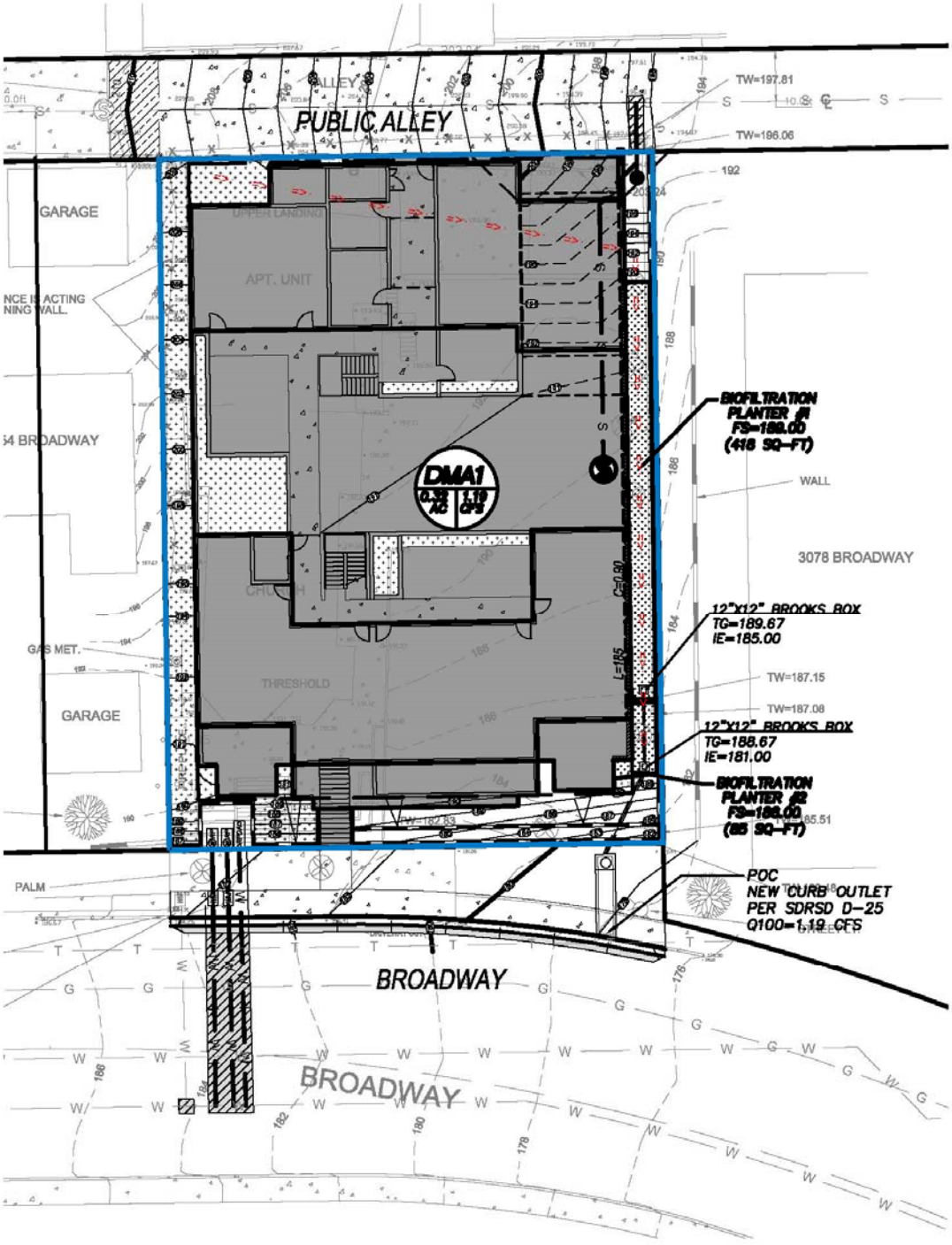
Project Name: 3060 BROADWAY

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: Click or tap here to enter text.			
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	☐ N/A
6a-2 Is green roof credit volume calculated using Appendix B.2.1.2 and SD-6A Fact Sheet in Appendix E?	☐ Yes	☒ No	☐ N/A
6b-1 Are permeable pavements implemented in accordance with design criteria in SD-6B Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☒ No	☐ N/A
6b-2 Is permeable pavement credit volume calculated using Appendix B.2.1.3 and SD-6B Fact Sheet in Appendix E?	☐ Yes	☒ No	☐ N/A
SD-7 Landscaping with Native or Drought Tolerant Species	☒ Yes	☐ No	☐ N/A
Discussion / justification if SD-7 not implemented: The project does not propose a green roof or permeable pavers therefore the primary approach to treatment is biofiltration planters planted with drought tolerant species.			
SD-8 Harvesting and Using Precipitation	☐ Yes	☒ No	☐ N/A
Discussion / justification if SD-8 not implemented: According to Form I-7, Harvest & Use not feasible because the water generated does not exceed the required threshholds.			
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	☐ N/A
8-2 Is rain barrel credit volume calculated using Appendix B.2.2.2 and SD-8 Fact Sheet in Appendix E?	☐ Yes	☒ No	☐ N/A

Project Name: 3060 BROADWAY

Form I-5 Page 4 of 4

Insert Site Map with all site design BMPs identified:



Project Name: 3060 BROADWAY

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.

The overall strategy was to minimze impervious area where feasible and direct all storm water runoff to biofiltration planter area. The existing soil does not infiltrate and therefore the next highest priority biofiltration treatment facility was selected to treat the required design capture volume (DCV). The project includes one (1) drainage management area that is tributary to 1 biofiltraton planter area. The planter area has been sized to treat the tributary DCV and also provide flow control to meet hydromodification management criteria. The combined treatment and flow control planter meets the Storm Water Standards requirements by providing above the minimum footprint required for treatment and restrict flow using an orifice plate within the outlet structures to reduce the peak discharge rates. EPA SWMM continuous simmulation was used to determine the required orifice diameter.

(Continue on page 2 as necessary.)

Form I-6 Page 2 of X
(Page reserved for continuation of description of general strategy for structural BMP implementation at the site)
(Continued from page 1) Click or tap here to enter text.

Form I-6 Page 3 of X (Copy as many as needed)
Structural BMP Summary Information
Structural BMP ID No. BMP #1
Construction Plan Sheet No. C110
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 ☐ 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	Little Point, LLC
Who will be the final owner of this BMP?	Little Point, LLC
Who will maintain this BMP into perpetuity?	Little Point, LLC
What is the funding mechanism for maintenance?	Little Point, LLC

Form I-6 Page 4 of X (Copy as many as needed)
Structural BMP ID No. Click or tap here to enter text.
Construction Plan Sheet No. Click or tap here to enter text.
Discussion (as needed): Click or tap here to enter text.

THE CITY OF SAN DIEGO City of San Diego **Development Services** 1222 First Ave., MD-302 San Diego, CA 92101 (619) 446-5000	**Permenant BMP Construction** **Self Certification Form**	FORM DS-563 January 2016

Date Prepared: Click here to enter text.	Project No.: Click here to enter text.
Project Applicant: Click here to enter text.	Phone: Click here to enter text.
Project Address: Click here to enter text.	
Project Engineer: Click here to enter text.	Phone: Click here to enter text.

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. Click here to enter text.; 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: _ Insert Date_

Printed Name: _Click here to enter text._

Title: _Click here to enter text._

Phone No. _Click here to enter text._

Engineer's Stamp

DS-563 (12-15)

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ATTACHMENT 1
BACKUP FOR PDP POLLUTANT CONTROL BMPS

This is the cover sheet for Attachment 1.

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Project Name: 3060 BROADWAY

Indicate which Items are Included:

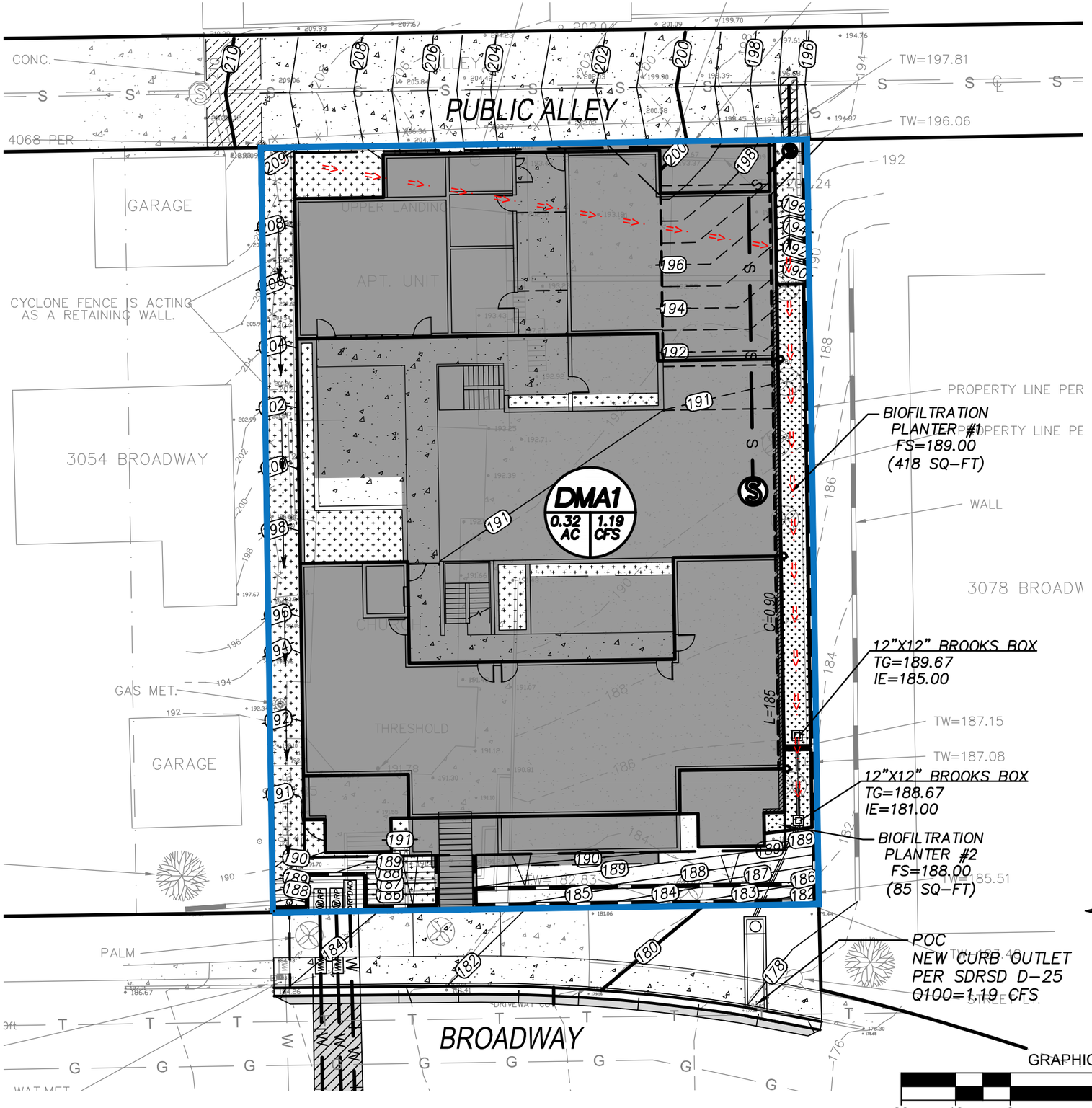
Attachment Sequence	Contents	Checklist
Attachment 1a	DMA Exhibit (Required) See DMA Exhibit Checklist.	☒ Included
Attachment 1b	Tabular Summary of DMAs Showing DMA ID matching DMA Exhibit, DMA Area, and DMA Type (Required)* *Provide table in this Attachment OR on DMA Exhibit in Attachment 1a	◉ Included on DMA Exhibit in Attachment 1a ○ Included as Attachment 1b, separate from DMA Exhibit
Attachment 1c	Form I-7, Harvest and Use Feasibility Screening Checklist (Required unless the entire project will use infiltration BMPs) Refer to Appendix B.3-1 of the BMP Design Manual to complete Form I-7.	◉ Included ○ Not included because the entire project will use infiltration BMPs
Attachment 1d	Form I-8, Categorization of Infiltration Feasibility Condition (Required unless the project will use harvest and use BMPs) Refer to Appendices C and D of the BMP Design Manual to complete Form I-8.	◉ Included ○ Not included because the entire project will use harvest and use BMPs
Attachment 1e	Pollutant Control BMP Design Worksheets / Calculations (Required) Refer to Appendices B and E of the BMP Design Manual for structural pollutant control BMP design guidelines and site design credit calculations	☒ Included

Project Name: 3060 BROADWAY

Use this checklist to ensure the required information has been included on the DMA Exhibit:

The DMA 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 and impervious areas
☒ 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
☒ Drainage management area (DMA) boundaries, DMA ID numbers, and DMA areas (square footage or acreage), and DMA type (i.e., drains to BMP, self-retaining, or self-mitigating)
☒ Potential pollutant source areas and corresponding required source controls (see Chapter 4, Appendix E.1, and Form I-3B)
☒ Structural BMPs (identify location, type of BMP, and size/detail)



LEGEND

DESCRIPTION	SYMBOL
LOT LINE	
EXIST. CONTOUR	300
PROP. CONTOUR	289
BASIN BOUNDARY	
FLOWLINE	=>
FLOW DIRECTION	
BASIN SUMMARY Q_{100}	EX 1 / X.X AC / X.X CFS
IMPERVIOUS AREA	
PERVIOUS PAVERS	
BIOFILTRATION BASIN AREA	
CRITICAL COURSE SEDIMENT YIELD AREAS	

SWQMP
POST-PROJECT WORKMAP

3060 BROADWAY

3060 BROADWAY, SAN DIEGO

PROJECT NUMBER: PE 2639

SCALE: 1" = 20'

DATE: MAY 19, 2017

SHEET 1 OF 1

PASCO LARET SUITER & ASSOCIATES

CIVIL ENGINEERING + LAND PLANNING + LAND SURVEYING

535 North Highway 101, Ste A, Solana Beach, CA 92075

ph 858.259.8212 | fx 858.259.4812 | plsaengineering.com

BMP Sizing and DCV Summary Table

BMP Location	BMP Description	Total Area (sq-ft)	% Impervious	% Pervious	% Pavers	Weighted Runoff Factor	DCV (Cu-ft)	Minimum 3.0% Treatment Area (sq-ft)	Treatment Area Provided (sq-ft)	DCV Provided (Cu-Ft)	1.5xDCV from B.5-1 (cu-ft)	0.75xDCV from B.5-1 (cu-ft)
DMA-1	**BIOFILTRATION PLANTER**	**14000.00**	**77%**	**23%**	**0%**	0.76	463.3	321	505.0	942.835	692	346.0
		14000.00					463.27		**505.0**	**942.8**		

NOTE:

Runoff Factor			SUSMP Parameters		
Impervious	0.9		Intensity:	0.20	in/hr
Landscape	0.30	*Class "D" Soils	Precip:	0.52	in
Permeable Pavers	0.10				

Drawdown Time for Biofiltration Basin 1

Outlet Q:	0.05	cfs	*Based on the Low Flow Orifice
BMP Percolation Rate:	5	in/hr	0.0001 ft/sec
BMP Area:	505.0	sq-ft	
BMP Percolation Rate:	0.06	cfs	
Basin Volume:	943	cu-ft	
DCV/Average Q:	19305	secs	**5.36 Hours**

3060 BROADWAY
J-2639
5/17/2017

PRE-PROJECT HYDROLOGY

Drainage Area	Area Description	Total Area (Ac)	Total Area (sq-ft)	Total Impervious Area (Sq-Ft)	% Impervious	% Pervious	Weighted Runoff Coefficient	Peak Runoff Q: (CFS)	Peak Runoff Volume: (cu-ft)
A-1	**EX LOT**	0.32	14000	11564	83%	17%	0.86	1.23	2517

POST-PROJECT HYDROLOGY

BMP Location	DMA Description	Total Area (Ac)	Total Area (sq-ft)	Total Impervious Area (Sq-Ft)	% Impervious	% Pervious	Weighted Runoff Coefficient	Peak Runoff Q: (CFS)	Peak Runoff Volume: (cu-ft)
A-1	**PODIUM BMP TRIB AREA**	0.32	14000	10818	77%	23%	0.84	1.19	2439
	TOTAL:	**0.32**	**14000.00**	**10818.00**	**77%**	**23%**	**0.84**	**1.19**	**2439.38**

Note:

1. 500 sq-ft of additional impervios area was included to account for unforseen impervious areas (i.e. Pool and patio areas)

100 Yr Storm at 5 Min TC		
Intensity:	4.40	in/hr
Precip:	2.50	in

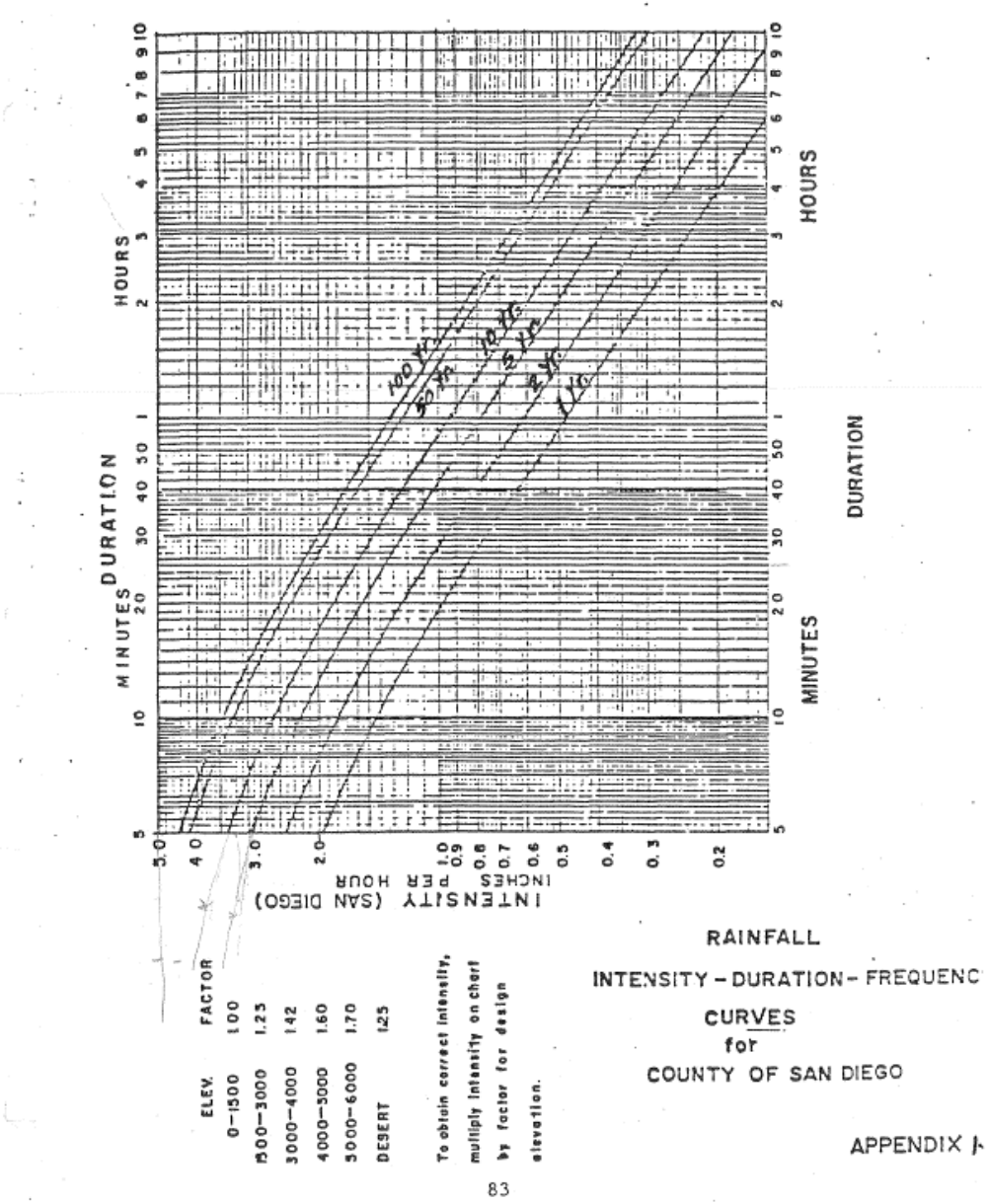
Runoff Coefficient	
Impervious	0.95
Landscape	0.45
Permeable Pavers	0.45

Detention Calculation:

Pre-Project Peak Runoff Volume:	2517	cu-ft	
Post-Project Peak Runoff Volume:	2439	cu-ft	
Delta Peak Runoff Volume (Post - Pre):	-78	cu-ft	
Volume Provided by BMP's:	942.835	cu-ft	*From SWQMP BMP sizing summary

1027 > -78 Therefore, Adequate Detention Provided

Results: The volume provided in the BMPs and the overall decrease of impervious areas results a smaller post project discharge Q
Therefore, detention is not required


MINUTES DURATION
HOURS
100 Yr.
50 Yr.
10 Yr.
5 Yr.
2 Yr.
1 Yr.
INTENSITY (SAN DIEGO)
INCHES PER HOUR
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

Harvest and Use Feasibility Checklist	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.

(9.3gal/person*day)*(0.13368ft^3/gal)= (1.24ft^3/person*day)*(1.5 days)= 1.86ft^3/36hr

[Provide a summary of calculations here]
28 units with 2 people/unit = 56 people Therefore: (56 people)*(1.86ft^3/36hr) = 104.16 ft^3/36hrs

3. Calculate the DCV using worksheet B-2.1.

DCV = 463 (cubic feet)

3a. Is the 36 hour demand greater than or equal to the DCV?	3b. Is the 36 hour demand greater than 0.25DCV but less than the full DCV?	3c. Is the 36 hour demand less than 0.25DCV?
☐ Yes / ☑ No ⇨ ⇩	☐ Yes / ☑ No ⇨ ⇩	☑ 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.

Worksheet C.4-1: Categorization of Infiltration Feasibility Condition

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?

Note that it is not necessary to investigate each and every criterion in the worksheet if infiltration is precluded. Instead a letter of justification from a geotechnical professional familiar with the local conditions substantiating any geotechnical issues will be required.

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 must be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		x

Provide basis: The measured infiltration rates with a minimum factor of safety of 2 were 0.0035 and 0.0075 inches per hour.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

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 must be based on a comprehensive evaluation of the factors presented in Appendix C.2.		x

Provide basis:

The measured infiltration rates with a minimum factor of safety of 2 were 0.0035 and 0.0075 inches per hour.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

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 must be based on a comprehensive evaluation of the factors presented in Appendix C.3.		x
Provide basis: The measured infiltration rates with a minimum factor of safety of 2 were 0.0035 and 0.0075 inches per hour. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
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 must be based on a comprehensive evaluation of the factors presented in Appendix C.3.		x
Provide basis: The measured infiltration rates with a minimum factor of safety of 2 were 0.0035 and 0.0075 inches per hour. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
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		

*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 County staff to substantiate findings.

Worksheet C.4-1 Page 3 of 4

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 must be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		x

Provide basis: The measured infiltration rates with a minimum factor of safety of 2 were 0.0035 and 0.0075 inches per hour. It is our understanding that an infiltration rate of less than 0.01 inches per is not considered suitable for partial infiltration. Therefore the question is not applicable.

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.

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 must be based on a comprehensive evaluation of the factors presented in Appendix C.2.		x

Provide basis:

The measured infiltration rates with a minimum factor of safety of 2 were 0.0035 and 0.0075 inches per hour. It is our understanding that an infiltration rate of less than 0.01 inches per is not considered suitable for partial infiltration. Therefore the question is not applicable.

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.

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 must be based on a comprehensive evaluation of the factors presented in Appendix C.3.		x
Provide basis: The measured infiltration rates with a minimum factor of safety of 2 were 0.0035 and 0.0075 inches per hour. It is our understanding that an infiltration rate of less than 0.01 inches per is not considered suitable for partial infiltration. Therefore the question is not applicable. 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 must be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: The measured infiltration rates with a minimum factor of safety of 2 were 0.0035 and 0.0075 inches per hour. It is our understanding that an infiltration rate of less than 0.01 inches per is not considered suitable for partial infiltration. Therefore the question is not applicable. 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.			
Part 2 Result*	If all answers from row 5-8 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.**		

*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 Agency/Jurisdictions to substantiate findings

3060 BROADWAY
J-2639
5/17/2017

DMA 1

Worksheet B.2-1: DCV				
Design Capture Volume				
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.52	inches
2	Area Tributary to BMP (s)	A=	0.32	acres
3	Area Weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.76	unitless
4	Trees Credit Volume	TCV=	0.00	cubic-feet
5	Rain Barrels Credit Volume	RCV=	0.00	cubic-feet
6	Calculate DCV = (3630 x C x d x A) - TCV - RCV	DCV=	**463.3**	cubic-feet

The City of SAN DIEGO	Project Name	3060 BROADWAY (SDP)	
	BMP ID	BMP #1 & #2 (IN SERIES)	
Sizing Method for Pollutant Removal Criteria		**Worksheet B.5-1**	
1	Area draining to the BMP	14000	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)	0.76	
3	85th percentile 24-hour rainfall depth	0.52	inches
4	Design capture volume [Line 1 x Line 2 x (Line 3/12)]	461	cu. ft.
BMP Parameters			
5	Surface ponding [6 inch minimum, 12 inch maximum]	8	inches
6	Media thickness [18 inches minimum], also add mulch layer and washed ASTM 33 fine aggregate sand thickness to this line for sizing calculations	24	inches
7	Aggregate storage (also add ASTM No 8 stone) above underdrain invert (12 inches typical) – use 0 inches if the aggregate is not over the entire bottom surface area	12	inches
8	Aggregate storage below underdrain invert (3 inches minimum) – use 0 inches if the aggregate is not over the entire bottom surface area	3	inches
9	Freely drained pore storage of the media	0.2	in/in
10	Porosity of aggregate storage	0.4	in/in
11	Media filtration rate to be used for sizing (maximum filtration rate of 5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate (includes infiltration into the soil and flow rate through the outlet structure) which will be less than 5 in/hr.)	1.07	in/hr.
Baseline Calculations			
12	Allowable routing time for sizing	6	hours
13	Depth filtered during storm [Line 11 x Line 12]	6.42	inches
14	Depth of Detention Storage [Line 5 + (Line 6 x Line 9) + (Line 7 x Line 10) + (Line 8 x Line 10)]	18.8	inches
15	Total Depth Treated [Line 13 + Line 14]	25.22	inches
Option 1 – Biofilter 1.5 times the DCV			
16	Required biofiltered volume [1.5 x Line 4]	692	cu. ft.
17	Required Footprint [Line 16/ Line 15] x 12	329	sq. ft.
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
18	Required Storage (surface + pores) Volume [0.75 x Line 4]	346	cu. ft.
19	Required Footprint [Line 18/ Line 14] x 12	221	sq. ft.
Footprint of the BMP			
20	BMP Footprint Sizing Factor (Default 0.03 or an alternative minimum footprint sizing factor from Line 11 in Worksheet B.5-3)	0.03	
21	Minimum BMP Footprint [Line 1 x Line 2 x Line 20]	319	sq. ft.
22	Footprint of the BMP = Maximum(Minimum(Line 17, Line 19), Line 21)	319	sq. ft.
23	Provided BMP Footprint	505	sq. ft.
24	Is Line 23 > Line 22?	**Yes, Performance Standard is Met**	

The City of SAN DIEGO	Project Name	3060 BROADWAY (SDP)
	BMP ID	BMP #1 & #2 (IN SERIES)

Volume Retention for No Infiltration Condition							Worksheet B.5-5
1	Area draining to the biofiltration BMP					14000	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)					0.76	
3	Effective impervious area draining to the BMP [Line 1 x Line 2]					10640	sq. ft.
4	Required area for Evapotranspiration [Line 3 x 0.03]					319	sq. ft.
5	Biofiltration BMP Footprint					505	sq. ft.
Landscape Area (must be identified on DS-3247)							
		Identification	**1**	**2**	**3**	**4**	**5**
6	Landscape area that meet the requirements in SD-4 and SD-5 Fact Sheet (sq. ft.)		0				
7	Impervious area draining to the landscape area (sq. ft.)		0				
8	Impervious to Pervious Area ratio [Line 7/Line 6]		0.00	0.00	0.00	0.00	0.00
9	Effective Credit Area If (Line 8 >1.5, Line 6, Line 7/1.5]		0	0	0	0	0
10	Sum of Landscape area [sum of Line 9 Id's 1 to 5]					0	sq. ft.
11	Provided footprint for evapotranspiration [Line 5 + Line 10]					505	sq. ft.
Volume Retention Performance Standard							
14	Is Line 11 ≥ Line 4? If yes, then volume retention performance standard for no infiltration condition is met. If no, increase the landscape area or propose other site design BMPs (e.g. trees, rain barrels, etc.) that will result in equivalent or greater average annual volume retention when compared to the average annual volume retention achieved by a standard biofiltration BMP. If the option of implementing other site design BMPs is selected, applicant must include supporting documentation with explanation of the approach in the PDP SWQMP.					**Performance Standard is Met**	

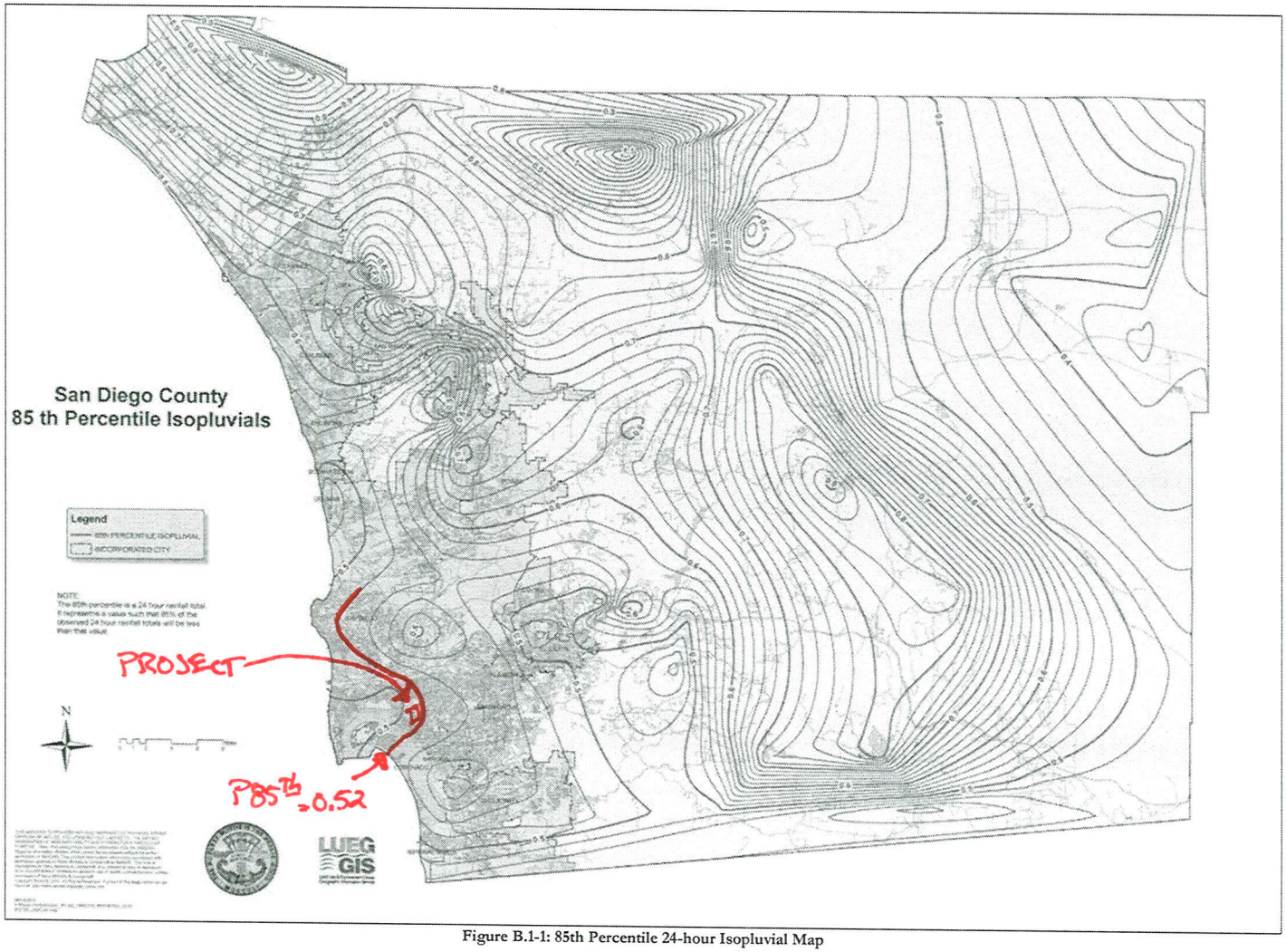


Figure B.1-1: 85th Percentile 24-hour Isopluvial Map

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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Project Name: 3060 BROADWAY

