CHRISTIAN WHEELER
ENGINEERING

REPORT OF PRELIMINARY GEOTECHNICAL INVESTIGATION

SU CASA
6738 LA JOLLABOULEVARD
LA JOLLA, CALIFORNIA

PREPARED FOR

SU CASA PROPERTIES
912 NEWKIRK DRIVE
LA JOLLA, CALIFORNIA 92037

PREPARED BY

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October 23, 2015

Su Casa Properties
912 Newkirk Drive
La Jolla, California 92037

CWE 2150460.01

Subject: Report of Preliminary Geotechnical Investigation
Su Casa, 6738 La Jolla Boulevard, La Jolla, California

Ladies and Gentlemen:

In accordance with your request and our proposal dated July 30, 2015, we have completed a preliminary geotechnical investigation for proposed mixed-use structure to be constructed at the subject property. We are presenting herewith a report of our findings and recommendations.

It is our opinion and judgment that no geotechnical conditions exist at or in the vicinity of the subject property that would preclude the construction of the subject project as presently proposed.

If you have any questions after reviewing this report, please do not hesitate to contact our office. This opportunity to be of professional service is sincerely appreciated.

Respectfully submitted,
CHRISTIAN WHEELER ENGINEERING

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PRELIMINARY GEOTECHNICAL INVESTIGATION

SU CASA

6738 LA JOLLA BOULEVARD

LA JOLLA, CALIFORNIA

INTRODUCTION AND PROJECT DESCRIPTION

This report presents the results of a preliminary geotechnical investigation performed for a proposed mixed-use structure to be constructed at 6738 La Jolla Boulevard, La Jolla, California. The following Figure No. 1 presents a vicinity map showing the location of the property.

We understand that the subject project will consist of the construction of two, two-story and one, three-story structures over a single-level podium underground garage. It is anticipated that the underground garage will be of masonry or concrete construction, whereas the above grade structures will be of wood-frame construction. The structures will be supported on a mat foundation system. Grading is anticipated to consist primarily of cuts up to about 12 feet from existing grade.

To assist in the preparation of this report, we were provided with miscellaneous plans prepared by Marengo Morton Architects, dated May 20 and October 16, 2015, as well as an ALTA/ACSM Survey prepared by San Diego Land Surveying, dated August 22, 2014. A copy of a site plan included in the set was used as a base map for our Site Plan and Geologic Map, and is included herein as Plate No. 1.

This report has been prepared for the exclusive use of Su Casa Properties, and its design consultants, for specific application to the project described herein. Should the project be modified, the conclusions and recommendations presented in this report should be reviewed by Christian Wheeler Engineering for conformance with our recommendations and to determine whether any additional subsurface investigation, laboratory testing and/or recommendations are necessary. Our professional services have been performed, our findings obtained and our recommendations prepared in accordance with

SITE VICINITY

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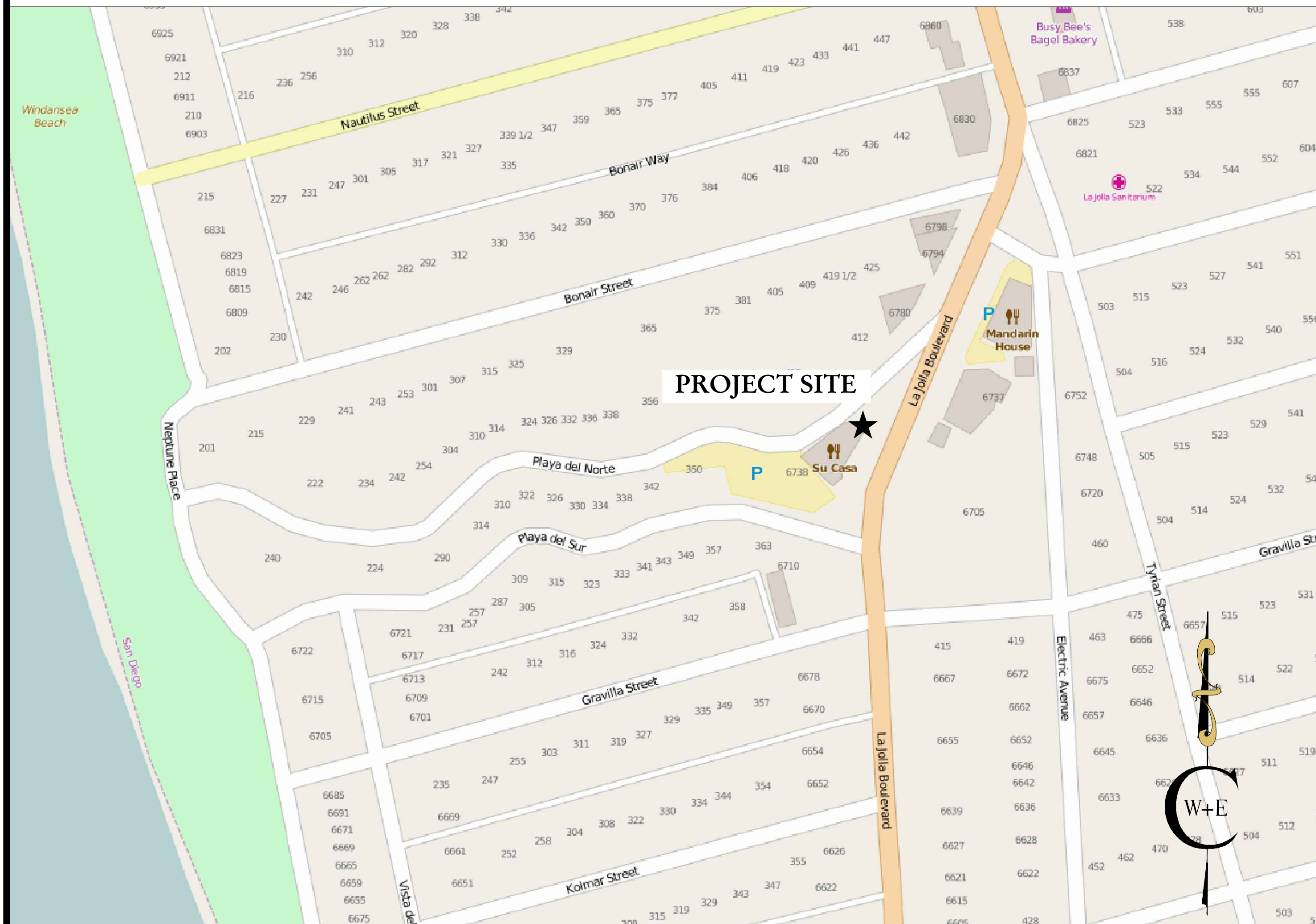

SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

DATE: OCTOBER 2015	JOB NO.: 2150460.01
BY: SRD	FIGURE NO.: 1

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generally accepted engineering principles and practices. This warranty is in lieu of all other warranties, expressed or implied.

SCOPE OF SERVICES

Our preliminary geotechnical investigation consisted of surface reconnaissance, subsurface exploration, obtaining representative soil samples, laboratory testing, analysis of the field and laboratory data, and review of relevant geologic literature. Our scope of service did not include assessment of hazardous substance contamination, recommendations to prevent floor slab moisture intrusion or the formation of mold within the structures, evaluation or design of storm water infiltration facilities, or any other services not specifically described in the scope of services presented below.

More specifically, the intent of our proposed investigation was to:

- Obtain a boring permit from the County of San Diego Department of Environmental Health to conduct the proposed subsurface investigation.
- Drill three exploratory borings at the site using a truck mounted drill rig, in order to explore the existing soil conditions at the site.
- Backfill the boring holes using a grout or a grout/bentonite mix as required by the County of San Diego Department of Environmental Health.
- Evaluate, by laboratory tests and our past experience with similar soil types, the engineering properties of the various soil strata that may influence the proposed construction, including bearing capacities, shear strengths, expansive characteristics and settlement potential.
- Describe the general geology at the site, including possible geologic hazards that could have an effect on the proposed construction, and provide the seismic design parameters as required by the current edition of the California Building Code.
- Address potential construction difficulties that may be encountered due to soil conditions, groundwater or geologic hazards, and provide geotechnical recommendations to deal with these difficulties.
- Provide site preparation and grading recommendations for the anticipated work, as necessary.
- Provide foundation recommendations for the type of construction anticipated and develop soil engineering design criteria for the recommended foundation designs.
- Provide recommendations for shored and unshored temporary cut slopes.

- Provide earth retaining wall design recommendations.
- Provide a preliminary geotechnical report presenting the results of our investigation, including a plot plan showing the location of our subsurface explorations, excavation logs, laboratory test results, and our conclusions and recommendations for the proposed project. The report will be provided as an electronic document in Portable Document Format (PDF).

Although a test for the presence of soluble sulfates within the soils that may be in contact with reinforced concrete was performed as part of the scope of our services, it should be understood Christian Wheeler Engineering does not practice corrosion engineering. If a corrosivity analysis is considered necessary, we recommend that the client retain an engineering firm that specializes in this field to consult with them on this matter. The results of our sulfate testing should only be used as a guideline to determine if additional testing and analysis is necessary.

FINDINGS

SITE DESCRIPTION

The subject site is located at 6738 La Jolla Boulevard in the La Jolla community of San Diego, California. The irregular-shaped site is bounded on the east by La Jolla Boulevard, on the north by Playa del Norte, on the south by Playa del Sur, and on the west by residential structures. The property presently supports a restaurant, an apartment structure, and associated paved parking. Topographically, the site slopes gently to the west with elevations ranging from about 70 feet to 57 feet (Marengo Morton Architects, 2015).

Prior to site grading and development in the early 1900's, the site originally consisted of a westerly trending ravine that was infilled to create its present topography. Playa del Sur and Playa del Norte are roughly located along the alignments of the northern and southern sides of the infilled ravine. It appears that the ravine extended east across La Jolla Boulevard. An aerial photograph from 1928 and a topographic map from 1943 indicate that the upper, eastern portion of the ravine had been infilled and La Jolla Boulevard had been constructed by 1928; however, the area of the ravine west of La Jolla Boulevard may not have been infilled in 1943.

GENERAL GEOLOGY AND SUBSURFACE CONDITIONS

GEOLOGIC SETTING AND SOIL DESCRIPTION: The subject site is located in the Coastal Plains Physiographic Province of San Diego County. Based upon the findings of our subsurface explorations and review of readily available, pertinent geologic and geotechnical literature, it was determined that the project area is underlain by artificial fill/alluvium, subsoil, and Cretaceous-age sedimentary deposits of the Point Loma Formation. These materials are described below.

ARTIFICIAL FILL/ALLUVIUM (Qaf/Qal): Undifferentiated artificial fill and alluvium was encountered underlying the entire site, extending to depths ranging from approximately 8½ feet, 19 feet, and 10½ feet below existing grade, in borings B-1, B-2, and B-3, respectively. As encountered in our borings, these materials generally consisted of brown, grayish-brown, and greenish-gray, moist to saturated, interbedded, loose to medium dense, silty sand (SM) and clayey sand (SC) and medium stiff sandy clay/clayey sand (CL/SC). Some concrete debris was encountered in this material. Maximum concrete debris size encountered was estimated to be approximately 12 inches in dimension. The silty sandy (SM) and clayey sandy (SC) portions of the artificial fill/alluvium were judged to have a low expansion potential (EI between 21 and 50). The sandy clay/clayey sand (CL/SC) artificial fill/alluvium was judged to have a medium expansion potential (EI between 51 and 90). However, a tested sample of this material had a low expansion potential (EI=35).

SUBSOIL: A 2½-feet-thick subsoil layer was encountered underlying the artificial fill/alluvium in boring B-1. This material generally consisted of greenish-gray, very moist, medium stiff, sandy clay (CL). The subsoil was judged to have to have a medium expansion potential (EI between 51 and 90).

POINT LOMA FORMATION (Kp): Cretaceous-age sedimentary deposits of the Point Loma Formation were encountered underlying the artificial fill/alluvium and subsoil. As encountered in our explorations, the formational soils generally consisted of yellowish-brown and greenish-gray, moist, dense to very dense, silty sand (SM). The upper foot of formational soils in boring B-1 consisted of greenish-gray, very moist, very stiff, clayey silt with sand (ML). The Point Loma Formation deposits were judged to have a low expansion potential (EI between 21 and 50).

GROUNDWATER: Seepage was encountered in all the borings. Moderate to heavy seepage was encountered at a depth of about 11 feet, 7 feet, and 8 feet, in borings B-1, B-2, and B-3, respectively. Very moist to saturated soils were encountered below said depth in borings B-1 and B-2. It is our opinion that perched groundwater exists at the contact between the undifferentiated fill/alluvium and the underlying materials of the Point Loma Formation, at the bottom of the original ravine. Furthermore, localized perched groundwater exists within the undifferentiated fill/alluvium due to layers of different permeability characteristics. This condition will affect the construction of the subject project. Recommendations to mitigate this condition are provided hereinafter. However, it should be recognized that minor groundwater seepage problems might occur after construction and landscaping are completed. These are usually minor phenomena and are often the result of an alteration in drainage patterns and/or an increase in irrigation water. Based on the anticipated construction and the permeability of the on-site soils, it is our opinion that any seepage problems that may occur will be minor in extent. It is further our opinion that these problems can be most effectively corrected on an individual basis if and when they occur.

TECTONIC SETTING: It should be noted that much of Southern California, including the San Diego County area, is characterized by a series of Quaternary-age fault zones that consist of several individual, en echelon faults that generally strike in a northerly to northwesterly direction. Some of these fault zones (and the individual faults within the zone) are classified as active while others are classified as only potentially active according to the criteria of the California Division of Mines and Geology. Active fault zones are those which have shown conclusive evidence of faulting during the Holocene Epoch (the most recent 11,000 years) while potentially active fault zones have demonstrated movement during the Pleistocene Epoch (11,000 to 1.6 million years before the present) but no movement during Holocene time. Inactive faults are those faults that can be demonstrated to have no movement in the past 1.6 million years.

It should be recognized that the active Rose Canyon Fault Zone is located approximately 1¾ miles northeast of the site. Other active fault zones in the region that could possibly affect the site include the Coronado Bank, San Diego Trough, and San Clemente Fault Zones to the west; the Earthquake Valley to the north; and the Elsinore and San Jacinto Fault Zones to the northeast.

GENERAL GEOLOGIC HAZARDS

GENERAL: The site is located in an area where the risks due to significant geologic hazards are relatively low. No geologic hazards of sufficient magnitude to preclude use of the site for residential purposes are known to exist. In our professional opinion and to the best of our knowledge, the site is suitable for the proposed improvements.

SLOPE STABILITY: As part of this investigation we reviewed the publication, “Landslide Hazards in the Southern Part of the San Diego Metropolitan Area” by Tan, 1995. This reference is a comprehensive study that classifies San Diego County into areas of relative landslide susceptibility. The subject site is located in Area 2, which includes areas that are considered to be “marginally susceptible” to slope failures. Based on our findings, existing and proposed site topography, and the proposed construction, it is our opinion that the likelihood of slope stability related problems at the site is very low.

LIQUEFACTION: The earth materials underlying the site are not considered subject to liquefaction due to such factors as soil density, grain-size distribution, and the absence of an unconfined, free groundwater table within the undifferentiated artificial fill/alluvium.

FLOODING: As delineated on the Flood Insurance Rate Map (FIRM) prepared by the Federal Emergency Management Agency, the site is not located within either the 100-year flood zone or the 500-year flood zone.

TSUNAMIS: Tsunamis are great sea waves produced by submarine earthquakes or volcanic eruptions. The site is not within the projected tsunami inundation area presented on the La Jolla Quadrangle of the Tsunami Inundation Map for Emergency Planning (CEMA, 2009). Furthermore, due to the site’s setback from the ocean and elevation, it is not considered directly susceptible from damage from tsunamis.

SEICHES: Seiches are periodic oscillations in large bodies of water such as lakes, harbors, bays or reservoirs. Due to the site’s location, it is considered to have a negligible risk potential for seiches.

CONCLUSIONS AND DISCUSSION

In general, it is our professional opinion and judgment that the subject property is suitable for the construction of the subject project and associated improvements provided the recommendations presented herein are implemented. The main geotechnical conditions encountered affecting the proposed project include relatively deep potentially compressible fill soils/alluvium, seepage and very moist to saturated soils, temporary cut slopes, cut/fill transitions, and expansive soils. These conditions are discussed hereinafter.

The site originally consisted of a westerly trending ravine that was backfilled to its present configuration. The limits of the ravine are unknown. However, it appears that it was bounded on the south and north by Playa del Sur and Playa del Norte, respectively, and extended east across La Jolla Boulevard. Our borings indicate that the property is underlain by relatively deep undifferentiated fill soils/ alluvium. The contact between these materials and the underlying formational soils is shown in three cross-sections presented in Plates No. 2, 3, and 4. Based on our findings, it is estimated that the maximum depth of the fill/alluvium is about 22 feet from existing grade. The undifferentiated fill/alluvium is considered unsuitable, in its present condition, for the support of settlement sensitive improvements.

Moderate to heavy seepage was encountered at a depth of about 11 feet, 7 feet, and 8 feet, in borings B-1, B-2, and B-3, respectively. Very moist to saturated soils were encountered below said depth in borings B-1 and B-2. It is our opinion that perched groundwater exists at the contact between the undifferentiated fill/alluvium and the Point Loma Formation at the bottom of the original ravine. Furthermore, localized perched groundwater exists within the undifferentiated fill alluvium due to layers of different permeability characteristics.