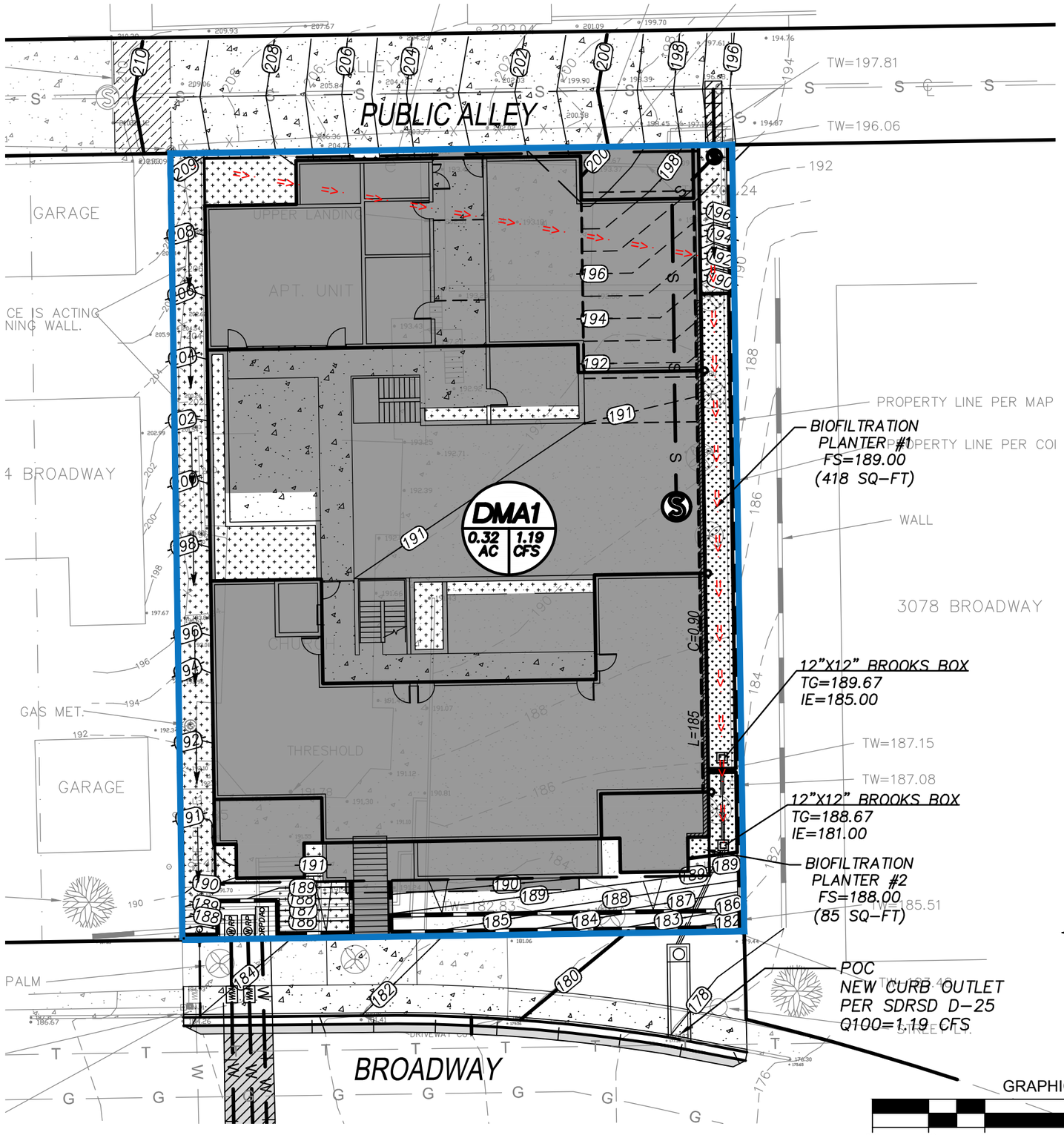
Indicate which Items are Included:

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)



LEGEND

DESCRIPTION	SYMBOL
LOT LINE	
EXIST. CONTOUR	300
PROP. CONTOUR	299
BASIN BOUNDARY	
FLOWLINE	=>
FLOW DIRECTION	
BASIN SUMMARY Q_{100}	EX 1 / X.X AC / X.X CFS
IMPERVIOUS AREA	
PERVIOUS PAVERS	
BIOFILTRATION BASIN AREA	
CRITICAL COURSE SEDIMENT YIELD AREAS	

HMP
POST-PROJECT WORKMAP

3060 BROADWAY

3060 BROADWAY, SAN DIEGO

PROJECT NUMBER: PE 2639

SCALE: 1" = 20'

DATE: MAY 19, 2017

SHEET 1 OF 1

PASCO LARET SUITER & ASSOCIATES

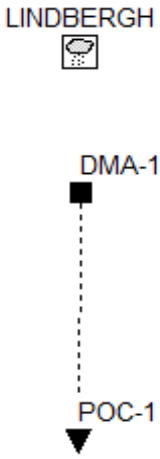
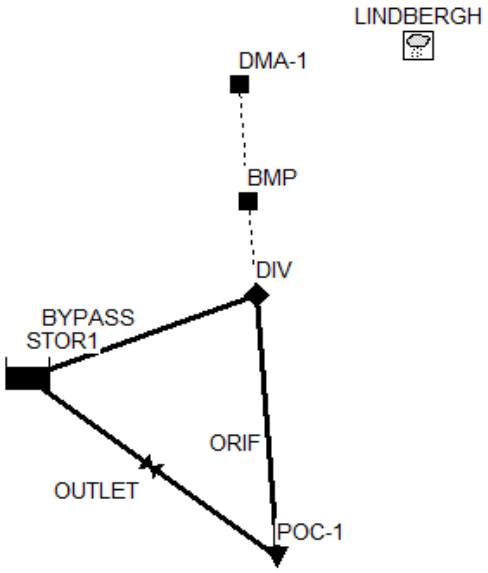
CIVIL ENGINEERING + LAND PLANNING + LAND SURVEYING

535 North Highway 101, Ste A, Solana Beach, CA 92075

ph 858.259.8212 | fx 858.259.4812 | plsaengineering.com

3060 BROADWAY
J-2639
12/8/2016

SWMM MODEL SCHEMATICS FOR 3060 BROADWAY

PRE-PROJECT MODEL	POST-PROJECT MODEL
	

30TH STREET
J-2508
3/20/2017

SWMM MODEL INPUTS

PRE-PROJECT										
DMA	Basin	Area (ac)	Width (Area/ Flow Length) (ft)	% Slope	% Impervious	% "C" Soils	% "D" Soils	Weighted Infiltration (in/hr):	Weighted Suction Head (in):	Weighted Initial Deficit:
DMA-1	1	0.32	100.00	8%	0%	0%	100%	0.025	9.000	0.330
	Total:	**0.32**								

POST-PROJECT											
DMA	Basin	BMP	Area (ac)	Width (Area/ Flow Length) (ft)	% Impervious	% Slope	% "C" Soils	% "D" Soils	Weighted Infiltration (in/hr):	Weighted Suction Head (in):	Weighted Initial Deficit:
DMA-1	1	1	0.32	70.00	77%	2%	0%	100%	0.025	9.000	0.330
		Total:	**0.32**								

Infiltration:		
C:	1	in/hr
D:	0.025	in/hr

Suction Head:		
C:	6	in
D:	9	in

Initial Deficit	
C:	0.32
D:	0.33

OUTLET RATING CURVE	
HEAD	12" X 12" BROOKS BOX
(ft)	Q (cfs)
0.1	0.4
0.2	1.14
0.3	2.1
0.4	3.24

```
[TITLE]
;;Project Title/Notes
MIX 30
J-2508
PRE-PROJECT CONDITION

[OPTIONS]
;;Option             Value
FLOW_UNITS           CFS
INFILTRATION         GREEN_AMPT
FLOW_ROUTING         KINWAVE
LINK_OFFSETS         DEPTH
MIN_SLOPE            0
ALLOW_PONDING        NO
SKIP_STEADY_STATE    NO

START_DATE           10/17/1948
START_TIME           08:00:00
REPORT_START_DATE    10/17/1948
REPORT_START_TIME    08:00:00
END_DATE             12/31/2005
END_TIME             23:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          01:00:00
WET_STEP             00:15:00
DRY_STEP             04:00:00
ROUTING_STEP         0:01:00

INERTIAL_DAMPING     PARTIAL
NORMAL_FLOW_LIMITED  BOTH
FORCE_MAIN_EQUATION  H-W
VARIABLE_STEP        0.75
LENGTHENING_STEP     0
MIN_SURFAREA         12.557
MAX_TRIALS           8
HEAD_TOLERANCE       0.005
SYS_FLOW_TOL         5
LAT_FLOW_TOL         5
MINIMUM_STEP         0.5
THREADS              1

[EVAPORATION]
;;Data Source    Parameters
;;--------------- ----------------
MONTHLY          0.06   0.08   0.12   0.16   0.17   0.19   0.18   0.17   0.14   0.11
0.08   0.06
DRY_ONLY         NO

[RAINGAGES]
;;Name           Format    Interval SCF      Source
;;-------------- --------- ------ ------ ----------
LINDBERGH        INTENSITY 1:00     1.0      TIMESERIES LINDBERGH

[SUBCATCHMENTS]
;;Name           Rain Gage        Outlet           Area     %Imperv  Width    %Slope
CurbLen  SnowPack
;;-------------- ---------------- ---------------- -------- -------- -------- --------
-------- ----------------
DMA-1            LINDBERGH        POC-1            0.48     0        139.62   2        0


[SUBAREAS]
;;Subcatchment   N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo
PctRouted
;;-------------- ---------- ---------- ---------- ---------- ---------- ----------
----------
DMA-1            .011       .017       0.05       0.1        25         OUTLET
```

```
[INFILTRATION]
;;Subcatchment   Suction    Ksat       IMD
;;-------------- ---------- ---------- ----------
DMA-1            9          0.025      0.33

[OUTFALLS]
;;Name           Elevation  Type       Stage Data       Gated    Route To
;;-------------- ---------- ---------- ---------------- -------- ----------------
;Basin 200
POC-1            0          FREE                        NO

[TIMESERIES]
;;Name           Date       Time       Value
;;-------------- ---------- ---------- ----------
Encinitas        FILE "J:\Active Jobs\2186
CLARK\CIVIL\REPORTS\SWMM\Rainfall_Data\encinitas.dat"
;
OCEANSIDE        FILE "J:\Active Jobs\2569 SANDERLING WALDORF
SCHOOL\CIVIL\REPORTS\SWQMP\SWMM\ELECTRONIC FILES\Rainfall_data\oceanside.txt"
;
LINDBERGH        FILE "J:\Active Jobs\2508 BOTHWELL\CIVIL\REPORTS\SWQMP\SWMM\ELECTRONIC
FILES\Rainfall_data\lindbergh (1)\ccda_lindbergh.txt"

[REPORT]
;;Reporting Options
INPUT      NO
CONTROLS   NO
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]

[MAP]
DIMENSIONS 0.000 0.000 10000.000 10000.000
Units      None

[COORDINATES]
;;Node           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
POC-1            1100.000           3500.000

[VERTICES]
;;Link           X-Coord            Y-Coord
;;-------------- ------------------ ------------------

[Polygons]
;;Subcatchment   X-Coord            Y-Coord
;;-------------- ------------------ ------------------
DMA-1            1133.487           5730.725

[SYMBOLS]
;;Gage           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
LINDBERGH        1100.000           7300.000
```

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.009)

3060 BROADWAY
J-2639
PRE-PROJECT CONDITION

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CFS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... NO
  Water Quality ..... NO
Infiltration Method ..... GREEN_AMPT
Starting Date OCT-17-1948 08:00:00
Ending Date DEC-31-2005 23:00:00
Antecedent Dry Days 0.0
Report Time Step 01:00:00
Wet Time Step 00:15:00
Dry Time Step 04:00:00

**********	Volume	Depth
Runoff Quantity Continuity	acre-feet	inches
**********	---	---
Total Precipitation	15.036	563.840
Evaporation Loss	0.478	17.908
Infiltration Loss	11.945	447.940
Surface Runoff	2.976	111.598
Final Storage	0.000	0.000
Continuity Error (%)	-2.413	

**********	Volume	Volume
Flow Routing Continuity	acre-feet	10^6 gal
**********	---	---

Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	2.976	0.970
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	2.976	0.970
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.000
Continuity Error (%)	0.000	

****

Analysis begun on: Thu Dec 08 15:44:59 2016
Analysis ended on: Thu Dec 08 15:45:18 2016
Total elapsed time: 00:00:19

```
[TITLE]
;;Project Title/Notes
3060 BROADWAY
J-2639
POST-PROJECT CONDITION

[OPTIONS]
;;Option             Value
FLOW_UNITS           CFS
INFILTRATION         GREEN_AMPT
FLOW_ROUTING         KINWAVE
LINK_OFFSETS         DEPTH
MIN_SLOPE            0
ALLOW_PONDING        NO
SKIP_STEADY_STATE    NO

START_DATE           10/17/1948
START_TIME           08:00:00
REPORT_START_DATE    10/17/1948
REPORT_START_TIME    08:00:00
END_DATE             12/31/2005
END_TIME             23:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          01:00:00
WET_STEP             00:15:00
DRY_STEP             04:00:00
ROUTING_STEP         0:01:00

INERTIAL_DAMPING     PARTIAL
NORMAL_FLOW_LIMITED  BOTH
FORCE_MAIN_EQUATION  H-W
VARIABLE_STEP        0.75
LENGTHENING_STEP     0
MIN_SURFAREA         12.557
MAX_TRIALS           8
HEAD_TOLERANCE       0.005
SYS_FLOW_TOL         5
LAT_FLOW_TOL         5
MINIMUM_STEP         0.5
THREADS              1

[EVAPORATION]
;;Data Source    Parameters
;;-------------- ----------------
MONTHLY          0.06   0.08   0.12   0.16   0.17   0.19   0.18   0.17   0.14
0.11   0.08   0.06
DRY_ONLY         NO

[RAINGAGES]
;;Name           Format    Interval SCF      Source
;;-------------- --------- ------ ------ ----------
LINDBERGH        INTENSITY 1:00     1.0      TIMESERIES LINDBERGH

[SUBCATCHMENTS]
;;Name           Rain Gage        Outlet           Area     %Imperv  Width
%Slope   CurbLen  SnowPack
;;-------------- ---------------- ---------------- -------- -------- --------
-------- -------- ----------------
DMA-1            LINDBERGH        BMP              0.32     77       70       2
     0
BMP              LINDBERGH        DIV              0.0115932048 0        10
```

```
0        0

[SUBAREAS]
;;Subcatchment   N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo
 PctRouted
;;-------------- ---------- ---------- ---------- ---------- ----------
---------- ----------
DMA-1            .011       .017       0.05       0.1        25         OUTLET

BMP              .011       .017       0.05       0.1        25         OUTLET


[INFILTRATION]
;;Subcatchment   Suction    Ksat       IMD
;;-------------- ---------- ---------- ----------
DMA-1            9          0.025      0.330
BMP              9          0.025      0.33

[LID_CONTROLS]
;;Name           Type/Layer Parameters
;;-------------- ---------- ----------
BF-1             BC
BF-1             SURFACE    8          0.0        0          0          5

BF-1             SOIL       24         .4         0.2        0.1        5
 5          1.5
BF-1             STORAGE    12         0.67       0.0        0
BF-1             DRAIN      0.1617     0.5        0          6

[LID_USAGE]
;;Subcatchment   LID Process      Number  Area       Width      InitSat
FromImp    ToPerv     RptFile                  DrainTo
;;-------------- ---------------- ------- ---------- ---------- ----------
---------- ---------- ------------------------ ----------------
BMP              BF-1             1       505.00     0          0          100
    0

[OUTFALLS]
;;Name           Elevation  Type       Stage Data       Gated    Route To
;;-------------- ---------- ---------- ---------------- -------- ----------------
;Basin 200
POC-1            0          FREE                        NO

[DIVIDERS]
;;Name           Elevation  Diverted Link    Type       Parameters
;;-------------- ---------- ---------------- ---------- ----------
DIV              0          BYPASS           CUTOFF     0.01254    0          0
       0          0

[STORAGE]
;;Name           Elev.    MaxDepth   InitDepth  Shape      Curve Name/Params
               Fevap    Psi      Ksat     IMD
;;-------------- -------- ---------- ----------- ----------
--------------------------- -------- --------          -------- --------
STOR1            0        1          0          TABULAR    STOR1
      0        0

[CONDUITS]
;;Name           From Node        To Node          Length     Roughness  InOffset
  OutOffset  InitFlow   MaxFlow
;;-------------- ---------------- ---------------- ---------- ----------
---------- ---------- ---------- ----------
ORIF             DIV              POC-1            400        0.01       0
```

```
  0          0          0
BYPASS           DIV              STOR1            400        0.01       0
  0          0          0

[OUTLETS]
;;Name           From Node        To Node          Offset     Type
QTable/Qcoeff    Qexpon     Gated
;;-------------- ---------------- ---------------- ---------- ---------------
---------------- ---------- --------
OUTLET           STOR1            POC-1            0          TABULAR/DEPTH
OUTLET                      NO

[XSECTIONS]
;;Link           Shape        Geom1            Geom2      Geom3      Geom4
Barrels    Culvert
;;-------------- ------------ ---------------- ---------- ---------- ----------
---------- ----------
ORIF             CIRCULAR     1                0          0          0          1

BYPASS           CIRCULAR     1                0          0          0          1


[CURVES]
;;Name           Type       X-Value    Y-Value
;;-------------- ---------- ---------- ----------
;12"X12" BROOKS BOX
OUTLET           Rating     0          0
OUTLET                      0.1        0.4
OUTLET                      0.2        1.14
OUTLET                      0.3        2.1
OUTLET                      0.4        3.24
OUTLET                      0.5        4.52
;
STOR1            Storage    0          550
STOR1                       .25        550
STOR1                       .5         550

[TIMESERIES]
;;Name           Date       Time       Value
;;-------------- ---------- ---------- ----------
Encinitas        FILE "J:\Active Jobs\2186
CLARK\CIVIL\REPORTS\SWMM\Rainfall_Data\encinitas.dat"
;
OCEANSIDE        FILE "J:\Active Jobs\2569 SANDERLING WALDORF
SCHOOL\CIVIL\REPORTS\SWQMP\SWMM\ELECTRONIC FILES\Rainfall_data\oceanside.txt"
;
LINDBERGH        FILE "J:\Active Jobs\2508
BOTHWELL\CIVIL\REPORTS\SWQMP\SWMM\ELECTRONIC FILES\Rainfall_data\lindbergh
(1)\ccda_lindbergh.txt"

[REPORT]
;;Reporting Options
INPUT      NO
CONTROLS   NO
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]

[MAP]
DIMENSIONS 0.000 0.000 10000.000 10000.000
Units      None
```

```
[COORDINATES]
;;Node           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
POC-1            230.263            4057.018
DIV              109.649            5723.684
STOR1            -1292.017          5199.580

[VERTICES]
;;Link           X-Coord            Y-Coord
;;-------------- ------------------ ------------------

[Polygons]
;;Subcatchment   X-Coord            Y-Coord
;;-------------- ------------------ ------------------
DMA-1            0.000              7072.368
BMP              54.825             6326.754

[SYMBOLS]
;;Gage           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
LINDBERGH        1100.000           7300.000
```

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.009)

3060 BROADWAY
J-2639
POST-PROJECT CONDITION
WARNING 04: minimum elevation drop used for Conduit ORIF
WARNING 04: minimum elevation drop used for Conduit BYPASS

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CFS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
Infiltration Method ..... GREEN_AMPT
Flow Routing Method ..... KINWAVE
Starting Date OCT-17-1948 08:00:00
Ending Date DEC-31-2005 23:00:00
Antecedent Dry Days 0.0
Report Time Step 01:00:00
Wet Time Step 00:15:00
Dry Time Step 04:00:00
Routing Time Step ..... 60.00 sec

********** Volume Depth
Runoff Quantity Continuity acre-feet inches
********** --------- -------
Initial LID Storage 0.002 0.084
Total Precipitation 15.580 563.840
Evaporation Loss 3.245 117.416
Infiltration Loss 2.719 98.387
Surface Runoff 0.931 33.699
LID Drainage 8.886 321.584

Final Storage 0.005 0.194
Continuity Error (%) ..... -1.304

********** Volume Volume
Flow Routing Continuity acre-feet 10^6 gal
********** --------- ---------
Dry Weather Inflow 0.000 0.000
Wet Weather Inflow 9.817 3.199
Groundwater Inflow 0.000 0.000
RDII Inflow 0.000 0.000
External Inflow 0.000 0.000
External Outflow 9.913 3.230
Flooding Loss 0.169 0.055
Evaporation Loss 0.000 0.000
Exfiltration Loss 0.000 0.000
Initial Stored Volume 0.000 0.000
Final Stored Volume 0.000 0.000
Continuity Error (%) ..... -2.693

****
Highest Flow Instability Indexes
****
All links are stable.

****
Routing Time Step Summary
****
Minimum Time Step : 60.00 sec
Average Time Step : 60.00 sec
Maximum Time Step : 60.00 sec
Percent in Steady State : 0.00
Average Iterations per Step : 1.00
Percent Not Converging : 0.00

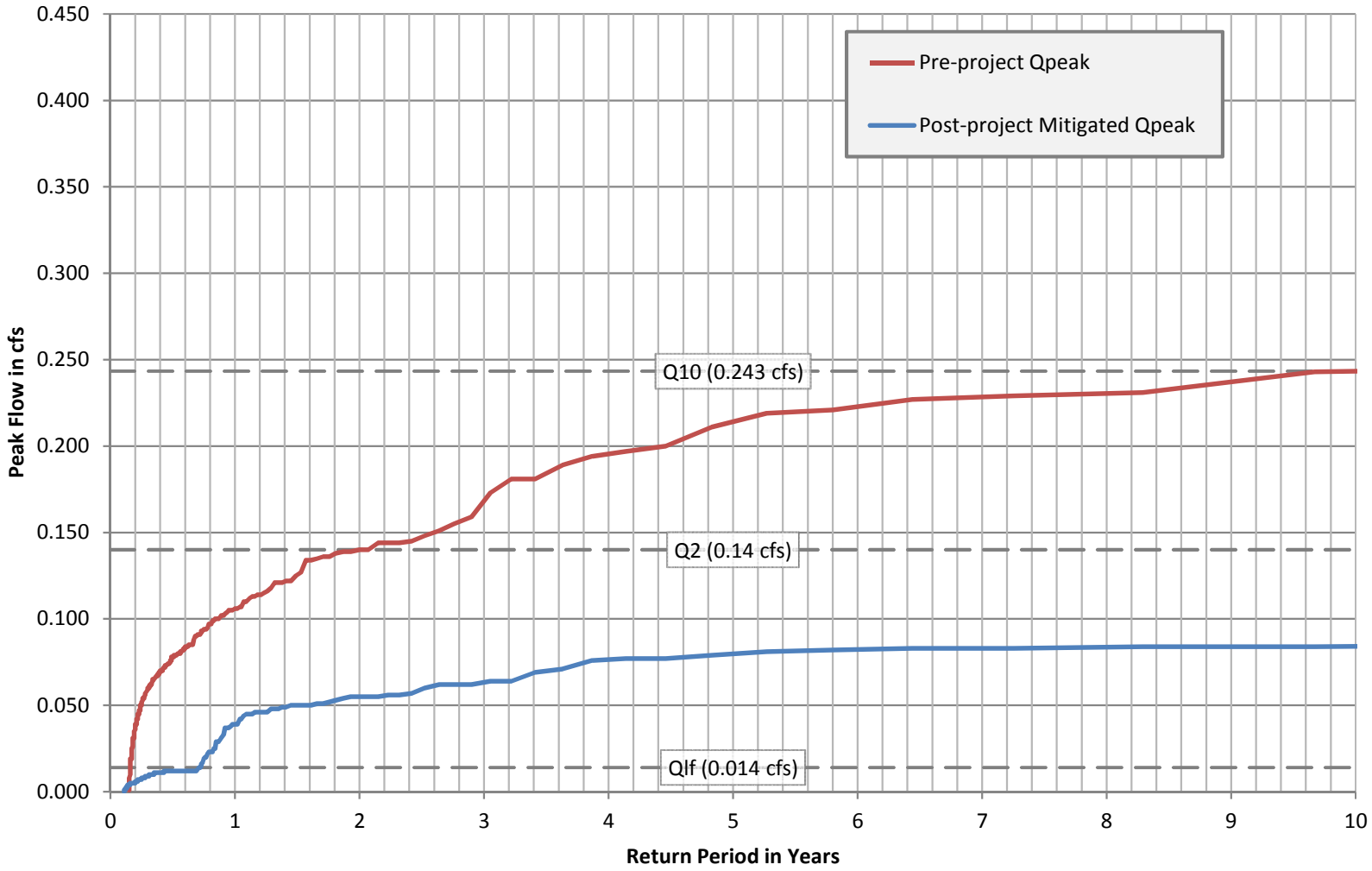
****
Analysis begun on: Mon Mar 20 15:51:32 2017
Analysis ended on: Mon Mar 20 15:52:25 2017
Total elapsed time: 00:00:53

3060 BROADWAY
J-2639
3/20/2017

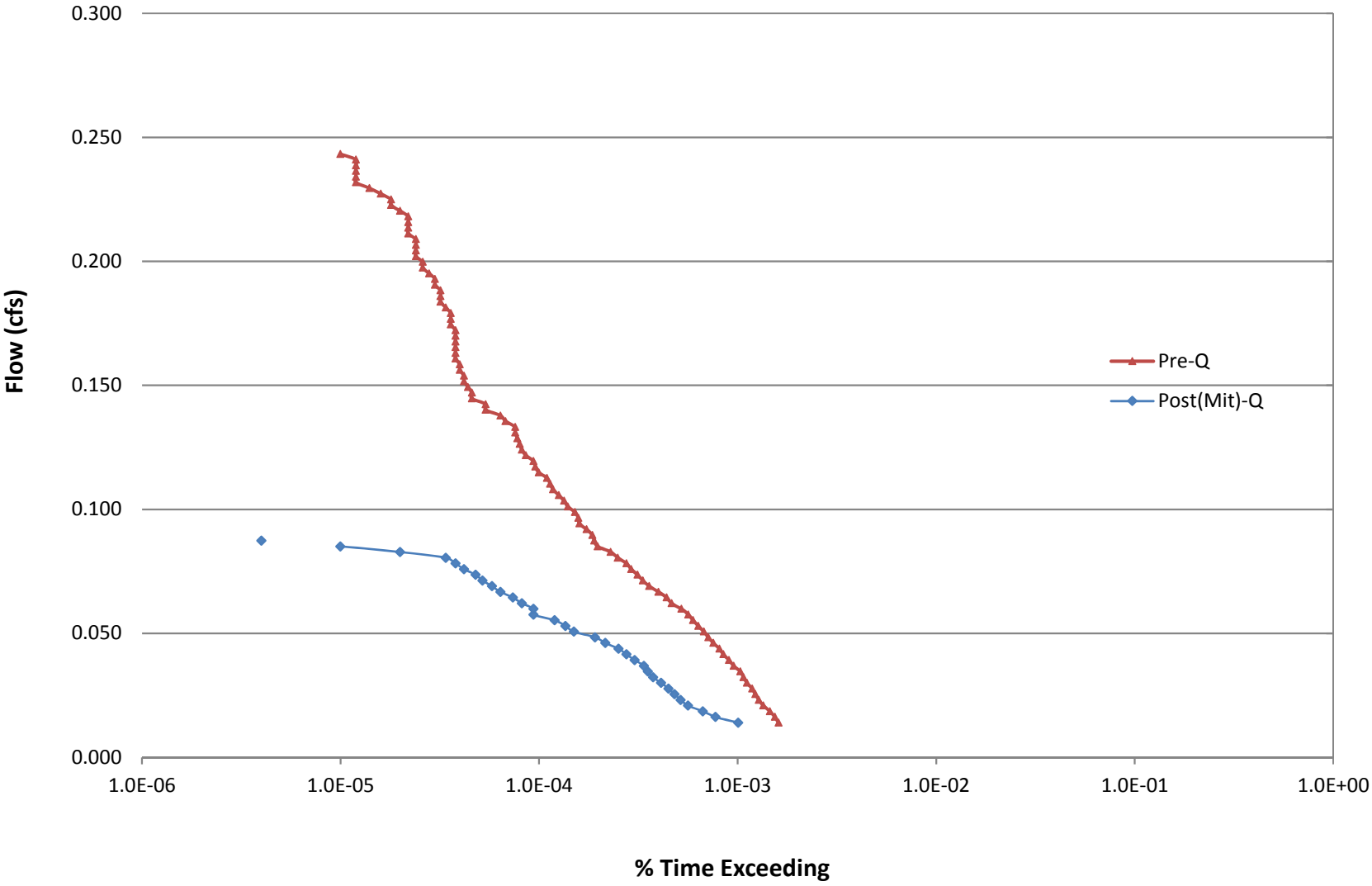
Peak Flow Frequency Summary

Return Period	Pre-project Q (cfs)	Post-project - Mitigated Q (cfs)
LF = 0.1*Q2	0.014	0.006
2-year	0.140	0.055
3-year	0.168	0.063
4-year	0.195	0.076
5-year	0.214	0.080
6-year	0.223	0.082
7-year	0.228	0.083
8-year	0.230	0.084
9-year	0.237	0.084
10-year	0.243	0.084

Peak Flow Frequency Curves



Flow Duration Curve [Pre vs. Post (Mitigated)]



3060 BROADWAY
J-2639
3/20/2017

Low-flow Threshold: 10%
0.1xQ2 (Pre): 0.014 cfs
Q10 (Pre): 0.243 cfs
Ordinate #: 100
Incremental Q (Pre): 0.00229 cfs
Total Hourly Data: 501471 hours

The proposed BMP: PASSED

Interval	Pre-project Flow (cfs)	Pre-project Hours	Pre-project % Time Exceeding	Post-project Hours	Post-project % Time Exceeding	Percentage	Pass/Fail	PRE-PROJECT WORK	POST-PROJECT WORK
0	0.014	806	1.61E-03	504	1.01E-03	63%	Pass	0.00	0.00
1	0.016	772	1.54E-03	388	7.74E-04	50%	Pass	0.22	0.11
2	0.019	728	1.45E-03	335	6.68E-04	46%	Pass	0.58	0.27
3	0.021	676	1.35E-03	282	5.62E-04	42%	Pass	0.98	0.41
4	0.023	641	1.28E-03	259	5.16E-04	40%	Pass	1.40	0.57
5	0.025	615	1.23E-03	241	4.81E-04	39%	Pass	1.86	0.73
6	0.028	593	1.18E-03	225	4.49E-04	38%	Pass	2.32	0.88
7	0.030	558	1.11E-03	206	4.11E-04	37%	Pass	2.72	1.00
8	0.032	537	1.07E-03	188	3.75E-04	35%	Pass	3.15	1.10
9	0.035	517	1.03E-03	177	3.53E-04	34%	Pass	3.58	1.22
10	0.037	479	9.55E-04	169	3.37E-04	35%	Pass	3.84	1.35
11	0.039	453	9.03E-04	152	3.03E-04	34%	Pass	4.14	1.39
12	0.042	425	8.48E-04	138	2.75E-04	32%	Pass	4.37	1.42
13	0.044	406	8.10E-04	126	2.51E-04	31%	Pass	4.66	1.45
14	0.046	378	7.54E-04	108	2.15E-04	29%	Pass	4.80	1.37
15	0.048	357	7.12E-04	96	1.91E-04	27%	Pass	4.97	1.34
16	0.051	339	6.76E-04	75	1.50E-04	22%	Pass	5.15	1.14
17	0.053	318	6.34E-04	68	1.36E-04	21%	Pass	5.24	1.12
18	0.055	299	5.96E-04	60	1.20E-04	20%	Pass	5.32	1.07
19	0.058	283	5.64E-04	47	9.37E-05	17%	Pass	5.41	0.90
20	0.060	261	5.20E-04	47	9.37E-05	18%	Pass	5.34	0.96
21	0.062	233	4.65E-04	41	8.18E-05	18%	Pass	5.08	0.89
22	0.064	220	4.39E-04	37	7.38E-05	17%	Pass	5.10	0.86
23	0.067	200	3.99E-04	32	6.38E-05	16%	Pass	4.91	0.79
24	0.069	180	3.59E-04	29	5.78E-05	16%	Pass	4.68	0.75
25	0.071	167	3.33E-04	26	5.18E-05	16%	Pass	4.58	0.71
26	0.074	157	3.13E-04	24	4.79E-05	15%	Pass	4.53	0.69
27	0.076	146	2.91E-04	21	4.19E-05	14%	Pass	4.42	0.64
28	0.078	138	2.75E-04	19	3.79E-05	14%	Pass	4.38	0.60
29	0.081	125	2.49E-04	17	3.39E-05	14%	Pass	4.15	0.56
30	0.083	115	2.29E-04	10	1.99E-05	9%	Pass	3.99	0.35
31	0.085	99	1.97E-04	5	9.97E-06	5%	Pass	3.58	0.18
32	0.087	95	1.89E-04	2	3.99E-06	2%	Pass	3.58	0.08
33	0.090	93	1.85E-04	0	0.00E+00	0%	Pass	3.64	0.00
34	0.092	87	1.73E-04	0	0.00E+00	0%	Pass	3.54	0.00
35	0.094	80	1.60E-04	0	0.00E+00	0%	Pass	3.38	0.00
36	0.097	79	1.58E-04	0	0.00E+00	0%	Pass	3.46	0.00
37	0.099	76	1.52E-04	0	0.00E+00	0%	Pass	3.44	0.00
38	0.101	70	1.40E-04	0	0.00E+00	0%	Pass	3.28	0.00
39	0.103	67	1.34E-04	0	0.00E+00	0%	Pass	3.24	0.00
40	0.106	63	1.26E-04	0	0.00E+00	0%	Pass	3.15	0.00
41	0.108	59	1.18E-04	0	0.00E+00	0%	Pass	3.04	0.00
42	0.110	57	1.14E-04	0	0.00E+00	0%	Pass	3.03	0.00
43	0.113	55	1.10E-04	0	0.00E+00	0%	Pass	3.01	0.00
44	0.115	50	9.97E-05	0	0.00E+00	0%	Pass	2.82	0.00
45	0.117	48	9.57E-05	0	0.00E+00	0%	Pass	2.78	0.00
46	0.119	47	9.37E-05	0	0.00E+00	0%	Pass	2.80	0.00
47	0.122	43	8.57E-05	0	0.00E+00	0%	Pass	2.63	0.00
48	0.124	41	8.18E-05	0	0.00E+00	0%	Pass	2.57	0.00
49	0.126	40	7.98E-05	0	0.00E+00	0%	Pass	2.57	0.00
50	0.129	39	7.78E-05	0	0.00E+00	0%	Pass	2.57	0.00
51	0.131	38	7.58E-05	0	0.00E+00	0%	Pass	2.57	0.00
52	0.133	38	7.58E-05	0	0.00E+00	0%	Pass	2.63	0.00

3060 BROADWAY
J-2639
3/20/2017

Interval	Pre-project Flow (cfs)	Pre-project Hours	Pre-project % Time Exceeding	Post-project Hours	Post-project % Time Exceeding	Percentage	Pass/Fail	PRE-PROJECT WORK	POST-PROJECT WORK
53	0.136	34	6.78E-05	0	0.00E+00	0%	Pass	2.41	0.00
54	0.138	32	6.38E-05	0	0.00E+00	0%	Pass	2.32	0.00
55	0.140	27	5.38E-05	0	0.00E+00	0%	Pass	2.00	0.00
56	0.142	27	5.38E-05	0	0.00E+00	0%	Pass	2.05	0.00
57	0.145	23	4.59E-05	0	0.00E+00	0%	Pass	1.78	0.00
58	0.147	23	4.59E-05	0	0.00E+00	0%	Pass	1.82	0.00
59	0.149	22	4.39E-05	0	0.00E+00	0%	Pass	1.78	0.00
60	0.152	21	4.19E-05	0	0.00E+00	0%	Pass	1.73	0.00
61	0.154	21	4.19E-05	0	0.00E+00	0%	Pass	1.77	0.00
62	0.156	20	3.99E-05	0	0.00E+00	0%	Pass	1.72	0.00
63	0.158	20	3.99E-05	0	0.00E+00	0%	Pass	1.75	0.00
64	0.161	19	3.79E-05	0	0.00E+00	0%	Pass	1.70	0.00
65	0.163	19	3.79E-05	0	0.00E+00	0%	Pass	1.73	0.00
66	0.165	19	3.79E-05	0	0.00E+00	0%	Pass	1.76	0.00
67	0.168	19	3.79E-05	0	0.00E+00	0%	Pass	1.79	0.00
68	0.170	19	3.79E-05	0	0.00E+00	0%	Pass	1.83	0.00
69	0.172	19	3.79E-05	0	0.00E+00	0%	Pass	1.86	0.00
70	0.175	18	3.59E-05	0	0.00E+00	0%	Pass	1.79	0.00
71	0.177	18	3.59E-05	0	0.00E+00	0%	Pass	1.82	0.00
72	0.179	18	3.59E-05	0	0.00E+00	0%	Pass	1.85	0.00
73	0.181	17	3.39E-05	0	0.00E+00	0%	Pass	1.78	0.00
74	0.184	16	3.19E-05	0	0.00E+00	0%	Pass	1.70	0.00
75	0.186	16	3.19E-05	0	0.00E+00	0%	Pass	1.73	0.00
76	0.188	16	3.19E-05	0	0.00E+00	0%	Pass	1.76	0.00
77	0.191	15	2.99E-05	0	0.00E+00	0%	Pass	1.68	0.00
78	0.193	15	2.99E-05	0	0.00E+00	0%	Pass	1.70	0.00
79	0.195	14	2.79E-05	0	0.00E+00	0%	Pass	1.61	0.00
80	0.197	13	2.59E-05	0	0.00E+00	0%	Pass	1.52	0.00
81	0.200	13	2.59E-05	0	0.00E+00	0%	Pass	1.54	0.00
82	0.202	12	2.39E-05	0	0.00E+00	0%	Pass	1.45	0.00
83	0.204	12	2.39E-05	0	0.00E+00	0%	Pass	1.47	0.00
84	0.207	12	2.39E-05	0	0.00E+00	0%	Pass	1.49	0.00
85	0.209	12	2.39E-05	0	0.00E+00	0%	Pass	1.51	0.00
86	0.211	11	2.19E-05	0	0.00E+00	0%	Pass	1.40	0.00
87	0.214	11	2.19E-05	0	0.00E+00	0%	Pass	1.42	0.00
88	0.216	11	2.19E-05	0	0.00E+00	0%	Pass	1.44	0.00
89	0.218	11	2.19E-05	0	0.00E+00	0%	Pass	1.46	0.00
90	0.220	10	1.99E-05	0	0.00E+00	0%	Pass	1.35	0.00
91	0.223	9	1.79E-05	0	0.00E+00	0%	Pass	1.23	0.00
92	0.225	9	1.79E-05	0	0.00E+00	0%	Pass	1.24	0.00
93	0.227	8	1.60E-05	0	0.00E+00	0%	Pass	1.12	0.00
94	0.230	7	1.40E-05	0	0.00E+00	0%	Pass	0.99	0.00
95	0.232	6	1.20E-05	0	0.00E+00	0%	Pass	0.86	0.00
96	0.234	6	1.20E-05	0	0.00E+00	0%	Pass	0.87	0.00
97	0.236	6	1.20E-05	0	0.00E+00	0%	Pass	0.88	0.00
98	0.239	6	1.20E-05	0	0.00E+00	0%	Pass	0.89	0.00
99	0.241	6	1.20E-05	0	0.00E+00	0%	Pass	0.90	0.00
100	0.243	5	9.97E-06	0	0.00E+00	0%	Pass	0.76	0.00

TOTAL WORK: 258.21 26.90

EROSION POTENTIAL (EP): 0.1042

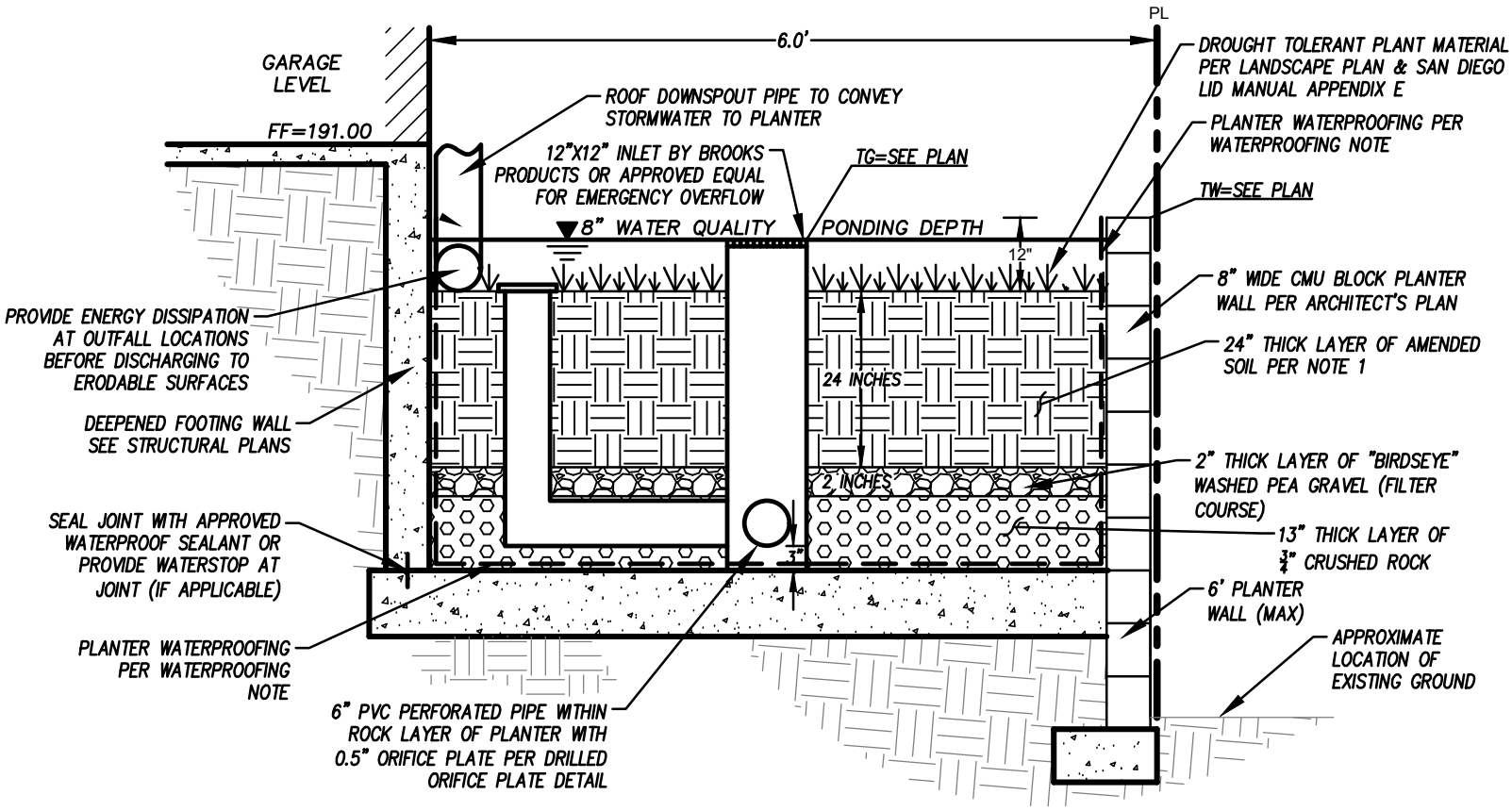
3060 BROADWAY
J-2639
3/20/2017

BMP 1&2 Combined

SWMM Model Drain Coefficient Calculation

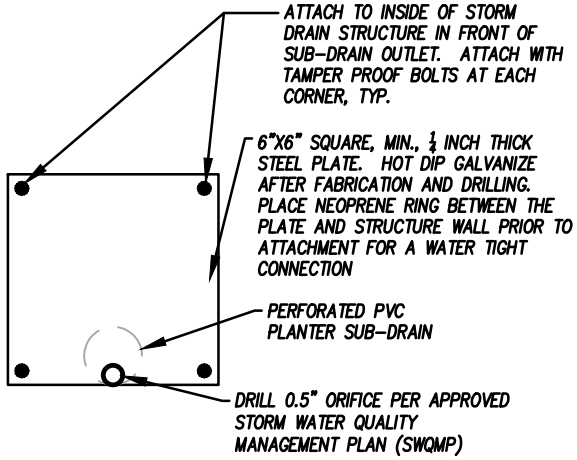
PARAMETER	ABBREV.	Basin 1	
Ponding Depth	PD	8	in
Bioretention Soil Layer	S	24	in
Gravel Layer	G	12	in
TOTAL		3.7	ft
		44	in
Orifice Coefficient	c_g	0.6	--
Low Flow Orifice Diameter	D	0.5	in
Drain exponent	n	0.5	--
Flow Rate (volumetric)	Q	0.013	cfs
Ponding Depth Surface Area	A_{PD}	505	ft^2
Bioretention Surface Area	A_S, A_G	505	ft^2
	A_S, A_G	0.0116	ac
Flow Rate (per unit area)	q	1.072	in/hr
Effective Ponding Depth	PD_{eff}	**8.00**	in
Drain Coefficient	C	**0.1617**	--

Cutoff Flow	Q_{cutoff}	**0.01254**	cfs



TYPICAL SECTION: BIOFILTRATION PLANTER (BF-1)

NOT TO SCALE

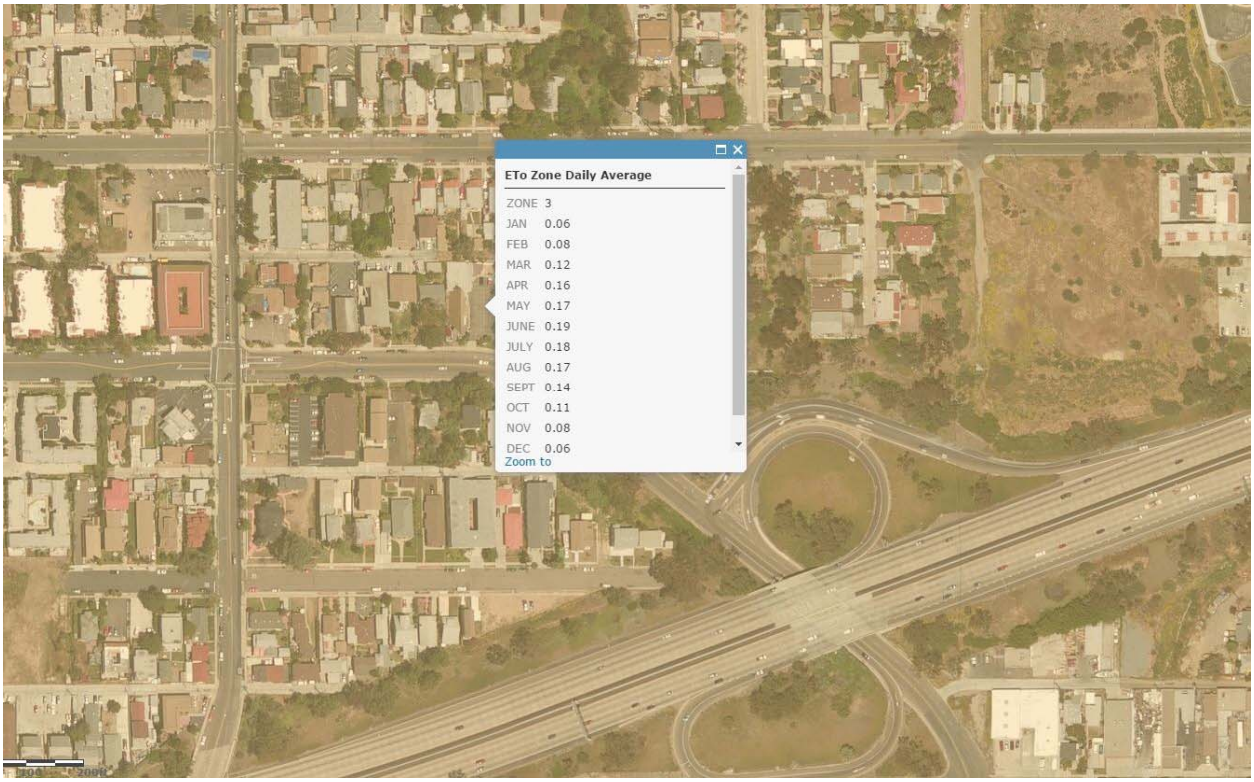


DRILLED ORIFICE PLATE DETAIL (TYP.)

NOT TO SCALE

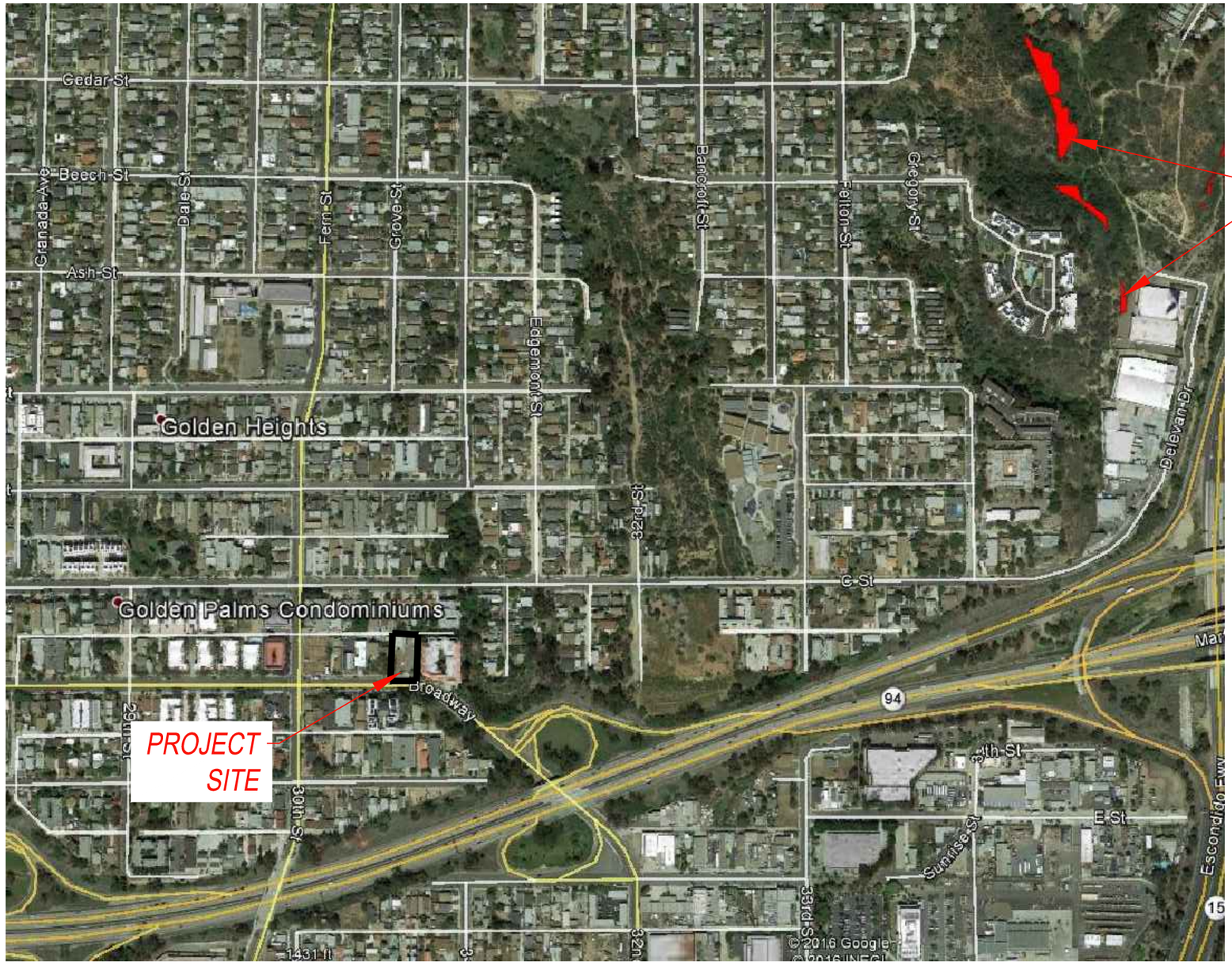
3060 BROADWAY
J-2639
12/12/2016

3060 BROADWAY EVAPORATION DATA



Source:

http://www.arcgis.com/home/webmap/viewer.html?webmap=46368de75d69480db276c0b42e4afd80



POTENTIAL CCSYA EXHIBIT

3060 BROADWAY

3060 BROADWAY, SAN DIEGO, CA 92102

PROJECT NUMBER: PE 2639

SCALE: NOT TO SCALE

DATE: DECEMBER 13, 2016

SHEET 1 OF 1

PASCO LARET SUITER & ASSOCIATES

CIVIL ENGINEERING + LAND PLANNING + LAND SURVEYING

535 North Highway 101, Ste A, Solana Beach, CA 92075

ph 858.259.8212 | fx 858.259.4812 | plsengineering.com

ATTACHMENT 3
STRUCTURAL BMP MAINTENANCE INFORMATION

This is the cover sheet for Attachment 3.

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Project Name: 3060 BROADWAY

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

Project Name: 3060 BROADWAY

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).

The City of SAN DIEGO

RECORDING REQUESTED BY:
THE CITY OF SAN DIEGO AND
WHEN RECORDED MAIL TO:

_____

_____

_____ _____

(THIS SPACE IS FOR RECORDER'S USE ONLY)

STORM WATER MANAGEMENT AND DISCHARGE CONTROL MAINTENANCE AGREEMENT

APPROVAL NUMBER:	ASSESSORS PARCEL NUMBER:	PROJECT NUMBER:
_____	539-542-18	_____

This agreement is made by and between the City of San Diego, a municipal corporation [City] and _____
LITTLE POINT, LLC _____,
the owner or duly authorized representative of the owner [Property Owner] of property located at
3060 BROADWAY, SAN DIEGO, CALIFORNIA 92102
(PROPERTY ADDRESS)

and more particularly described as: LOTS 39, 40, 41 & 42 OF BLOCK 94 OF E.W. MOSRSE'S SUBDIVISION OF PUEBLO LOT 1150
(LEGAL DESCRIPTION OF PROPERTY)

in the City of San Diego, County of San Diego, State of California.

Property Owner is required pursuant to the City of San Diego Municipal Code, Chapter 4, Article 3, Division 3, Chapter 14, Article 2, Division 2, and the Land Development Manual, Storm Water Standards to enter into a Storm Water Management and Discharge Control Maintenance Agreement [Maintenance Agreement] for the installation and maintenance of Permanent Storm Water Best Management Practices [Permanent Storm Water BMP's] prior to the issuance of construction permits. The Maintenance Agreement is intended to ensure the establishment and maintenance of Permanent Storm Water BMP's onsite, as described in the attached exhibit(s), the project's Storm Water Quality Management Plan [SWQMP] and Grading and/or Improvement Plan Drawing No(s), or Building Plan Project No(s): _____.

Property Owner wishes to obtain a building or engineering permit according to the Grading and/or Improvement Plan Drawing No(s) or Building Plan Project No(s): _____.

Continued on Page 2

Reset Button Page 1

NOW, THEREFORE, the parties agree as follows:

1. Property Owner shall have prepared, or if qualified, shall prepare an Operation and Maintenance Procedure [OMP] for Permanent Storm Water BMP's, satisfactory to the City, according to the attached exhibit(s), consistent with the Grading and/or Improvement Plan Drawing No(s), or Building Plan Project No(s): _____.

2. Property Owner shall install, maintain and repair or replace all Permanent Storm Water BMP's within their property, according to the OMP guidelines as described in the attached exhibit(s), the project's SWQMP and Grading and/or Improvement Plan Drawing No(s), or Building Plan Project No(s) _____.

3. Property Owner shall maintain operation and maintenance records for at least five (5) years. These records shall be made available to the City for inspection upon request at any time.

This Maintenance Agreement shall commence upon execution of this document by all parties named hereon, and shall run with the land.

Executed by the City of San Diego and by Property Owner in San Diego, California.

See Attached Exhibit(s): A

_____
(Owner Signature)

_____
(Print Name and Title)

_____
(Company/Organization Name)

_____
(Date)

THE CITY OF SAN DIEGO

APPROVED:

_____
(City Control Engineer Signature)

_____
(Print Name)

_____
(Date)

NOTE: ALL SIGNATURES MUST INCLUDE NOTARY ACKNOWLEDGMENTS PER CIVIL CODE SEC. 1180 ET.SEQ.

Reset Button Page 2

Attachment 3a: Structural BMP Maintenance Thresholds and Actions

Inspection and Maintenance Activities for Treatment Control BMPs

The structural treatment control BMPs for the proposed project consists of two (2) biofiltration basins in series that act as one. The discussions below provide inspection frequency, maintenance indicators and maintenance activities for the proposed structural BMPs. The proposed biofiltration basins should be inspected and maintained to ensure proper functionality over time. The discussion below provides recommendations for inspection and maintenance for the biofiltration basins in order to ensure their lasting effectiveness.

During inspection, the inspector shall check for the maintenance indicators given below and take the appropriate maintenance action:

Typical Maintenance Indicator(s) for Vegetated BMPs	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
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 or biofiltration basin 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.

*These BMPs typically include a surface ponding layer as part of their function which may take 96 hours to drain following a storm event.

Inspection and Maintenance Frequency

The Table below lists the TC-BMPs to be inspected and maintained and the minimum frequency of inspection and maintenance activities.

Table 4.1: Summary Table of Inspection and Maintenance Frequency

BMP	**Inspection Frequency**	**Maintenance Frequency**
Biofiltration Basins	At a minimum: annually, and after major storm events	Routine maintenance to remove accumulated materials at the inlets and outlets: annually, on or before September 30th. As-needed maintenance based on maintenance indicators

The frequencies given in the Summary Table of Inspection and Maintenance Frequency are minimum recommended frequencies for inspection and maintenance activities for the project. Typically, the frequency of maintenance required for structural BMPs is site and drainage area specific. If it is determined during the regularly scheduled inspection and/or routine maintenance that a structural BMP requires more frequent maintenance (e.g., to remove accumulated trash) it may be necessary to increase the frequency of inspection and/or routine maintenance.

Recordkeeping Requirements

The party responsible to ensure implementation and funding of maintenance of structural BMPs shall maintain records documenting the inspection and maintenance activities. The records must be kept a minimum of 5 years and shall be made available to the City of San Diego for inspection upon request at any time.

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 propritery BMPs are used, site specific cross section with outflow, inflow and model number shall be provided. Broucher photocopies are not allowed.

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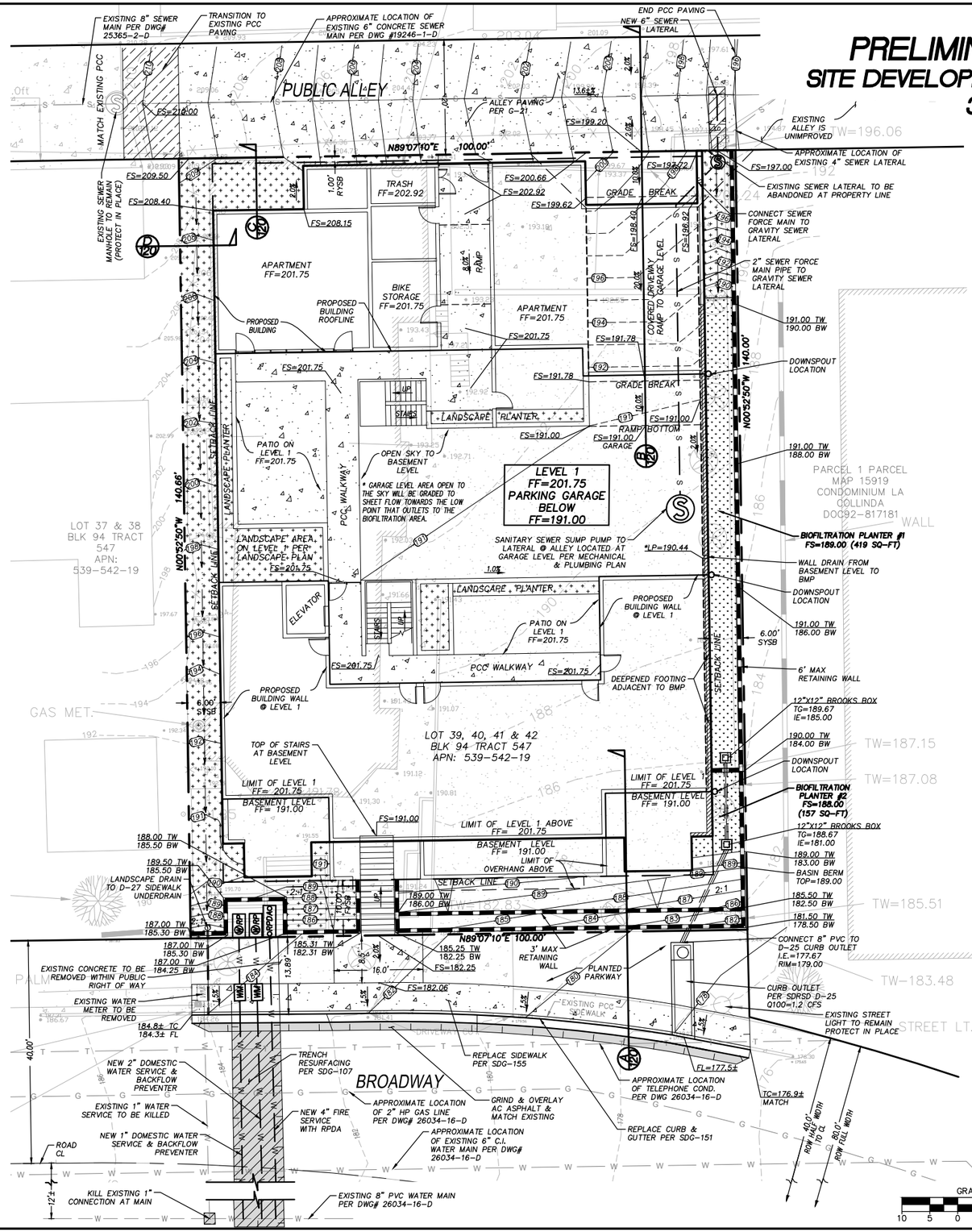
PRELIMINARY GRADING PLAN
SITE DEVELOPMENT PERMIT (SDP) NO. 1847594
3060 BROADWAY



RETAINING WALLS:

FRONT YARD WALL LENGTH:	172 FT
WALL HEIGHT:	3 FT
SIDE YARD WALL LENGTH:	140 FT
WALL HEIGHT:	6 FT

GRADING QUANTITIES:

SITE AREA:	14,085 SQ-FT / 0.32 AC
AREA TO BE GRADED:	100%
MAX CUT INSIDE BUILDING FOOTPRINT:	19.50 FEET
MAX FILL INSIDE BUILDING FOOTPRINT:	5.0 FEET
MAX CUT OUTSIDE THE BUILDING FOOTPRINT:	3.0 FEET
MAX FILL OUTSIDE THE BUILDING FOOTPRINT:	3.0 FEET
TOTAL CUT VOLUME:	1,400 CUBIC YARDS
TOTAL FILL VOLUME:	200 CUBIC YARDS
TOTAL EXPORT VOLUME:	1,200 CUBIC YARDS

EARTH QUANTITIES MAY VARY DUE TO SHRINKAGE AND SWELLING

SURVEY NOTE:

SURVEY COMPLETED BY:

KEN LONG, RCE 32728
SPENCER-LUEY ENGINEERING, INC
DATE COMPLETED: 2/22/17

LEGAL DESCRIPTION:

LOTS 39, 40, 41 AND 42, BLOCK 94 OF E. W. MORSE'S SUBDIVISION OF PUEBLO LOT 1150; IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO MAP THEREOF NO. 547, FILED IN THE COUNTY RECORDER'S OFFICE OF SAN DIEGO COUNTY, DECEMBER 30, 1871

BASIS OF ELEVATION

BRASS PLUG ON THE NORTHWEST CORNER AT THE INTERSECTION OF 30TH AND BROADWAY PER CITY OF SAN DIEGO VERTICAL CONTROL BOOK, PAGE 9.