The depth of the fill/alluvium, high moisture content of a high percentage of these materials, seepage, perched groundwater, and proximity of the proposed structures to some property lines make the removal and replacement as compacted fill of the potentially compressible soils unfeasible. It is therefore recommended that the proposed structure be founded on a compensated mat foundation. However, partial removal and recompaction of fill/alluvium is recommended for areas to support the above grade miscellaneous exterior improvements.

The presence of seepage and very moist to saturated soils at relatively shallow depths will need to be accounted for in the underground garage waterproofing as well as shoring design. In addition, this condition will impact proposed construction and may require dewatering and stabilization of the bottom of the excavation, as well as special drilling techniques for excavations associated with shoring.

Based on our findings, portion of the proposed basement excavation will expose formational soils at foundation levels. It is recommended that these deposits be undercut as recommend hereinafter. It is our opinion that undercutting the portions of the garage building pad exposing formational soils at grade will further help with the anticipated seepage conditions.

Temporary cut slopes up to about 14 feet below existing grade are anticipated. Due to the proximity of these slopes to some of the property lines and the flatter than typical inclinations recommended for unshored slopes constructed into the existing of the fill/alluvium, temporary shoring will be necessary.

Some of the fill/alluvium underlying the site was found to be expansive (EI between 51 and 90). It is recommended that select grading be performed for the at-grade associated exterior improvements.

The site is located in an area that is relatively free of geologic hazards that will have a significant effect on the proposed construction. The most likely geologic hazard that could affect the site is ground shaking due to seismic activity along one of the regional active faults. However, construction in accordance with the requirements of the most recent edition of the California Building Code and the local governmental agencies should provide a level of life-safety suitable for the type of development proposed.

RECOMMENDATIONS

GRADING AND EARTHWORK

GENERAL: All grading should conform to the guidelines presented in the current edition of the California Building Code, the minimum requirements of the City of San Diego, and the recommended Grading Specifications and Special Provisions attached hereto, except where specifically superseded in the text of this report.

PREGRADE MEETING: It is recommended that a pregrade meeting including the grading contractor, the client, and a representative from Christian Wheeler Engineering be performed, to discuss the recommendations of this report and address any issues that may affect grading operations.

CLEARING AND GRUBBING: Site preparation should begin with the demolition of existing structures and associated improvements. The resulting debris, any existing vegetation, and other deleterious materials in areas to receive proposed improvements or new fill soils should be removed from the site.

SITE PREPARATION: It is recommended that existing fill/alluvial soils underlying the above grade portion of the proposed structure and associated exterior improvements be removed to a minimum depth of 4 feet below existing or proposed grade, whichever is more. Deeper removals may be necessary in areas of the site not investigated or due to unforeseen conditions. Lateral removals limits should extend at least 5 feet beyond the perimeter of the improvements or removal depth, whichever is more. All excavated areas should be approved by the geotechnical engineer or his representative prior to replacing any of the excavated soils. The excavated materials can be replaced as properly compacted fill provided that they have been properly mixed as recommended in the Select Grading paragraph. Compacted fills should be placed in accordance with the recommendations presented in the "Compaction and Method of Filling" section of this report.

UNDERCUT: It is recommended that existing formational soils underling proposed structure be undercut to a minimum depth of 4 feet below proposed mat foundation bottom. Minimum horizontal limits of this operation are 4 feet beyond the perimeter of the proposed structure. The materials removed may be replaced as compacted fill.

UNSTABLE EXCAVATION BOTTOM: It is anticipated that the bottom of the proposed underground portion of the structure will likely be unstable and require special stabilizing techniques. Stabilizing fabric such as Mirafi 570 HP or equivalent, a crushed rock layer wrapped in filter fabric or other similar techniques may be necessary for construction purposed.

SEEPAGE: Moderately to heavy seepage was encountered in our investigation. The impact of this condition once the site is excavated is difficult to evaluate. However, some dewatering may be necessary. A contractor specializing in construction dewatering should be retained to design and perform the necessary dewatering.

SELECT GRADING: It is recommended that expansive fill/alluvium within 4 feet from finish pad grade at-grade portion of the proposed structure and associated improvements be exported from the site. The material removed may be replaced with on-site low expansive (EI between 21 and 50) compacted fill soils. Minimum horizontal limits of this operation are 5 feet beyond the perimeter of the proposed structure and associated hardscape.

IMPORTED FILL: Imported fill should consist of low expansive silty and or clayey sands (EI between 21 and 50) with relatively high strength and low permeability. Imported fill should be approved by this office prior to delivery to the site. At least 72 hours will be necessary to properly evaluated potential import material.

PROCESSING OF FILL AREAS: Prior to placing any new fill soils or constructing any new improvements in areas that have been cleaned out to receive fill, the exposed soils should be scarified to a depth of 12 inches, moisture-conditioned, and compacted to at least 90 percent relative compaction.

COMPACTION AND METHOD OF FILLING: In general, all structural fill placed at the site should be compacted to a relative compaction of at least 90 percent of its maximum laboratory dry density as determined by ASTM Laboratory Test D1557. Fills should be placed at or slightly above optimum moisture content, in lifts six to eight inches thick, with each lift compacted by mechanical means. Fills should consist of approved earth material, free of trash or debris, roots, vegetation, or other materials determined to be unsuitable by the Geotechnical Consultant. Fill material should be free of rocks or lumps of soil in excess of 6 inches in maximum dimension.

Utility trench backfill within 5 feet of the proposed structure and beneath all concrete flatwork or pavements should be compacted to a minimum of 90 percent of its maximum dry density.

SURFACE DRAINAGE: The drainage around the proposed improvements should be designed to collect and direct surface water away from proposed improvements toward appropriate drainage facilities. Rain gutters with downspouts that discharge runoff away from the structure into controlled drainage devices are recommended.

The ground around the proposed improvements should be graded so that surface water flows rapidly away from the improvements without ponding. In general, we suggest that the ground adjacent to structures be sloped away at a minimum gradient of 2 percent. In densely vegetated areas where runoff can be impaired we suggest a minimum gradient of 5 percent for the first 5 feet from the structure. It is essential that new and existing drainage patterns be coordinated to produce proper drainage. Pervious hardscape surfaces adjacent to structures should be similarly graded.

Drainage patterns provided at the time of construction should be maintained throughout the life of the proposed improvements. Site irrigation should be limited to the minimum necessary to sustain landscape growth. Over watering should be avoided. Should excessive irrigation, impaired drainage, or unusually high rainfall occur, zones of wet or saturated soil may develop.

Based on the presence of man-placed fill materials on-site as well as the geomorphic conditions of the site that include an infilled ravine in which perched water is commonly encountered along the contact with surficial materials of artificial fill/alluvium and underlying and much less permeable Cretaceous-age sedimentary deposits, the use of infiltration facilities to manage storm water discharge at the site are not recommended.

TEMPORARY CONSTRUCTION SLOPES: Temporary cut slopes may be necessary for the construction of the proposed underground garage. We anticipate that, if required, temporary slopes necessary for the project will be up to about 14 feet in height. Temporary slopes can be excavated at a continuous 1.5:1 (horizontal to vertical) or flatter inclination. All temporary slopes should be observed by the engineering geologist during grading to ascertain that no unforeseen adverse conditions exist. No surcharge loads such as adjacent building foundations, soil or equipment stockpiles, vehicles, etc. should be allowed within a distance from the top of temporary slopes equal to half the slope height.

It should be noted that the contractor is solely responsible for designing and constructing stable, temporary excavations and may need to shore, slope, or bench the sides of trench excavations as required to maintain the stability of the excavation sides. The contractor's "competent person", as defined in the OSHA Construction Standards for Excavations, 29 CFR, Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety process. Temporary cut slopes should be constructed in accordance with the recommendations presented in this section. In no other case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations.

SHORING RECOMMENDATIONS

Shoring will be required for the construction of the proposed basement where the 1.5:1 (horizontal to vertical) temporary cut slopes cannot be made. It is anticipated that conventional shoring consisting of soldier piles with wood lagging will be used. The following design parameters may be assumed to calculate earth pressures on shoring. Due to the presence of seepage and wet soils special drilling techniques may be necessary to avoid caving during drilling. Hydrostatic pressure should be assumed for the bottom 3 feet of shoring.

TABLE I: SHORING DESIGN PARAMETERS

Angle of friction	25°
Apparent cohesion	100 pounds per square foot
Soil unit weight	130 pounds per cubic foot

An active condition can be applied to shoring that is capable of rotating 0.002 radians. An at-rest condition should be applied to a shoring system that is unyielding and not able to rotate. These values do not include surcharge loads. Construction surcharge loads should be evaluated on a case-by-case basis. Vertical and lateral movements of the temporary shoring are expected to be small assuming an adequate lateral support system. Shoring should be periodically monitored for soil loss behind the lagging.

FOUNDATIONS

GENERAL: Based on the anticipated soil conditions and the site preparation recommendations provided in this report, a concrete structural mat foundation may be utilized for the support of the proposed structure. Conventional shallow foundations may be utilized for associated light exterior miscellaneous improvements.

STRUCTURAL MAT FOUNDATION

A structurally reinforced concrete mat foundation is recommended for support of the proposed structure. Thickness and reinforcement requirements of the mat foundation should be in accordance with the recommendations of the project structural engineer. To reduce potential consolidation settlements, the mat should be designed using an allowable bearing capacity of no more than 900 pounds per square foot. The recommended allowable bearing capacity may be increased by up to one-third when considering loads of a short duration such as wind or seismic forces.

Mat foundations typically experience some deflection due to loads placed on the mat and the reaction of the soils underlying the mat. A design coefficient of subgrade reaction, K_{v1}, of 100 pounds per cubic inch (pci) may be used for evaluating such deflections at the site. This value is based on the soil conditions encountered in our exploratory excavations and is considered as applied to a unit square foot area. The value should be adjusted for the design mat size. The coefficient of subgrade reaction K_b for a mat of a specific width may be evaluated using the following equation:

$$\mathbf{K_b = K_{v1}\,[(b+1)/2b]^2}$$

Where **b** is the least width of the foundation

Based on our preliminary evaluation, the anticipated total settlement for the mat foundation should be less than approximately 1 inch. Anticipated maximum differential settlements of approximately 50 percent of the total settlements may occur between the center of the base of the structure and the structure corners. Lateral forces may be resisted by passive pressure resistance. For passive pressure design, an allowable equivalent fluid pressure of 250 pounds per cubic foot (pcf) may be assumed.

CONVENTIONAL SHALLOW FOUNDATIONS

DIMENSIONS: Conventional footings supporting associated light exterior miscellaneous improvements should have a minimum embedment depth of 12 inches below lowest adjacent finish grade. Continuous and isolated footings should have a minimum width of 18 inches and 24 inches, respectively. Retaining wall footings should have a minimum depth of 18 inches and a minimum width of 24 inches.

BEARING CAPACITY: Continuous shallow footings may be designed for an allowable soil bearing pressure of 1,500 pounds per square foot (psf). The bearing value may also be increased by one-third for combinations of temporary loads such as those due to wind or seismic loads.

FOOTING REINFORCEMENT: The project structural engineer should provide reinforcement requirements for foundations. However, based on soil conditions, we recommend that the minimum reinforcing for continuous footings should consist of at least 2 No. 5 bars positioned near the bottom of the footing and 2 No. 5 bars positioned near the top of the footing.

LATERAL LOAD RESISTANCE: Lateral loads against foundations may be resisted by friction between the bottom of the footing and the supporting soil, and by the passive pressure against the footing. The coefficient of friction between concrete and fill material may be considered to be 0.30. The passive resistance for the fill may be considered to be equal to an equivalent fluid weight of 300 pounds per cubic foot. These values are based on the assumption that the footings are poured tight against undisturbed soil. If a combination of the passive pressure and friction is used, the friction value should be reduced by one-third.

SETTLEMENT CHARACTERISTICS: The anticipated total and differential footing static settlement is expected to be less than about 1 inch and 1 inch in 40 feet, respectively, provided the recommendations presented in this report are followed. It should be recognized that minor cracks normally occur in concrete slabs and foundations due to concrete shrinkage during curing or redistribution of stresses, therefore some cracks should be anticipated. Such cracks are not necessarily an indication of excessive vertical movements.

EXPANSIVE CHARACTERISTICS: The foundation soils at the proposed underground garage level are judged to have a low to medium expansion potential (EI between 21 and 90). The anticipated foundation soils underlying at-grade miscellaneous improvements are expected to have a low expansion potential (EI between 21 and 50). The recommendations presented in this report reflect this condition.

FOUNDATION PLAN REVIEW: The final foundation plan and accompanying details and notes should be submitted to this office for review. The intent of our review will be to verify that the plans used for construction reflect the minimum dimensioning and reinforcing criteria presented in this section and that no additional criteria are required due to changes in the foundation type or layout. It is not our intent to review structural plans, notes, details, or calculations to verify that the design engineer has correctly applied the geotechnical design values. It is the responsibility of the design engineer to properly design/specify the foundations and other structural elements based on the requirements of the structure and considering the information presented in this report.

FOUNDATION EXCAVATION OBSERVATION: All foundation excavations should be observed by the Geotechnical Consultant prior to constructing forms or placing reinforcing steel to determine if the foundation recommendations presented herein are complied with. All footing excavations should be excavated neat, level and square. All loose or unsuitable material should be removed prior to the placement of concrete.

SOLUBLE SULFATES: The water soluble sulfate content of selected soil samples from the site was determined in accordance with California Test Method 417. The results of these tests indicate that the fill/alluvium soil sample had a soluble sulfate content of 0.130 percent. The formational soils sample had a soluble sulfate content of 0.040 percent. Soils with a soluble sulfate content of less than 0.1 percent are considered to be negligible. Soils with a sulfate content of 0.1 to 0.2 are considered moderate and require special consideration as recommended by the project structural engineer.

SEISMIC DESIGN FACTORS

The seismic design factors applicable to the subject site are provided below. The seismic design factors were determined in accordance with the 2013 California Building Code. The site coefficients and adjusted maximum considered earthquake spectral response acceleration parameters are presented in the following Table I.

TABLE I: SEISMIC DESIGN FACTORS

Site Coordinates: Latitude Longitude	32.832° -117.258°
Site Class	D
Site Coefficient F_a	1.151
Site Coefficient F_v	1.725
Spectral Response Acceleration at Short Periods S_s	1.260 g
Spectral Response Acceleration at 1 Second Period S_1	0.486 g
$S_{MS}=F_aS_s$	1.260 g
$S_{M1}=F_vS_1$	0.735 g
$S_{DS}=2/3*S_{MS}$	0840 g
$S_{D1}=2/3*S_{M1}$	0.490 g

Probable ground shaking levels at the site could range from slight to moderate, depending on such factors as the magnitude of the seismic event and the distance to the epicenter. It is likely that the site will experience the effects of at least one moderate to large earthquake during the life of the proposed improvements.

ON-GRADE SLABS

UNDER-SLAB VAPOR RETARDERS: Due to the anticipated high moisture content of the underground garage foundation soils special waterproofing measures should be implemented. Waterproofing recommendations should be provided by a project's waterproofing consultant. Steps should be taken to minimize the transmission of moisture vapor from the subsoil through the interior slabs where it can potentially damage the interior floor coverings. Local industry standards typically include the placement of a vapor retarder, such as plastic, in a layer of coarse sand placed directly beneath the concrete slab. In this case we recommend that as a minimum a six-inch-thick layer of crushed rock be placed under the plastic. Filter fabric such as Mirafi 140N is recommended between the rock and the soil. For the above grade portion of the structure, the rock layer is not necessary, and two inches of sand above and below the plastic are recommended. The vapor retarder should be at least 15-mil Stegowrap® or similar material with sealed seams and should extend at least 12 inches down the sides of the interior and perimeter footings. The sand should have a sand equivalent of at least 30, and contain less than 10% passing the Number 100 sieve and less than 5% passing the Number 200 sieve. The membrane should be placed in accordance with the recommendation and consideration of ACI 302, “Guide for Concrete Floor and Slab Construction” and ASTM E1643, “Standards Practice for Installation of Water Vapor Retarder Used in Contact with Earth or Granular Fill Under Concrete Slabs.” It is the flooring contractor’s responsibility to place floor coverings in accordance with the flooring manufacturer specifications.

EXTERIOR CONCRETE FLATWORK: Exterior concrete slabs on grade should have a minimum thickness of 4 inches and be reinforced with at least No. 3 bars placed at 18 inches on center each way (ocew). Exterior concrete slabs adjacent to the structure should be doweled to perimeter footings as recommended by the structural engineer. Driveway slabs should have a minimum thickness of 5 inches and be reinforced with at least No. 4 bars placed at 12 inches ocew. Driveway slabs should be provided with a thickened edge a least 24 inches deep and 6 inches wide. All slabs should be provided with weakened plane joints in accordance with the American Concrete Institute (ACI) guidelines. Special attention should be paid to the method of concrete curing to reduce the potential for excessive shrinkage cracking. It should be recognized that minor cracks occur normally in concrete slabs due to shrinkage. Some shrinkage cracks should be expected and are not necessarily an indication of excessive movement or structural distress. .