DATUM: MSL
ELEVATION: 197.676

SURVEY NOTE:

ALL TOPOGRAPHIC AND BOUNDARY INFORMATION SHOWN HERON WAS PROVIDED BY OTHERS AND IS ASSUMED TO BE COMPLETE AND ACCURATE. PLSA HAS NOT PROVIDED ANY VERIFICATION OF EXISTING SITE TOPOGRAPHY, PROPERTY LINE LOCATIONS, OR EXISTING EASEMENTS OR ENCUMBRANCES AFFECTING THE SUBJECT PROPERTY.

WATER UTILITY NOTE:

ALL WATER SERVICES TO THE SITE, INCLUDING DOMESTIC, IRRIGATION AND FIRE, WILL REQUIRE PRIVATE, ABOVE GROUND BACKFLOW PREVENTION DEVICES BACKFLOW PREVENTION DEVICES SHALL BE LOCATED ON PRIVATE PROPERTY, IN LINE WITH THE SERVICE AND IMMEDIATELY ADJACENT TO THE RIGHT-OF-WAY. THE PUBLIC UTILITIES DEPARTMENT WILL NOT PERMIT THE REQUIRED BACKFLOW PREVENTION DEVICES TO BE LOCATED BELOW GRADE OR WITHIN THE STRUCTURE.

EXISTING WATER PRESSURE

PER CITY OF SAN DIEGO PUBLIC UTILITIES DEPT. GIS SECTION, THE EXISTING WATER PRESSURE AT THE SITE IS 92 PSI +/- 10 PSI.

GENERAL NOTES:

PRIOR TO THE ISSUANCE OF ANY CONSTRUCTION PERMIT THE OWNER/PERMITEE SHALL ENTER INTO A MAINTENANCE AGREEMENT FOR THE ONGOING PERMANENT BMP MAINTENANCE, SATISFACTORY TO THE CITY ENGINEER

PRIOR TO THE ISSUANCE OF ANY CONSTRUCTION PERMIT, THE OWNER/PERMITTEE SHALL INCORPORATE AN 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.

PRIOR TO THE ISSUANCE OF ANY CONSTRUCTION PERMIT, THE OWNER/PERMITTEE SHALL SUBMIT A WATER POLLUTION CONTROL PLAN (WPCP). THE WPCP SHALL BE PREPARED IN ACCORDANCE WITH THE GUIDELINES IN PART 2 CONSTRUCTION BMP STANDARDS CHAPTER 4 OF THE CITY'S STORM WATER STANDARDS.

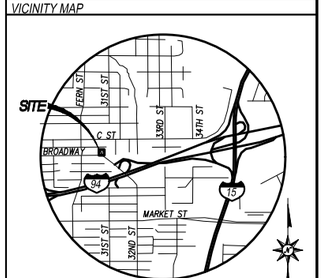
LEGEND

- SITE BOUNDARY
- RIGHT OF WAY
- PROPOSED SETBACKS
- STREET CENTERLINE
- EXISTING BUILDING
- EXISTING CONTOUR —100—
- EXISTING CURB
- EXISTING PCC
- EXISTING WALL
- EXISTING WATER MAIN W
- EXISTING WATER SERVICE W W
- EXISTING SEWER LATERAL S S
- EXISTING SEWER MAIN S
- PROPOSED BUILDING FOOTPRINT
- PROPOSED PCC PAVING
- GRIND & OVERLAY
- PROPOSED CURB & GUTTER PER SDG-151
- PROPOSED RETAINING WALL
- TRENCH RESURFACING
- LANDSCAPE AREA
- BIOFILTRATION PLANTER AREA
- PROPOSED CONTOUR 90
- PROPOSED SEWER SUMP & FORCE MAIN S S
- PROPOSED SEWER LATERAL PER SDS-103, 105, 108, 110(c) S
- PROPOSED WATER SERVICE W/ METER AND BACKFLOW PREV. PER SDW-135, 148, 149, 150 W W
- PROPOSED FIRE SERVICE PER SDW-105, SDW-118 RPDA W
- STORM DRAIN CURB OUTLET PER SDRSD D-25
- STORM DRAIN INLET
- STORM DRAIN PIPE
- DEEPENED FOOTING

ABBREVIATIONS:

BW	BOTTOM OF WALL
C/O	CLEANOUT
ELEC	ELECTRIC
EX	EXISTING
FF	FINISH FLOOR
FL	FLOW LINE
GF	GARAGE FLOOR
IE	INVERT ELEVATION
MH	MANHOLE
PROP	PROPOSED
PVC	POLYVINYL CHLORIDE PIPE
R/W	RIGHT-OF-WAY
TC	TOP OF CURB
TG	TOP OF GRATE
TW	TOP OF WALL

VICINITY MAP



VICINITY MAP
N.T.S.

3060 BROADWAY

PTS# 525677

3060 BROADWAY
SAN DIEGO, CA 92102

APN: 539-542-18

PROJECT TEAM

ARCHITECT
Safdie Rabines Architects
925 Fort Stockton Drive
San Diego, CA 92103
(619) 297-6153

CIVIL ENGINEER
Pasco Laret Suiter & Associates
535 N. Hwy 101
Solana Beach, CA 92075
PH: (858) 259-8212

LANDSCAPE ARCHITECT
McCullough Landscape Architecture, Inc
703 16th Street, Suite 100
San Diego, CA 92101
PH: (619) 296-3150
FAX: (619) 501-7725

LAND SURVEYOR
Spencer-Luey Engineering, Inc.
220 Linda Mar Drive
Solana Beach, CA 92075
PH: (858) 792-9242

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Veneklasen Associates
1711 Sixteenth Street
Santa Monica, CA 90404
PH: (310) 450-1733
FAX: (310) 396-3424

PASCO LARET SUITER & ASSOCIATES
CIVIL ENGINEERING + LAND PLANNING + LAND SURVEYING
535 North Highway 101, Ste A, Solana Beach, CA 92075
pb 858.259.8212 | fx 858.259.4812 | plsaengineering.com

REGISTERED PROFESSIONAL ENGINEER
WILLIAM GREGG MACK
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CIVIL
STATE OF CALIFORNIA

REVISIONS

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3	SDP RESUBMITTAL	03/24/2017
4	SDP RESUBMITTAL	05/19/2017

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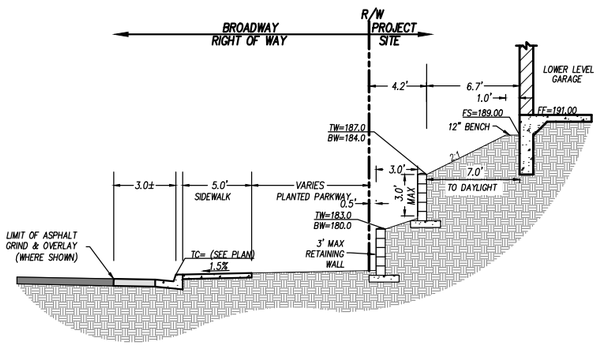
PLSA Project Number: 2639

PRELIMINARY GRADING PLAN

C110

SECTIONS AND DETAILS
SITE DEVELOPMENT PERMIT (SDP) NO. 1847594
3060 BROADWAY



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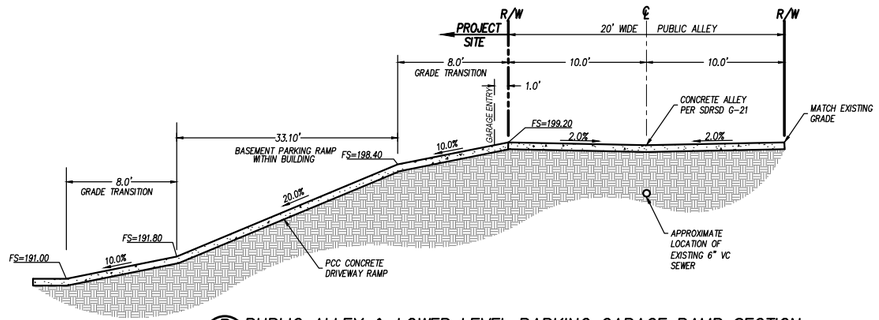

B 110 PUBLIC ALLEY & LOWER LEVEL PARKING GARAGE RAMP SECTION
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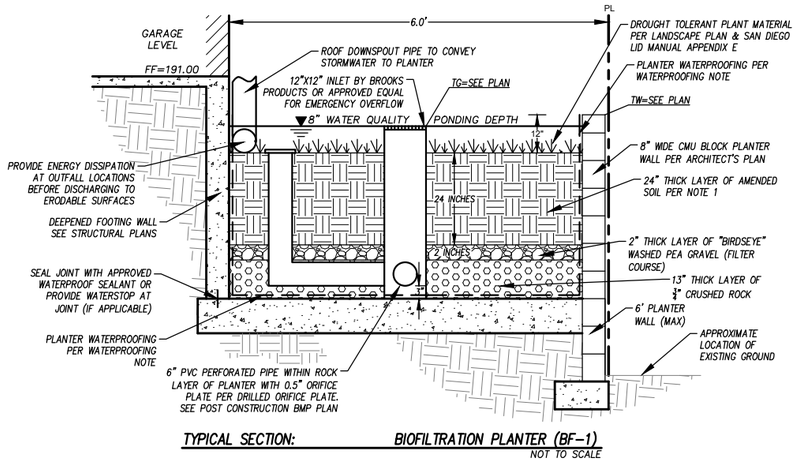

TYPICAL SECTION: BIOFILTRATION PLANTER (BF-1)
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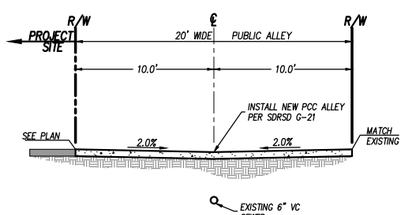

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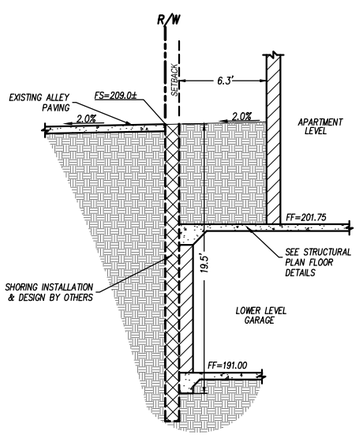

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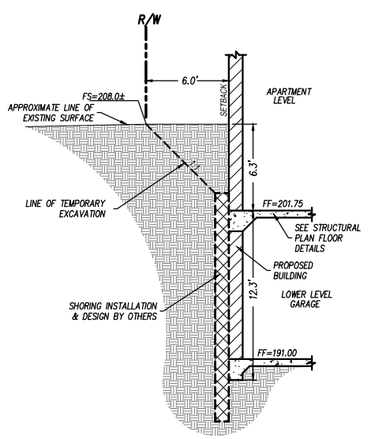
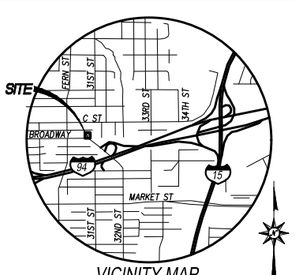


D 110 SITE SECTION: WESTERLY PL
NOT TO SCALE

VICINITY MAP



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ARCHITECT
Safdie Rabines Architects
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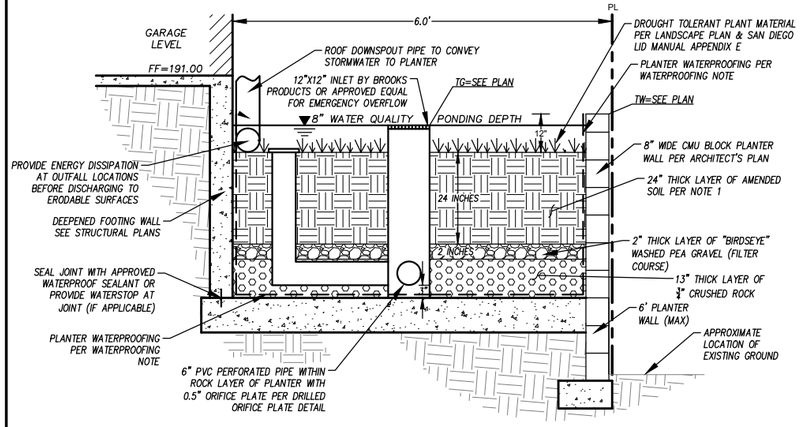
SECTIONS & DETAILS

C120

POST CONSTRUCTION BMP PLAN
SITE DEVELOPMENT PERMIT (SDP) NO. 1847594
3060 BROADWAY



TYPICAL SECTION: BIOFILTRATION PLANTER (BF-1)
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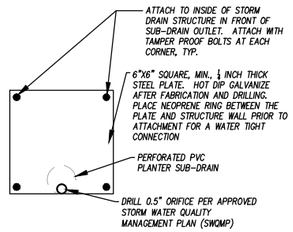

DRILLED ORIFICE PLATE DETAIL (TYP.)
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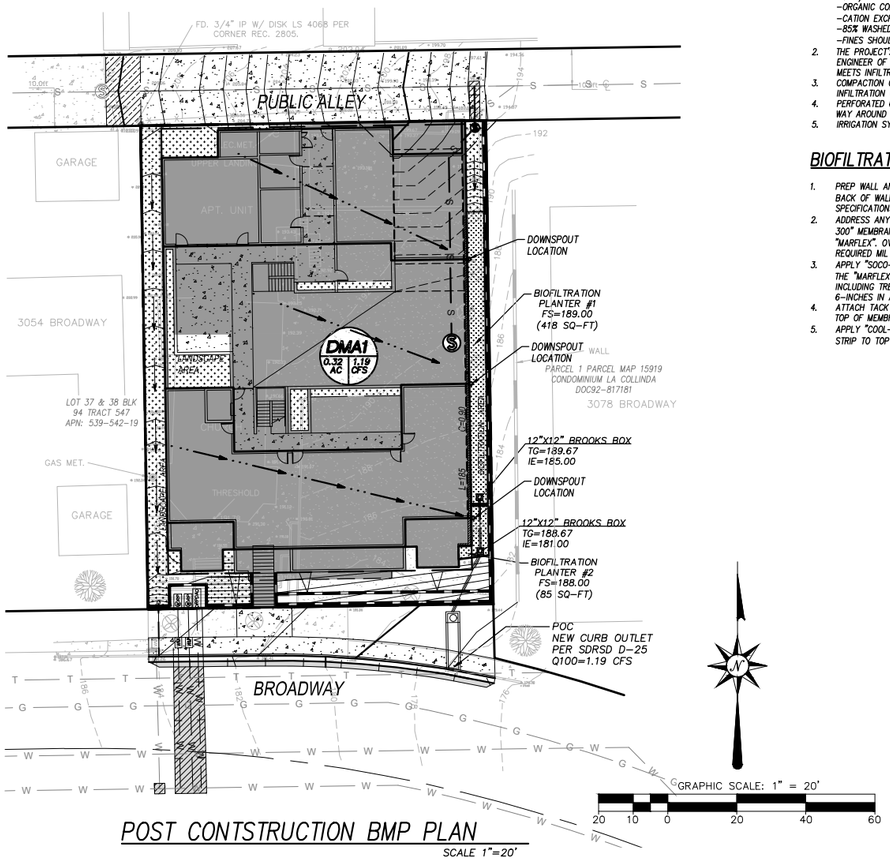


POST CONTSTRUCTION BMP PLAN
SCALE 1"=20'

BIOFILTRATION AREA NOTES

1. THE SOIL SHALL HAVE THE FOLLOWING PROPERTIES:
   - 5 IN/HR MINIMUM INFILTRATION RATE
   - ORGANIC CONTECT > 5 PERCENT
   - CATION EXCHANGE CAPACITY > 5 MILLIEQUIVALENT/100 G SOIL
   - 85% WASHED COURSE CONCRETE SAND, 10 PERCENT FINES
   - FINES SHOULD PASS A #270 (SCREEN SIZE) SIEVE
2. THE PROJECT'S GEOTECHNICAL ENGINEER SHALL PROVIDE CERTIFICATION TO THE ENGINEER OF WORK STATING THAT THE SOIL PLACED IN EACH BIOFILTRATION AREA MEETS INFILTRATION SPECIFICATIONS LISTED ABOVE.
3. COMPACTION OF SOIL IN BIOFILTRATION AREAS SHALL BE MINIMIZED TO ALLOW INFILTRATION TO OCCUR.
4. PERFORATED 6-INCH DIA. UNDERDRAIN PIPE SHALL HAVE PERFORATIONS ALL THE WAY AROUND THE PIPE AND BE SET AT THE BOTTOM OF THE PLANTER
5. IRRIGATION SYSTEM PER LANDSCAPE PLANS.

BIOFILTRATION AREA WATERPROOFING NOTES

1. PREP WALL AND FOOTING – SPRAY APPLY "MARFLEX 5000" COMMERCIAL MEMBRANE TO BACK OF WALL, TOP OF FOOTING AND BOTTOM OF PLANTER PER MANUFACTURER'S SPECIFICATIONS.
2. ADDRESS ANY EXPANSION JOINTS WITH 12-INCH MIN. STRIP OF "SOCO-SHIELD 300" MEMBRANE (10 MIL. MIN. THICKNESS) CENTERED OVER JOINT, ADHERED TO "MARFLEX". OVER SPRAY JOINT WITH "MARFLEX 5000" TO MANUFACTURER'S REQUIRED MIL THICKNESS.
3. APPLY "SOCO-SHIELD 300" MEMBRANE (10 MIL. MIN. THICKNESS) TO ADHERE TO THE "MARFLEX 5000" OVER ENTIRE WALL, STEM WALL AND PLANTER BOTTOM INCLUDING TREATED EXPANSION JOINTS. OVERLAP MATERIAL SEAMS A MIN. OF 6-INCHES IN ALL DIRECTIONS.
4. ATTACH TACK STRIP AT TOP OF MEMBRANE AND ON SIDE ENDS OF WALL FROM TOP OF MEMBRANE TO TOP OF FOOTING.
5. APPLY "COOL-COAT" OF EQUIVALENT U.V. RESISTANT MEMBRANE ABOVE TACK STRIP TO TOP OF WALL PER MANUFACTURER'S SPECIFICATIONS.

IMPERVIOUS AREA TABULATIONS:

EXISTING IMPERVIOUS AREA: 11,564 S.F. (0.27 ACRES)

PROPOSED IMPERVIOUS AREA: 12,618 S.F. (0.29 ACRES) INCREASE OF 7.5%

ROOF AREA RUNOFF CONVEYANCE:

THE STORMWATER RUNOFF FROM THE THE PROPOSED ROOF AREAS SHALL BE CONVEYED THROUGH THE PROPOSED ROOF DRAIN SYSTEMS DESIGNED BY THE PROJECT ARCHITECT ACCORDING TO THE DRAINAGE AREAS SHOWN ON THIS PLAN.

SOIL INFORMATION

SOIL TYPE: TYPE D
DEPTH TO GROUNDWATER: UNKNOWN

LOW-IMPACT DEVELOPMENT DESIGN PRACTICES

- DESIGN CONCEPT LID-1: OPTIMIZE THE SITE LAYOUT
  - UTILIZE EXISTING TOPOGRAPHY TO REDUCE THE NEED FOR GRADING BY MATCHING THE SITE'S EXISTING IMPROVEMENTS AS MUCH AS FEASIBLE.
  - PROMOTE SHEET FLOW AND NATURAL SURFACE DRAINAGE TO BMPS OR INTEGRATED MANAGEMENT PRACTICES LOCATED AT LOWER ELEVATIONS OF THE SITE.
  - REPLICATE THE SITE'S EXISTING DRAINAGE PATTERN.
- DESIGN CONCEPT LID-2: MINIMIZE IMPERVIOUS FOOTPRINT
  - INTRODUCE NEW LANDSCAPE AREAS IN PLACE OF EXISTING IMPERVIOUS AREA.
  - MINIMIZE THE USE OF IMPERVIOUS SURFACES IN THE LANDSCAPE DESIGN.
- DESIGN CONCEPT LID-3: DISPERSE RUNOFF TO ADJACENT LANDSCAPING AND IMPS
  - DRAIN IMPERVIOUS PARKING LOTS AND ROOK AREAS INTO ADJACENT LANDSCAPING AREAS.
- DESIGN CONCEPT LID-4: CONSTRUCTION CONSIDERATIONS
  - MINIMIZE SOIL COMPACTION FOR LANDSCAPED AREAS OF THE PROJECT SITE.
  - IMPLEMENT SOIL AMENDMENTS TO IMPROVE PLANT HEALTH AND ESTABLISHMENT.

SOURCE CONTROL BEST MANAGEMENT PRACTICES

- USE EFFICIENT IRRIGATION SYSTEMS AND LANDSCAPE DESIGN
- EMPLOY INTEGRATED PEST MANAGEMENT PRINCIPLES
- REQUIRE IMPLEMENTATION OF POST-CONSTRUCTION SOIL STABLIZATION PRATICES
- RESTRICT THE USE OF GALVANIZED AND COPPER ROOFING MATERIALS

BIOFILTRATION PLANTER SOIL PROPERTIES

ORGANIC CONTENT (OC) > 5 PERCENT, PH BETWEEN 6-8, CATION EXCHANGE CAPACITY (CEC) > 5 MILLIEQUIVALENT (MEQ)/100 G SOIL, INFILTRATION RATES OF 0.5 INCHES PER HOUR OR GREATER, SOIL MEDIA MUST HAVE AN APPROPRIATE AMOUNT OF ORGANIC MATERIAL TO SUPPORT PLANT GROWTH (E.G. LOAMY SAND MIXED THOROUGHLY WITH AN ORGANIC MATERIAL). IF THE EXISTING SOILS DO NOT MEET THE CRITERIA, A SUBSTITUTE MEDIA MUST BE USED. SOIL MEDIA THAT IS BROUGHT TO THE SITE MUST MEET THE STANDARDS SET IN THE STORM WATER STANDARDS AS WELL AS THE FOLLOWING CRITERIA:

1. SOIL MEDIA CONSISTS OF 85 PERCENT WASHED COURSE SAND, 10 PERCENT FINES (RANGE: 8-12 PERCENT; 8 PERCENT – 2 IN/HR INFILTRATION RATE), AND 5 PERCENT ORGANIC MATTER.

2. THE SAND PORTION SHOULD CONSIST OF CONCRETE SAND (PASSING A ONE-EIGHTH -INCH-SIEVE). MORTAR SAND (PASSING A ONE-EIGHTH-INCH-SIEVE) IS ACCEPTABLE AS LONG AS IT IS THOROUGHLY WASHED TO REMOVE THE FINES.

3. FINES SHOULD PASS A # 270 (SCREEN SIZE) SIEVE.

4. ORGANIC MATTER IS CONSIDERED AN ADDITIVE TO ASSIST VEGETATION IN INITIAL ESTABLISHMENT AND CONTRIBUTES TO ABSORPTION OF POLLUTANTS BUT GENERALLY SHOULD BE MINIMIZED (5 PERCENT). ORGANIC MATERIALS WILL OXIDIZE OVER TIME CAUSING AN INCREASE IN PONDING THAT COULD ADVERSELY AFFECT THE PERFORMANCE OF THE BIORETENTION AREA. ORGANIC MATERIAL SHOULD CONSIST OF MANURE OR ANIMAL COMPOST. STUDIES HAVE ALSO SHOWN NEWSPAPER MULCH TO BE AN ACCEPTABLE ADDITIVE.

PERMANENT POST-CONSTRUCTION BMP NOTES:

1. OPERATION AND MAINTENANCE SHALL BE SECURED BY AN EXECUTED AND RECORDED STORM WATER MANAGEMENT AND DISCHARGE CONTROL MAINTENANCE AGREEMENT (SWMDCMA), OR ANOTHER MECHANISM APPROVED BY THE CITY ENGINEER, THAT ASSURES ALL PERMANENT BMPS WILL BE MAINTAINED IN PERPETUITY, PER THE LAND DEVELOPMENT MANUAL, STORM WATER STANDARDS.
2. ANY MODIFICATIONS TO THE PERMANENT POST-CONSTRUCTION BMP DEVICES/STRUCTURES SHOWN ON PLAN REQUIRES A CONSTRUCTION CHANGE TO BE PROCESSED AND APPROVED THROUGH DEVELOPMENT SERVICES DEPARTMENT BY THE ENGINEER OF WORK. APPROVAL OF THE CONSTRUCTION CHANGE IS REQUIRED PRIOR TO CONSTRUCTION OF THE PERMANENT BMP.

POST-CONSTRUCTION PERMANENT BMP OPERATION & MAINTENANCE PROCEDURE DETAILS

STORM WATER MANAGEMENT AND DISCHARGE CONTROL MAINTENANCE AGREEMENT APPROVAL NO.: _____

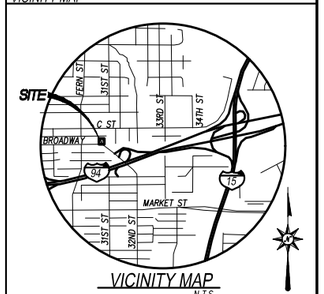
O&M RESPONSIBLE PARTY DESIGNEE: LITTLE POINT, LLC

BMP DESCRIPTION	INSPECTION FREQUENCY	MAINTENANCE FREQUENCY	MAINTENANCE METHOD	QUANTITY	SHEET NUMBER(S)
EDUCATION PROGRAM (SOURCE CONTROL)	ANNUAL	AS NEEDED	EMPLOYEE EDUCATION PROGRAM	N/A	N/A
SITE SIGNAGE & STENCILING (SOURCE CONTROL)	ANNUAL	AS NEEDED	REPAIR AND REPLACE AS NECESSARY	N/A	N/A
BIOFILTRATION PLANTER (LID & TREATMENT CONTROL)	BI-ANNUAL	BI-ANNUAL, AS NEEDED	MOWING AND DEBRIS COLLECTION AS NECESSARY. REPAIR AS NEEDED	520 S.F.	C 1.10

LEGEND

- FLOW PATH
- PROPOSED P.C.C. CONCRETE PAVEMENT
- IMPERVIOUS AREA
- PROPOSED BUILDING
- PROPOSED FLOW THROUGH PLANTER BMP
- MAJOR DMA BOUNDARY
- PROPOSED BROOKS BOX CATCH BASIN
- PROPOSED STORM DRAIN DISCHARGE CONVEYANCE
- D-25 CURB OUTLET

VICINITY MAP



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POST CONSTRUCTION BMP PLAN

C130

ATTACHMENT 5
DRAINAGE REPORT

Attach project's drainage report. Refer to Drainage Design Manual to determine the reporting requirements.

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DRAINAGE STUDY

3060 BROADWAY

PTS#: 525677

APN: 539-542-18
3060 Broadway
San Diego, California 92102

Prepared By:

William Gregg Mack, P.E. RCE 73620 EXP: 12-31-18
Pasco Laret Suiter & Associates, Inc.
535 N. Highway 101, Suite A
Solana Beach, CA 92075

PASCO LARET SUITER & ASSOCIATES
CIVIL ENGINEERING + LAND PLANNING + LAND SURVEYING

Prepared for:
Little Point, LLC
1601 N Sepulveda Blvd, #372
Manhattan Beach, CA 92066

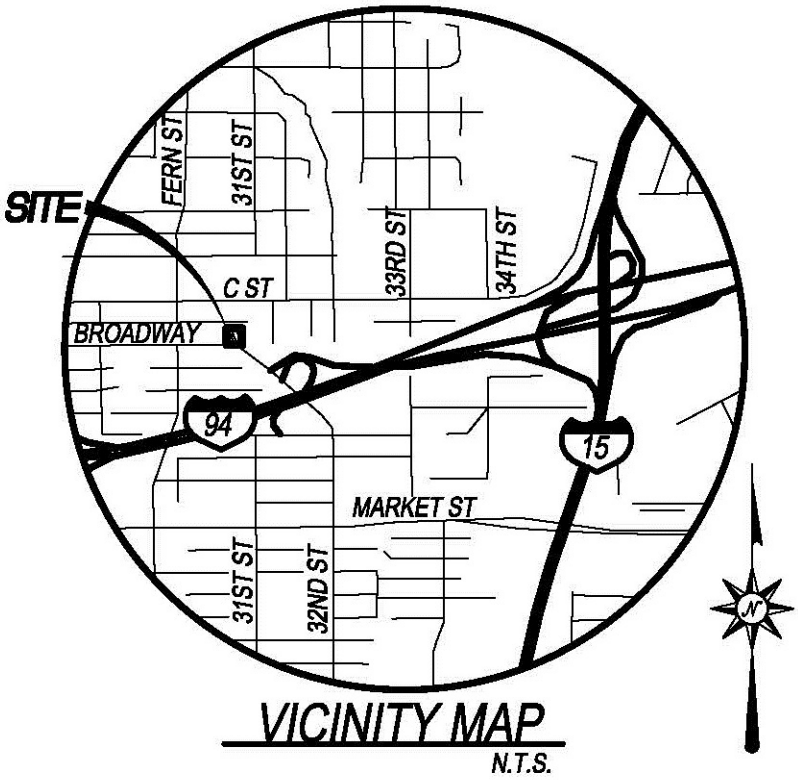
May 19, 2017

TABLE OF CONTENTS

1. INTRODUCTION 4
1.1 Project Description 4
1.2 Existing Conditions 4
1.3 Proposed Conditions 4
2. METHODOLOGY 5
2.1 Rational Method 5
2.2 Runoff Coefficient 5
2.3 Rainfall Intensity 5
2.4 Tributary Areas 6
3. CALCULATIONS/RESULTS 6
3.1 Pre & Post Development Peak Flow Comparison 6
4. CONCLUSION 7

Appendix 1 ..... Pre & Post Project Hydrology Calculations
Appendix 2 ..... Existing and Proposed Drainage Exhibits

Figure 1 Vicinity Map



1. INTRODUCTION

Project Description

The 0.32 acre project site is located at 3060 Broadway in the City of San Diego, California, APN: 539-542-18. The project site is comprised of Lots 39, 40, 41 & 42 of Block 94 of Morse's Subdivision of Pueblo Lot 1150. The existing site condition is developed and includes an existing church, apartment building and parking lot. The proposed project will remove the existing buildings and improvements and construct a new multifamily residential building along with the surface improvements around the proposed building which include concrete paving, landscape areas & stormwater treatment facilities.

Existing Conditions

The project site currently functions as a church and apartment building. The existing 0.32 acre site is 83% impervious including the existing buildings and on-site improvements (i.e. driveway, parking lot and concrete walkways). The site currently sheet flows storm water south across the site towards Broadway. The site is currently developed with 2 existing structures and a parking lot with no on-site storm drain system. The site does not have any natural drainage features through the site and does not receive any run-on from adjacent properties. The peak storm water runoff flow was calculated using the rational method, Q=CiA. The site is 83% impervious in the existing condition, therefore a runoff coefficient of 0.86 is used. The site is relatively small so the minimum 5 min time of concentration was used which generated a peak runoff Q of 1.23 CFS. The runoff is collected and conveyed in the street gutter of Broadway. It then travels east and is collected by a public storm drain inlet located on the north side of Broadway. The public storm drain system then conveys the storm water out to Chollas Creek and eventually to the San Diego Bay. Portions of the drainage path leading to the San Diego Bay are earthen unreinforced channels, therefore hydromodification management criteria will be implemented in the post-project design.

Proposed Conditions

The project proposes a new multi-family residential building with covered parking. The project will aslo improve the hardscaping around the proposed building which will include sidewalk, landscaping and concrete paving. The peak post project storm water runoff flow was calculated using the rational method, Q=CiA. The proposed site will be 77% impervious, therefore a runoff coefficient of 0.84 is used. The site is relatively small so the minimum 5 min time of concentration was used which generated a peak runoff Q of 1.19 CFS. As a result of the overall decrease in impervious area, there will be a decrease in peak runoff of 0.04 cfs from the pre-project condition. Please refer to the Storm Water Quality Management Plan (SWQMP) for 3060 Broadway, prepared by PLSA, dated March 24, 2017, for a detailed discussion and calculations of the proposed storm water treatment control facilities.

2. METHODOLOGY

The proposed project has been analyzed to determine the peak runoff flow for 100 year, 6 hour rainfall event using the Rational Method per the City of San Diego Drainage Design Manual (Section 1-102.3). The Runoff Coefficient, C, for the existing and proposed conditions were selected using Table 2 of page 82 of the City of San Diego Drainage Design Manual, Revised C Method. The time of concentration for all existing and proposed drainage areas were calculated using the minimum T_C of 5 min which yields an intensity of 6.5 inches per hour.

The proposed LID best management practices have been sized and located such that all runoff will be directed to flow through planters or through pervious areas before ultimately discharging to the downstream storm drain system.

2.1 Rational Method

As mentioned above, runoff from the project site was calculated for the 100-year storm events. Runoff was calculated using the Rational Method which is given by the following equation:
$Q = C \times I \times A$

Where:
Q = Flow rate in cubic feet per second (cfs)
C = Runoff coefficient (Determined from Table 2, P. 82, City of San Diego Drainage Design Manual)
I = Rainfall Intensity in inches per hour (in/hr)
A = Drainage basin area in acres, (ac)
Rational Method calculations were performed using the City of San Diego Drainage Design Manual (Section 1-102.3)

2.2 Runoff Coefficient

The runoff coefficients for the project were calculated using Table 2 from the City of San Diego Drainage Design Manual (April, 1984), using the Revised C Method for the proposed condition.

In the existing condition, the project site is an existing development. Per the City of San Diego Drainage Design Manual, the C value is 0.45 for pervious area and 0.95 for impervious area. The existing condition drainage characteristics are divided into one (1) drainage area. The weighted runoff factor is calculated based on the actual percentage of impervious area. Please refer to the Table 3.1 for a summary of the calculated C values.

In the proposed condition: Of the total site area of 0.32 acres, approximately 0.29 acres or 90% is impervious in the proposed condition. The post project runoff coefficient is calculated based on the actual percentage of impervious area. Please refer to table 3.1

2.3 Rainfall Intensity

Rainfall intensity was determined using the Rainfall Intensity Duration Frequency Curves from page 83 of the City of San Diego Drainage Design Manual (April, 1984). Based on a 5 min time of concentration, an intensity of 6.5 inches per hour is used.

2.4 Tributary Areas

Drainage basins are delineated in the Post Development Drainage Exhibit in Appendix 1 and graphically portray the tributary area for each drainage basin.

3. CALCULATIONS/RESULTS

3.1 Pre & Post Development Peak Flow Comparison

Below are a series of tables which summarize the calculations provided in the Appendix of this report.

SITE IMPERVIOUS AREA COMPOSITION					
	TOTAL IMPERVIOUS AREA (ACRES)	TOTAL PERVIOUS AREA (ACRES)	TOTAL PROJECT AREA (ACRES)	% IMPERVIOUS SURFACES	RUNOFF COEFFICIENT "C"
Existing	0.27	0.05	0.32	83%	0.86
Proposed	0.25	0.07	0.32	77%	0.84

Table 1. Runoff Coefficient "C" Comparison

The table above shows the difference in the runoff coefficient, "C", between the existing and proposed condition.

EXISTING DRAINAGE FLOWS			
DRAINAGE AREA	DRAINAGE AREA (ACRES)	Q_{100} (CFS)	I_{100} (IN/HR)
A–1	0.32	1.23	4.4

Table 2. Existing Condition Peak Drainage Flow Rates

Table 2 above lists the peak flow rates for the project site in the existing condition for the respective rainfall events.

Table 3. Proposed Condition Peak Drainage Flow Rates

PROPOSED DRAINAGE FLOWS			
DRAINAGE AREA	DRAINAGE AREA (ACRES)	Q_{100} (CFS)	I_{100} (IN/HR)
A–1	0.32	1.19	4.4

The table above lists the peak flow rates for the project site for the proposed condition for the respective rainfall events.

Table 4. Proposed Condition Peak Drainage Flow Rates

PEAK DRAINAGE FLOW COMPARISON			
CONDITION	DRAINAGE AREA (ACRES)	Q_{100} (CFS)	C
Existing	0.32	1.23	0.86
Proposed	0.32	1.19	0.90
Existing vs. Proposed Condition Comparison		-0.04	

Table 4 above shows a comparison between the peak flow rates for the proposed project and the existing condition for the peak project site for the proposed condition for the respective rainfall events.

As shown in Table 4, the project does not increase the peak runoff rate for the design storms analyzed when comparing the pre-project runoff coefficient to the post-project runoff coefficient, however, the comparison does not account for detention and routing through the BMP's. Therefore, the comparison is considered conservative and the actual post project runoff, accounting for routing, will be less than the post-project peak runoff value tabled above, therefore Q100 detention is not required. As a result, the post project runoff will be less than the pre-project condition.

4. CONCLUSION

As discussed previously, the proposed project's peak runoff is less than the existing condition peak runoff. The proposed project will not negatively affect downstream facilities since the overall peak flow rate will decrease when compared to the pre-project condition. It is my professional opinion that the storm drain and treatment systems as proposed in this report and on the grading plans herein is adequate to intercept, treat, contain and convey Q100.

PASCO LARET SUITER & ASSOCIATES
CIVIL ENGINEERING + LAND PLANNING + LAND SURVEYING

APPENDIX 1

PRE-PROJECT & POST-PROJECT

HYDROLGY CALCULATIONS

3060 BROADWAY
J-2639
5/16/2017

PRE-PROJECT HYDROLOGY

Drainage Area	Area Description	Total Area (Ac)	Total Area (sq-ft)	Total Impervious Area (Sq-Ft)	% Impervious	% Pervious	Weighted Runoff Coefficient	Peak Runoff Q: (CFS)	Peak Runoff Volume: (cu-ft)
A-1	**EX LOT**	0.32	14000	11564	83%	17%	0.86	1.23	2517

POST-PROJECT HYDROLOGY

BMP Location	DMA Description	Total Area (Ac)	Total Area (sq-ft)	Total Impervious Area (Sq-Ft)	% Impervious	% Pervious	Weighted Runoff Coefficient	Peak Runoff Q: (CFS)	Peak Runoff Volume: (cu-ft)
A-1	**PODIUM BMP TRIB AREA**	0.32	14000	10818	77%	23%	0.84	1.19	2439
	TOTAL:	**0.32**	**14000.00**	**10818.00**	**77%**	**23%**	**0.84**	**1.19**	**2439.38**

Note:

1. 500 sq-ft of additional impervios area was included to account for unforseen impervious areas (i.e. Pool and patio areas)

100 Yr Storm at 5 Min TC		
Intensity:	4.40	in/hr
Precip:	2.50	in

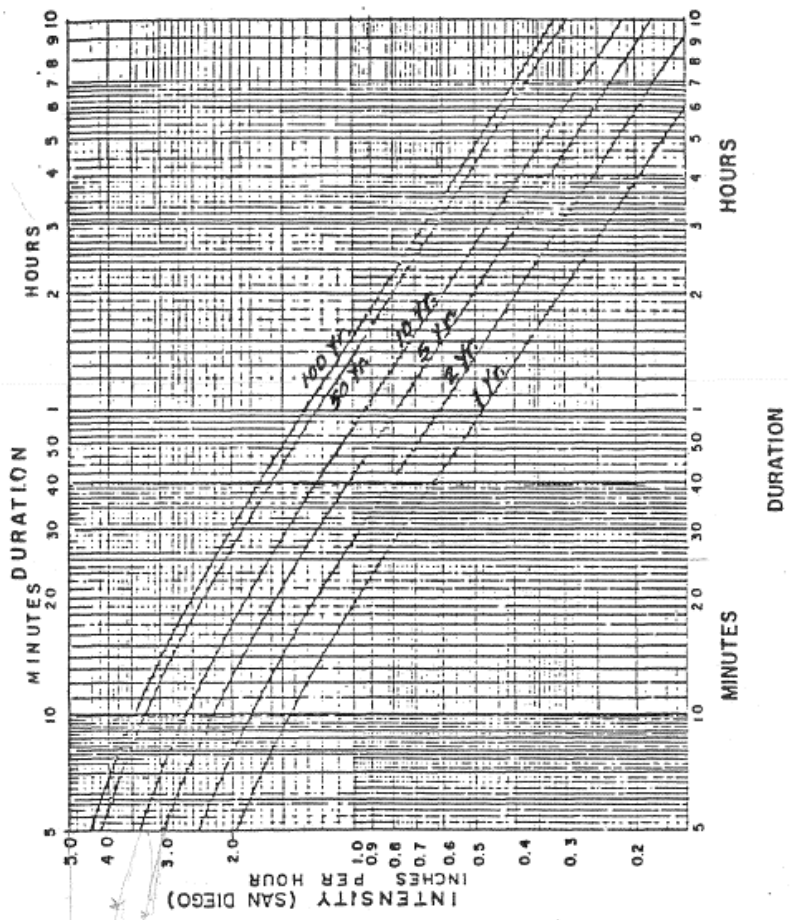
Runoff Coefficient	
Impervious	0.95
Landscape	0.45
Permeable Pavers	0.45

Detention Calculation:

Pre-Project Peak Runoff Volume:	2517	cu-ft	
Post-Project Peak Runoff Volume:	2439	cu-ft	
Delta Peak Runoff Volume (Post - Pre):	-78	cu-ft	
Volume Provided by BMP's:	942.835	cu-ft	*From SWQMP BMP sizing summary

1027 > -78 Therefore, Adequate Detention Provided

Results: The volume provided in the BMPs and the overall decrease of impervious areas results a smaller post project discharge Q
Therefore, detention is not required



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.

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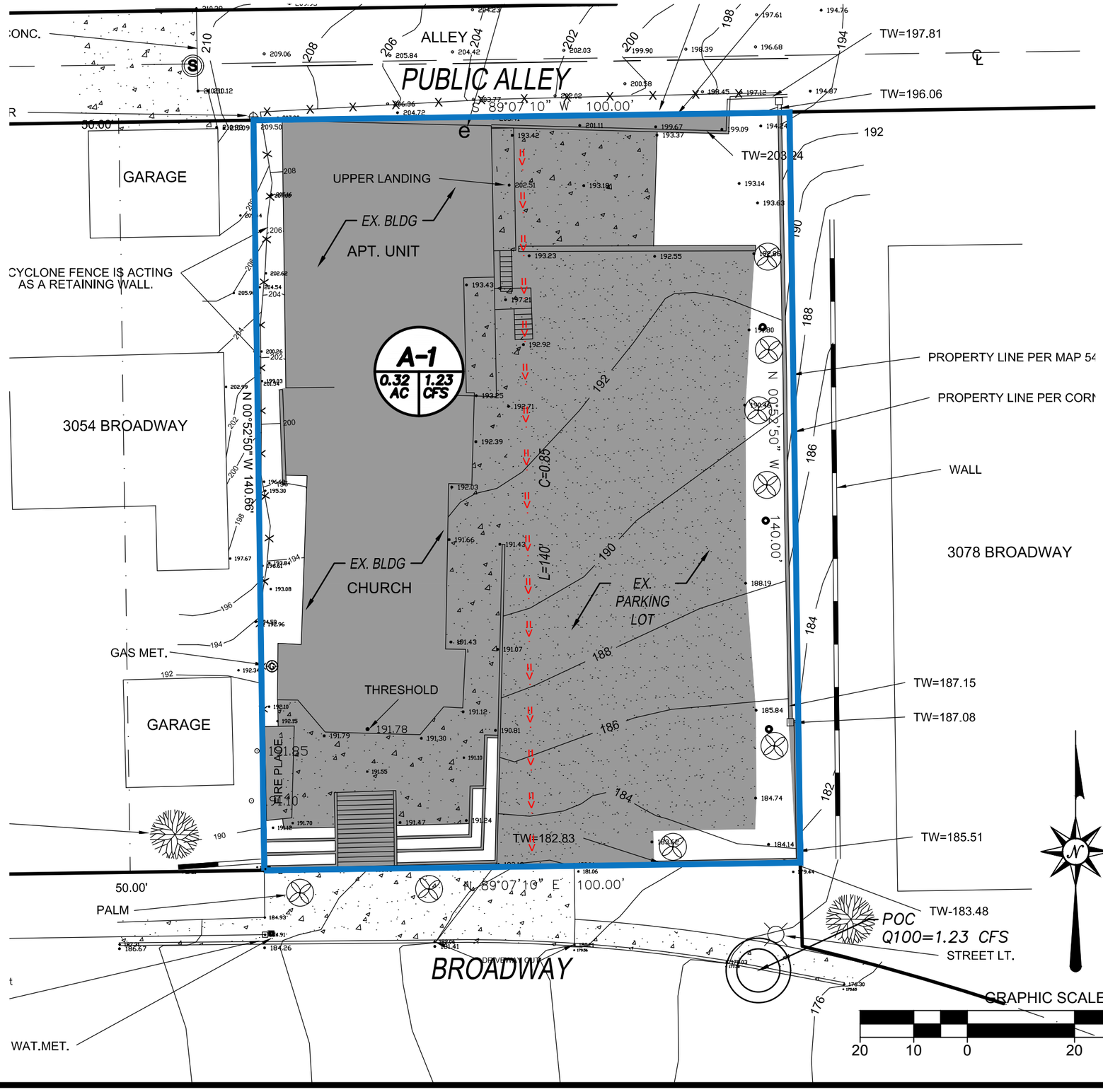
APPENDIX 2

EXISTING & PROPOSED

DRAINAGE EXHIBITS



LEGEND

DESCRIPTION	SYMBOL
LOT LINE	
EXIST. CONTOUR	300
BASIN BOUNDARY	
FLOWLINE	=>
FLOW DIRECTION	
BASIN SUMMARY Q_{100}	A-1 / X.X AC / X.X CFS
IMPERVIOUS AREA	
PERVIOUS PAVERS	
BIOFILTRATION BASIN AREA	

HYDROLOGY
PRE-PROJECT EXHIBIT

3060 BROADWAY

3060 BROADWAY, SAN DIEGO

PROJECT NUMBER: PE 2639

SCALE: 1" = 20'

DATE: MARCH 24, 2017

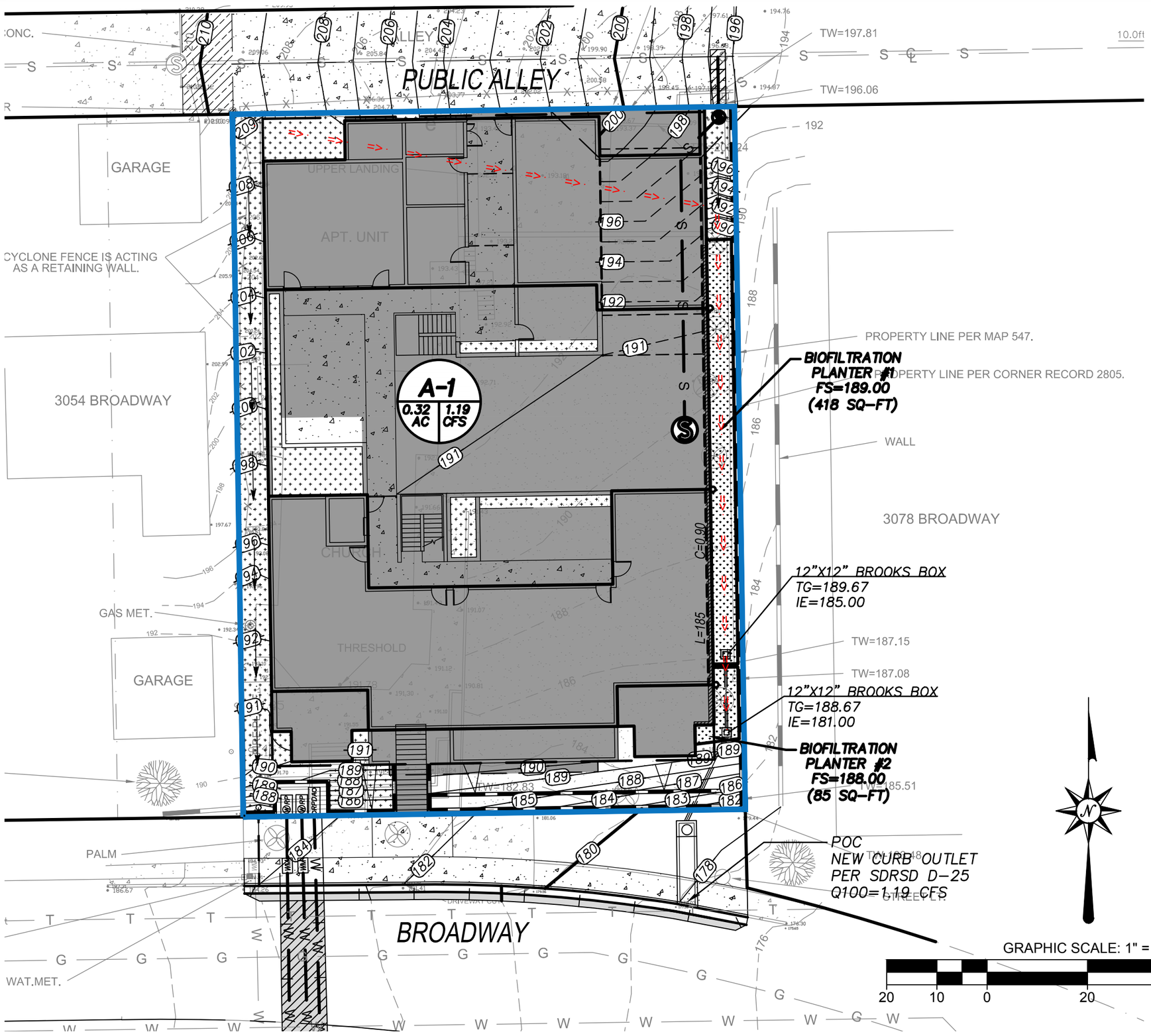
SHEET 1 OF 1

PASCO LARET SUITER & ASSOCIATES

CIVIL ENGINEERING + LAND PLANNING + LAND SURVEYING

535 North Highway 101, Ste A, Solana Beach, CA 92075

ph 858.259.8212 | fx 858.259.4812 | plsaengineering.com



LEGEND

DESCRIPTION	SYMBOL
LOT LINE	
EXIST. CONTOUR	300
PROP. CONTOUR	299
BASIN BOUNDARY	
FLOWLINE	=>
FLOW DIRECTION	
BASIN SUMMARY Q_{100}	A-1 / X.X AC / X.X CFS
IMPERVIOUS AREA	
PERVIOUS PAVERS	
BIOFILTRATION BASIN AREA	

HYDROLOGY
POST-PROJECT EXHIBIT

3060 BROADWAY

3060 BROADWAY, SAN DIEGO

PROJECT NUMBER: PE 2639

SCALE: 1" = 20'

DATE: MARCH 24, 2017

SHEET 1 OF 1

PASCO LARET SUITER & ASSOCIATES

CIVIL ENGINEERING + LAND PLANNING + LAND SURVEYING

535 North Highway 101, Ste A, Solana Beach, CA 92075

ph 858.259.8212 | fx 858.259.4812 | plsaengineering.com

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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REPORT OF PRELIMINARY GEOTECHNICAL INVESTIGATION AND INFILTRATION TESTING

Proposed 4-Story Residential Building
3060 Broadway
San Diego, California

JOB NO. 16-11320
17 March 2017

Prepared for:

Little Point LLC

Geotechnical Exploration, Inc.

SOIL AND FOUNDATION ENGINEERING ● GROUNDWATER ● ENGINEERING GEOLOGY

17 March 2017

Little Point LLC
c/o Cabochon
7647 Girard Avenue
San Diego, CA 92307
Attn: Mr. Jerry Rudick

Job No. 16-11320

Subject: **Report of Preliminary Geotechnical Investigation and Infiltration Testing**
Proposed 4-Story Residential Building
3060 Broadway
San Diego, California

Dear Mr. Rudick:

In accordance with your request ***Geotechnical Exploration, Inc***. has performed a preliminary geotechnical investigation and infiltration testing for the subject project in San Diego, California. The fieldwork was performed on February 24, 2017.

If the conclusions and recommendations presented in this report are incorporated into the design and construction of the proposed development, it is our opinion that the site is suitable for the project.

This opportunity to be of service is sincerely appreciated. Should you have any questions concerning the following report, please do not hesitate to contact us. Reference to our **Job No. 16-11320** will expedite a response to your inquiries.

Respectfully submitted,

GEOTECHNICAL EXPLORATION, INC.

Wm. D. Hespeler, G.E. 396
Senior Geotechnical Engineer

Jonathan A. Browning
C.E.G. 2615/P.G. 9012
Senior Project Geologist

7420 TRADE STREET ● SAN DIEGO, CA. 92121 ● (858) 549-7222 ● FAX: (858) 549-1604 ● EMAIL: geotech@gei-sd.com

TABLE OF CONTENTS

		PAGE
I.	PROJECT SUMMARY AND SCOPE OF SERVICES	1
II.	SITE DESCRIPTION AND HISTORY	2
III.	FIELD INVESTIGATION	2
IV.	LABORATORY TESTS	5
V.	SOIL DESCRIPTION	6
VI	GROUNDWATER	7
VII.	GEOLOGIC HAZARDS AND SEISMIC CONSIDERATIONS	8
VIII.	CONCLUSION AND RECOMMENDATIONS	9
IX.	GRADING NOTES	24
X.	LIMITATIONS	25

FIGURES

I. Vicinity Map
IIa. City of San Diego Topographic Map
III. Site Plan
IVa-f. Exploratory Boring Logs
V. Geologic Hazards Map
VI. Geologic Map
VIIa-e. Geologic Cross Sections

APPENDICES

A. Unified Soil Classification System
B. Percolation Test Results and Infiltration Rate Conversions

REPORT OF PRELIMINARY GEOTECHNICAL INVESTIGATION AND INFILTRATION TESTING

Proposed 4-Story Residential Building
3060 Broadway
San Diego, California

JOB NO. 16-11320

The following report presents the findings and recommendations of ***Geotechnical Exploration, Inc.*** for the subject project.

I. PROJECT SUMMARY AND SCOPE OF SERVICES

Based on our review of preliminary plans provided us, the project will consist of a 4-story residential building with parking on the ground floor which will be below grade. We anticipate that maximum combined dead plus live column and wall loads will be on the order of 200 kips and 10 kips per lineal foot, respectively. Grading to achieve the desired elevations will include raising the lower eastern half of the site and lowering the western half of the site. To achieve the proposed grades will require shoring along the northern and western property boundaries

Based on the preceding, the scope of work performed for this investigation included a site reconnaissance and subsurface exploration program including percolation testing, laboratory testing, geotechnical engineering analysis of the field and laboratory data, and the preparation of this report. The data obtained and the analyses performed were for the purpose of providing design and construction criteria for the project earthwork, building foundations, slab on-grade floors, basement walls, temporary shoring, and storm water infiltration BMPs.

II. SITE DESCRIPTION AND HISTORY

The site of the proposed residential building is located on the north side of Broadway about 370 feet east of 30th Street (see Vicinity Map, Figure No. I). The property is currently occupied by a church and apartment building in the western half of the site and AC pavement in the eastern half. The rectangular-shaped property has a plan area of 0.32-acre and is bounded to the south by Broadway, to the east and west by existing residential structures, and to the north by an alley. Elevations across the site range from about elevation +209 feet above MSL at the northwest corner to elevation +184 feet above MSL at the southeast corner. Based on our review of a City of San Diego Metropolitan Topographic Survey Map (Sheet 198-1725), 1954 edition (see Figure No. II), the eastern portion of the site was on the western flank of a southerly trending drainage. Review of the 1976 edition (see Figure No. IIa) indicates that, during that time interval, the lower eastern portion of the site had been filled to the current elevations. There is likely no documentation regarding that grading and the grading may well have occurred prior to current compaction standards.

III. FIELD INVESTIGATION

A. Subsurface Investigation

The field investigation consisted of a surface reconnaissance and a subsurface exploration program utilizing a truck-mounted, continuous-flight auger drill rig. Six exploratory borings were drilled in the eastern portion of the site on February 24, 2017, to depths of 3½ to 17½ feet. The soils encountered in the borings were continuously logged in the field by our geologist and described in accordance with

the Unified Soil Classification System (refer to Appendix A). The approximate locations of the borings are shown on the Site Plan, Figure No. III.

Representative samples were obtained from the exploratory borings at selected depths appropriate to the investigation. All samples were returned to our laboratory for evaluation and testing. Standard penetration resistance blow counts were obtained by driving a 2-inch O.D. split spoon sampler with a 140-pound hammer dropping through a 30-inch free fall. The sampler was driven a maximum of 18 inches and the number of blows for each 6-inch interval was recorded. The blows per foot indicated on the boring logs represent the accumulated number of blows that were required to drive the last 12 inches or portion thereof. Samples contained in liners were recovered by driving a 3.0-inch O.D. modified California sampler 18 inches into the soil using a 140-pound hammer.

Boring logs have been prepared on the basis of our observations and laboratory test results. Logs of the borings are attached as Figure Nos. IVa-f. The following chart provides an in-house correlation between the number of blows and the relative density of the soil for the Standard Penetration Test and the 3-inch sampler.

SOIL	***DENSITY DESIGNATION***	***2-INCH O.D. SAMPLER BLOWS/FOOT***	***3-INCH O.D. SAMPLER BLOWS/FOOT***
Sand and Nonplastic Silt	Very loose	0-4	0-7
	Loose	5-10	8-20
	Medium	11-30	21-53
	Dense	31-50	54-98
	Very Dense	Over 50	Over 98

SOIL	DENSITY DESIGNATION	2-INCH O.D. SAMPLER BLOWS/FOOT	3-INCH O.D. SAMPLER BLOWS/FOOT
Clay and Plastic Silt	Very soft	0-2	0-2
	Soft	3-4	3-4
	Firm	5-8	5-9
	Stiff	9-15	10-18
	Very stiff	16-30	19-45
	Hard	31-60	46-90
	Very Hard	Over 60	Over 90

B. Infiltration Testing

In addition to the exploratory borings, we drilled two infiltration testing borings in the lower southern portion of the site on February 24, 2017, for evaluation of storm water infiltration BMPs, per the requirements of the City of San Diego's Storm Water Standards, BMP Design Manual in accordance with the Guidelines for Geotechnical Reports (Appendix C), and Approved Infiltration Rate Assessment Methods (Appendix D). The location of the infiltration test holes are indicated on Figure No. III. The soils encountered in the test holes consisted of clayey sand to sandy clay existing fill soils.

We performed percolation tests in both borings and converted the percolation rates to infiltration rates utilizing the Porchet equation. The results of the infiltration testing indicated infiltration rates of 0.0035- and 0.0075-inch per hour with a factor of safety of 2. It is our understanding that infiltration rates of less than 0.01-inch per hour are not considered suitable for partial infiltration. The test data and a completed Worksheet C.4-1 are presented in the attached Appendix B.

IV. LABORATORY TESTS

Laboratory tests were performed on samples of the soils encountered in order to evaluate their index, strength, expansion, and compressibility properties. The following tests were conducted on the sampled soils:

1. *Laboratory Compaction Characteristics (ASTM D1557-12)*
2. *Determination of Percentage of Particles Smaller than No. 200 Sieve (ASTM D1140-14)*
3. *Expansion Index Test (ASTM D4829-11)*

Laboratory compaction tests establish the laboratory maximum dry density and optimum moisture content of the tested soils and are also used to aid in evaluating the strength characteristics of the soils. The test results are presented on the boring logs at the appropriate sample depths.

The particle size smaller than a No. 200 sieve analysis aids in classifying the tested soils in accordance with the Unified Soil Classification System and provides qualitative information related to engineering characteristics such as expansion potential, permeability, and shear strength. The test results are presented on the boring logs at the appropriate sample depths.

The expansion potential of soils are evaluated, when necessary, utilizing the Standard Test Method for Expansion Index of Soils (ASTM D4829-11). The test results are presented on the boring logs at the appropriate sample depths. In accordance with the UBC (Table 18-1-B), potentially expansive soils are classified as follows:

EXPANSION INDEX	***EXPANSION POTENTIAL***
0 to 20	Very low
21 to 50	Low
51 to 90	Medium
91 to 130	High
Above 130	Very high

Based on the test results, the more clayey on-site materials have a low to medium potential for expansion with a measured Expansion Index value of 60.

V. SOIL DESCRIPTION

The materials encountered below the existing AC pavement in all the borings consisted of loose to medium dense, clayey sand existing fill soils containing some gravel and cobbles. The materials encountered below the fill soils in Borings 1, 2, 4, and 5, consisted of medium dense to dense formational clayey and silty sands and very stiff sandy clay (Very Old Paralic deposits) to the depths explored of 3½ to 17.5 feet. Drilling refusal was met on cobbles in Borings 1, 3, and 6 at depths of 3.5 to 12.3 feet.