EARTH RETAINING WALLS

FOUNDATIONS: Foundations for any proposed retaining walls should be constructed in accordance with the foundation recommendations presented previously in this report.

PASSIVE PRESSURE: The passive pressure for the anticipated foundation soils at the underground garage level may be considered to be 250 pounds per square foot per foot of depth. The coefficient of friction for concrete to soil may be assumed to be 0.25 for the resistance to lateral movement. The passive pressure for the anticipated foundation soils at the at the at-grade portion of the structure and associated improvements may be considered to be 300 pounds per square foot per foot of depth. In this case the coefficient of friction for concrete to soil may be assumed to be 0.30 for the resistance to lateral movement. These pressures may be increased by one-third for seismic loading. When combining frictional and passive resistance, the friction should be reduced by one-third. The upper one foot of soil should be neglected in passive pressure calculations where the footing is abutted by landscaping.

ACTIVE PRESSURE: The active soil pressure for the design of unrestrained and restrained earth retaining structures with level backfill may be assumed to be equivalent to the pressure of a fluid weighing 45 and 65 pounds per cubic foot, respectively. This pressure does not consider any surcharges. If any are anticipated, this office should be contacted for the necessary increase in soil pressure. These values assume a drained backfill condition.

Seismic lateral earth pressures may be assumed to equal an inverted triangle starting at the bottom of the wall with the maximum pressure equal to 12H pounds per square foot (where H = wall height in feet) occurring at the top of the wall.

WATERPROOFING AND WALL DRAINAGE SYSTEMS: Due to the anticipated high moisture content of the underground garage foundation soils special waterproofing measures should be implemented. Waterproofing recommendations should be provided by a project's waterproofing consultant. The project architect should provide (or coordinate) waterproofing details for the retaining walls. The design values presented above are based on a drained backfill condition and do not consider hydrostatic pressures. Unless hydrostatic pressures are incorporated into the design, the retaining wall designer should provide a detail for a wall drainage system. Typical retaining wall drain system details are presented as Plate No. 5 of this report for informational purposes. Additionally, outlets points for the retaining wall drain system should be coordinated with the project civil engineer. It is assumed that sump pumps will be necessary to discharge retaining wall subdrains.

BACKFILL: All backfill soils should be compacted to at least 90 percent relative compaction. Expansive or clayey soils should not be used for backfill material. The wall should not be backfilled until the masonry has reached an adequate strength.

LIMITATIONS

REVIEW, OBSERVATION AND TESTING

The recommendations presented in this report are contingent upon our review of final plans and specifications. Such plans and specifications should be made available to the geotechnical engineer and engineering geologist so that they may review and verify their compliance with this report and with the California Building Code.

It is recommended that Christian Wheeler Engineering be retained to provide continuous soil engineering services during the earthwork operations. This is to verify compliance with the design concepts, specifications or recommendations and to allow design changes in the event that subsurface conditions differ from those anticipated prior to start of construction.

UNIFORMITY OF CONDITIONS

The recommendations and opinions expressed in this report reflect our best estimate of the project requirements based on an evaluation of the subsurface soil conditions encountered at the subsurface exploration locations and on the assumption that the soil conditions do not deviate appreciably from those encountered. It should be recognized that the performance of the foundations and/or cut and fill slopes may be influenced by undisclosed or unforeseen variations in the soil conditions that may occur in the intermediate and unexplored areas. Any unusual conditions not covered in this report that may be encountered during site development should be brought to the attention of the geotechnical engineer so that he may make modifications if necessary.

CHANGE IN SCOPE

This office should be advised of any changes in the project scope or proposed site grading so that we may determine if the recommendations contained herein are appropriate. This should be verified in writing or modified by a written addendum.

TIME LIMITATIONS

The findings of this report are valid as of this date. Changes in the condition of a property can, however, occur with the passage of time, whether they be due to natural processes or the work of man on this or adjacent properties. In addition, changes in the Standards-of-Practice and/or Government Codes may occur. Due to such changes, the findings of this report may be invalidated wholly or in part by changes beyond our control. Therefore, this report should not be relied upon after a period of two years without a review by us verifying the suitability of the conclusions and recommendations.

PROFESSIONAL STANDARD

In the performance of our professional services, we comply with that level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions and in the same locality. The client recognizes that subsurface conditions may vary from those encountered at the locations where our borings, surveys, and explorations are made, and that our data, interpretations, and recommendations be based solely on the information obtained by us. We will be responsible for those data, interpretations, and recommendations, but shall not be responsible for the interpretations by others of the information developed. Our services consist of professional consultation and observation only, and no warranty of any kind whatsoever, express or implied, is made or intended in connection with the work performed or to be performed by us, or by our proposal for consulting or other services, or by our furnishing of oral or written reports or findings.

CLIENT'S RESPONSIBILITY

It is the responsibility of the Client, or its representatives, to ensure that the information and recommendations contained herein are brought to the attention of the structural engineer and architect for the project and incorporated into the project's plans and specifications. It is further their responsibility to take the necessary measures to insure that the contractor and his subcontractors carry out such recommendations during construction.

FIELD EXPLORATIONS

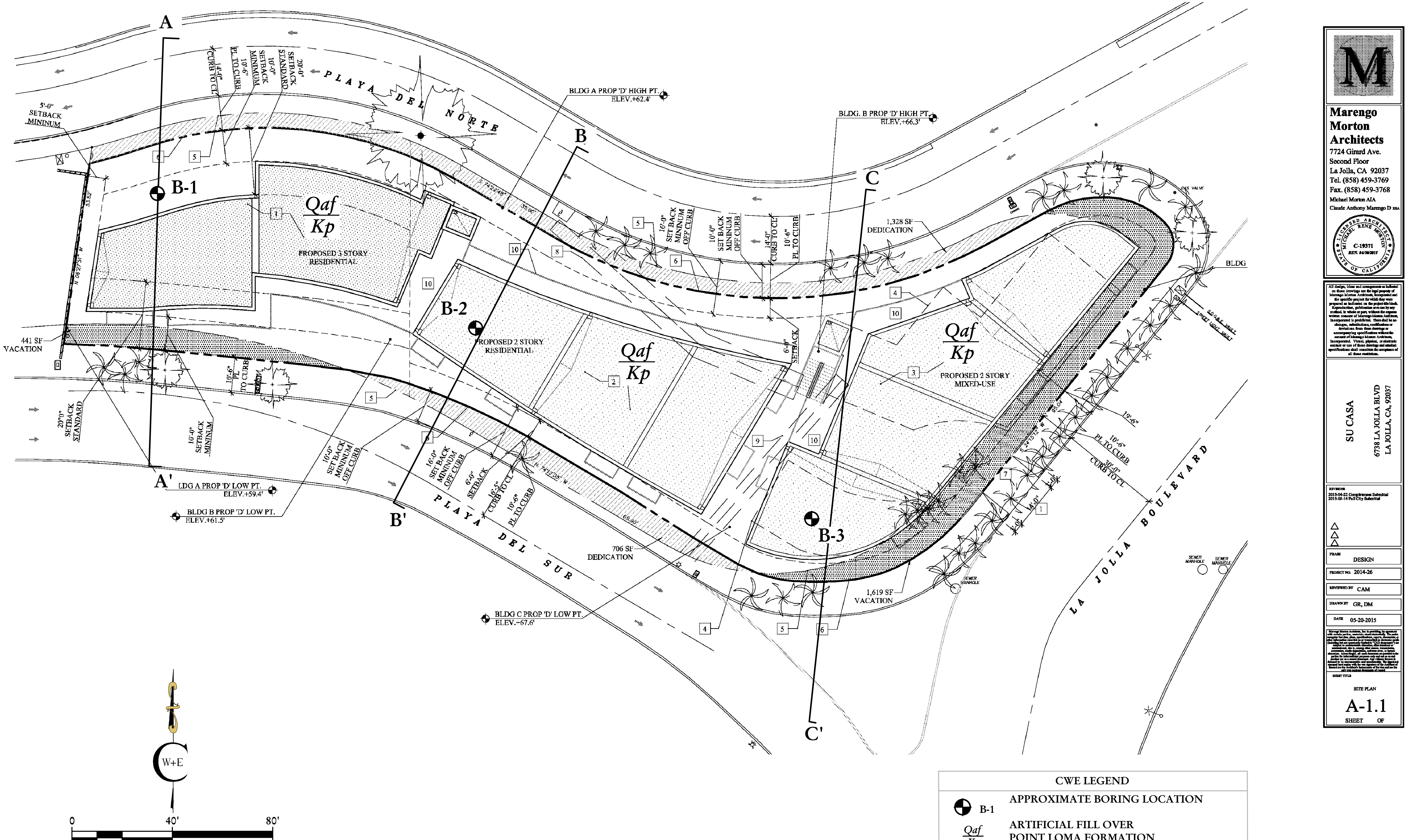
Three subsurface explorations were made on September 22, 2015 at the locations indicated on the Site Plan and Geotechnical Map included herewith as Plate No. 1. These explorations consisted of small diameter borings drilled utilizing a truck mounted drill rig (Mobile B-61). The fieldwork was conducted under the observation and direction of our engineering geology personnel.

The explorations were carefully logged when made. The logs are presented on Appendix A. The soils are described in accordance with the Unified Soils Classification. In addition, a verbal textural description, the wet color, the apparent moisture, and the density or consistency is provided. The density of granular soils is given as very loose, loose, medium dense, dense or very dense. The consistency of silts or clays is given as either very soft, soft, medium stiff, stiff, very stiff, or hard.

Relatively undisturbed drive samples were collected using a modified California sampler. The sampler, with an external diameter of 3.0 inches, is lined with 1-inch long, thin, brass rings with inside diameters of approximately 2.4 inches. The sample barrel was driven into the ground with the weight of a 140-pound hammer falling 30 inches in general accordance with ASTM D 3550-84. The driving weight is permitted to fall freely. The number of blows per foot of driving, or as indicated, are presented on the boring logs as an index to the relative resistance of the sampled materials. The samples were removed from the sample barrel in the brass rings, and sealed. Bulk samples of the earth materials encountered were also collected. Samples were transported to our laboratory for testing.

LABORATORY TESTING

Laboratory tests were performed in accordance with the generally accepted American Society for Testing and Materials (ASTM) test methods or suggested procedures. A brief description of the tests performed and the subsequent results are presented in Appendix B.



SCALE: 1" = 40'

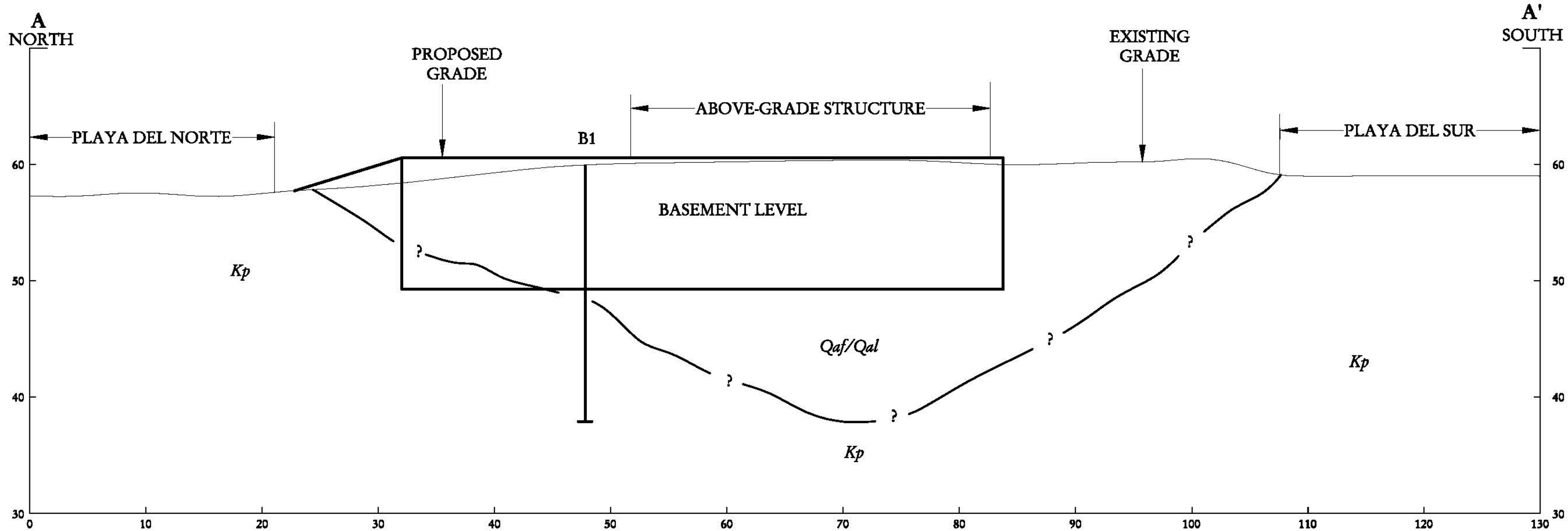
CWE LEGEND	
B-1	APPROXIMATE BORING LOCATION
Qaf/Kp	ARTIFICIAL FILL OVER POINT LOMA FORMATION
C — C'	APPROXIMATE CROSS SECTION LOCATION

SITE PLAN AND GEOTECHNICAL MAP

SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

DATE:	OCTOBER 2015	JOB NO.:	2150460.01
BY:	SRD	PLATE NO.:	1

CHRISTIAN WHEELER ENGINEERING



CWE LEGEND	
B-1	APPROXIMATE BORING LOCATION
Qaf/Qal	UNDIFFERENTIATED ARTIFICIAL FILL/ALLUVIUM
Kp	POINT LOMA FORMATION

0 10' 20'

SCALE: 1" = 10'

GEOLOGIC CROSS SECTION A-A'

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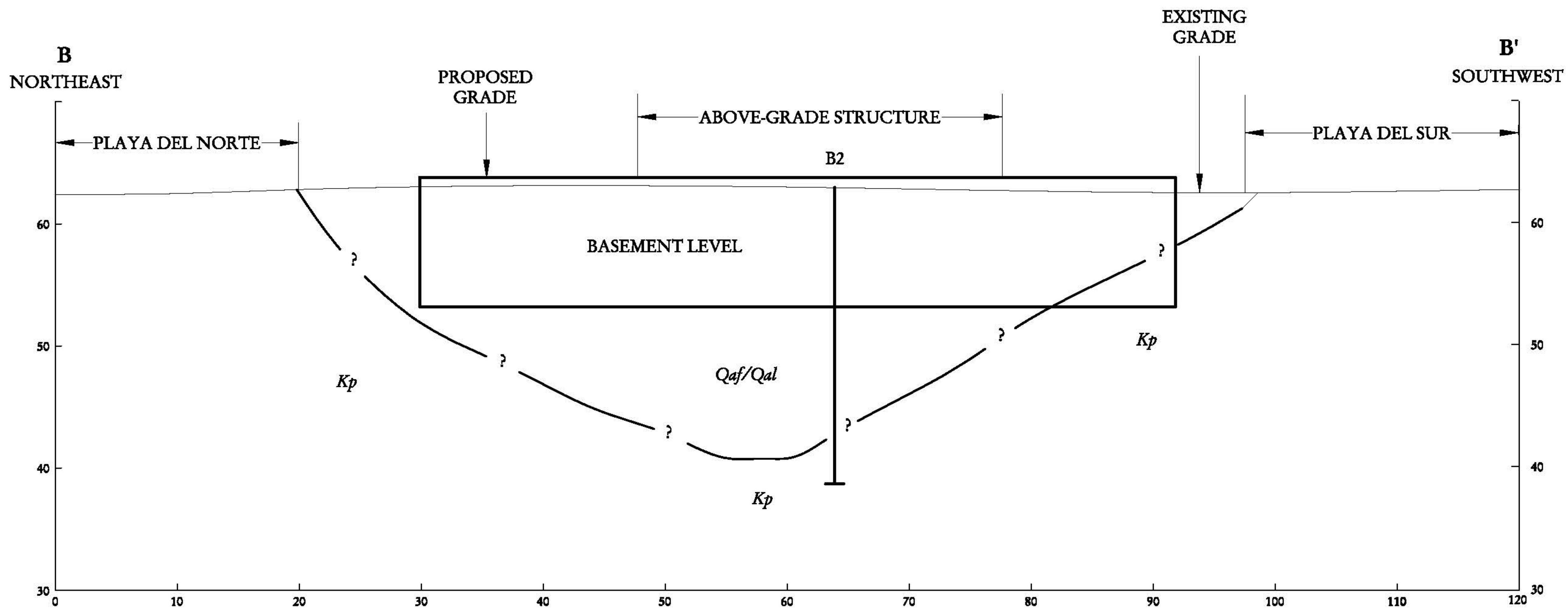
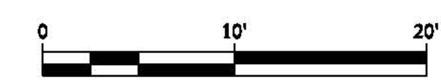
DATE:	OCTOBER 2015	JOB NO.:	2150460
BY:	SRD	PLATE NO.:	2