The exploratory boring logs and related information depict subsurface conditions only at the specific locations shown on the site plan and on the particular date designated on the logs. Subsurface conditions at other locations may differ from conditions occurring at these boring locations. Also, the passage of time may result in changes in the subsurface conditions due to environmental changes.

VI. GROUNDWATER

Free groundwater was not encountered in the exploratory borings. It must be noted, however, that fluctuations in the level of groundwater may occur due to variations in ground surface topography, subsurface stratification, rainfall, and other possible factors which may not have been evident at the time of our field investigation.

It should be kept in mind that grading operations can change surface drainage patterns and/or reduce permeabilities due to the densification of compacted soils. Such changes of surface and subsurface hydrologic conditions, plus irrigation of landscaping or significant increases in rainfall, may result in the appearance of surface or near-surface water at locations where none existed previously. The appearance of such water is expected to be localized and cosmetic in nature, if good positive drainage is implemented, as recommended in this report, during and at the completion of construction.

It must be understood that unless discovered during initial site exploration or encountered during site grading operations, it is extremely difficult to predict if or where perched or true groundwater conditions may appear in the future. When site fill or formational soils are fine-grained and of low permeability, water problems may not become apparent for extended periods of time.

Water conditions, where suspected or encountered during construction, should be evaluated and remedied by the project civil and geotechnical consultants. The project developer and property owner, however, must realize that post-construction appearances of groundwater may have to be dealt with on a site-specific basis.

VII. GEOLOGIC HAZARDS AND SEISMIC CONSIDERATIONS

Our review of some available published information including the City of San Diego Seismic Safety Study, Geologic Hazards and Faults Map, Sheet 17 (see attached Figure No. V), indicates that the site is located in a low risk geologic hazard area designated as Category 52. Category 52 is defined as "Other l*evel areas, gently sloping to steep terrain, favorable geologic structure, low risk."* Reference to the geologic map of the area, "*Geologic Map of San Diego, 30'x60' Quadrangle,*" (Kennedy and Tan, 2008) Figure No. VI, indicates that the site is underlain by Pleistocene-age Very Old Paralic deposit ($Qvop_8$) formational materials. Refer to Figure No. VII for geologic cross sections. Based on the Geologic Map of San Diego and the City of San Diego Seismic Safety Study, Geologic Hazards Map No. 17, there are no faults mapped on the site.

The San Diego area, as most of California, is located in a seismically active region. The San Diego area has been referred to as the eastern edge of the Southern California Continental Borderland, an extension of the Peninsular Ranges Geomorphic Province. The borderland is part of a broad tectonic boundary between the North American and Pacific Plates. The plate boundary is dominated by a complex system of active major strike-slip (right lateral), northwest-trending faults extending from the San Andreas Fault about 70 miles east, to the San Clemente Fault, about 50 miles west of the San Diego metropolitan area.

The prominent fault zones generally considered having the most potential for earthquake damage in the vicinity of the site are the active Rose Canyon and Coronado Bank fault zones mapped approximately 2 and 15 miles southwest of the site, respectively, and the active Elsinore and San Jacinto fault zones mapped approximately 41 and 62 miles northeast of the site, respectively.

Although research on earthquake prediction has greatly increased in recent years, geologists and seismologists have not yet reached the point where they can predict when and where an earthquake will occur. Nevertheless, on the basis of current technology, it is reasonable to assume that the site may be subject to the effects of at least one moderate to major earthquake during the design life of the project. During such an earthquake, the danger from fault offset through the site is remote, but relatively strong ground shaking is likely to occur.

Strong ground shaking not only can cause structures to shake, but it also has the potential for including other phenomena that can indirectly cause substantial ground movements or other hazards resulting in damage to structures. These phenomena include seismically induced waves such as tsunamis and seiches, inundation due to dam or embankment failure, soil liquefaction, landsliding, lateral spreading, differential compaction and ground cracking. Available information indicates that the location of and geotechnical conditions at the site are not conducive to any of these phenomena.

VIII. CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are based on the field investigation conducted by our firm, our laboratory test results, our analysis of the field and laboratory data, and our experience with similar soils and formational materials. The primary feature of concern at the site is the presence of undocumented existing fill soils which are not considered suitable for support of the proposed structure and associated improvements. Accordingly, adequate support for the proposed structure will require either removal and recompaction of all existing fill soils or supporting the proposed structure (including floor/parking slabs) on end bearing piers founded on the underlying formational materials.

The opinions, conclusions, and recommendations presented in this report are contingent upon ***Geotechnical Exploration, Inc.*** being retained to review the final plans and specifications as they are developed and to observe the site earthwork and installation of foundations. Accordingly, we recommend that the following paragraph be included on the grading and foundation plans for the project.

> *If the geotechnical consultant of record is changed for the project, the work shall be stopped until the replacement has agreed in writing to accept responsibility within their area of technical competence for approval upon completion of the work. It shall be the responsibility of the permittee to notify the City Engineer in writing of such change prior to the recommencement of grading and/or foundation installation work.*

A. Preparation of Soils for Site Development

1. *Clearing and Stripping:* The site should be cleared of the existing buildings, pavements and utilities to be abandoned and any miscellaneous debris that may be present at the time of construction and stripped of all vegetation. The cleared and stripped materials should be properly disposed of off-site.

2. *Excavation:* Based on the results of our exploratory borings, as well as our experience with similar materials, it is our opinion that the existing fill soils and natural formational materials can be excavated utilizing ordinary heavy earthmoving equipment. Contractors should not, however, be relieved of making their own independent evaluation of the excavatability of the on-site materials prior to submitting their bids.

3. *Removal and Recompaction of Existing Fill Soils:* If it is desired to support the proposed building (including floor/parking slabs) and associated improvements on conventional shallow footing foundations and slabs on grade, all existing fill soils should be removed and recompacted to a minimum degree of compaction of 93 percent.

4. *Subgrade Preparation:* After the site has been cleared, stripped, and the required excavations made, the exposed subgrade soils in areas to receive fill and/or building improvements should be scarified to a depth of 8 inches, moisture conditioned to at least 2 percent above the laboratory optimum, and compacted to the requirements for structural fill.

5. *Material for Fill:* All existing on-site soils with an organic content of less than 3 percent by volume are in general suitable for use as fill. Both existing on-site soils, however, and any required imported fill materials should not contain rocks or lumps more than 6 inches in greatest dimension, not more than 15 percent larger than 2½ inches, and no more than 25 percent of the fill should be larger than ¼-inch. All materials for use as fill should be approved by our representative prior to filling.

6. *Fill Compaction:* All fill should in general be compacted to a minimum degree of compaction of 90 percent at a moisture content at least 2 percent above the optimum based upon ASTM D1557-12. All structural fill, however, to be utilized for support of conventional shallow footing foundations should be compacted to a minimum degree of compaction of 93 percent at a moisture content at least 2 percent above the optimum based upon ASTM D1557-12. Before compaction begins, the fill should be brought to a moisture content that will permit proper compaction by either: (1) aerating and drying the fill

if it is too wet, or (2) moistening the fill with water if it is too dry. Each lift should be thoroughly mixed before compaction to ensure a uniform distribution of moisture.

7. *Permanent Slopes:* We recommend that any required permanent cut and fill slopes be constructed to an inclination no steeper than 2.0:1.0 (horizontal to vertical). The project plans and specifications should contain all necessary design features and construction requirements to prevent erosion of the on-site soils both during and after construction. Slopes and other exposed ground surfaces should be appropriately planted with a protective groundcover.

   Fill slopes should be constructed to assure that the recommended minimum degree of compaction is attained out to the finished slope face. This may be accomplished by "backrolling" with a sheepsfoot roller or other suitable equipment as the fill is raised. Placement of fill near the tops of slopes should be carried out in such a manner as to assure that loose, uncompacted soils are not sloughed over the tops and allowed to accumulate on the slope face.

8. *Temporary Slopes:* Based on our subsurface investigation work, laboratory test results, and engineering analysis, temporary cut slopes up to 15 feet in height in the formational materials should be safe against mass instability at an inclination of 1.0:1.0 (horizontal to vertical).

   Some localized sloughing or ravelling of the soils exposed on the slopes, however, may occur. Since the stability of temporary construction slopes will depend largely on the contractor's activities and safety precautions (storage

and equipment loadings near the tops of cut slopes, surface drainage provisions, etc.), it should be the contractor's responsibility to establish and maintain all temporary construction slopes at a safe inclination appropriate to the methods of operation.

9. *Shoring:* Shoring will be required for the planned cuts along the north and west boundaries of the proposed structure as well as along the east and south boundaries if removal and recompaction of the existing fill is to be performed. We recommend that the shoring along the north and west boundaries, which will be made in the very old Paralic deposit formational soils be designed using an angle of internal friction of 32 degrees and a unit soil weight of 120 pounds per cubic foot. We recommend that the shoring along the south and east boundaries, which will be made in the existing undocumented fill soils be designed using an angle of internal friction of 28 degrees and a unit soil weight of 120 pounds per cubic foot. If needed, additional recommendations could be provided to the shoring design consultant.

10. *Trench and Retaining/Basement Wall Backfill:* All backfill soils placed in utility trenches or behind retaining/basement walls should be compacted to a minimum degree of compaction of 90 percent. Backfill material should be placed in lift thicknesses appropriate to the type of compaction equipment utilized and compacted to a minimum degree of 90 percent by mechanical means. In pavement areas, that portion of the trench backfill within the pavement section should conform to the material and compaction requirements of the adjacent pavement section.

Our experience has shown that even shallow, narrow trenches, such as for irrigation and electrical lines, that are not properly compacted can result in problems, particularly with respect to shallow groundwater accumulation and migration.

11. *Surface Drainage:* Positive surface gradients should be provided adjacent to the building and roof gutters and downspouts should be installed so as to direct water away from foundations and slabs toward suitable discharge facilities. Ponding of surface water should not be allowed anywhere on the site. Appropriate erosion control measures should be taken at all times during and after construction to prevent surface runoff waters from entering footing excavations or ponding on finished building pad areas.

B. ***Foundation Recommendations***

12. *Footings:* Provided all existing fill soils are removed and recompacted as recommended in Items 3 through 6 above, we recommend that the proposed building be supported on conventional, individual-spread and/or continuous footing foundations bearing on undisturbed formational materials and/or recompacted fill soils. All footings should be founded at least 24 inches below the lowest adjacent finished grade.

At the recommended depths, footings may be designed for allowable bearing pressures of 4,000 pounds per square foot (psf) for combined dead and live loads and 5,300 psf for all loads, including wind or seismic. The footings should, however, have a minimum width of 18 inches.

13. *General Criteria for All Footings*: Footings located adjacent to the tops of slopes should be extended sufficiently deep so as to provide at least 10 feet of horizontal cover or 1½ times the width of the footing, whichever is greater, between the slope face and outside edge of the footing at the footing bearing level. Footings located adjacent to utility trenches should have their bearing surfaces situated below an imaginary 1.5 to 1.0 plane projected upward from the bottom edge of the adjacent utility trench.

    All continuous footings should contain top and bottom reinforcement to provide structural continuity and to permit spanning of local irregularities. We recommend that a minimum of two No. 5 top and two No. 5 bottom reinforcing bars be provided in the footings. A minimum clearance of 3 inches should be maintained between steel reinforcement and the bottom or sides of the footing. In order for us to offer an opinion as to whether the footings are founded on soils of sufficient load bearing capacity, it is essential that our representative inspect the footing excavations prior to the placement of reinforcing steel or concrete.

    NOTE: The project Civil/Structural Engineer should review all reinforcing schedules. The reinforcing minimums recommended herein are not to be construed as structural designs, but merely as minimum reinforcement to reduce the potential for cracking and separations.

14. *Drilled End-Bearing Piers*: An alternative to the removal and recompaction of all existing fill soils would be to support the proposed structure (including floor/parking slabs) on end bearing piers founded in the formational materials underlying the site. The end-bearing piers should be embedded at least 6 feet into undisturbed formational material or twice the pier diameter

below the adjacent finish grade, whichever is deeper. At the recommended depth, the piers may be designed for an allowable end-bearing pressure of 8,000 pounds per square foot (psf) for combined dead and live loads with a one-third increase for wind and/or seismic loads.

When drilling excavations for piers utilizing end-bearing support, it is important to limit the amount of loose material at the bottom of the excavation. Therefore, we recommend that the piers be designed with a minimum diameter of 2 feet in order to facilitate observation of the excavations and allow ease of material removal at the bottom. No slough over 1 inch in thickness should remain at the bottom of the excavation before concrete placement. The drilling contractor should provide an appropriate cleaning tool to satisfy this requirement. Otherwise, casing and hand-tool cleaning (or another acceptable option) will be required.

15. *Seismic Design Criteria:* Site-specific seismic design criteria for the proposed structure are presented in the following table in accordance with the 2016 CBC, which incorporates by reference ASCE 7-10 for seismic design. We have determined the mapped spectral acceleration values for the site, based on a latitude of 32.716 degrees and longitude of -117.128 degrees, utilizing a tool provided by the USGS, which provides a solution for ASCE 7-10 (2016 CBC) utilizing digitized files for the Spectral Acceleration maps. We have assigned a Site Soil Classification of C.

TABLE I
Mapped Spectral Acceleration Values and Design Parameters

S_s	S_1	F_a	F_v	S_{ms}	S_{m1}	S_{ds}	S_{d1}
1.136g	0.436g	1.000	1.364	1.136g	0.595g	0.758g	0.397g

16. *Lateral Loads:* Lateral load resistance for the structure supported on footing foundations may be developed in friction between the foundation bottoms and the supporting subgrade. An allowable friction coefficient of 0.35 is considered applicable. An additional allowable passive resistance equal to an equivalent fluid weight of 350 pounds per cubic foot (pcf) acting against the foundations may be used in design provided the footings are poured neat against the adjacent undisturbed compacted fill or formational materials. These lateral resistance values assume a level surface in front of the footing for a minimum distance of three times the embedment depth of the footing and any shear keys.

    Lateral load resistance for the drilled piers may be developed by passive resistance of the fill and/or formational soil materials they are embedded in. We recommend an allowable lateral resistance utilizing an equivalent fluid weight of 600 pounds per cubic foot against the projected area of the shafts.

17. *Settlement:* Settlements under building loads are expected to be within tolerable limits for the proposed structures. For footings or drilled piers designed in accordance with the recommendations presented in the preceding paragraphs, we anticipate that total settlements should not exceed 1 inch and that post-construction differential settlements should be less than ¼-inch in 25 feet.

18. *Retaining/Basement Walls*: Retaining walls must be designed to resist lateral earth pressures and any additional lateral pressures caused by surcharge loads on the adjoining retained surface. We recommend that unrestrained (cantilever) walls with level backfill be designed for an equivalent fluid pressure of 35 pcf. We recommend that restrained walls (i.e., basement

walls or any walls with angle points that restrain them from rotation) with level backfill be designed for an equivalent fluid pressure of 35 pcf plus an additional uniform lateral pressure of 8H pounds per square foot, where H is equal to the height of backfill above the top of the wall footing in feet. Wherever walls will be subjected to surcharge loads, they should also be designed for an additional uniform lateral pressure equal to one-third the anticipated surcharge pressure in the case of unrestrained walls and one-half the anticipated surcharge pressure in the case of restrained walls.

For seismic design of unrestrained walls, we recommend that the seismic pressure increment be taken as a fluid pressure distribution utilizing an equivalent fluid weight of 11 pcf. For restrained walls we recommend that the seismic pressure increment be taken as a fluid pressure distribution utilizing an equivalent fluid weight of 17 pcf added to the active static fluid pressure utilizing an equivalent fluid weight of 35 pcf.

The preceding design pressures assume that the walls are backfilled with low expansion potential materials (Expansion Index less than 50) and that there is sufficient drainage behind the walls to prevent the build-up of hydrostatic pressures from surface water infiltration. We recommend that drainage be provided by a composite drainage material such as J-Drain 200/220 and J-Drain SWD, or equivalent. No perforated pipes are utilized with the J-Drain system. The drain material should terminate 12 inches below the finish surface where the surface is covered by slabs or 18 inches below the finish surface in landscape areas.

Backfill placed behind the walls should be compacted to a minimum degree of compaction of 90 percent using light compaction equipment. If heavy equipment is used, the walls should be appropriately temporarily braced.

C. ***Concrete Slab-on-grade Criteria***

19. *Minimum Floor Slab Thickness and Reinforcement for Slabs on Recompacted Fill/Formational Material:* Based on our experience, we have found that, for various reasons, floor slabs occasionally crack, causing brittle surfaces such as ceramic tiles to become damaged. Therefore, we recommend that all slabs-on-grade contain at least a minimum amount of reinforcing steel to reduce the separation of cracks, should they occur.

19.1 Interior floor slabs should be a minimum of 5 inches actual thickness and be reinforced with No. 4 bars on 24-inch centers, both ways, placed at midheight in the slab. Slab subgrade soil should be verified by a ***Geotechnical Exploration, Inc.*** representative to have the proper moisture content within 48 hours prior to placement of the vapor barrier and pouring of concrete.

19.2 Following placement of any concrete floor slabs, sufficient drying time must be allowed prior to placement of floor coverings. Premature placement of floor coverings may result in degradation of adhesive materials and loosening of the finish floor materials.

20. *Concrete Isolation Joints:* We recommend the project Civil/Structural Engineer incorporate isolation joints and sawcuts to at least one-fourth the thickness of the slab in any floor designs. The joints and cuts, if properly

placed, should reduce the potential for and help control floor slab cracking. We recommend that concrete shrinkage joints be spaced no farther than approximately 20 feet apart, and also at re-entrant corners. However, due to a number of reasons (such as base preparation, construction techniques, curing procedures, and normal shrinkage of concrete), some cracking of slabs can be expected.

21. *Slab Moisture Protection and Vapor Barrier Membrane:* Although it is not the responsibility of geotechnical engineering firms to provide moisture protection recommendations, as a service to our clients we provide the following discussion and suggested minimum protection criteria. Actual recommendations should be provided by the architect and waterproofing consultants.

Soil moisture vapor can result in damage to moisture-sensitive floors, some floor sealers, or sensitive equipment in direct contact with the floor, in addition to mold and staining on slabs, walls and carpets. The common practice in Southern California is to place vapor retarders made of PVC, or of polyethylene. PVC retarders are made in thickness ranging from 10- to 60-mil. Polyethylene retarders, called visqueen, range from 5- to 10-mil in thickness. These products are no longer considered adequate for moisture protection and can actually deteriorate over time.

Specialty vapor retarding products possess higher tensile strength and are more specifically designed for and intended to retard moisture transmission into and through concrete slabs. The use of such products is highly recommended for reduction of floor slab moisture emission.

The following American Society for Testing and Materials (ASTM) and American Concrete Institute (ACI) sections address the issue of moisture transmission into and through concrete slabs: ASTM E1745-97 (2009) Standard Specification for Plastic Water Vapor Retarders Used in Contact Concrete Slabs; ASTM E154-88 (2005) Standard Test Methods for Water Vapor Retarders Used in Contact with Earth; ASTM E96-95 Standard Test Methods for Water Vapor Transmission of Materials; ASTM E1643-98 (2009) Standard Practice for Installation of Water Vapor Retarders Used in Contact Under Concrete Slabs; and ACI 302.2R-06 Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.

21.1 Based on the above, we recommend that the vapor barrier consist of a minimum 15-mil extruded polyolefin plastic (no recycled content or woven materials permitted). Permeance as tested before and after mandatory conditioning (ASTM E1745 Section 7.1 and sub-paragraphs 7.1.1-7.1.5) should be less than 0.01 perms (grains/square foot/hour in Hg) and comply with the ASTM E1745 Class A requirements. Installation of vapor barriers should be in accordance with ASTM E1643. The basis of design is 15-mil StegoWrap vapor barrier placed per the manufacturer's guidelines. Reef Industries Vapor Guard membrane has also been shown to achieve a permeance of less than 0.01 perms. We recommend that the slab be poured directly on the vapor barrier, which is placed directly on the prepared subgrade soil.

21.2 Common to all acceptable products, vapor retarder/barrier joints must be lapped and sealed with mastic or the manufacturer's recommended tape or sealing products. In actual practice, stakes are often driven through the retarder material, equipment is dragged or rolled across

the retarder, overlapping or jointing is not properly implemented, etc. All these construction deficiencies reduce the retarder's effectiveness. In no case should retarder/barrier products be punctured or gaps be allowed to form prior to or during concrete placement.

21.3 Vapor retarders/barriers do not provide full waterproofing for structures constructed below free water surfaces. They are intended to help reduce or prevent vapor transmission and/or capillary migration through the soil and through the concrete slabs. Waterproofing systems must be designed and properly constructed if full waterproofing is desired. The owner and project designers should be consulted to determine the specific level of protection required.

21.4 Following placement of concrete floor slabs, sufficient drying time must be allowed prior to placement of any floor coverings. Premature placement of floor coverings may result in degradation of adhesive materials and loosening of the finish floor materials.

22. *Exterior Slab Thickness and Reinforcement:* As a minimum for protection of on-site improvements, we recommend that all exterior pedestrian concrete slabs be 4½ inches thick, founded on properly compacted and tested fill, and contain No. 4 bars at 24-inch centers, both ways, at the center of the slab, and contain adequate isolation and control joints. The performance of on-site improvements can be greatly affected by soil base preparation and the quality of construction. It is therefore important that all improvements are properly designed and constructed for the existing soil conditions. The improvements should not be built on loose soils or fills placed without our observation and testing.

For exterior slabs with the minimum shrinkage reinforcement, control joints should be placed at spaces no farther than 15 feet apart or the width of the slab, whichever is less, and also at re-entrant corners. Control joints in exterior slabs should be sealed with elastomeric joint sealant. The sealant should be inspected every 6 months and be properly maintained.

D. Pavements

23. *Concrete Pavement:* We recommend that concrete pavements supported on recompacted fill and/or undisturbed formational materials, including the garage slab, subject only to automobile and light truck traffic be 6 inches thick. The upper 8 inches of the subgrade below the slab should be compacted to a minimum degree of compaction of 95 percent just prior to paving. The concrete should conform to Section 201 of The Standard Specifications for Public Works Construction, 2000 Edition, for Class 560-C-3250.

In order to control shrinkage cracking, we recommend that saw-cut, weakened-plane joints be provided at about 15-foot centers both ways. The pavement slabs should be saw-cut as soon as practical but no more than 24 hours after the placement of the concrete. The depth of the joint should be one-quarter of the slab thickness and its width should not exceed 0.02-foot. Reinforcing steel is not necessary unless it is desired to increase the joint spacing recommended above.

E. General Recommendations

24. *Project Start Up Notification:* In order to minimize any work delays during site development, this firm should be contacted 24 hours prior to any need for observation of footing excavations or field density testing of compacted fill soils. If possible, placement of formwork and steel reinforcement in footing excavations should not occur prior to observing the excavations; in the event that our observations reveal the need for deepening or redesigning foundation structures at any locations, any formwork or steel reinforcement in the affected footing excavation areas would have to be removed prior to correction of the observed problem (i.e., deepening the footing excavation, recompacting soil in the bottom of the excavation, etc.).

IX. GRADING NOTES

Geotechnical Exploration, Inc. recommends that we be retained to verify the actual soil conditions revealed during site grading work and footing/pier excavations to be as anticipated in this "*Report of Preliminary Geotechnical Investigation and Infiltration Testing*" for the project. In addition, the compaction of any fill soils placed during site grading work must be observed and tested by the soil engineer. It is the responsibility of the grading contractor to comply with the requirements on the grading plans and the local grading ordinance. All retaining wall and trench backfill should be properly compacted. ***Geotechnical Exploration, Inc.*** will assume no liability for damage occurring due to improperly or uncompacted backfill placed without our observations and testing.

X. LIMITATIONS

Our conclusions and recommendations have been based on available data obtained from our document review, field investigation and laboratory analysis, as well as our experience with similar soils and formational materials located in this area of San Diego. Of necessity, we must assume a certain degree of continuity between exploratory excavations. It is, therefore, necessary that all observations, conclusions, and recommendations be verified at the time grading operations begin or when footing excavations are placed. In the event discrepancies are noted, additional recommendations may be issued, if required.

The work performed and recommendations presented herein are the result of an investigation and analysis that meet the contemporary standard of care in our profession within the City of San Diego. No warranty is provided.

This report should be considered valid for a period of two (2) years, and is subject to review by our firm following that time. If significant modifications are made to the building plans, especially with respect to the height and location of any proposed structures, this report must be presented to us for immediate review and possible revision.

It is the responsibility of the owner and/or developer to ensure that the recommendations summarized in this report are carried out in the field operations and that our recommendations for design of this project are incorporated in the structural plans. We should be retained to review the project plans once they are available, to verify that our recommendations are adequately incorporated in the plans.

This firm does not practice or consult in the field of safety engineering. We do not direct the contractor's operations, and we cannot be responsible for the safety of personnel other than our own on the site; the safety of others is the responsibility of the contractor. The contractor should notify the owner if any of the recommended actions presented herein are considered to be unsafe.

The firm of ***Geotechnical Exploration, Inc.*** shall not be held responsible for changes to the physical condition of the property, such as addition of fill soils or changing drainage patterns, which occur subsequent to issuance of this report and the changes are made without our observations, testing, and approval.

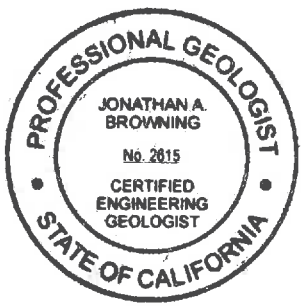
Once again, should any questions arise concerning this report, please feel free to contact the undersigned. Reference to our **Job No. 16-11320** will expedite a reply to your inquiries.

Respectfully submitted,

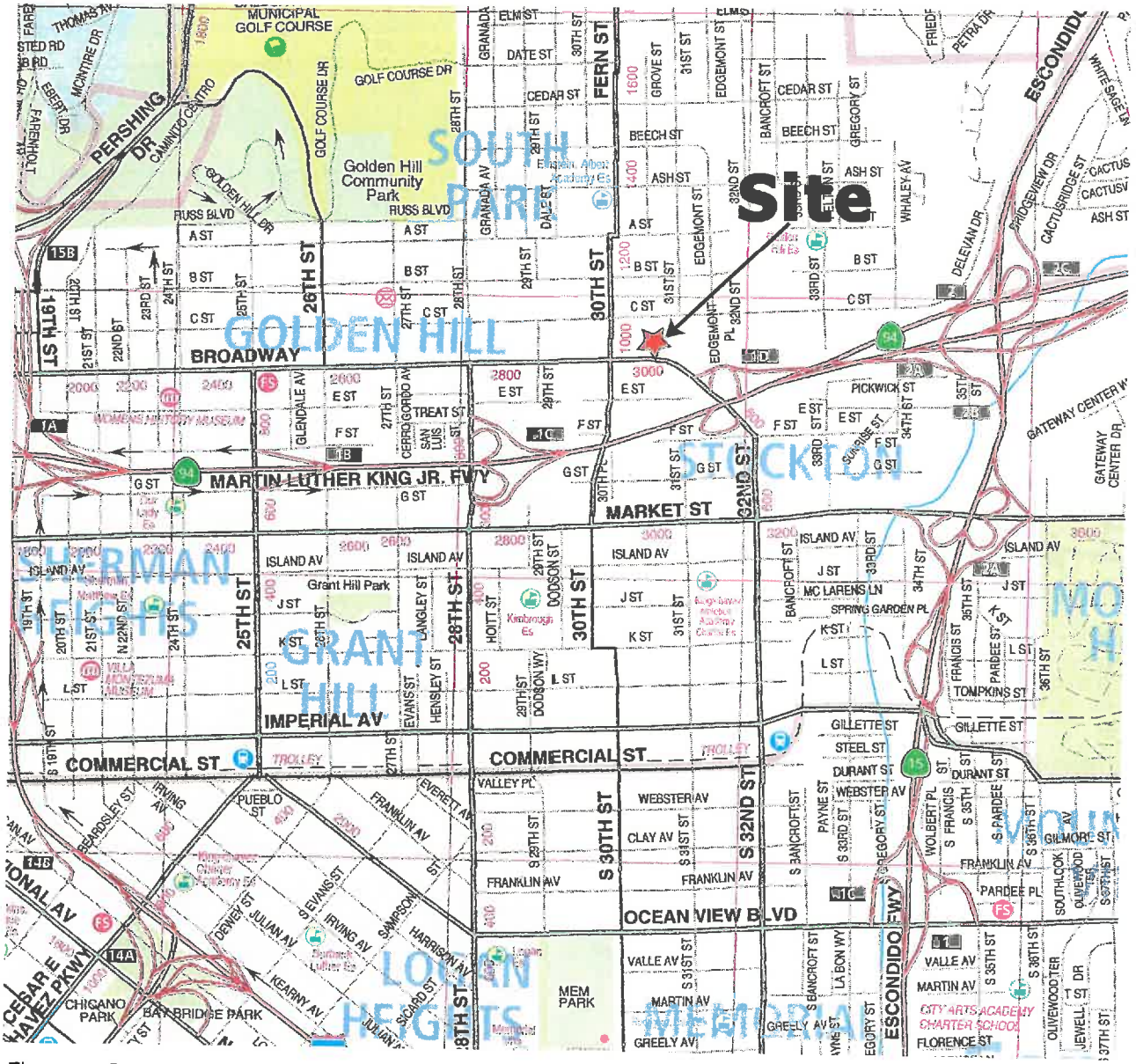
GEOTECHNICAL EXPLORATION, INC.

Wm. D. Hespeler, G.E. 396
Senior Geotechnical Engineer

Jonathan A. Browning
C.E.G. 2615/P.G. 9012
Senior Project Geologist



VICINITY MAP

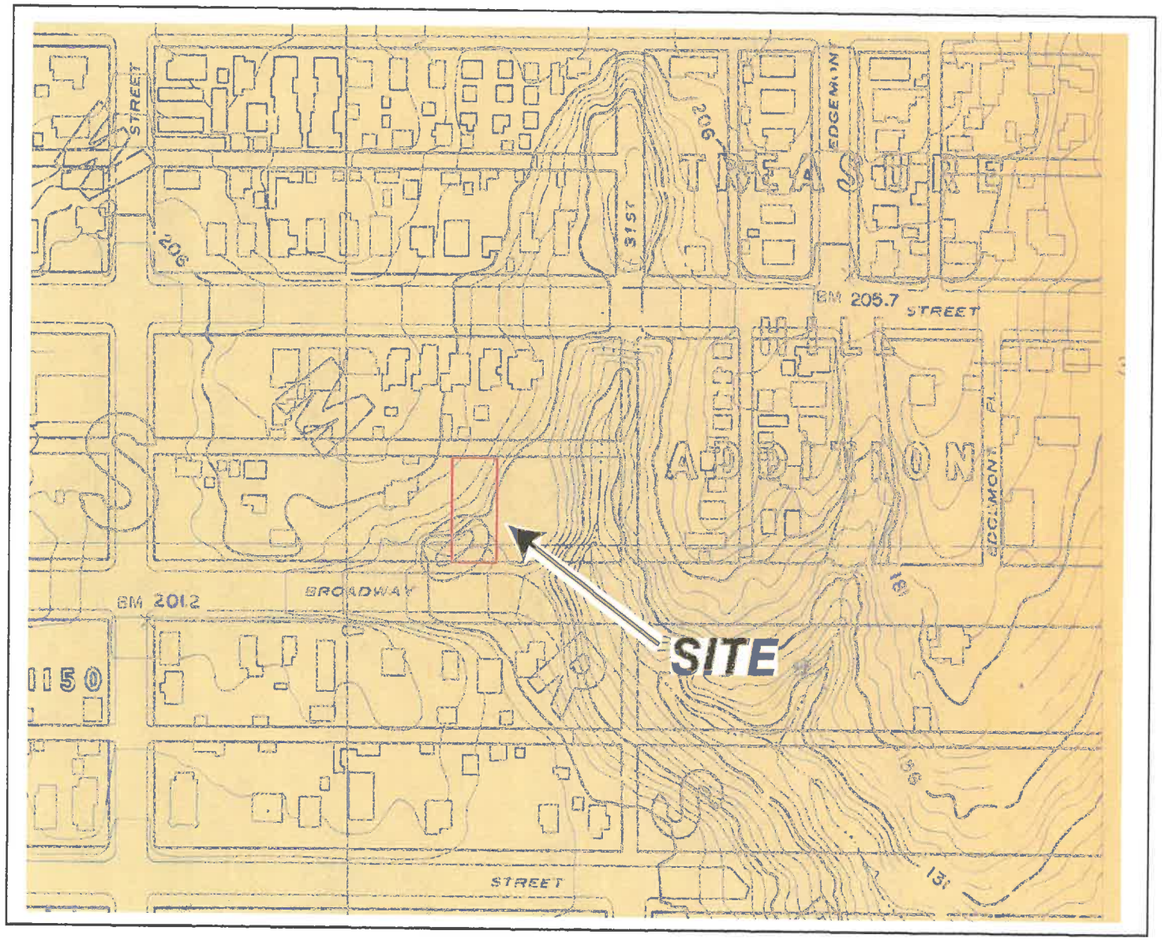


Thomas Bros Guide San Diego County pg 1289-E3

Proposed Apartment Project
3060 Broadway
San Diego, CA.

Figure No. I
Job No. 16-11320

City of San Diego
METROPOLITAN TOPOGRAPHIC SURVEY MAP
Sheet 198-1725
Edition of 1954



Scale: 1" = 200'
(approximate)

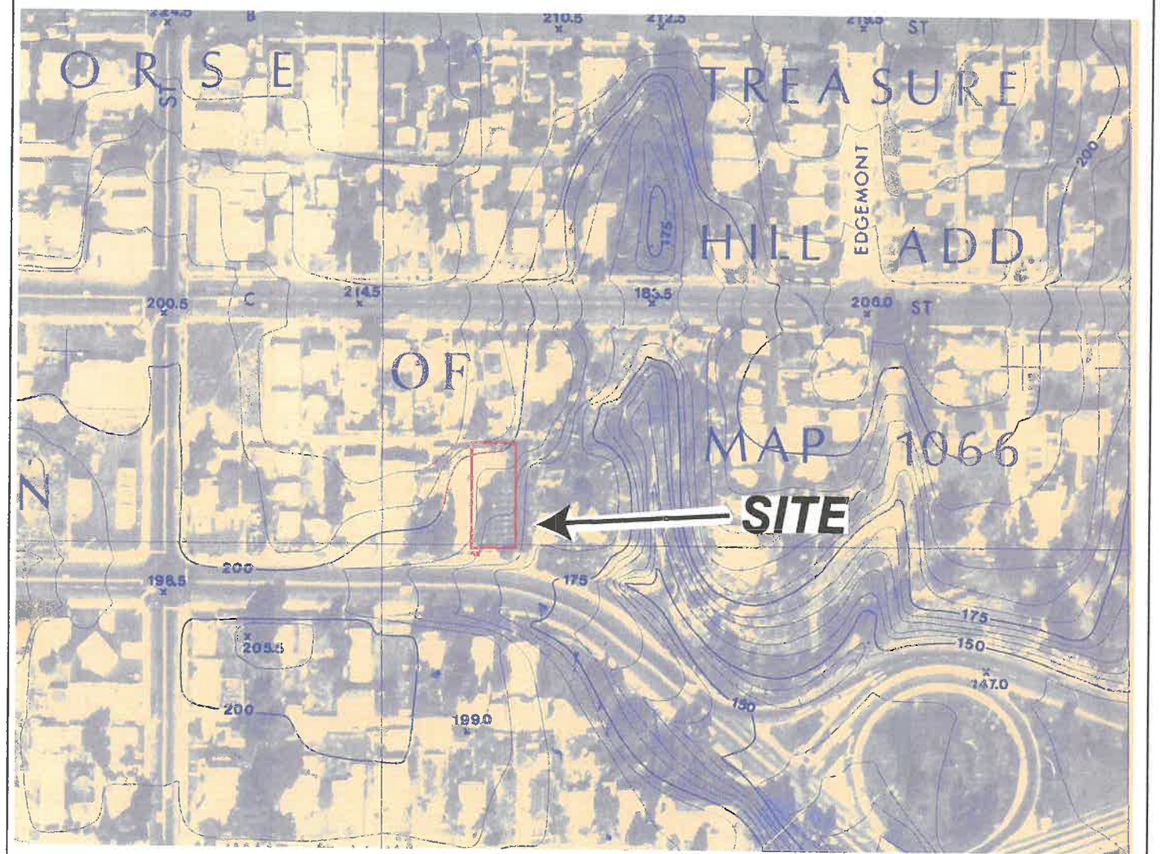
Proposed Apartment Project
3060 Broadway
San Diego, CA.
Figure No. II
Job No. 16-11320

Geotechnical Exploration, Inc.

(March 2017)

16-11320-II.ai

City of San Diego
METROPOLITAN TOPOGRAPHIC SURVEY MAP
Sheet 198-1725
Edition of 1976



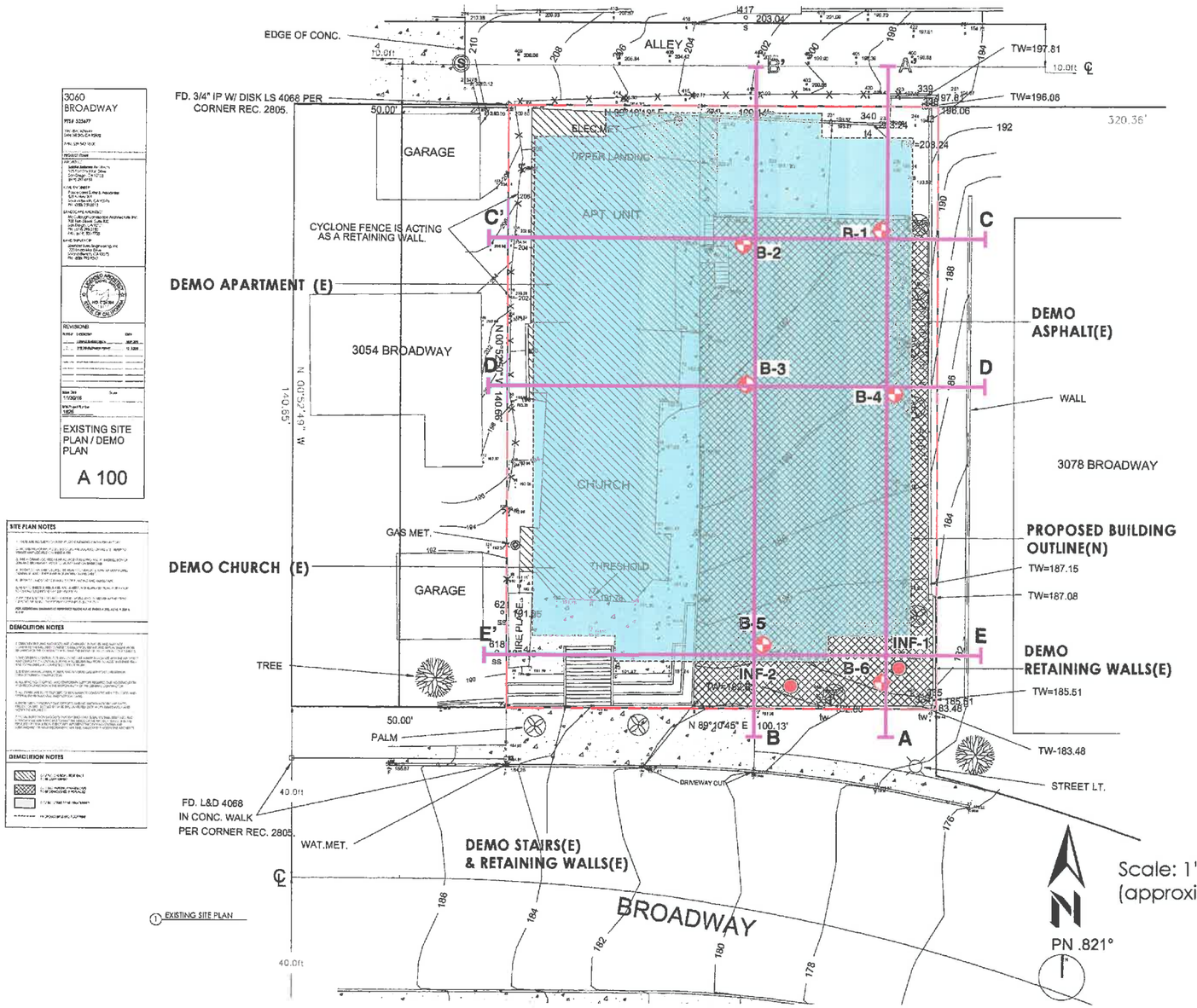
Scale: 1" = 200'
(approximate)

Proposed Apartment Project
3060 Broadway
San Diego, CA.
Figure No. IIa
Job No. 16-11320

Geotechnical Exploration, Inc.

(March 2017)

16-11320-IIa.ai



3060 BROADWAY

EXISTING SITE PLAN / DEMO PLAN

A 100

SITE PLAN NOTES

DEMOLITION NOTES

DEMOLITION NOTES

① EXISTING SITE PLAN

Scale: 1" = 30' (approximate)

LEGEND

- **B-3** Indicates Approximate Location of Exploratory Boring
- **INF-1** Indicates Approximate Location of Infiltration Test
- **E — E'** Indicates Approximate Location of Geologic Cross Section Location

NOTE: This Plot Plan is not to be used for legal purposes. Locationss and dimensions are approximate. Actual property dimensions and locations of utilities may be obtained from the Approved Building Plans or the "As-Built" Grading Plans.

REFERENCE: This Plot Plan was prepared from an existing SITE PLAN by SAFDIE RABINES ARCHITECTS dated 11/30/16 and from on-site field reconnaissance performed by GEI.

SITE PLAN

Proposed Apartment Project
3060 Broadway
San Diego, CA.
Figure No. III
Job No. 16-11320

Geotechnical Exploration, Inc.

(March 2017)

16-11320-p.ai

EQUIPMENT	DIMENSION & TYPE OF EXCAVATION	DATE LOGGED
Truck-mounted Auger Drill Rig	**8-inch diameter Boring**	**2-24-17**
SURFACE ELEVATION	**GROUNDWATER/ SEEPAGE DEPTH**	**LOGGED BY**
± 193' Mean Sea Level	**Not Encountered**	**JAB**

DEPTH (feet)	SYMBOL	SAMPLE	FIELD DESCRIPTION AND CLASSIFICATION DESCRIPTION AND REMARKS (Grain size, Density, Moisture, Color)	U.S.C.S.	IN-PLACE MOISTURE (%)	IN-PLACE DRY DENSITY (pcf)	OPTIMUM MOISTURE (%)	MAXIMUM DRY DENSITY (pcf)	DENSITY (% of M.D.D.)	EXPAN. + (%) CONSOL. -	BLOW COUNTS/FT.	SAMPLE O.D. (INCHES)
			ASPHALT PAVEMENT , 4.5" thick.									
1			**CLAYEY SAND** , fine- to coarse-grained, some subrounded gravel. Loose to medium dense. Moist. Red-brown. **FILL (Qaf)**	SC								
2			**CLAYEY SAND** , fine- to coarse-grained, some subrounded gravel. Very dense. Slightly moist. Mottled yellow-brown to light red-brown. **VERY OLD PARALIC DEPOSITS (Qvop $_8$)**	SC	11.7						78	2"
3			-- 17% passing #200 sieve.									
4			Refusal on cobbles @ 3.5'. Bottom @ 3.5'									
5												
6												

EXPLORATION LOG 11320 BROADWAY APTS.GPJ GEO_EXPL.GDT 3/15/17

- PERCHED WATER TABLE
- BULK BAG SAMPLE
- 1 IN-PLACE SAMPLE
- MODIFIED CALIFORNIA SAMPLE
- S NUCLEAR FIELD DENSITY TEST
- STANDARD PENETRATION TEST

JOB NAME
Broadway Apartments

SITE LOCATION
3060 Broadway, San Diego, CA

JOB NUMBER
16-11320

REVIEWED BY **JAB/WDH**

LOG No.
B-1

FIGURE NUMBER
IVa

Geotechnical Exploration, Inc.

EQUIPMENT	DIMENSION & TYPE OF EXCAVATION	DATE LOGGED
Truck-mounted Auger Drill Rig	**8-inch diameter Boring**	**2-24-17**
SURFACE ELEVATION	GROUNDWATER/ SEEPAGE DEPTH	LOGGED BY
± 193' Mean Sea Level	**Not Encountered**	**JAB**

DEPTH (feet)	SYMBOL	SAMPLE	FIELD DESCRIPTION AND CLASSIFICATION DESCRIPTION AND REMARKS (Grain size, Density, Moisture, Color)	U.S.C.S.	IN-PLACE MOISTURE (%)	IN-PLACE DRY DENSITY (pcf)	OPTIMUM MOISTURE (%)	MAXIMUM DRY DENSITY (pcf)	DENSITY (% of M.D.D.)	EXPAN. + (%) CONSOL. -	EXPANSION INDEX	BLOW COUNTS/FT.	SAMPLE O.D. (INCHES)
0			**ASPHALT PAVEMENT** , 3" thick.										
1			**CLAYEY SAND** , fine- to coarse-grained, some subrounded gravel. Loose to medium dense. Moist. Red-brown. **FILL (Qaf)**	SC									
2			**SANDY CLAY/ CLAYEY SAND** , fine- to coarse-grained, trace subrounded gravel. Very stiff/ medium dense. Moist. Red-brown. **VERY OLD PARALIC DEPOSITS (Qvop 8)**	CL/ SC	16.7							20	2"
3			-- 47% passing #200 sieve.										
4													
5			Bulk bag sample from 3'- 6'.				11.0	123.5			60		
6													
7			-- becomes **CLAYEY SAND**.										
8			-- 23% passing #200 sieve.		9.2							22	2"
9			Bottom @ 8.5'										

EXPLORATION LOG 11320 BROADWAY APTS.GPJ GEO_EXPL.GDT 3/15/17

- PERCHED WATER TABLE
- BULK BAG SAMPLE
- IN-PLACE SAMPLE
- MODIFIED CALIFORNIA SAMPLE
- NUCLEAR FIELD DENSITY TEST
- STANDARD PENETRATION TEST

JOB NAME		
Broadway Apartments		
SITE LOCATION		
3060 Broadway, San Diego, CA		
JOB NUMBER	REVIEWED BY	LOG No.
16-11320	**JAB/WDH**	**B-2**
FIGURE NUMBER	Geotechnical Exploration, Inc.	
IVb		

EQUIPMENT	DIMENSION & TYPE OF EXCAVATION	DATE LOGGED
Truck-mounted Auger Drill Rig	**8-inch diameter Boring**	**2-24-17**
SURFACE ELEVATION	GROUNDWATER/ SEEPAGE DEPTH	LOGGED BY
± 192' Mean Sea Level	**Not Encountered**	**JAB**

DEPTH (feet)	SYMBOL	SAMPLE	FIELD DESCRIPTION AND CLASSIFICATION DESCRIPTION AND REMARKS (Grain size, Density, Moisture, Color)	U.S.C.S.	IN-PLACE MOISTURE (%)	IN-PLACE DRY DENSITY (pcf)	OPTIMUM MOISTURE (%)	MAXIMUM DRY DENSITY (pcf)	DENSITY (% of M.D.D.)	EXPAN. + (%) CONSOL. -	BLOW COUNTS/FT.	SAMPLE O.D. (INCHES)
			ASPHALT PAVEMENT , 3" thick.									
1			**CLAYEY SAND** , fine- to medium-grained, some subrounded gravel, trace cobbles. Loose to medium dense. Moist. Red-brown. **FILL (Qaf)**	SC								
2												
3			-- sampler encountered cobble @ 3'. -- 17% passing #200 sieve. -- gravel in sample tip.		9.8						60/ 10"	2"
4			Refusal on cobbles @ 3.5' after 2 attempts to advance. Bottom @ 3.5'									
5												

PERCHED WATER TABLE
BULK BAG SAMPLE
1 IN-PLACE SAMPLE
MODIFIED CALIFORNIA SAMPLE
S NUCLEAR FIELD DENSITY TEST
STANDARD PENETRATION TEST

JOB NAME
Broadway Apartments

SITE LOCATION
3060 Broadway, San Diego, CA

JOB NUMBER
16-11320

REVIEWED BY **JAB/WDH**

FIGURE NUMBER
IVc

Geotechnical Exploration, Inc.

LOG No.
B-3

EXPLORATION LOG 11320 BROADWAY APTS.GPJ GEO_EXPL.GDT 3/15/17

EQUIPMENT	DIMENSION & TYPE OF EXCAVATION	DATE LOGGED
Truck-mounted Auger Drill Rig	8-inch diameter Boring	2-24-17
SURFACE ELEVATION	**GROUNDWATER/ SEEPAGE DEPTH**	**LOGGED BY**
± 189' Mean Sea Level	Not Encountered	JAB

DEPTH (feet)	SYMBOL	SAMPLE	FIELD DESCRIPTION AND CLASSIFICATION DESCRIPTION AND REMARKS (Grain size, Density, Moisture, Color)	U.S.C.S.	IN-PLACE MOISTURE (%)	IN-PLACE DRY DENSITY (pcf)	OPTIMUM MOISTURE (%)	MAXIMUM DRY DENSITY (pcf)	DENSITY (% of M.D.D.)	EXPAN. + (%) CONSOL. -	BLOW COUNTS/FT.	SAMPLE O.D. (INCHES)
			ASPHALT PAVEMENT , 3" thick.									
			CLAYEY SAND , fine- to coarse-grained, some subrounded gravel. Loose. Moist. Red-brown.	SC								
2			**FILL (Qaf)**								8	2"
4			Bulk bag sample from 3'- 8'.									
6												
8			**CLAYEY SAND** , fine- to medium-grained, some subrounded gravel. Medium dense. Moist. Dark red-brown.	SC	12.7						11	2"
10			**VERY OLD PARALIC DEPOSITS (Qvop $_8$)** -- 32% passing #200 sieve.									
12			-- becomes dense, slightly moist, light yellow-brown.								38	2"
14			Bottom @ 13.5'									

EXPLORATION LOG 11320 BROADWAY APTS.GPJ GEO_EXPL.GDT 3/15/17

- PERCHED WATER TABLE
- BULK BAG SAMPLE
- IN-PLACE SAMPLE
- MODIFIED CALIFORNIA SAMPLE
- NUCLEAR FIELD DENSITY TEST
- STANDARD PENETRATION TEST

JOB NAME	Broadway Apartments
SITE LOCATION	3060 Broadway, San Diego, CA
JOB NUMBER	16-11320
REVIEWED BY	JAB/WDH
FIGURE NUMBER	IVd
LOG No.	B-4

Geotechnical Exploration, Inc.

EQUIPMENT	DIMENSION & TYPE OF EXCAVATION	DATE LOGGED
Truck-mounted Auger Drill Rig	**8-inch diameter Boring**	**2-24-17**
SURFACE ELEVATION	GROUNDWATER/ SEEPAGE DEPTH	LOGGED BY
± 184' Mean Sea Level	**Not Encountered**	**JAB**

DEPTH (feet)	SYMBOL	SAMPLE	FIELD DESCRIPTION AND CLASSIFICATION DESCRIPTION AND REMARKS (Grain size, Density, Moisture, Color)	U.S.C.S.	IN-PLACE MOISTURE (%)	IN-PLACE DRY DENSITY (pcf)	OPTIMUM MOISTURE (%)	MAXIMUM DRY DENSITY (pcf)	DENSITY (% of M.D.D.)	EXPAN. + (%) CONSOL. -	BLOW COUNTS/FT.	SAMPLE O.D. (INCHES)
			ASPHALT PAVEMENT , 3" thick.									
2			**CLAYEY SAND** , fine- to coarse-grained, some subrounded gravel, trace cobbles. Loose to medium dense. Moist. Red-yellow.	SC								
			FILL (Qaf)								12	2"
4												
6			-- 20% passing #200 sieve.		7.4						15	2"
8												
10												
12			**CLAYEY SAND** , fine- to medium-grained, some subrounded gravel. Medium dense. Slightly moist. Red-yellow.	SC							11	2"
14			**VERY OLD PARALIC DEPOSITS (Qvop $_8$)**									
16			-- encountered cobble in sample.								50/ 5"	2"
18			Bottom @ 17.5'									

EXPLORATION LOG 11320 BROADWAY APTS.GPJ GEO_EXPL.GDT 3/15/17

PERCHED WATER TABLE
BULK BAG SAMPLE
IN-PLACE SAMPLE
MODIFIED CALIFORNIA SAMPLE
NUCLEAR FIELD DENSITY TEST
STANDARD PENETRATION TEST

JOB NAME
Broadway Apartments

SITE LOCATION
3060 Broadway, San Diego, CA

JOB NUMBER
16-11320

REVIEWED BY **JAB/WDH**

FIGURE NUMBER
IVe

Geotechnical Exploration, Inc.

LOG No.
B-5

EQUIPMENT	DIMENSION & TYPE OF EXCAVATION	DATE LOGGED
Truck-mounted Auger Drill Rig	**8-inch diameter Boring**	**2-24-17**
SURFACE ELEVATION	GROUNDWATER/ SEEPAGE DEPTH	LOGGED BY
± 184' Mean Sea Level	**Not Encountered**	**JAB**

DEPTH (feet)	SYMBOL	SAMPLE	FIELD DESCRIPTION AND CLASSIFICATION DESCRIPTION AND REMARKS (Grain size, Density, Moisture, Color)	U.S.C.S.	IN-PLACE MOISTURE (%)	IN-PLACE DRY DENSITY (pcf)	OPTIMUM MOISTURE (%)	MAXIMUM DRY DENSITY (pcf)	DENSITY (% of M.D.D.)	EXPAN. + (%) CONSOL. -	BLOW COUNTS/FT.	SAMPLE O.D. (INCHES)
			ASPHALT PAVEMENT , 3" thick.									
			CLAYEY SAND , fine- to coarse-grained, some subrounded gravel, trace cobbles. Loose to medium dense. Moist. Red-yellow.	SC								
2			**FILL (Qaf)**								6	2"
4			From 4'- 9' -- gravel and cobble layer, becomes medium dense, brown.									
6			-- no sample recovery; driving sampler on rock.								41	3"
8			Bulk bag sample from 5'- 10'.									
10											24	2"
12			-- gravel and cobble layer. Refusal on cobbles @ 12.3'.								50/ 3"	2"
			Bottom @ 12.3'									

PERCHED WATER TABLE
BULK BAG SAMPLE
IN-PLACE SAMPLE
MODIFIED CALIFORNIA SAMPLE
NUCLEAR FIELD DENSITY TEST
STANDARD PENETRATION TEST

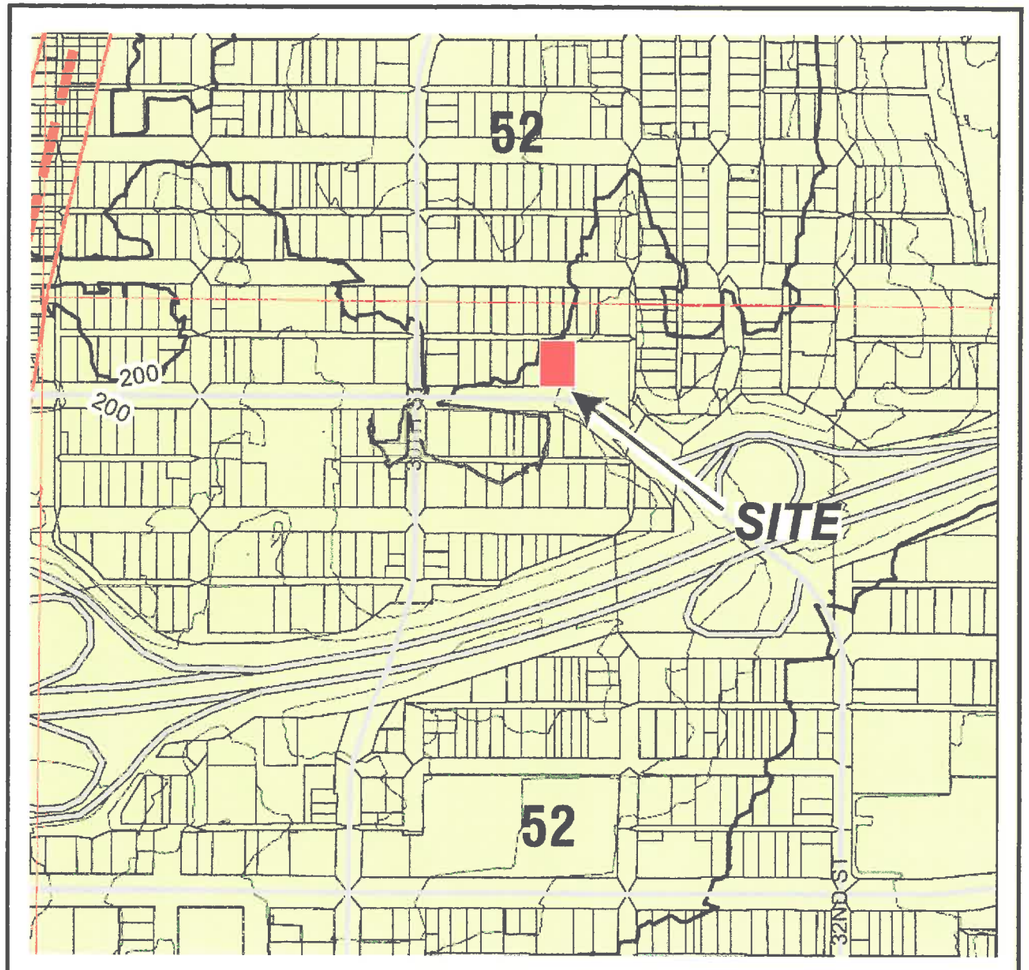
JOB NAME		
Broadway Apartments		
SITE LOCATION		
3060 Broadway, San Diego, CA		
JOB NUMBER	REVIEWED BY	LOG No.
16-11320	**JAB/WDH**	**B-6**
FIGURE NUMBER	Geotechnical Exploration, Inc.	
IVf		

EXPLORATION LOG 11320 BROADWAY APTS.GPJ GEO_EXPL.GDT 3/15/17

Geologic Hazards Map Excerpt from City of San Diego Geologic Hazards and Fault Map Sheet 17

Development Services Department

DATE: 4/3/2008



Proposed Apartment Project
3060 Broadway
San Diego, CA.

LEGEND

Geologic Hazard Categories

FAULT ZONES

- 11 Active, Alquist-Priolo Earthquake Fault Zone
- 12 Potentially Active, Inactive, Presumed Inactive, or Activity Unknown
- 13 Downtown special fault zone

LANDSLIDES

- 21 Confirmed, known, or highly suspected
- 22 Possible or conjectured

SLIDE-PRONE FORMATIONS

- 23 Friars: neutral or favorable geologic structure
- 24 Friars: unfavorable geologic structure
- 25 Ardath: neutral or favorable geologic structure
- 26 Ardath: unfavorable geologic structure
- 27 Otay, Sweetwater, and others

LIQUEFACTION

- 31 High Potential -- shallow groundwater major drainages, hydraulic fills
- 32 Low Potential -- fluctuating groundwater minor drainages

COASTAL BLUFFS

- 41 Generally unstable Numerous landslides, high steep bluffs, severe erosion, unfavorable geologic structure
- 42 Generally unstable Unfavorable bedding plains, high erosion
- 43 Generally unstable Unfavorable jointing, local high erosion
- 44 Moderately stable Mostly stable formations, local high erosion
- 45 Moderately stable Some minor landslides, minor erosion
- 46 Moderately stable Some unfavorable geologic structure, minor or no erosion
- 47 Generally stable Favorable geologic structure, minor or no erosion, no landslides
- 48 Generally stable Broad beach areas, developed harbor

OTHER TERRAIN

- 51 Level mesas -- underlain by terrace deposits and bedrock nominal risk
- 52 Other level areas, gently sloping to steep terrain, favorable geologic structure, Low risk
- 53 Level or sloping terrain, unfavorable geologic structure, Low to moderate risk
- 54 Steeply sloping terrain, unfavorable or fault controlled geologic structure, Moderate risk
- 55 Modified terrain (graded sites) Nominal risk

Water (Bays and Lakes)

FAULTS

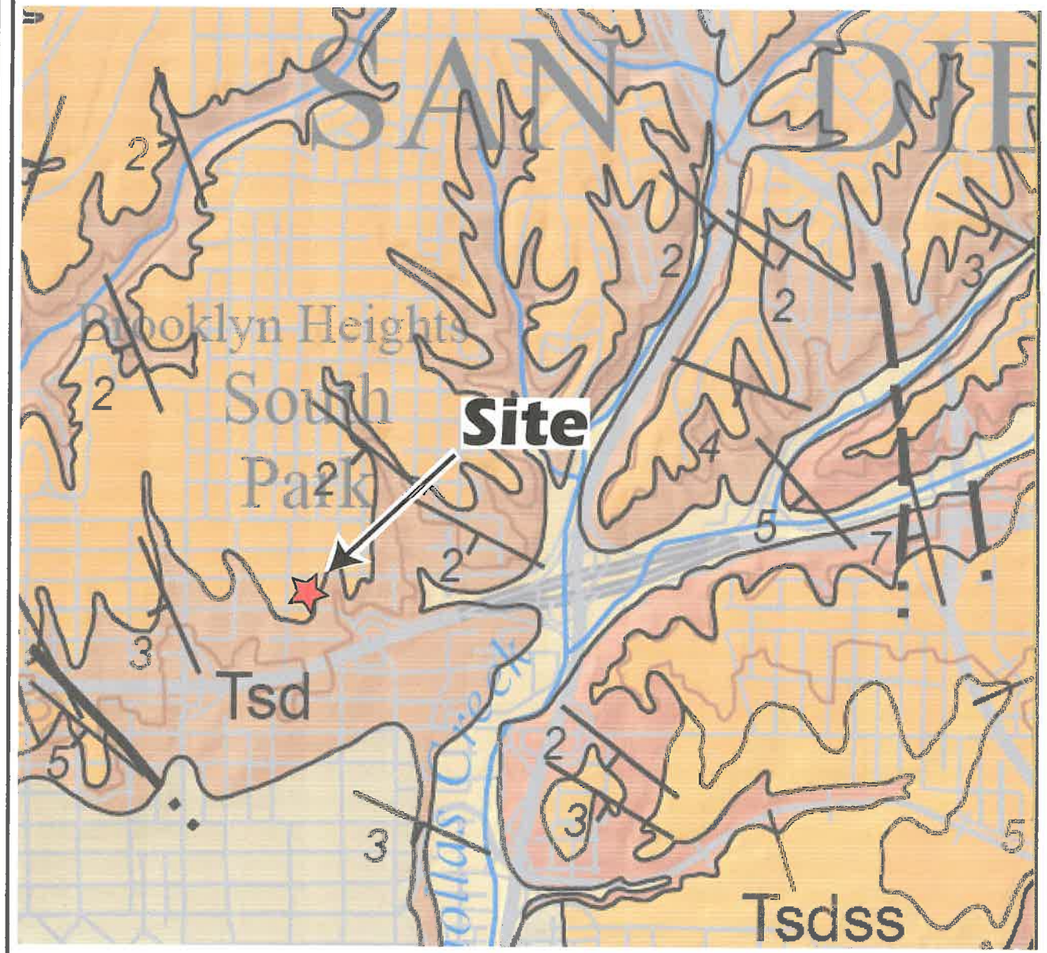
- Fault
- Inferred Fault
- Concealed Fault
- Shear Zone

Figure No.V
Job No. 16-11320

Geotechnical Exploration, Inc.