CHRISTIAN WHEELER
ENGINEERING



CWE LEGEND	
B-1	APPROXIMATE BORING LOCATION
Qaf/Qal	UNDIFFERENTIATED ARTIFICIAL FILL/ALLUVIUM
Kp	POINT LOMA FORMATION

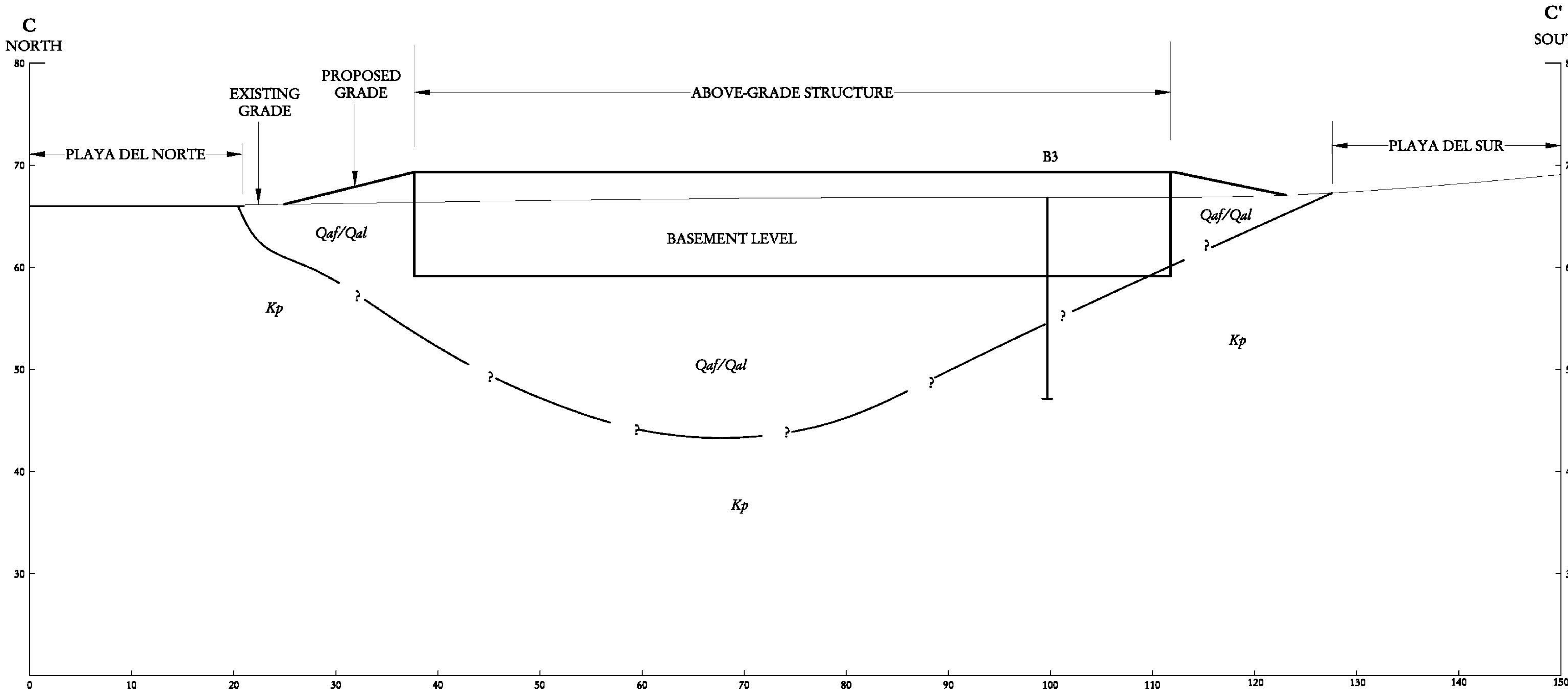


SCALE: 1" = 10'

GEOLOGIC CROSS SECTION B-B'

SU CASA 6738 LA JOLLA BOULEVARD LA JOLLA, CALIFORNIA			
DATE:	OCTOBER 2015	JOB NO.:	2150460
BY:	SRD	PLATE NO.:	3

CHRISTIAN WHEELER
ENGINEERING



CWE LEGEND	
B-1	APPROXIMATE BORING LOCATION
Qaf/Qal	UNDIFFERENTIATED ARTIFICIAL FILL/ALLUVIUM
Kp	POINT LOMA FORMATION

0 10' 20'

SCALE: 1" = 10'

GEOLOGIC CROSS SECTION C-C'

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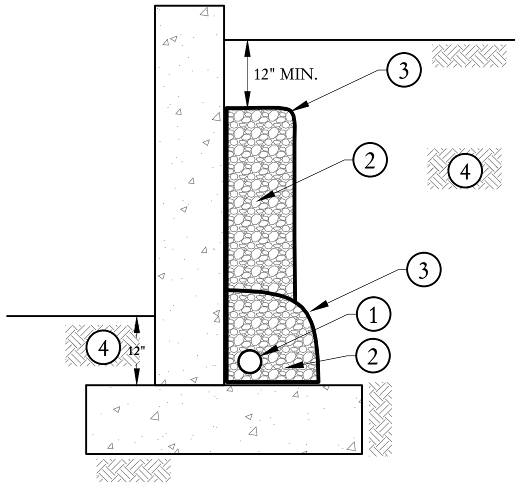
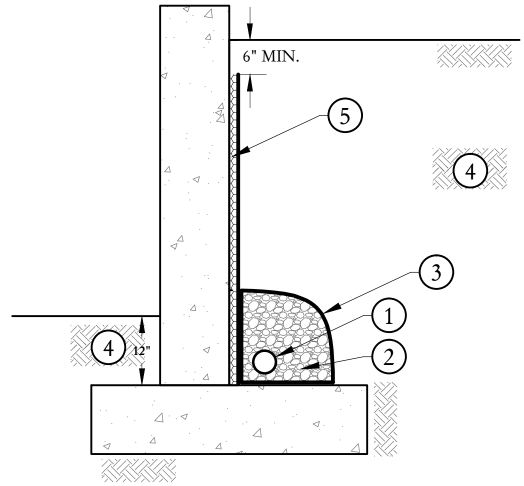
LA JOLLA, CALIFORNIA

DATE:	OCTOBER 2015	JOB NO.:	2150460
BY:	SRD	PLATE NO.:	4

CHRISTIAN WHEELER
ENGINEERING



1 DETAIL



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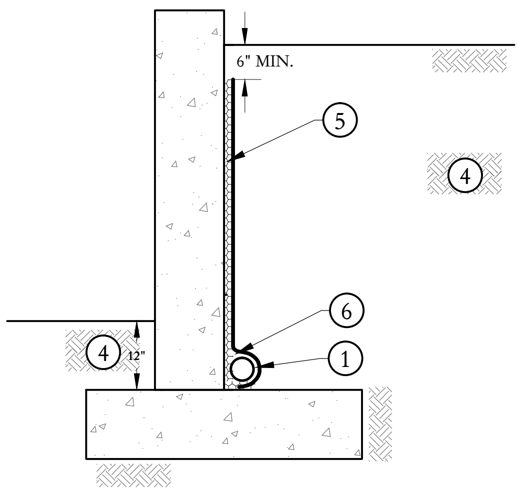

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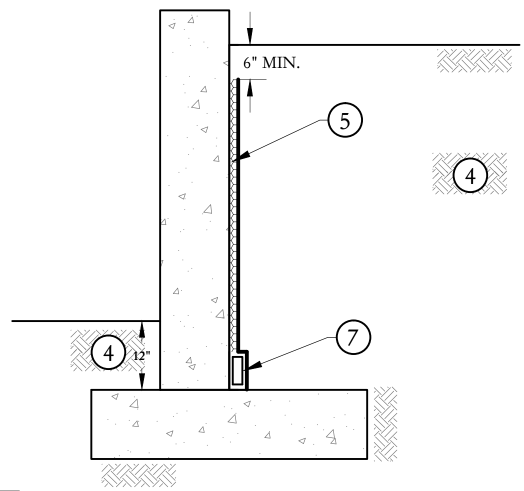

4 DETAIL

NOTES AND DETAILS

GENERAL NOTES:

1) THE NEED FOR WATERPROOFING SHOULD BE EVALUATED BY OTHERS.
2) WATERPROOFING TO BE DESIGNED BY OTHERS (CWE CAN PROVIDE A DESIGN IF REQUESTED).
3) EXTEND DRAIN TO SUITABLE DISCHARGE POINT PER CIVIL ENGINEER.
4) DO NOT CONNECT SURFACE DRAINS TO SUBDRAIN SYSTEM.

DETAILS:

1. 4-INCH PERFORATED PVC PIPE ON TOP OF FOOTING, HOLES POSITIONED DOWNWARD (SDR 35, SCHEDULE 40, OR EQUIVALENT).
2. ¾ INCH OPEN-GRADED CRUSHED AGGREGATE.
3. GEOFARBRIC WRAPPED COMPLETELY AROUND ROCK.
4. PROPERLY COMPACTED BACKFILL SOIL.
5. WALL DRAINAGE PANELS (MIRADRAIN OR EQUIVALENT) PLACED PER MANUFACTURER'S REC'S.
6. UNDERLAY SUBDRAIN WITH AND CUT FABRIC BACK FROM DRAINAGE PANELS AND WRAP FABRIC AROUND PIPE.
7. COLLECTION DRAIN (TOTAL DRAIN OR EQUIVALENT) LOCATED AT BASE OF WALL DRAINAGE PANEL PER MANUFACTURER'S RECOMMENDATIONS.

CANTILEVER RETAINING WALL DRAINAGE SYSTEMS

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BY:	SRD	PLATE NO.:	5

CHRISTIAN WHEELER
ENGINEERING

Appendix A

Subsurface Explorations

LOG OF TEST BORING B-1

Date Logged:	9/22/15	Equipment:	Mobil B-61
Logged By:	DJF	Auger Type:	8 inch Hollow Stem
Existing Elevation:	60.0 feet	Drive Type:	140lbs/30 inches
Proposed Elevation:	49½ feet	Depth to Water:	N/A

Sample Type and Laboratory Test Legend

Cal Modified California Sampler; SPT Standard Penetration Test; ST Shelby Tube; CK Chunk Density; DR Density Ring

MD Max Density; SO4 Soluble Sulfates; SA Sieve Analysis; HA Hydrometer; SE Sand Equivalent; PI Plasticity Index; CP Collapse Potential; DS Direct Shear; Con Consolidation; EI Expansion Index; R-Val Resistance Value; Chl Soluble Chlorides; Res pH & Resistivity

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS SYMBOL	SUMMARY OF SUBSURFACE CONDITIONS (based on Unified Soil Classification System)	PENETRATION (blows per foot)	SAMPLE TYPE	BULK	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	RELATIVE COMPACTION (%)	LABORATORY TESTS
0	60			1" of AC over 2" of PCC							
			SM	**Artificial Fill (Qaf):** Brown, moist, loose, very fine- to medium-grained, SILTY SAND with CLAY, trace gravels, brick and concrete debris.	8	Cal					SA MD DS
5	55				30**	Cal		18.9	102.2		
			SC/CL	Grayish-brown, moist, loose to medium stiff, CLAYEY SAND/SANDY CLAY with gravels, brick, and concrete debris.							
			SC	**Subsoil:** Greenish-gray, very moist, medium stiff, VERY SANDY CLAY with rootlets and white precipitate deposits, moderate seepage at 10'.							SA
10	50				10	Cal		22.0	103.2		
			⁹⁹	Saturated.							
			ML	**Point Loma Formation (Kp):** Greenish-gray, very moist to very moist, very stiff, CLAYEY SILT with SAND and white precipitate deposits; moderately weathered.	24	Cal		17.5	110.9		
					51	Cal					DS
			SM	Greenish-gray to yellowish-brown, moist, dense, very fine- to medium-grained, SILTY SAND; micaceous with trace rootlets, slightly weathered to 14 feet.	50/3"	Cal		12.7	117.9		
15	45			Moist, very dense.							
20	40				50/3"	Cal		19.5	107.5		
					50/2"	Cal		13.1	114.6		
25	35			Boring terminated at 24 feet. Seepage encountered at 10 feet.							
30	30										

Notes:

Symbol Legend

- ▽ Groundwater Level During Drilling
- ▼ Groundwater Level After Drilling
- ⁹⁹ Apparent Seepage
- * No Sample Recovery
- ** Non-Representative Blow Count (rocks present)

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DATE:	OCTOBER 2015	JOB NO.:	2150460.01
BY:	SRD	FIGURE NO.:	A-1

CHRISTIAN WHEELER ENGINEERING

LOG OF TEST BORING B-2

Date Logged:	9/22/15	Equipment:	Mobil B-61
Logged By:	DJF	Auger Type:	8 inch Hollow Stem
Existing Elevation:	63.0 feet	Drive Type:	140lbs/30 inches
Proposed Elevation:	53.6 feet	Depth to Water:	N/A

Sample Type and Laboratory Test Legend

Cal	Modified California Sampler	CK	Chunk Density
SPT	Standard Penetration Test	DR	Density Ring
ST	Shelby Tube		
MD	Max Density	DS	Direct Shear
SO4	Soluble Sulfates	Con	Consolidation
SA	Sieve Analysis	EI	Expansion Index
HA	Hydrometer	R-Val	Resistance Value
SE	Sand Equivalent	Chl	Soluble Chlorides
PI	Plasticity Index	Res	pH & Resistivity
CP	Collapse Potential		

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS SYMBOL	SUMMARY OF SUBSURFACE CONDITIONS (based on Unified Soil Classification System)	PENETRATION (blows per foot)	SAMPLE TYPE	BULK	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	RELATIVE COMPACTION (%)	LABORATORY TESTS
0	63			3" of AC over 4" of Base							
			SC	**Artificial Fill (Qaf):** Dark grayish-brown, moist, loose to medium dense, very fine- to medium-grained, CLAYEY SAND with gravels, organic scent.	15	Cal					
			SM	Greenish-gray, moist, loose, very fine- to medium-grained, SILTY SAND, micaceous, Point Loma derived fill.	9	Cal		17.3	109.7		
5	58			Very moist.							
				Heavy seepage at 7', saturated.							
			SC	Grayish-brown, saturated, loose, very fine- to medium-grained, CLAYEY SAND with gravels and abundant concrete debris (no spoils generated during drilling below 7 feet).	29**	Cal					
10	53										
					5**	Cal		20.5	108.5		
					12**	Cal*					
15	48										
			SM	**Point Loma Formation (Kp):** Yellowish-brown to greenish-gray, moist, very dense, very fine- to medium-grained, SILTY SAND; micaceous.	50/5"	Cal		11.5	123.2		
20	43										
					50/2"	Cal		15.5	113.4		
25	38			Boring terminated at 24 feet. Seepage encountered at 7 feet.							
30	33										

Notes:

Symbol Legend

- ▽ Groundwater Level During Drilling
- ▼ Groundwater Level After Drilling
- Apparent Seepage
- * No Sample Recovery
- ** Non-Representative Blow Count (rocks present)

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DATE:	OCTOBER 2015	JOB NO.:	2150460.01
BY:	SRD	FIGURE NO.:	A-2

CHRISTIAN WHEELER ENGINEERING

LOG OF TEST BORING B-3

Date Logged:	9/22/15	Equipment:	Mobil B-61
Logged By:	DJF	Auger Type:	8 inch Hollow Stem
Existing Elevation:	67.0 feet	Drive Type:	140lbs/30 inches
Proposed Elevation:	59.5 feet	Depth to Water:	N/A

Sample Type and Laboratory Test Legend

Cal	Modified California Sampler	CK	Chunk Density
SPT	Standard Penetration Test	DR	Density Ring
ST	Shelby Tube		
MD	Max Density	DS	Direct Shear
SO4	Soluble Sulfates	Con	Consolidation
SA	Sieve Analysis	EI	Expansion Index
HA	Hydrometer	R-Val	Resistance Value
SE	Sand Equivalent	Chl	Soluble Chlorides
PI	Plasticity Index	Res	pH & Resistivity
CP	Collapse Potential		

DEPTH (ft)	ELEVATION (ft)	USCS SYMBOL	SUMMARY OF SUBSURFACE CONDITIONS (based on Unified Soil Classification System)	PENETRATION (blows per foot)	SAMPLE TYPE	BULK	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	RELATIVE COMPACTION (%)	LABORATORY TESTS
0	67		5" of AC							
		SM	**Artificial Fill (Qaf):** Dark grayish-brown, moist, loose to medium dense, very fine- to medium-grained, CLAYEY SAND with gravels, organic scent.	8	Cal					
			AC debris at 4 feet.	5	Cal					
5	62	SC/CL	Grayish-brown, moist to very moist, medium stiff, CLAYEY SAND/SANDY CLAY with gravels and concrete debris. EI = 35 (Low)							
			Moderate seepage at 8 feet.	9	Cal		22.5	99.3		
10	57	SM	**Point Loma Formation (Kp):** Yellowish-brown, moist, dense, very fine- to medium-grained, VERY SILTY SAND; micaceous, slightly weathered to 12½ feet.	55	Cal		13.2	114.2		DS
			Very dense.							
15	52			50/5"	Cal		12.7	117.9		
				50/3"	Cal		12.8	117.0		
20	47		Boring terminated at 19½ feet. Seepage encountered at 7 feet.							
25	42									
30	37									

Notes:

Symbol Legend

- Groundwater Level During Drilling
- Groundwater Level After Drilling
- Apparent Seepage
- * No Sample Recovery
- ** Non-Representative Blow Count (rocks present)

SU CASA
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LA JOLLA, CALIFORNIA

DATE:	OCTOBER 2015	JOB NO.:	2150460.01
BY:	SRD	FIGURE NO.:	A-3

CHRISTIAN WHEELER ENGINEERING

Appendix B

Laboratory Test Results

Laboratory tests were performed in accordance with the generally accepted American Society for Testing and Materials (ASTM) test methods or suggested procedures. Brief descriptions of the tests performed are presented below:

a) **CLASSIFICATION:** Field classifications were verified in the laboratory by visual examination. The final soil classifications are in accordance with the Unified Soil Classification System and are presented on the exploration logs in Appendix A.

b) **MOISTURE-DENSITY: MOISTURE-DENSITY:** In-place moisture contents and dry densities were determined for selected soil samples in accordance with ATM D 2937. The results are summarized in the boring logs presented in Appendix A.

c) **MAXIMUM DENSITY & OPTIMUM MOISTURE CONTENT:** The maximum dry density and optimum moisture content of typical soils were determined in the laboratory in accordance with ASTM Standard Test D-1557, Method A.

d) **DIRECT SHEAR:** Direct shear tests were performed on selected samples of the on-site soils in accordance with ASTM D 3080.

e) **EXPANSION INDEX TEST:** Expansion index tests were performed on selected remolded soil samples in accordance with ASTM D 4829.

f) **GRAIN SIZE DISTRIBUTION:** The grain size distributions of selected samples were determined in accordance with ASTM C136 and/or ASTM D 422.

g) **SOLUBLE SULFATE CONTENT:** The soluble sulfate content was determined for representative samples in accordance with California Test Methods 417.

LABORATORY TEST RESULTS

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MAXIMUM DRY DENSITY AND OPTIMUM MOISTURE CONTENT (ASTM D1557)

Sample Location	**Boring B-1 @ ½’-5’**
Sample Description	Brown Silty Sand with Clay, SM
Maximum Density	123.1 pcf
Optimum Moisture	10.1 %

DIRECT SHEAR (ASTM D3080)

Sample Location	**Boring B-1 @ ½’-5’**	**Boring B-1 @ 12½’**	**Boring B-3 @ 11½’**
Sample Type	Remolded to 90 %	Undisturbed	Undisturbed
Friction Angle	29°	33°	329°
Cohesion	250 psf	250 psf	250 psf

EXPANSION INDEX TESTS (ASTM D4829)

Sample Location	**Boring B-3 @5’-10’**
Initial Moisture:	9.9 %
Initial Dry Density	108.5 pcf
Final Moisture:	20.0 %
Expansion Index:	35 (Low)

GRAIN SIZE DISTRIBUTION (ASTM D422)

Sample Location	**Boring B-1 @ ½’-5’**	**Boring B-1 @ 8½’-11’**	**Boring B-3 @ 10½’-15’**
Sieve Size	*Percent Passing*	*Percent Passing*	*Percent Passing*
2”	100		
1½”	99		
1”	96		
¾”	95		
½”	93		
⅜”	92		
#4	90	100	100
#8	87	96	99
#16	85	92	97
#30	78	86	94
#50	59	75	83
#100	47	64	68
#200	40	55	52

LABORATORY TEST RESULTS (CONT)

SOLUBLE SULFATES (CALIFORNIA TEST METHOD 417)

Sample Location	**Boring B-1 @ 12'-17'**	**Boring B-3 @ 5'-10'**
Soluble Sulfate	0.040 % (SO_4)	0.130 % (SO_4)

Appendix C

References

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U.S. Geological Survey, U.S. Seismic Design Maps Web Application, http://geohazards.usgs.gov/designmaps/us/application.php

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City of San Diego, 1953, Topographic Map Sheet 242-1683; Scale: 1 inch = 200 feet

City of San Diego, 1963, Topographic Map Sheet 242-1683; Scale: 1 inch = 200 feet

City of San Diego, 1979, Ortho-Topographic Map Sheet 242-1683; Scale: 1 inch = 200 feet

United States Geological Survey, 1903, La Jolla Quadrangle; Scale 1 inch = 2000 feet

United States Geological Survey, 1943, La Jolla Quadrangle; Scale 1 inch = 2000 feet

United States Geological Survey, 1953, La Jolla Quadrangle; Scale 1 inch = 2000 feet

United States Geological Survey, 1967, La Jolla Quadrangle; Scale 1 inch = 2000 feet

United States Geological Survey, 1975, La Jolla Quadrangle; Scale 1 inch = 2000 feet

PHOTOGRAPHS

Aerial Fotobank Inc., 1996, County of San Diego Aerial Foto-Map Book, Page 1247

Lenska's Aerial Atlas, 1994, The Thomas Guide, Sheet 1247.

San Diego County, 1928, Flight 52, Photographs A1 and BX1; Scale: 1 inch = 1000 feet (approximate).

San Diego County, 1966, Photographs 1-40 and 1-41; Scale: 1 inch = 1500 feet (approximate).

San Diego County, 1973, Flight 32, Photographs 3 and 4; Scale: 1 inch= 1000 feet.

San Diego County, 1978, Flight 16C, Photographs 2, 3 and 4; Scale: 1 inch= 1000 feet (approximate).

San Diego County, 1983, Photographs 553 and 554; Scale: 1 inch= 2000 feet (approximate)

San Diego County, 1989, Flight 1, Photographs 199 and 201; Scale: 1 inch= 2000 feet (approximate).

San Diego Historical Society, 1948, Oblique Aerial Photograph of La Jolla (Windansea) Looking Southeast, no scale.

United States Department of Agriculture, 1953, Photos AXN-8M-91 and 92, Scale: 1 inch = 1700 feet (approximate).

Appendix D

Recommended Grading Specifications – General Provisions

RECOMMENDED GRADING SPECIFICATIONS - GENERAL PROVISIONS

SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

GENERAL INTENT

The intent of these specifications is to establish procedures for clearing, compacting natural ground, preparing areas to be filled, and placing and compacting fill soils to the lines and grades shown on the accepted plans. The recommendations contained in the preliminary geotechnical investigation report and/or the attached Special Provisions are a part of the Recommended Grading Specifications and shall supersede the provisions contained hereinafter in the case of conflict. These specifications shall only be used in conjunction with the geotechnical report for which they are a part. No deviation from these specifications will be allowed, except where specified in the geotechnical report or in other written communication signed by the Geotechnical Engineer.

OBSERVATION AND TESTING

Christian Wheeler Engineering shall be retained as the Geotechnical Engineer to observe and test the earthwork in accordance with these specifications. It will be necessary that the Geotechnical Engineer or his representative provide adequate observation so that he may provide his opinion as to whether or not the work was accomplished as specified. It shall be the responsibility of the contractor to assist the Geotechnical Engineer and to keep him apprised of work schedules, changes and new information and data so that he may provide these opinions. In the event that any unusual conditions not covered by the special provisions or preliminary geotechnical report are encountered during the grading operations, the Geotechnical Engineer shall be contacted for further recommendations.

If, in the opinion of the Geotechnical Engineer, substandard conditions are encountered, such as questionable or unsuitable soil, unacceptable moisture content, inadequate compaction, adverse weather, etc., construction should be stopped until the conditions are remedied or corrected or he shall recommend rejection of this work.

Tests used to determine the degree of compaction should be performed in accordance with the following American Society for Testing and Materials test methods:

Maximum Density & Optimum Moisture Content - ASTM D 1557

Density of Soil In-Place - ASTM D 1556 or ASTM D 6938

All densities shall be expressed in terms of Relative Compaction as determined by the foregoing ASTM testing procedures.

PREPARATION OF AREAS TO RECEIVE FILL

All vegetation, brush and debris derived from clearing operations shall be removed, and legally disposed of. All areas disturbed by site grading should be left in a neat and finished appearance, free from unsightly debris.

After clearing or benching the natural ground, the areas to be filled shall be scarified to a depth of 6 inches, brought to the proper moisture content, compacted and tested for the specified minimum degree of compaction. All loose soils in excess of 6 inches thick should be removed to firm natural ground which is defined as natural soil which possesses an in-situ density of at least 90 percent of its maximum dry density.

When the slope of the natural ground receiving fill exceeds 20 percent (5 horizontal units to 1 vertical unit), the original ground shall be stepped or benched. Benches shall be cut to a firm competent formational soil. The lower bench shall be at least 10 feet wide or 1-1/2 times the equipment width, whichever is greater, and shall be sloped back into the hillside at a gradient of not less than two (2) percent. All other benches should be at least 6 feet wide. The horizontal portion of each bench shall be compacted prior to receiving fill as specified herein for compacted natural ground. Ground slopes flatter than 20 percent shall be benched when considered necessary by the Geotechnical Engineer.

Any abandoned buried structures encountered during grading operations must be totally removed. All underground utilities to be abandoned beneath any proposed structure should be removed from within 10 feet of the structure and properly capped off. The resulting depressions from the above described procedure should be backfilled with acceptable soil that is compacted to the requirements of the Geotechnical Engineer. This includes, but is not limited to, septic tanks, fuel tanks, sewer lines or leach lines, storm drains and water lines. Any buried structures or utilities not to be abandoned should be brought to the attention of the Geotechnical Engineer so that he may determine if any special recommendation will be necessary.

All water wells which will be abandoned should be backfilled and capped in accordance to the requirements set forth by the Geotechnical Engineer. The top of the cap should be at least 4 feet below finish grade or 3 feet below the bottom of footing whichever is greater. The type of cap will depend on the diameter of the well and should be determined by the Geotechnical Engineer and/or a qualified Structural Engineer.

FILL MATERIAL

Materials to be placed in the fill shall be approved by the Geotechnical Engineer and shall be free of vegetable matter and other deleterious substances. Granular soil shall contain sufficient fine material to fill the voids. The definition and disposition of oversized rocks and expansive or detrimental soils are covered in the geotechnical report or Special Provisions. Expansive soils, soils of poor gradation, or soils with low strength characteristics may be thoroughly mixed with other soils to provide satisfactory fill material, but only with the explicit consent of the Geotechnical Engineer. Any import material shall be approved by the Geotechnical Engineer before being brought to the site.

PLACING AND COMPACTION OF FILL

Approved fill material shall be placed in areas prepared to receive fill in layers not to exceed 6 inches in compacted thickness. Each layer shall have a uniform moisture content in the range that will allow the compaction effort to be efficiently applied to achieve the specified degree of compaction. Each layer shall be uniformly compacted to the specified minimum degree of compaction with equipment of adequate size to economically compact the layer. Compaction equipment should either be specifically designed for soil compaction or of proven reliability. The minimum degree of compaction to be achieved is specified in either the Special Provisions or the recommendations contained in the preliminary geotechnical investigation report.

When the structural fill material includes rocks, no rocks will be allowed to nest and all voids must be carefully filled with soil such that the minimum degree of compaction recommended in the Special Provisions is achieved. The maximum size and spacing of rock permitted in structural fills and in non-structural fills is discussed in the geotechnical report, when applicable.

Field observation and compaction tests to estimate the degree of compaction of the fill will be taken by the Geotechnical Engineer or his representative. The location and frequency of the tests shall be at the Geotechnical Engineer's discretion. When the compaction test indicates that a particular layer is at less than the required degree of compaction, the layer shall be reworked to the satisfaction of the Geotechnical Engineer and until the desired relative compaction has been obtained.

Fill slopes shall be compacted by means of sheepsfoot rollers or other suitable equipment. Compaction by sheepsfoot roller shall be at vertical intervals of not greater than four feet. In addition, fill slopes at a ratio of two horizontal to one vertical or flatter, should be trackrolled. Steeper fill slopes shall be over-built and cut-back to finish contours after the slope has been constructed. Slope compaction operations shall result in all fill material six or more inches inward from the finished face of the slope having a relative compaction of at least 90 percent of maximum dry density or the degree of compaction specified in the Special Provisions section of this specification. The compaction operation on the slopes shall be continued until the Geotechnical Engineer is of the opinion that the slopes will be surficially stable.

Density tests in the slopes will be made by the Geotechnical Engineer during construction of the slopes to determine if the required compaction is being achieved. Where failing tests occur or other field problems arise, the Contractor will be notified that day of such conditions by written communication from the Geotechnical Engineer or his representative in the form of a daily field report.

If the method of achieving the required slope compaction selected by the Contractor fails to produce the necessary results, the Contractor shall rework or rebuild such slopes until the required degree of compaction is obtained, at no cost to the Owner or Geotechnical Engineer.

CUT SLOPES

The Engineering Geologist shall inspect cut slopes excavated in rock or lithified formational material during the grading operations at intervals determined at his discretion. If any conditions not anticipated in the preliminary report such as perched water, seepage, lenticular or confined strata of a potentially adverse nature, unfavorably inclined bedding, joints or fault planes are encountered during grading, these conditions shall be analyzed by the Engineering Geologist and Geotechnical Engineer to determine if mitigating measures are necessary.

Unless otherwise specified in the geotechnical report, no cut slopes shall be excavated higher or steeper than that allowed by the ordinances of the controlling governmental agency.

ENGINEERING OBSERVATION

Field observation by the Geotechnical Engineer or his representative shall be made during the filling and compaction operations so that he can express his opinion regarding the conformance of the grading with acceptable standards of practice. Neither the presence of the Geotechnical Engineer or his representative or the observation and testing shall release the Grading Contractor from his duty to compact all fill material to the specified degree of compaction.

SEASON LIMITS

Fill shall not be placed during unfavorable weather conditions. When work is interrupted by heavy rain, filling operations shall not be resumed until the proper moisture content and density of the fill materials can be achieved. Damaged site conditions resulting from weather or acts of God shall be repaired before acceptance of work.

RECOMMENDED GRADING SPECIFICATIONS - SPECIAL PROVISIONS

RELATIVE COMPACTION: The minimum degree of compaction to be obtained in compacted natural ground, compacted fill, and compacted backfill shall be at least 90 percent. For street and parking lot subgrade, the upper twelve inches should be compacted to at least 95 percent relative compaction.

EXPANSIVE SOILS: Detrimentally expansive soil is defined as clayey soil which has an expansion index of 50 or greater when tested in accordance with the American Society of Testing Materials (ASTM) Laboratory Test D4829-95.

OVERSIZED MATERIAL: Oversized fill material is generally defined herein as rocks or lumps of soil over six inches in diameter. Oversized materials should not be placed in fill unless recommendations of placement of such material is provided by the Geotechnical Engineer. At least 40 percent of the fill soils shall pass through a No. 4 U.S. Standard Sieve.

TRANSITION LOTS: Where transitions between cut and fill occur within the proposed building pad, the cut portion should be undercut a minimum of one foot below the base of the proposed footings and recompacted as structural backfill. In certain cases that would be addressed in the geotechnical report, special footing reinforcement or a combination of special footing reinforcement and undercutting may be required.

December 1, 2015

Su Casa Properties CWE 2150460.02
912 Newkirk Drive
La Jolla, California 92037

Subject: Addendum to Report of Preliminary Geotechnical Investigation
Su Casa, 6738 La Jolla Boulevard, La Jolla, California

Reference: Christian Wheeler Engineering, Report CWE 21540460.01, dated October 23, 2015

Ladies and Gentlemen,

We have prepared this addendum to provide revised seismic design factors and earth retaining wall seismic lateral pressure recommendations or the subject project.

SEISMIC DESIGN FACTORS

The seismic design factors applicable to the subject site are provided below. The seismic design factors were determined in accordance with the 2013 California Building Code. The site coefficients and adjusted maximum considered earthquake spectral response acceleration parameters are presented in the following Table I.

TABLE I: SEISMIC DESIGN FACTORS

Site Coordinates: Latitude Longitude	32.830° -117.283°
Site Class	D
Site Coefficient F_a	1.021
Site Coefficient F_v	1.542
Spectral Response Acceleration at Short Periods S_s	1.197 g
Spectral Response Acceleration at 1 Second Period S_1	0.458 g
$S_{MS}=F_aS_s$	1.223 g
$S_{M1}=F_vS_1$	0.706 g
$S_{DS}=2/3*S_{MS}$	0.815 g
$S_{D1}=2/3*S_{M1}$	0.471 g

EARTH RETAINING WALLS

Seismic lateral earth pressures may be assumed to equal an inverted triangle starting at the bottom of the wall with the maximum pressure equal to 11H pounds per square foot (where H = wall height in feet) occurring at the top of the wall.

If you have any questions after reviewing this report, please do not hesitate to contact our office. This opportunity to be of professional service is sincerely appreciated.

Respectfully submitted,
CHRISTIAN WHEELER ENGINEERING

Daniel B. Adler, RCE # 36037 Troy S. Wilson, CEG #2551

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January 26, 2016

Su Casa Properties
912 Newkirk Drive
La Jolla, California 92037

CWE 2150460.03

Subject: **Addendum to Report of Preliminary Geotechnical Investigation On-Site Storm Water Infiltration, Su Casa, 6738 La Jolla Boulevard, La Jolla, California**

References: 1) Christian Wheeler Engineering Report 2150460.01, "Report of Preliminary Geotechnical Investigation, Su Casa, 6738 La Jolla Boulevard, La Jolla, California", dated October 23, 2015.
2) Christian Wheeler Engineering Report 2150460.02, "Addendum to Report of Preliminary Geotechnical Investigation, Su Casa, 6738 La Jolla Boulevard, La Jolla, California", dated December 1, 2015.