March 2017

broadway-apts-seis-combo.ai



Proposed Apartment Project
3060 Broadway
San Diego, CA.

EXCERPT FROM GEOLOGIC MAP OF THE SAN DIEGO 30' x 60' QUADRANGLE, CALIFORNIA

By
Michael P. Kennedy[1] and Siang S. Tan[1]
2008
Digital preparation by
Kelly R. Bovard[2], Anne G. Garcia[2], Diane Burns[2], and Carlos I. Gutierrez[1]
1. Department of Conservation, California Geological Survey
2. U.S. Geological Survey, Department of Earth Sciences, University of California, Riverside

ONSHORE MAP SYMBOLS

Contact - Contact between geologic units; dotted where concealed.

Fault - Solid where accurately located; dashed where approximately located; dotted where concealed. U = upthrown block, D = downthrown block. Arrow and number indicate direction and angle of dip of fault plane.

Anticline - Solid where accurately located; dashed where approximately located; dotted where concealed. Arrow indicates direction of axial plunge.

Syncline - Solid where accurately located; dotted where concealed. Arrow indicates direction of axial plunge.

Qls? Landslide - Arrows indicate principal direction of movement. Queried where existence is questionable.

Strike and dip of beds

70 Inclined

Strike and dip of igneous joints

60 Inclined

Vertical

Strike and dip of metamorphic foliation

55 Inclined

ABBREVIATED EXPLANATION

Tsdcg / Tsd / Tsdss — San Diego Formation (early Pleistocene and late Pliocene)
Tsd - undivided
Tsdcg - transitional marine and nonmarine pebble and cobble conglomerate
Tsdss - marine sandstone

Qvop8 — Unit 8 Very old paralic deposits,

Base Map
Onshore base (hypsography, hydrography, and transportation) from U.S.G.S. digital line graph (DLG) data, San Diego 30' x 60' metric quadrangle. Shaded topographic base from U.S.G.S. digital elevation models (DEM's). Offshore bathymetric contours and shaded bathymetry from N.O.A.A. single and multibeam data. Projection is UTM, zone 11, North American Datum 1927

This map was funded in part by the U.S. Geological Survey National Cooperative Geologic Mapping Program STATEMAP Award no. 98HQAG2048

Prepared in cooperation with the U.S. Geological Survey, Southern California Areal Mapping Project.

broadway-apts-combo-2008-geo.ai

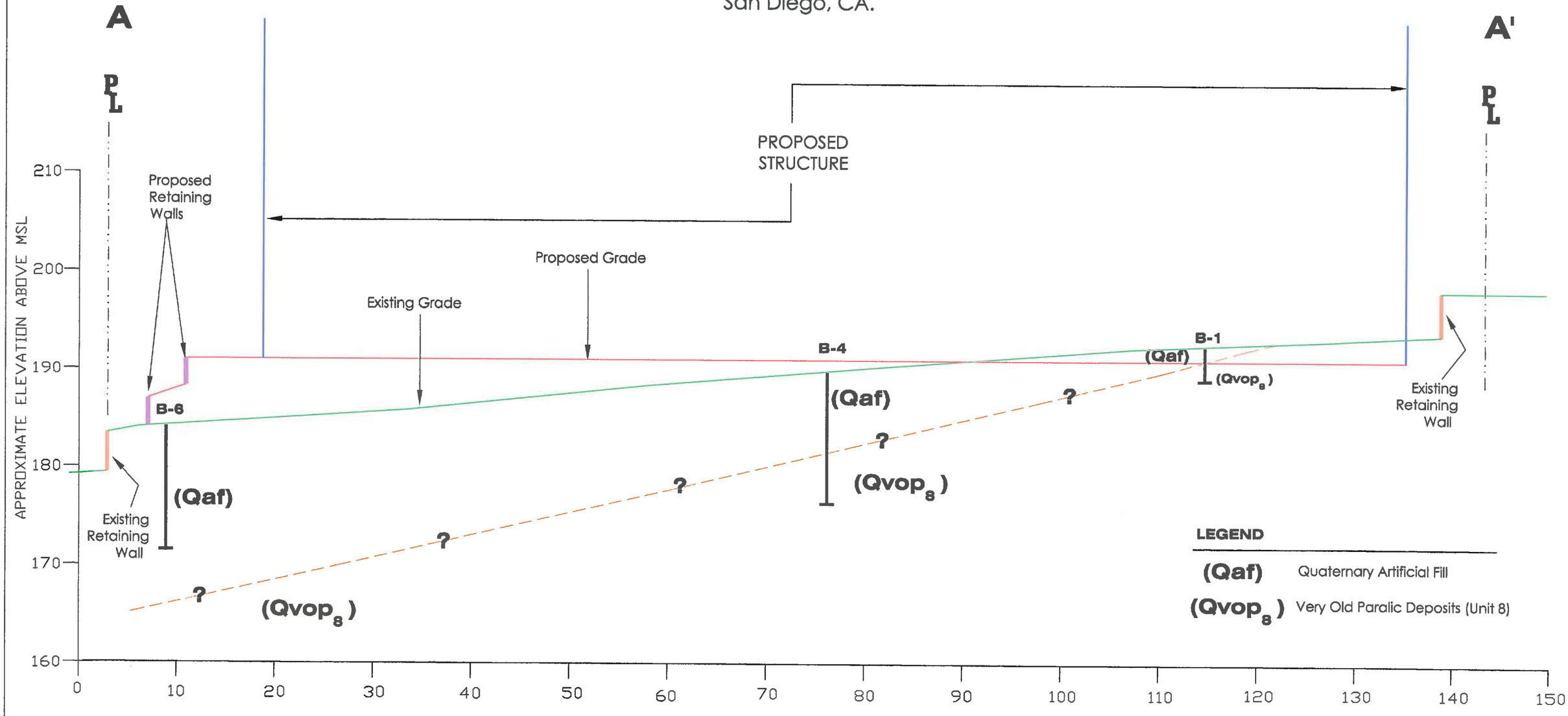
Figure No. VI
Job No. 16-11320

Geotechnical Exploration, Inc.

March 2017

CROSS SECTION A-A'

Broadway Residential Development
3060 Broadway
San Diego, CA.



LEGEND

(Qaf)	Quaternary Artificial Fill
(Qvop$_s$)	Very Old Paralic Deposits (Unit 8)

NOTE: This Cross Section is not to be used for legal purposes. Locations and dimensions are approximate. Actual property dimensions and locations of utilities may be obtained from the Approved Building Plans or the "As-Built" Grading Plans.

16-11320-AA

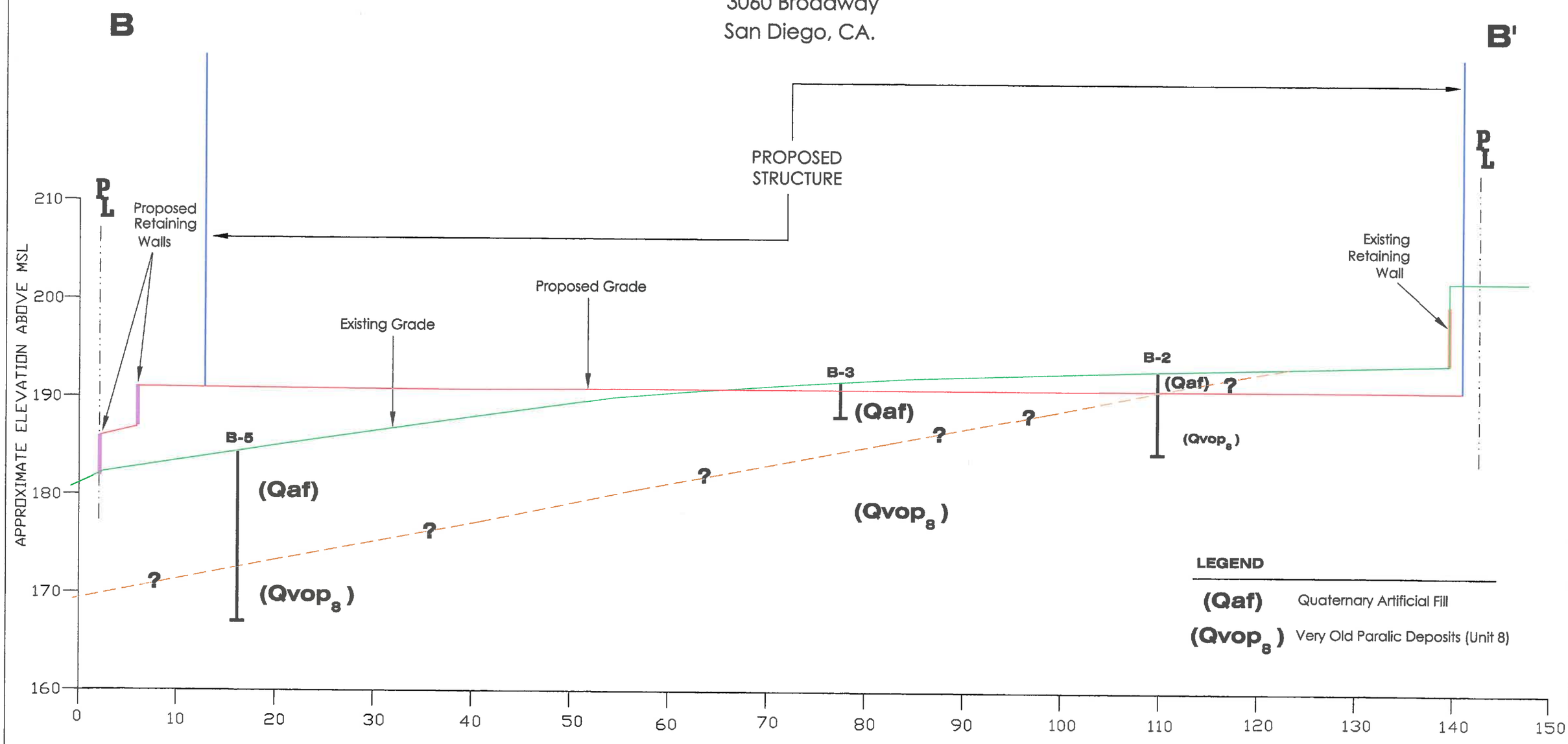
Figure No. VIIa
Job No. 16-11320

Geotechnical Exploration, Inc.

March 2017

CROSS SECTION B-B'

Broadway Residential Development
3060 Broadway
San Diego, CA.



LEGEND

(Qaf)	Quaternary Artificial Fill
(Qvop$_8$)	Very Old Paralic Deposits (Unit 8)

RELATIVE HORIZONTAL DISTANCE
SCALE: 1" = 10'

NOTE: This Cross Section is not to be used for legal purposes. Locations and dimensions are approximate. Actual property dimensions and locations of utilities may be obtained from the Approved Building Plans or the "As-Built" Grading Plans.

16-11320-BB

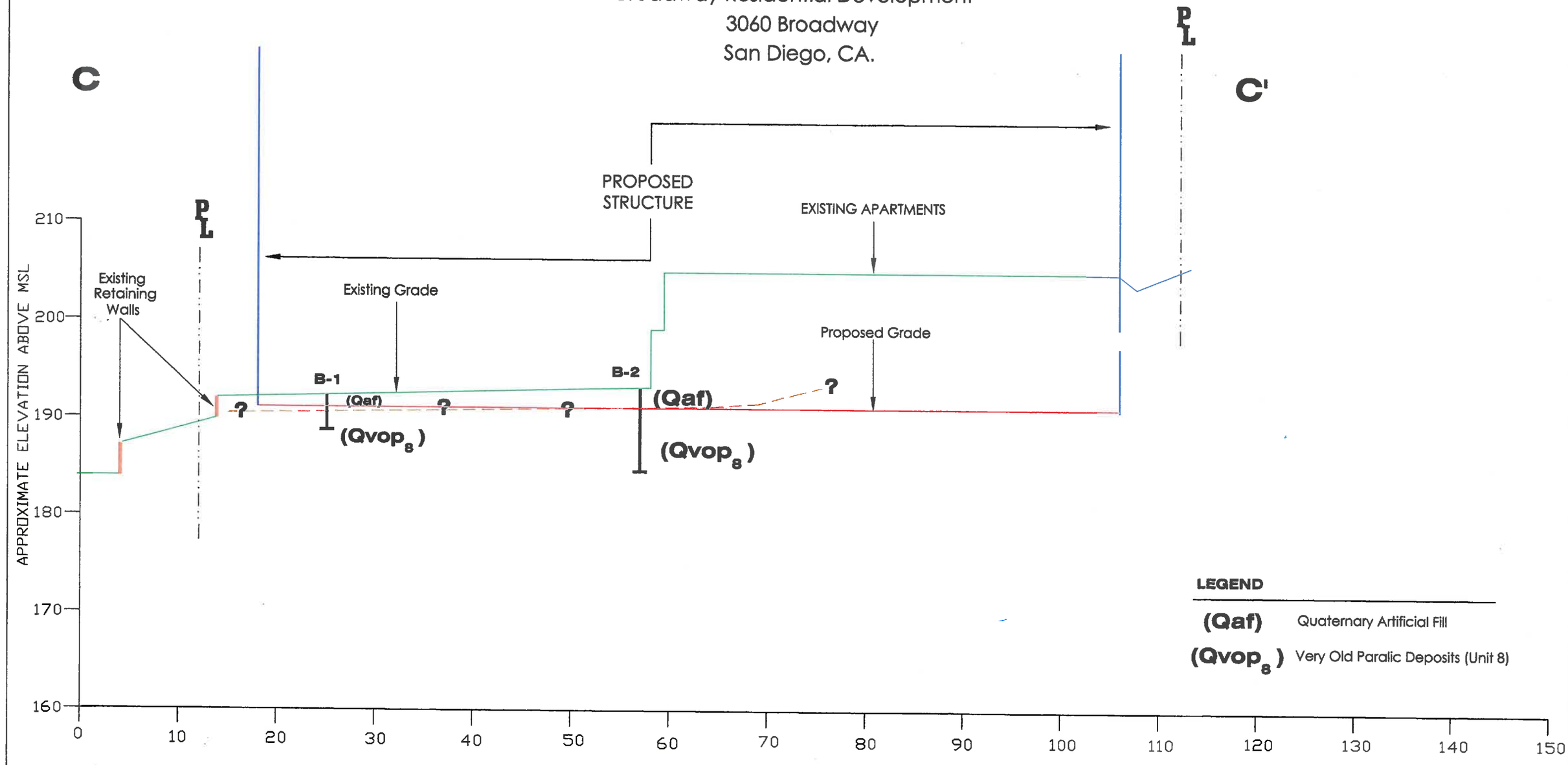
Figure No. VIIb
Job No. 16-11320

Geotechnical Exploration, Inc.

March 2017

CROSS SECTION C-C'

Broadway Residential Development
3060 Broadway
San Diego, CA.



LEGEND

(Qaf)	Quaternary Artificial Fill
(Qvop$_s$)	Very Old Paralic Deposits (Unit 8)

NOTE: This Cross Section is not to be used for legal purposes. Locations and dimensions are approximate. Actual property dimensions and locations of utilities may be obtained from the Approved Building Plans or the "As-Built" Grading Plans.

16-11320-CC

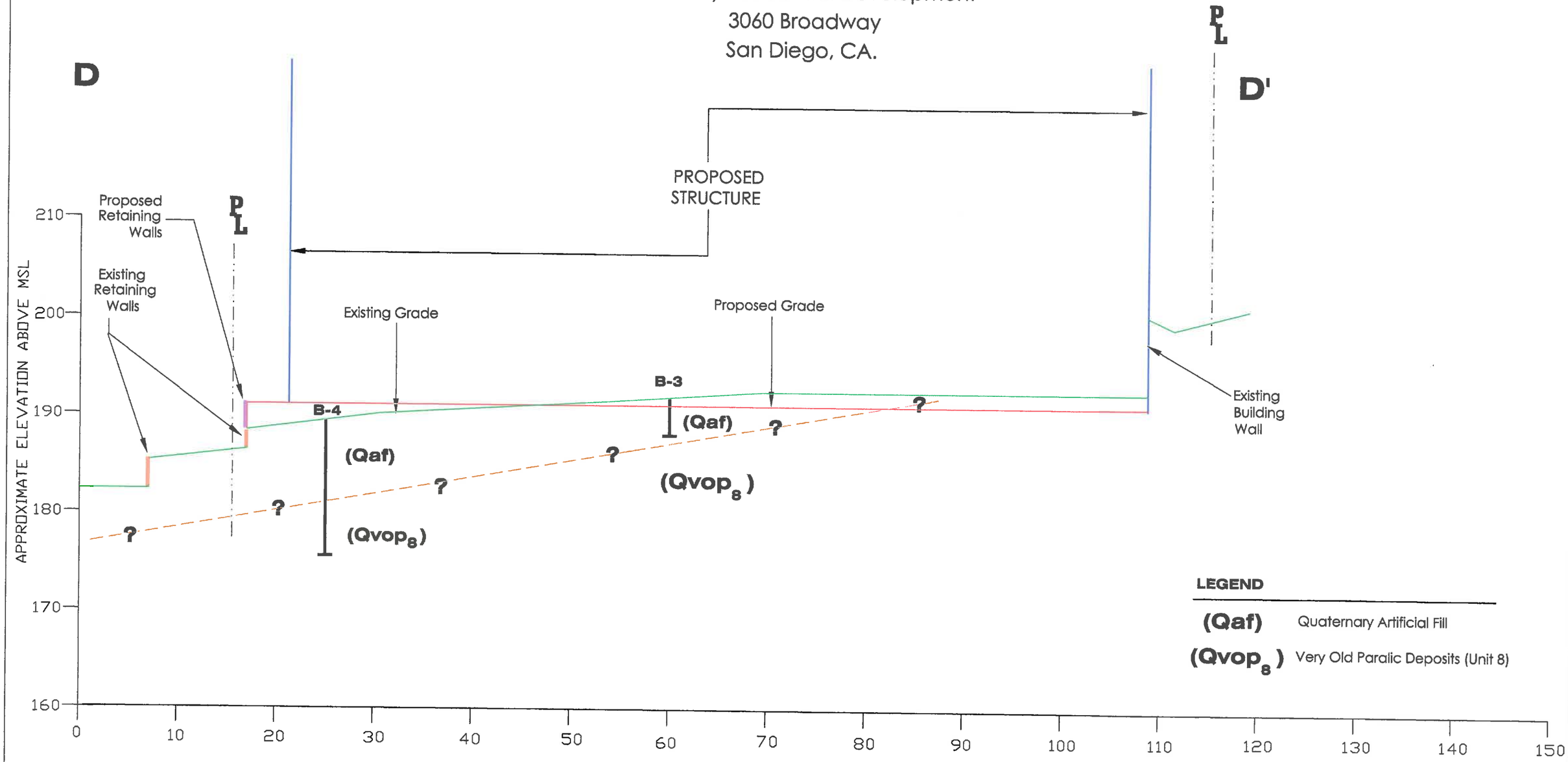
Figure No. VIIc
Job No. 16-11320

Geotechnical Exploration, Inc.

March 2017

CROSS SECTION D-D'

Broadway Residential Development
3060 Broadway
San Diego, CA.



LEGEND

(Qaf)	Quaternary Artificial Fill
(Qvop$_8$)	Very Old Paralic Deposits (Unit 8)

NOTE: This Cross Section is not to be used for legal purposes. Locations and dimensions are approximate. Actual property dimensions and locations of utilities may be obtained from the Approved Building Plans or the "As-Built" Grading Plans.

16-11320-AA

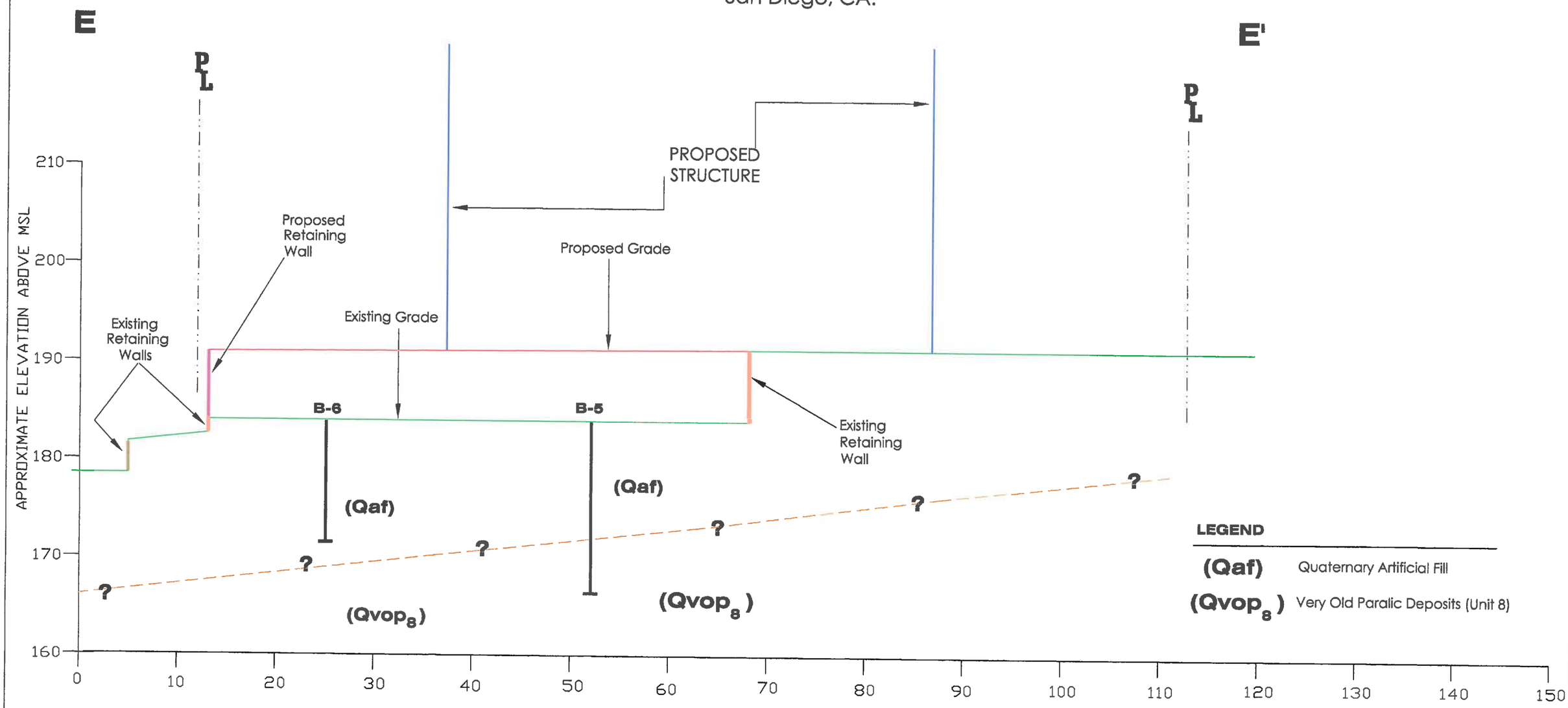
Figure No. VIId
Job No. 16-11320

Geotechnical Exploration, Inc.

March 2017

CROSS SECTION E-E'

Broadway Residential Development
3060 Broadway
San Diego, CA.



NOTE: This Cross Section is not to be used for legal purposes. Locations and dimensions are approximate. Actual property dimensions and locations of utilities may be obtained from the Approved Building Plans or the "As-Built" Grading Plans.

16-11320-EE

Figure No. VIIe
Job No. 16-11320

Geotechnical Exploration, Inc.

March 2017

APPENDIX A
UNIFIED SOIL CLASSIFICATION CHART
SOIL DESCRIPTION

Coarse-grained (More than half of material is larger than a No. 200 sieve)

GRAVELS, CLEAN GRAVELS (More than half of coarse fraction is larger than No. 4 sieve size, but smaller than 3")	GW	Well-graded gravels, gravel and sand mixtures, little or no fines.
	GP	Poorly graded gravels, gravel and sand mixtures, little or no fines.
GRAVELS WITH FINES (Appreciable amount)	GC	Clay gravels, poorly graded gravel-sand-silt mixtures
SANDS, CLEAN SANDS (More than half of coarse fraction is smaller than a No. 4 sieve)	SW	Well-graded sand, gravelly sands, little or no fines
	SP	Poorly graded sands, gravelly sands, little or no fines.
SANDS WITH FINES (Appreciable amount)	SM	Silty sands, poorly graded sand and silty mixtures.
	SC	Clayey sands, poorly graded sand and clay mixtures.

Fine-grained (More than half of material is smaller than a No. 200 sieve)

SILTS AND CLAYS

Liquid Limit Less than 50	ML	Inorganic silts and very fine sands, rock flour, sandy silt and clayey-silt sand mixtures with a slight plasticity
	CL	Inorganic clays of low to medium plasticity, gravelly clays, silty clays, clean clays.
	OL	Organic silts and organic silty clays of low plasticity.
Liquid Limit Greater than 50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
	CH	Inorganic clays of high plasticity, fat clays.
	OH	Organic clays of medium to high plasticity.
HIGHLY ORGANIC SOILS	PT	Peat and other highly organic soils

(rev. 6/05)

APPENDIX B

PERCOLATION TEST RESULTS AND INFILTRATION RATE CONVERSIONS

Percolation Test Sheet

Project Name: Broadway Apartments
Project No. 16-11320
Date Excavated: 2/24/17
Test Hole No: INF-1

Calculated By: JAB
Checked By:

Test Hole Dia: 8"

Date: 3/2/17
Date:

Soil Classification: (SC/CL)

Depth of Test Hole: 90"

	Time (minutes)	Time interval	Initial water level	Final water level (inches)	Change in water (inches)	Percolation rate (min/inches)
	835	180	50.500	52.500	2.000	90.000
	1135					
	1135	60	52.500	53.000	0.500	120.000
	1235					
	1235	90	53.000	53.500	0.500	180.000
	1405					
	1405	60	53.500	53.750	0.250	240.000
	1505					
	1505	60	53.750	53.875	0.125	480.000
	1605					

Percolation Test Sheet

Project Name: Broadway Apartments
Project No. 16-11320
Date Excavated: 2/24/17
Test Hole No: INF-2

Calculated By: JAB
Checked By:

Test Hole Dia: 8"

Date: 3/2/17
Date:

Soil Classification: (SC/CL)

Depth of Test Hole: 96"

	Time (minutes)	Time interval	Initial water level	Final water level (inches)	Change in water (inches)	Percolation rate (min/inches)
	910	120	62.500	63.625	1.125	106.667
	1110					
	1110	60	63.625	64.125	0.500	120.000
	1210					
	1210	60	64.125	64.500	0.375	160.000
	1310					
	1310	60	64.500	64.750	0.250	240.000
	1410					
	1410	60	64.750	65.000	0.250	240.000
	1510					

Percolation Rate to Infiltration Rate Conversion (Porchet Method)

Project Name: Broadway Apartments
Project No. 16-11320
Test Hole No: INF-1

Calculated By: JAB
Checked By:
Test Hole Dia: 8"

Date: 3/2/17
Date:
Depth of Test Hole: 90"

Porchet Corrections

Infiltration rate=((delta h*60r)/(delta t*(r+2 h avg))

Test No.	EB Depth (inches)	Delta T (min)	Water Depth 1	Water Depth 2	h 1 (inches)	h 2 (inches)	delta h (inches)	h avg (inches)	r (radius) (inches)	delta h*60r	delta t*(r+2 h	Infiltration rate (in/hr)
1	90	180	50.500	52.500	39.500	37.500	2.000	38.500	4	480	14580	0.033
2	90	60	52.500	53.000	37.500	37.000	0.500	37.250	4	120	4710	0.025
3	90	90	53.000	53.500	37.000	36.500	0.500	36.750	4	120	6975	0.017
4	90	60	53.500	53.750	36.500	36.250	0.250	36.375	4	60	4605	0.013
5	90	60	53.750	53.875	36.250	36.125	0.125	36.188	4	30	4582.5	0.007
6												
7												
8												
9												

Percolation Rate to Infiltration Rate Conversion (Porchet Method)

Project Name: Broadway Apartments | Calculated By: JAB | Date: 3/2/17
Project No. 16-11320 | Checked By: | Date:
Test Hole No: INF-2 | Test Hole Dia: 8" | Depth of Test Hole: 96"

Porchet Corrections

Infiltration rate=((delta h*60r)/(delta t*(r+2 h avg))

Test No.	EB Depth (inches)	Delta T (min)	Water Depth 1	Water Depth 2	h 1 (inches)	h 2 (inches)	delta h (inches)	h avg (inches)	r (radius) (inches)	delta h*60r	delta t*(r+2 h	Infiltration rate (in/hr)
1	96	120	62.500	63.625	33.500	32.375	1.125	32.938	4	270	8385	0.032
2	96	60	63.625	64.125	32.375	31.875	0.500	32.125	4	120	4095	0.029
3	96	60	64.125	64.500	31.875	31.500	0.375	31.688	4	90	4042.5	0.022
4	96	60	64.500	64.750	31.500	31.250	0.250	31.375	4	60	4005	0.015
5	96	60	64.750	65.000	31.250	31.000	0.250	31.125	4	60	3975	0.015
6												
7												
8												
9												

Worksheet C.4-1: Categorization of Infiltration Feasibility Condition

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?

Note that it is not necessary to investigate each and every criterion in the worksheet if infiltration is precluded. Instead a letter of justification from a geotechnical professional familiar with the local conditions substantiating any geotechnical issues will be required.

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 must be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		X

Provide basis: The measured infiltration rates with a minimum factor of safety of 2 were 0.0035 and 0.0075 inches per hour.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

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 must be based on a comprehensive evaluation of the factors presented in Appendix C.2.		X

Provide basis:

The measured infiltration rates with a minimum factor of safety of 2 were 0.0035 and 0.0075 inches per hour.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

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 must be based on a comprehensive evaluation of the factors presented in Appendix C.3.		X
Provide basis: The measured infiltration rates with a minimum factor of safety of 2 were 0.0035 and 0.0075 inches per hour. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
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 must be based on a comprehensive evaluation of the factors presented in Appendix C.3.		X
Provide basis: The measured infiltration rates with a minimum factor of safety of 2 were 0.0035 and 0.0075 inches per hour. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
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		

*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 County staff to substantiate findings.

Worksheet C.4-1 Page 3 of 4

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 must be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		X

Provide basis: The measured infiltration rates with a minimum factor of safety of 2 were 0.0035 and 0.0075 inches per hour. It is our understanding that an infiltration rate of less than 0.01 inches per is not considered suitable for partial infiltration. Therefore the question is not applicable.

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.

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 must be based on a comprehensive evaluation of the factors presented in Appendix C.2.		X

Provide basis:

The measured infiltration rates with a minimum factor of safety of 2 were 0.0035 and 0.0075 inches per hour. It is our understanding that an infiltration rate of less than 0.01 inches per is not considered suitable for partial infiltration. Therefore the question is not applicable.

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.

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 must be based on a comprehensive evaluation of the factors presented in Appendix C.3.		x
Provide basis: The measured infiltration rates with a minimum factor of safety of 2 were 0.0035 and 0.0075 inches per hour. It is our understanding that an infiltration rate of less than 0.01 inches per is not considered suitable for partial infiltration. Therefore the question is not applicable. 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 must be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: The measured infiltration rates with a minimum factor of safety of 2 were 0.0035 and 0.0075 inches per hour. It is our understanding that an infiltration rate of less than 0.01 inches per is not considered suitable for partial infiltration. Therefore the question is not applicable. 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.			
Part 2 Result*	If all answers from row 5-8 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.**		

*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 Agency/Jurisdictions to substantiate findings