Ladies and Gentlemen:

In accordance with your request and our proposal dated January 19, 2016, we have prepared this addendum to our referenced geotechnical reports to address the potential for storm water infiltration at the subject site. Unless specifically addressed or amended herein, all of the findings, conclusions, and recommendations presented in the referenced reports remain applicable to the subject project.

As presented on page 11 of our referenced Report of Preliminary Geotechnical Investigation, "Based on the presence of man-placed fill materials on-site, as well as the geomorphic conditions of the site that include an infilled ravine in which perched water is commonly encountered along the contact with surficial materials of artificial fill/alluvium and underlying and much less permeable Cretaceous-age sedimentary deposits, the use of infiltration facilities to manage storm water discharge at the site are not recommended."

In accordance with guidelines presented in Appendix F of the City of San Diego Guidelines for Geotechnical Reports (2011) our recommendation that infiltration facilities not be used to manage storm water discharge at the site was made due to the following unsuitable conditions, in regards to the feasibility of on-site infiltration, being present at the site:

- High perched groundwater (within 10 feet of the base of infiltration/ percolation)
- Engineered, compacted fill (structural fill) and undocumented fills on and adjacent to the site that are subject to hydro-consolidation.
- Infiltration/percolation rates anticipated to less than 0.52 inches/hour, corresponding to the presence of silt, clay, and clay or silt loam.
- The presence of on-site soils with >20% clay or >40% silt and clay, which are not typically suitable for infiltration.
- The low permeability or impermeable nature of the Cretaceous-age bedrock underlying the site.
- Expectation that changes in soil moisture content or rising groundwater level will adversely impact existing structures or improvements on and adjacent to the site.

It is also our professional opinion and judgment that our recommendation that infiltration facilities not be used to manage storm water discharge is consistent and in accordance with Appendices C and D of the Model BMP Design Manual San Diego Region (2015). A completed "Worksheet C.4-1: Categorization of Infiltration Feasibility Condition" for the subject project is included in Appendix A of this report. As presented on the last page (C-14) of Worksheet C.4-1, our feasibility screening for infiltration for the subject project indicates "No Infiltration." For reference, Appendix B of this report presents logs of our subsurface investigation of the site, geotechnical mapping, and the results of laboratory testing, which were previously included in our referenced Report of Preliminary Geotechnical Investigation and which support the findings of our feasibility screening.

If you have any questions after reviewing this report, please do not hesitate to contact our office. This opportunity to be of professional service is sincerely appreciated.

Respectfully submitted,
CHRISTIAN WHEELER ENGINEERING

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Appendix A

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

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?**			
Criteria	Screening Question	**Yes**	**No**
1	**Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		NO
Provide basis: Variable soil infiltration properties across site. Existing alluvium and fill possess layers of silts and clays demonstrating very low infiltration rates. Very low rates of infiltration within Cretaceous-age sediments of Point Loma Formation underlying site. Please refer to subsurface exploration data and laboratory test results presented in CWE Report 2150460.01. 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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		NO
Provide basis: C2.2 Settlement and Volume Change - On- and off-site fills and alluvial soils subject to consolidation as the result of infiltration. Near surface clayey soils subject to expansion. C.2.4 Utility Considerations - Existing and proposed on- and of-site utility trenches considered susceptible to saturation and lateral migration of infiltrated storm water. C.2.6 Retaining Walls and Foundations - The proposed project will include a subterranean level across almost the entirety of the site. Any proposed infiltration facility would infiltrate storm water adjacent to planned foundations and retaining walls. C.2.7 Other Factors - Adjacent subgrade soils in public right-of-ways subject to degradation as the result of infiltration. 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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		NO
Provide basis: C.3.2 Separation to Seasonal High Groundwater - The depth to perched groundwater beneath the site was measured by our firm (see CWE Report 2150460.01) at depths as shallow as 7 feet below existing site grades during the dry season (September 2015). The depth of perched groundwater beneath the site may increase during the wet season. 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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		N/A
Provide basis: C.3.6 Water Balance Impacts on Stream Flow – Not Applicable. No streams located hydrologically down gradient. 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	See Pages C-13 and C-14	

*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 [City Engineer] to substantiate findings.

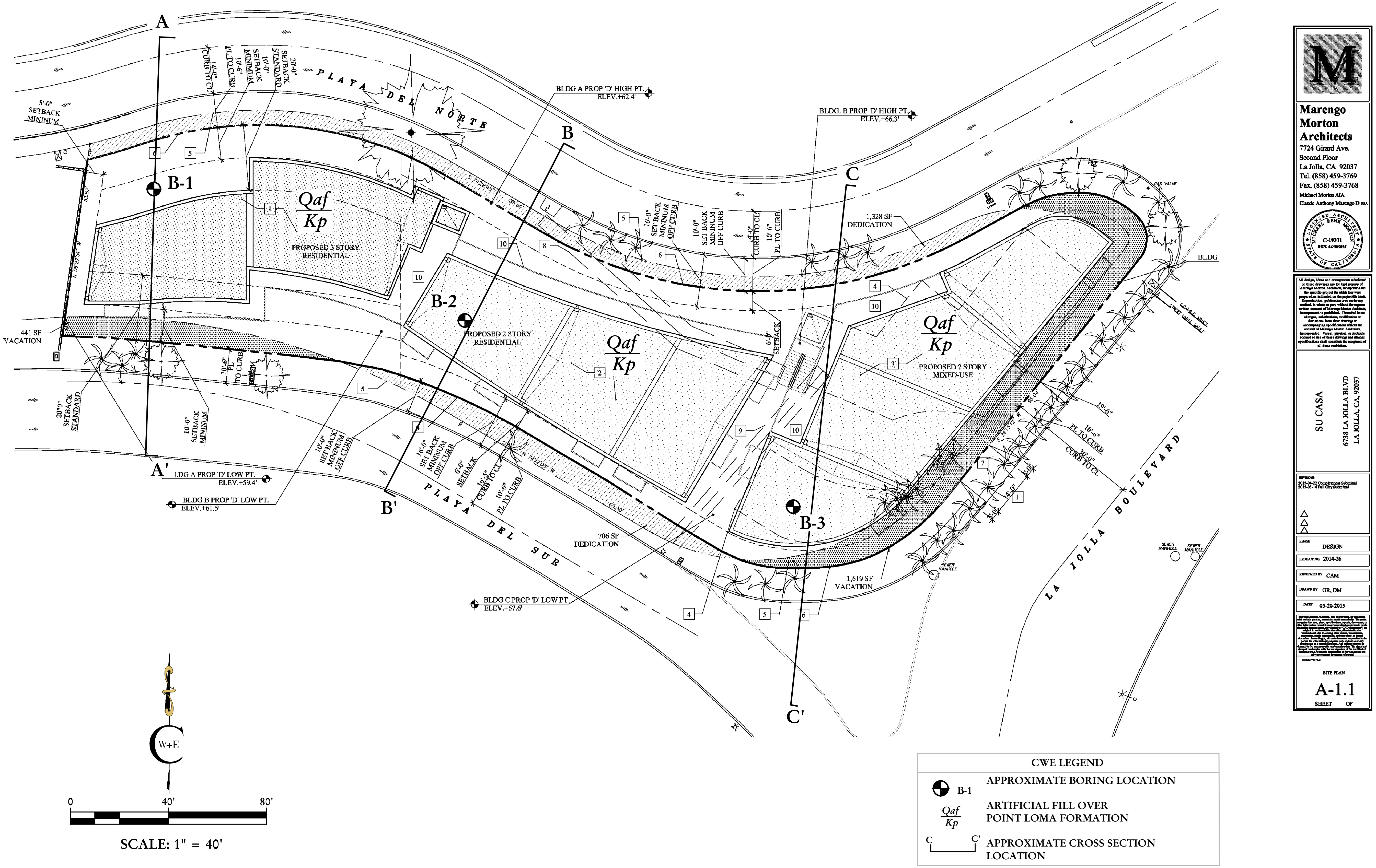
Worksheet C.4-1 Page 3 of 4			
Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria **Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?**			
Criteria	Screening Question	**Yes**	**No**
5	**Do soil and geologic conditions allow for infiltration in any appreciable rate or volume?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		NO
Provide basis: C2.2 Settlement and Volume Change - On- and off-site fills and alluvial soils subject to consolidation as the result of infiltration. Near surface clayey soils subject to expansion. C.2.4 Utility Considerations - Existing and proposed on- and of-site utility trenches considered susceptible to saturation and lateral migration of infiltrated storm water. C.2.6 Retaining Walls and Foundations - The proposed project will include a subterranean level across almost the entirety of the site. Any proposed infiltration facility would infiltrate storm water adjacent to planned foundations and retaining walls. C.2.7 Other Factors - Adjacent subgrade soils in public right-of-ways subject to degradation as the result of infiltration. 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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		NO
Provide basis: C.2.4 Utility Considerations - Existing and proposed on- and of-site utility trenches considered susceptible to saturation and lateral migration of infiltrated storm water. C.2.6 Retaining Walls and Foundations - The proposed project will include a subterranean level across almost the entirety of the site. Any proposed infiltration facility would infiltrate storm water adjacent to planned foundations and retaining walls. C.2.7 Other Factors - Adjacent subgrade soils in public right-of-ways subject to degradation as the result of infiltration. 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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		NO
Provide basis: C.3.2 Separation to Seasonal High Groundwater - The depth to perched groundwater beneath the site was measured by our firm (see CWE Report 2150460.01) at depths as shallow as 7 feet below existing site grades during the dry season (September 2015). The depth of perched groundwater beneath the site may increase during the wet season. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
8	**Can infiltration be allowed without violating downstream water rights**? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	YES	
Provide basis: There are no downstream water bodies before the Pacific Ocean. 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 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is **Partial Infiltration.** If any answer from row 5-8 is no, then infiltration of any volume is considered to be **infeasible** within the drainage area. The feasibility screening category is **No Infiltration.**		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

Appendix B

Data from CWE Report 2150460.01
October 23, 1015

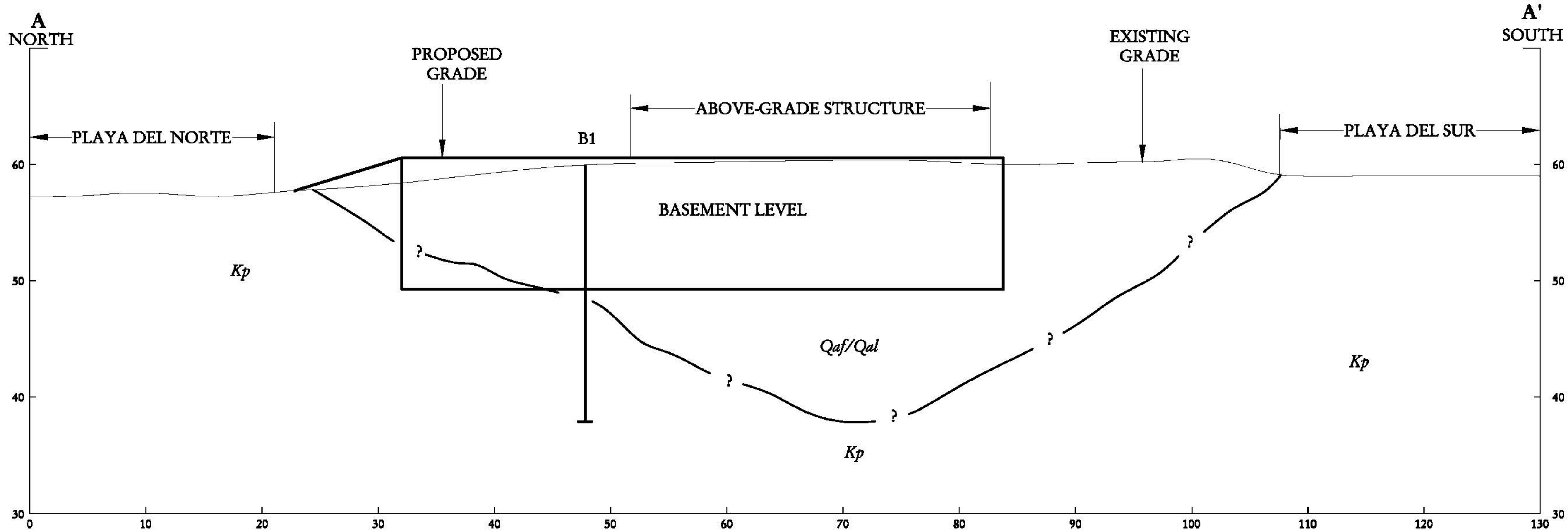


SITE PLAN AND GEOTECHNICAL MAP

SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

DATE:	OCTOBER 2015	JOB NO.:	2150460.01
BY:	SRD	PLATE NO.:	1

CHRISTIAN WHEELER ENGINEERING



CWE LEGEND	
B-1	APPROXIMATE BORING LOCATION
Qaf/Qal	UNDIFFERENTIATED ARTIFICIAL FILL/ALLUVIUM
Kp	POINT LOMA FORMATION

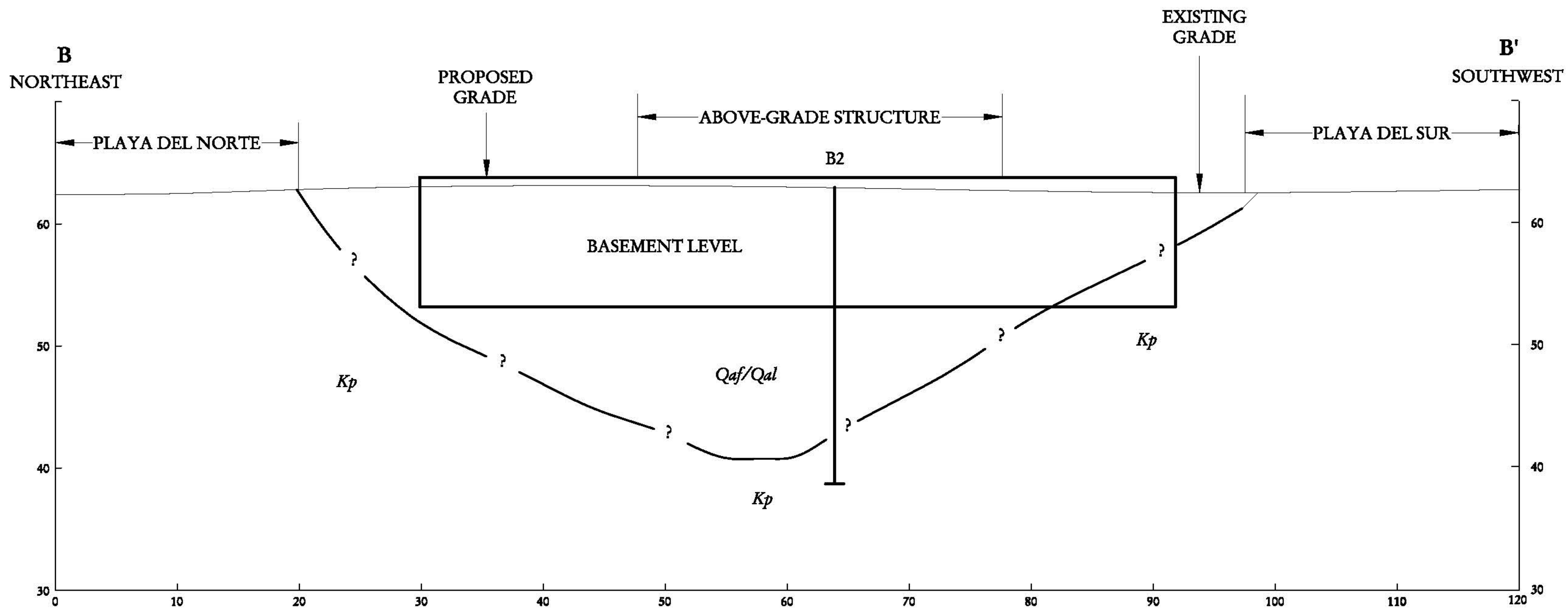
0 10' 20'

SCALE: 1" = 10'

GEOLOGIC CROSS SECTION A-A'

SU CASA 6738 LA JOLLA BOULEVARD LA JOLLA, CALIFORNIA			
DATE:	OCTOBER 2015	JOB NO.:	2150460
BY:	SRD	PLATE NO.:	2

CHRISTIAN WHEELER
ENGINEERING



CWE LEGEND	
B-1	APPROXIMATE BORING LOCATION
Qaf/Qal	UNDIFFERENTIATED ARTIFICIAL FILL/ALLUVIUM
Kp	POINT LOMA FORMATION

0 10' 20'

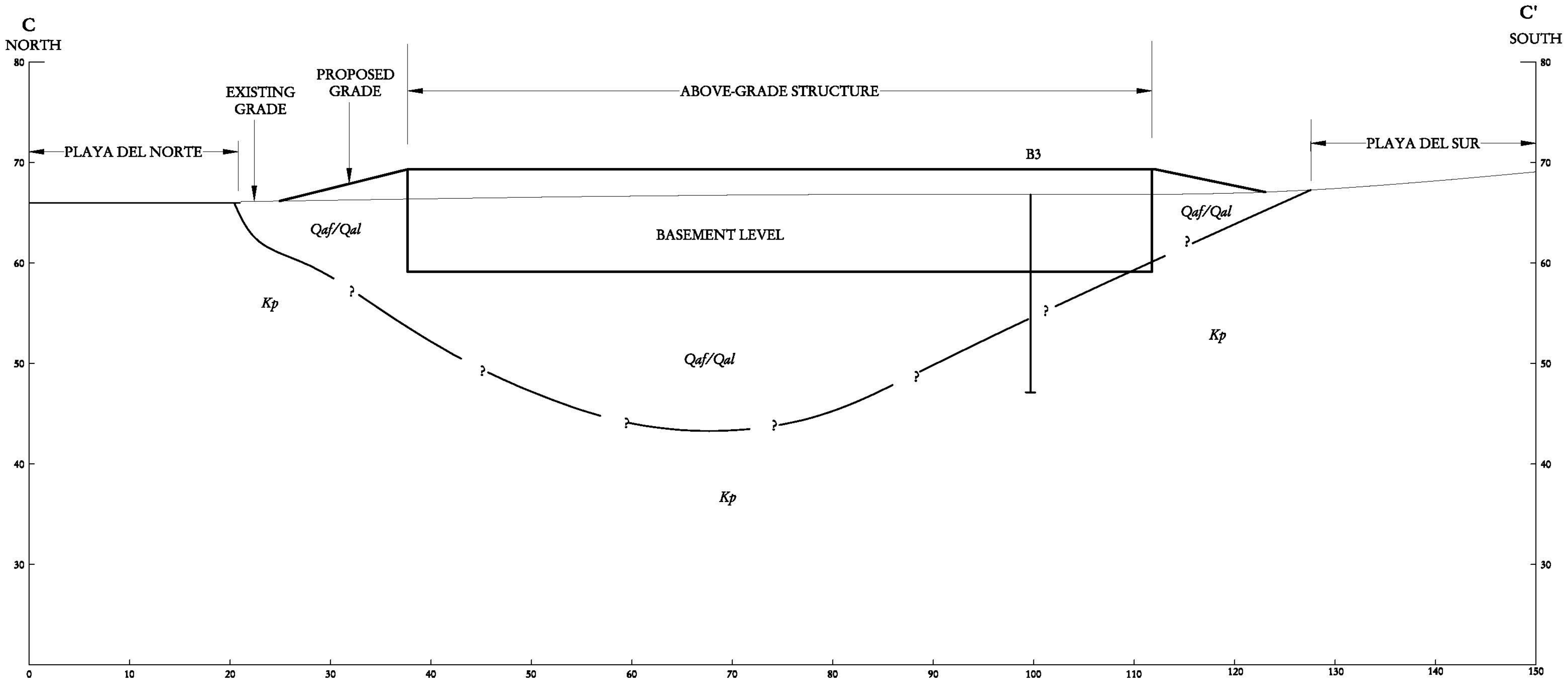
SCALE: 1" = 10'

GEOLOGIC CROSS SECTION B-B'

SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

DATE:	OCTOBER 2015	JOB NO.:	2150460
BY:	SRD	PLATE NO.:	3

CHRISTIAN WHEELER ENGINEERING



CWE LEGEND	
B-1	APPROXIMATE BORING LOCATION
Qaf/Qal	UNDIFFERENTIATED ARTIFICIAL FILL/ALLUVIUM
Kp	POINT LOMA FORMATION

0 10' 20'

SCALE: 1" = 10'

GEOLOGIC CROSS SECTION C-C'

SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

DATE:	OCTOBER 2015	JOB NO.:	2150460
BY:	SRD	PLATE NO.:	4

CHRISTIAN WHEELER
ENGINEERING

Appendix A

Subsurface Explorations

LOG OF TEST BORING B-1

Date Logged:	9/22/15	Equipment:	Mobil B-61
Logged By:	DJF	Auger Type:	8 inch Hollow Stem
Existing Elevation:	60.0 feet	Drive Type:	140lbs/30 inches
Proposed Elevation:	49½ feet	Depth to Water:	N/A

Sample Type and Laboratory Test Legend

Cal	Modified California Sampler	CK	Chunk Density
SPT	Standard Penetration Test	DR	Density Ring
ST	Shelby Tube		
MD	Max Density	DS	Direct Shear
SO4	Soluble Sulfates	Con	Consolidation
SA	Sieve Analysis	EI	Expansion Index
HA	Hydrometer	R-Val	Resistance Value
SE	Sand Equivalent	Chl	Soluble Chlorides
PI	Plasticity Index	Res	pH & Resistivity
CP	Collapse Potential		

DEPTH (ft)	ELEVATION (ft)	USCS SYMBOL	SUMMARY OF SUBSURFACE CONDITIONS (based on Unified Soil Classification System)	PENETRATION (blows per foot)	SAMPLE TYPE	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	RELATIVE COMPACTION (%)	LABORATORY TESTS
0	60		1" of AC over 2" of PCC						
		SM	**Artificial Fill (Qaf):** Brown, moist, loose, very fine- to medium-grained, SILTY SAND with CLAY, trace gravels, brick and concrete debris.	8	Cal				SA MD DS
5	55			30**	Cal	18.9	102.2		
		SC/CL	Grayish-brown, moist, loose to medium stiff, CLAYEY SAND/SANDY CLAY with gravels, brick, and concrete debris.						
		SC	**Subsoil:** Greenish-gray, very moist, medium stiff, VERY SANDY CLAY with rootlets and white precipitate deposits, moderate seepage at 10'.						SA
10	50			10	Cal	22.0	103.2		
			Saturated.						
		ML	**Point Loma Formation (Kp):** Greenish-gray, very moist to very moist, very stiff, CLAYEY SILT with SAND and white precipitate deposits; moderately weathered.	24	Cal	17.5	110.9		
				51	Cal				DS
		SM	Greenish-gray to yellowish-brown, moist, dense, very fine- to medium-grained, SILTY SAND; micaceous with trace rootlets, slightly weathered to 14 feet.	50/3"	Cal	12.7	117.9		
15	45								
			Moist, very dense.						
20	40			50/3"	Cal	19.5	107.5		
				50/2"	Cal	13.1	114.6		
25	35		Boring terminated at 24 feet. Seepage encountered at 10 feet.						
30	30								

Notes:

Symbol Legend

- ∇ Groundwater Level During Drilling
- ▼ Groundwater Level After Drilling
- Apparent Seepage
- * No Sample Recovery
- ** Non-Representative Blow Count (rocks present)

SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

DATE:	OCTOBER 2015	JOB NO.:	2150460.01
BY:	SRD	FIGURE NO.:	A-1

CHRISTIAN WHEELER ENGINEERING

LOG OF TEST BORING B-2

Sample Type and Laboratory Test Legend

Cal	Modified California Sampler	CK	Chunk Density
SPT	Standard Penetration Test	DR	Density Ring
ST	Shelby Tube		
MD	Max Density	DS	Direct Shear
SO4	Soluble Sulfates	Con	Consolidation
SA	Sieve Analysis	EI	Expansion Index
HA	Hydrometer	R-Val	Resistance Value
SE	Sand Equivalent	Chl	Soluble Chlorides
PI	Plasticity Index	Res	pH & Resistivity
CP	Collapse Potential		

Date Logged:	9/22/15	Equipment:	Mobil B-61
Logged By:	DJF	Auger Type:	8 inch Hollow Stem
Existing Elevation:	63.0 feet	Drive Type:	140lbs/30 inches
Proposed Elevation:	53.6 feet	Depth to Water:	N/A

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS SYMBOL	SUMMARY OF SUBSURFACE CONDITIONS (based on Unified Soil Classification System)	PENETRATION (blows per foot)	SAMPLE TYPE	BULK	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	RELATIVE COMPACTION (%)	LABORATORY TESTS
0	63			3" of AC over 4" of Base							
			SC	**Artificial Fill (Qaf):** Dark grayish-brown, moist, loose to medium dense, very fine- to medium-grained, CLAYEY SAND with gravels, organic scent.	15	Cal					
			SM	Greenish-gray, moist, loose, very fine- to medium-grained, SILTY SAND, micaceous, Point Loma derived fill.	9	Cal		17.3	109.7		
5	58			Very moist.							
				Heavy seepage at 7', saturated.							
			SC	Grayish-brown, saturated, loose, very fine- to medium-grained, CLAYEY SAND with gravels and abundant concrete debris (no spoils generated during drilling below 7 feet).	29**	Cal					
10	53										
					5**	Cal		20.5	108.5		
15	48				12**	Cal*					
			SM	**Point Loma Formation (Kp):** Yellowish-brown to greenish-gray, moist, very dense, very fine- to medium-grained, SILTY SAND; micaceous.	50/5"	Cal		11.5	123.2		
20	43										
					50/2"	Cal		15.5	113.4		
25	38			Boring terminated at 24 feet. Seepage encountered at 7 feet.							
30	33										

Notes:

Symbol Legend

- Groundwater Level During Drilling
- Groundwater Level After Drilling
- Apparent Seepage
- * No Sample Recovery
- ** Non-Representative Blow Count (rocks present)

SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

DATE:	OCTOBER 2015	JOB NO.:	2150460.01
BY:	SRD	FIGURE NO.:	A-2

CHRISTIAN WHEELER
ENGINEERING

LOG OF TEST BORING B-3

Sample Type and Laboratory Test Legend

Cal	Modified California Sampler	CK	Chunk Density
SPT	Standard Penetration Test	DR	Density Ring
ST	Shelby Tube		
MD	Max Density	DS	Direct Shear
SO4	Soluble Sulfates	Con	Consolidation
SA	Sieve Analysis	EI	Expansion Index
HA	Hydrometer	R-Val	Resistance Value
SE	Sand Equivalent	Chl	Soluble Chlorides
PI	Plasticity Index	Res	pH & Resistivity
CP	Collapse Potential		

Date Logged:	9/22/15	Equipment:	Mobil B-61
Logged By:	DJF	Auger Type:	8 inch Hollow Stem
Existing Elevation:	67.0 feet	Drive Type:	140lbs/30 inches
Proposed Elevation:	59.5 feet	Depth to Water:	N/A

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS SYMBOL	SUMMARY OF SUBSURFACE CONDITIONS (based on Unified Soil Classification System)	PENETRATION (blows per foot)	SAMPLE TYPE	BULK	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	RELATIVE COMPACTION (%)	LABORATORY TESTS
0	67			5" of AC							
			SM	**Artificial Fill (Qaf):** Dark grayish-brown, moist, loose to medium dense, very fine- to medium-grained, CLAYEY SAND with gravels, organic scent.	8	Cal					
				AC debris at 4 feet.	5	Cal					
5	62		SC/ CL	Grayish-brown, moist to very moist, medium stiff, CLAYEY SAND/SANDY CLAY with gravels and concrete debris. EI = 35 (Low)							
				Moderate seepage at 8 feet.	9	Cal		22.5	99.3		
10	57		SM	**Point Loma Formation (Kp):** Yellowish-brown, moist, dense, very fine- to medium-grained, VERY SILTY SAND; micaceous, slightly weathered to 12½ feet.	55	Cal		13.2	114.2		DS
				Very dense.							
15	52				50/5"	Cal		12.7	117.9		
					50/3"	Cal		12.8	117.0		
20	47			Boring terminated at 19½ feet. Seepage encountered at 7 feet.							
25	42										
30	37										

Notes:

Symbol Legend

- Groundwater Level During Drilling
- Groundwater Level After Drilling
- Apparent Seepage
- * No Sample Recovery
- ** Non-Representative Blow Count (rocks present)

SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

DATE:	OCTOBER 2015	JOB NO.:	2150460.01
BY:	SRD	FIGURE NO.:	A-3

CHRISTIAN WHEELER ENGINEERING

Appendix B

Laboratory Test Results

Laboratory tests were performed in accordance with the generally accepted American Society for Testing and Materials (ASTM) test methods or suggested procedures. Brief descriptions of the tests performed are presented below:

a) **CLASSIFICATION:** Field classifications were verified in the laboratory by visual examination. The final soil classifications are in accordance with the Unified Soil Classification System and are presented on the exploration logs in Appendix A.

b) **MOISTURE-DENSITY: MOISTURE-DENSITY:** In-place moisture contents and dry densities were determined for selected soil samples in accordance with ATM D 2937. The results are summarized in the boring logs presented in Appendix A.

c) **MAXIMUM DENSITY & OPTIMUM MOISTURE CONTENT:** The maximum dry density and optimum moisture content of typical soils were determined in the laboratory in accordance with ASTM Standard Test D-1557, Method A.

d) **DIRECT SHEAR:** Direct shear tests were performed on selected samples of the on-site soils in accordance with ASTM D 3080.

e) **EXPANSION INDEX TEST:** Expansion index tests were performed on selected remolded soil samples in accordance with ASTM D 4829.

f) **GRAIN SIZE DISTRIBUTION:** The grain size distributions of selected samples were determined in accordance with ASTM C136 and/or ASTM D 422.

g) **SOLUBLE SULFATE CONTENT:** The soluble sulfate content was determined for representative samples in accordance with California Test Methods 417.

LABORATORY TEST RESULTS

SU CASA

6738 LA JOLLA BOULEVARD

LA JOLLA, CALIFORNIA

MAXIMUM DRY DENSITY AND OPTIMUM MOISTURE CONTENT (ASTM D1557)

Sample Location	**Boring B-1 @ ½'-5'**
Sample Description	Brown Silty Sand with Clay, SM
Maximum Density	123.1 pcf
Optimum Moisture	10.1 %

DIRECT SHEAR (ASTM D3080)

Sample Location	**Boring B-1 @ ½'-5'**	**Boring B-1 @ 12½'**	**Boring B-3 @ 11½'**
Sample Type	Remolded to 90 %	Undisturbed	Undisturbed
Friction Angle	29°	33°	329°
Cohesion	250 psf	250 psf	250 psf

EXPANSION INDEX TESTS (ASTM D4829)

Sample Location	**Boring B-3 @5'-10'**
Initial Moisture:	9.9 %
Initial Dry Density	108.5 pcf
Final Moisture:	20.0 %
Expansion Index:	35 (Low)

GRAIN SIZE DISTRIBUTION (ASTM D422)

Sample Location	**Boring B-1 @ ½'-5'**	**Boring B-1 @ 8½'-11'**	**Boring B-3 @ 10½'-15'**
Sieve Size	*Percent Passing*	*Percent Passing*	*Percent Passing*
2"	100		
1½"	99		
1"	96		
¾"	95		
½"	93		
⅜"	92		
#4	90	100	100
#8	87	96	99
#16	85	92	97
#30	78	86	94
#50	59	75	83
#100	47	64	68
#200	40	55	52

LABORATORY TEST RESULTS (CONT)

SOLUBLE SULFATES (CALIFORNIA TEST METHOD 417)

Sample Location	Boring B-1 @ 12'-17'	Boring B-3 @ 5'-10'
Soluble Sulfate	0.040 % (SO_4)	0.130 % (SO_4)

CHRISTIAN WHEELER
ENGINEERING

May 10, 2016

Su Casa Properties CWE 2150460.04
912 Newkirk Drive
La Jolla, California 92037

Subject: Addendum Geotechnical Report and Response to Cycle 10 LDR-Geology Review of Documents, City Project Nbr. 420956, Su Casa, 6738 La Jolla Boulevard, La Jolla, California

References: 1) Christian Wheeler Engineering Report 2150460.01, "Report of Preliminary Geotechnical Investigation, Su Casa, 6738 La Jolla Boulevard, La Jolla, California", dated October 23, 2015.
2) Christian Wheeler Engineering Report 2150460.02, "Addendum to Report of Preliminary Geotechnical Investigation, Su Casa, 6738 La Jolla Boulevard, La Jolla, California", dated December 1, 2015.
3) Christian Wheeler Engineering Report 2150460.03, "Addendum to Report of Preliminary Geotechnical Investigation On-Site Storm Water Infiltration, Su Casa, 6738 La Jolla Boulevard, La Jolla, California", dated January 26, 2016.
4) City of San Diego, 2016, LDR-Geology Cycle 10 Review Memorandum, Su Casa, Project Nbr. 420956, prepared by James Quinn, CEG, dated March 25, 2016.

Ladies and Gentlemen:

In accordance with your request and our proposal dated May 3, 2016, we have prepared this report to present additional information required by the City of San Diego regarding the geotechnical issues at the site. The comments in the City Review Memorandum and our responses to the comments in the referenced memorandum are presented below.

City Comment No. 3: Submit an addendum geotechnical report or update letter that addresses the following:

CWE Response: This report serves as the requested addendum geotechnical investigation report.

City Comment No. 4: Regional geologic mapping indicates that terrace deposits (i.e. "Bay Point Fm.") rest on the Point Loma Formation in the vicinity of the site. However, the geologic map and cross sections do not show terrace deposits. Clarify if terrace deposits underlie any portion of the site.

CWE Response: As presented on page 3 of our referenced report of Preliminary Geotechnical Investigation (CWE 2150460.01), "Prior to site grading and development in the early 1900's, the site originally consisted of a westerly trending ravine that was infilled to create its present topography. Playa del Sur and Playa del Norte are roughly located along the alignments of the northern and southern sides of the infilled ravine." Based upon the findings of our subsurface explorations and review of readily available, pertinent geologic and geotechnical literature, it was determined that the project area is underlain by artificial fill/alluvium, subsoil, and Cretaceous-age sedimentary deposits of the Point Loma Formation. No evidence of the presence of old paralic/terrace deposits underlying the site was encountered in our subsurface explorations or our analysis of historic aerial photographs and topographic maps referenced in our report of Preliminary Geotechnical Investigation.

City Comment No. 5: If terrace deposits underlie any portion of the site, show the distribution of the terrace deposits on the geologic map and cross sections.

CWE Response: Terrace deposits are not anticipated to underlie any portions of the subject site.

City Comment No. 6: Show the anticipated limits of remedial grading on the geologic/geotechnical map and cross sections.

CWE Response: The anticipated limits of remedial grading are presented on our revised Site Plan and Geotechnical Map included herein as Plate No. 1 and on the revised geologic cross sections included herein as Plate Nos. 2 through 4.

City Comment No. 7: Show existing ground water conditions on the cross sections.

CWE Response: Free, unconfined groundwater was not encountered within any of our subsurface exploration that extended to a maximum depth of 24 feet below existing site grades. However, perched groundwater is anticipated to exist at the contact between the undifferentiated fill/alluvium and the underlying materials of the Point Loma Formation, at the bottom of the original ravine. Furthermore, localized perched groundwater exists within the undifferentiated fill/alluvium due to layers of different permeability characteristics. This perched groundwater/seepage is shown on the revised geologic cross sections included on Plate Nos. 2 through 4 of this report.

City Comment No. 8: Clarify if the proposed basement will be water tight.

CWE Response: Based on our discussions with the project architect, we understand that the proposed basement will be water tight.

City Comment No. 9: If the proposed basement is not water tight, indicate if continuous or intermittent pumping of groundwater from the basement will be required following project completion.

CWE Response: Based on our discussions with the project architect, we understand that the proposed basement will be water tight. As such, we recommend that hydrostatic forces be applied to the design of the proposed mat slab foundation. The active soil pressure for the design of the lower 5 feet of proposed basement walls may be assumed to be equivalent to the pressure of a fluid weighing 90 pounds per cubic foot.

City Comment No. 10: Indicate if the proposed development will adversely impact ground water flow or quality.

CWE Response: The proposed development is not anticipated to adversely impact ground water flow or quality.

City Comment No. 11: Indicate if the proposed development will destabilize or result in settlement of adjacent properties or the right of way.

CWE Response: Provided the proposed earthwork and construction are conducted in accordance with the geotechnical recommendations provided in our referenced geotechnical report and sound construction and site maintenance procedures are followed, the proposed development as recommended should not measurably destabilize or result in settlement of adjacent properties or the right of way.

City Comment No. 12: Addendum to Report of Preliminary Geotechnical Investigation, On-Site Storm Water Infiltration, Su Casa, 6738 La Jolla Boulevard, La Jolla, California, prepared by Christian Wheeler Engineering, dated January 26, 2016 (their project no. 2150460.03)

Addendum to Report of Preliminary Geotechnical Investigation, Su Casa, 6738 La Jolla Boulevard, La Jolla, California, prepared by Christian Wheeler Engineering, dated December 1, 2015 (their project no. 2150460.02)

Conceptual Grading Plan prepared by Spear & Associates, Inc., dated February 17, 2016

CWE Response: No response necessary.

City Comment No. 13: Responsive information to the previous review comments was not received and the review comments remain applicable and un-cleared.

CWE Response: No response necessary.

City Comment No. 14: Submit original quality prints of the referenced geotechnical reports that contain full-size Plates. The applicant should also consider providing a digital copy of the geotechnical documents.

CWE Response: The project applicant should submit original quality prints of the referenced geotechnical reports that contain full-size Plates. The applicant should also consider providing a digital copy of the geotechnical documents.

City Comment No. 15: The project's geotechnical consultant should clarify how the estimated reliable infiltration rate was determined. The consultant should refer to the Storm Water Standards, Part 1, BMP Design Manual, Appendix D, Section D.3 for guidance (https://www.sandiego.gov/sites/default/files/storm-water-standards-manual-2016-1.pdf).

CWE Response: Refer to the referenced CWE report 2150460.03, "Addendum to Report of Preliminary Geotechnical Investigation On-Site Storm Water Infiltration," dated January 26, 2016. A copy of this report is included in Appendix A of this report.

City Comment No. 16: Criteria 1 and 5 of Work Sheet C.4-1 should be based on Section C.2.1 and Appendix D of the Storm Water Standards, Part 1, BMP Design Manual (https://www.sandiego.gov/sites/default/files/storm-water-standards-manual-2016-1.pdf).

CWE Response: Refer to the referenced CWE report 2150460.03, "Addendum to Report of Preliminary Geotechnical Investigation On-Site Storm Water Infiltration," dated January 26, 2016. A copy of this report is included in Appendix A of this report.

City Comment No. 17: Clarify if the perched groundwater supports a beneficial use.

CWE Response: The perched groundwater, which is anticipated to fluctuate seasonally, is not considered to support a beneficial use.

If you have any questions regarding this letter, please do not hesitate to contact this office. Christian Wheeler Engineering appreciates this opportunity of providing professional services for you for the subject project.

Respectfully submitted,
CHRISTIAN WHEELER ENGINEERING

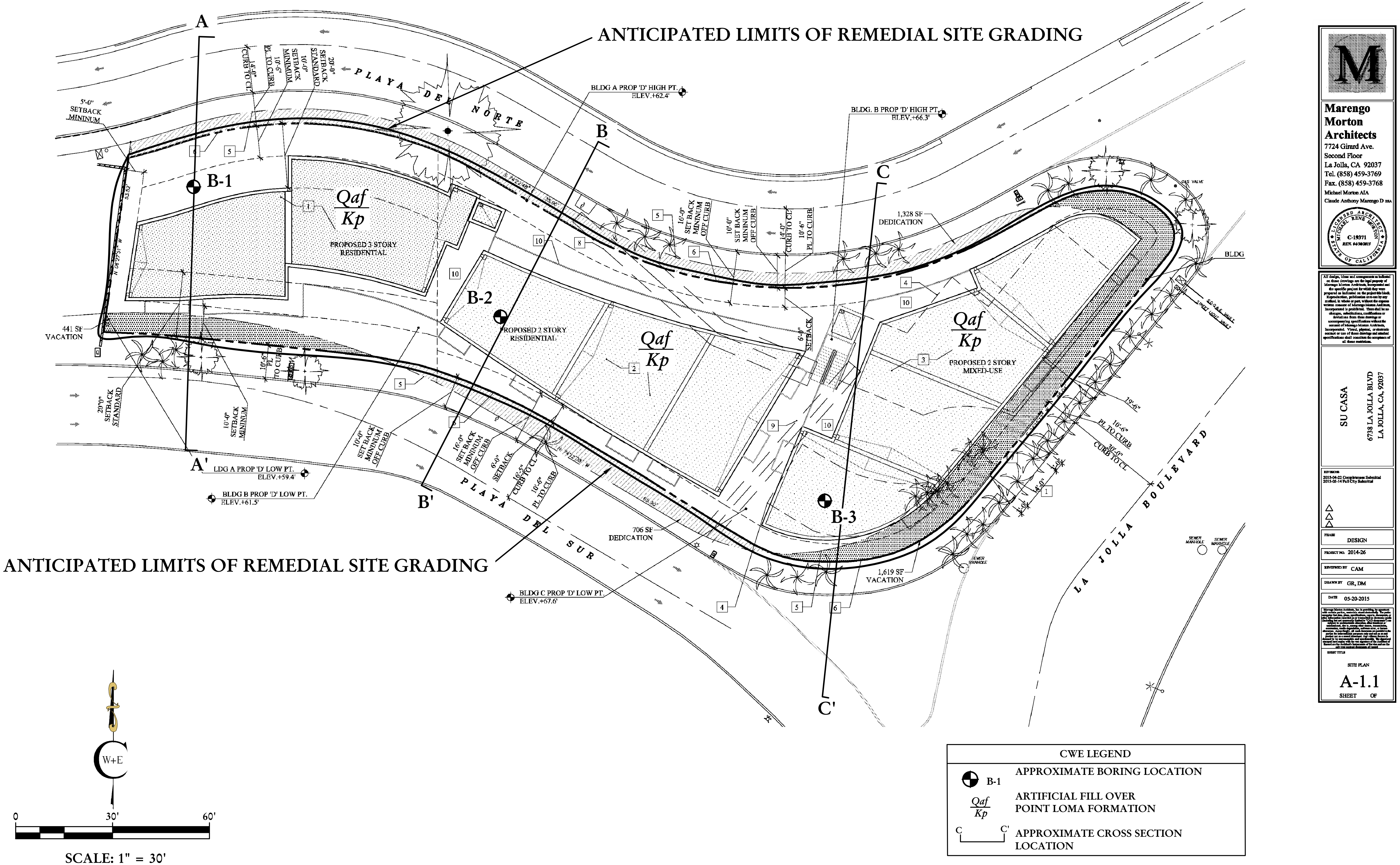
Daniel B. Adler, RCE 36037

David R. Russell, CEG 2215

Dist. CAMarengo@marengomortonarchitects.com

REGISTERED PROFESSIONAL ENGINEER
DANIEL B. ADLER
No. 36037
Exp. 06-30-16
CIVIL
STATE OF CALIFORNIA

REGISTERED GEOLOGIST
DAVID R. RUSSELL
No. 2215
CERTIFIED
ENGINEERING
GEOLOGIST
Exp. 09-17
STATE OF CALIFORNIA

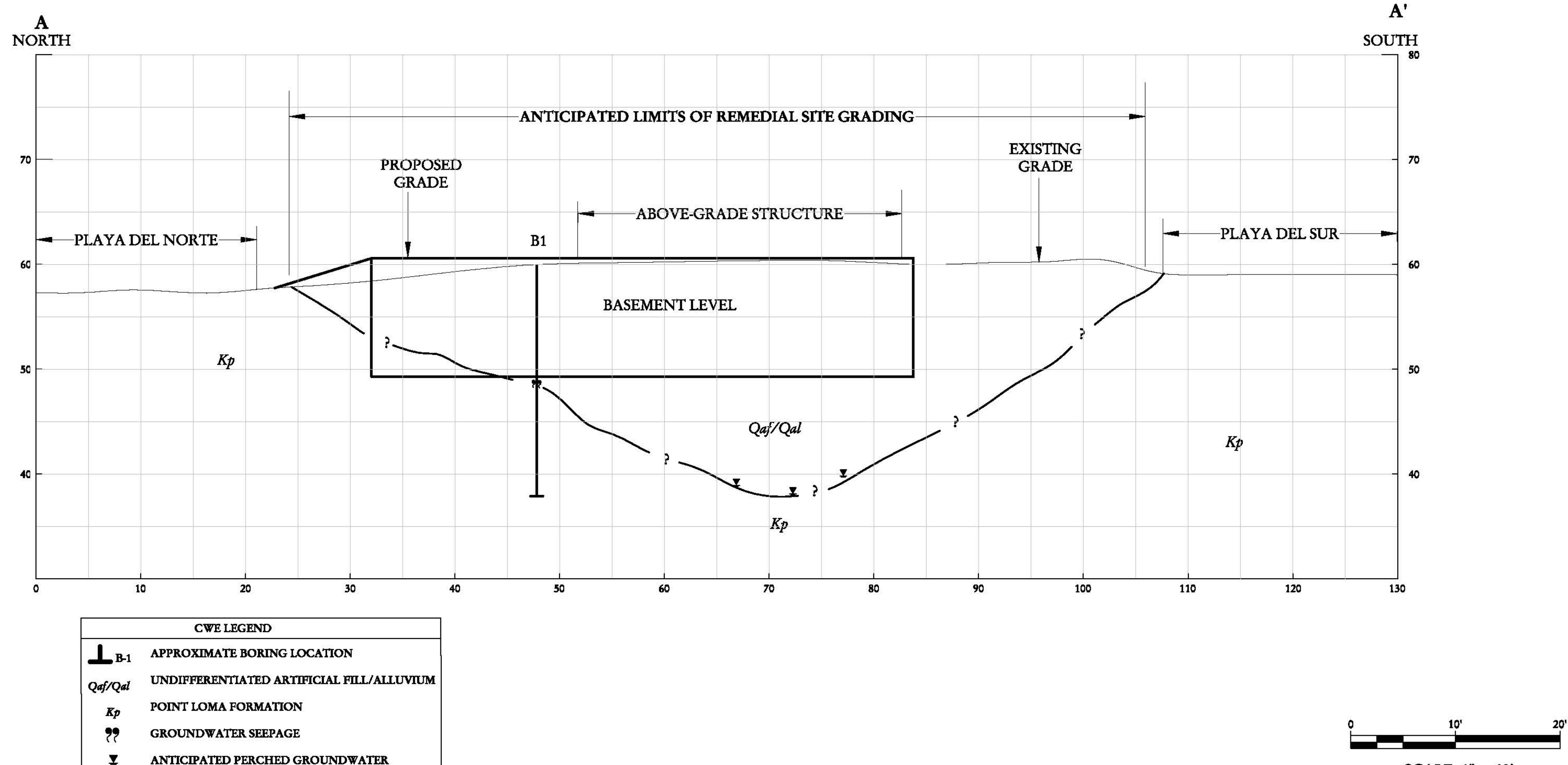


SITE PLAN AND GEOTECHNICAL MAP

SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

DATE:	MAY 2016	JOB NO.:	2150460.04
BY:	SRD	PLATE NO.:	1

CHRISTIAN WHEELER ENGINEERING

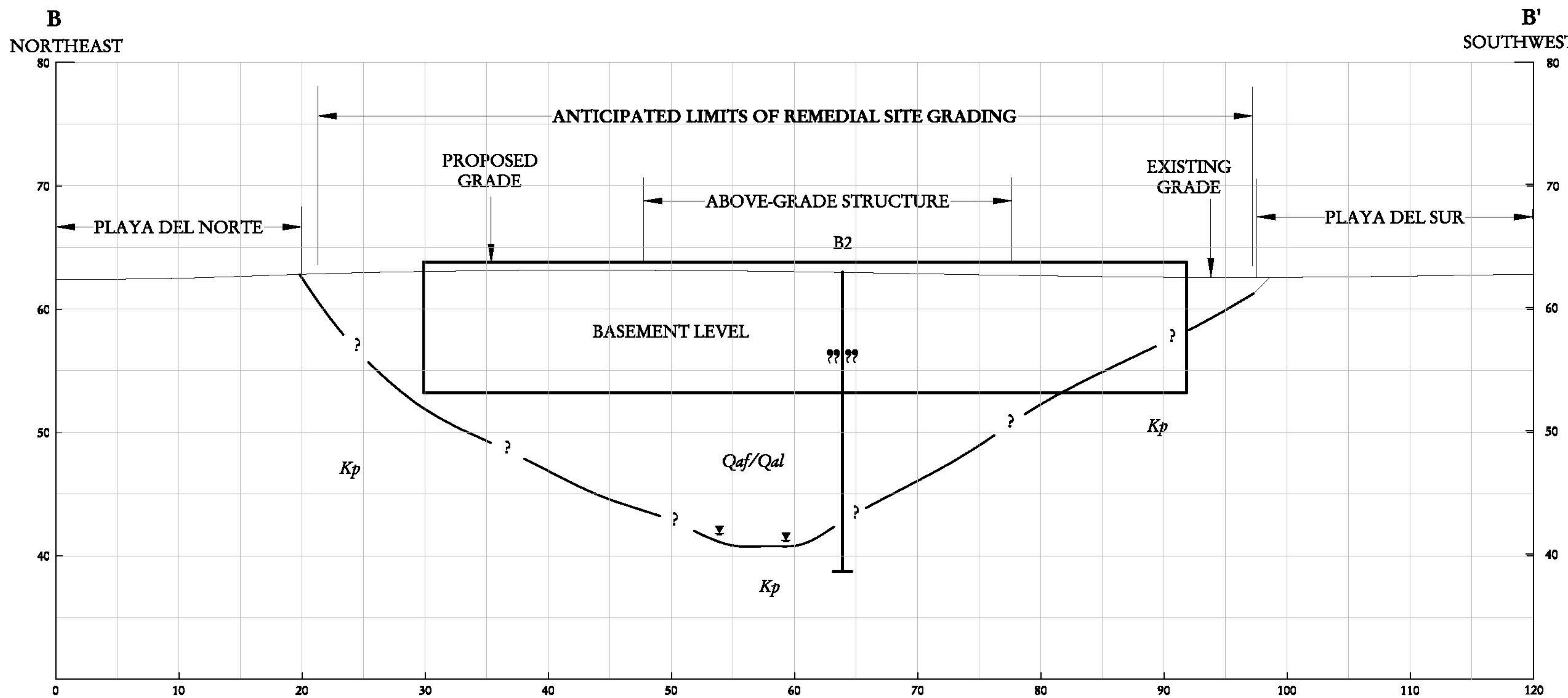


GEOLOGIC CROSS SECTION A-A'

SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

DATE:	MAY 2016	JOB NO.:	2150460.04
BY:	SRD	PLATE NO.:	2

CHRISTIAN WHEELER ENGINEERING



CWE LEGEND	
B-1	APPROXIMATE BORING LOCATION
Qaf/Qal	UNDIFFERENTIATED ARTIFICIAL FILL/ALLUVIUM
Kp	POINT LOMA FORMATION
	GROUNDWATER SEEPAGE
	ANTICIPATED PERCHED GROUNDWATER

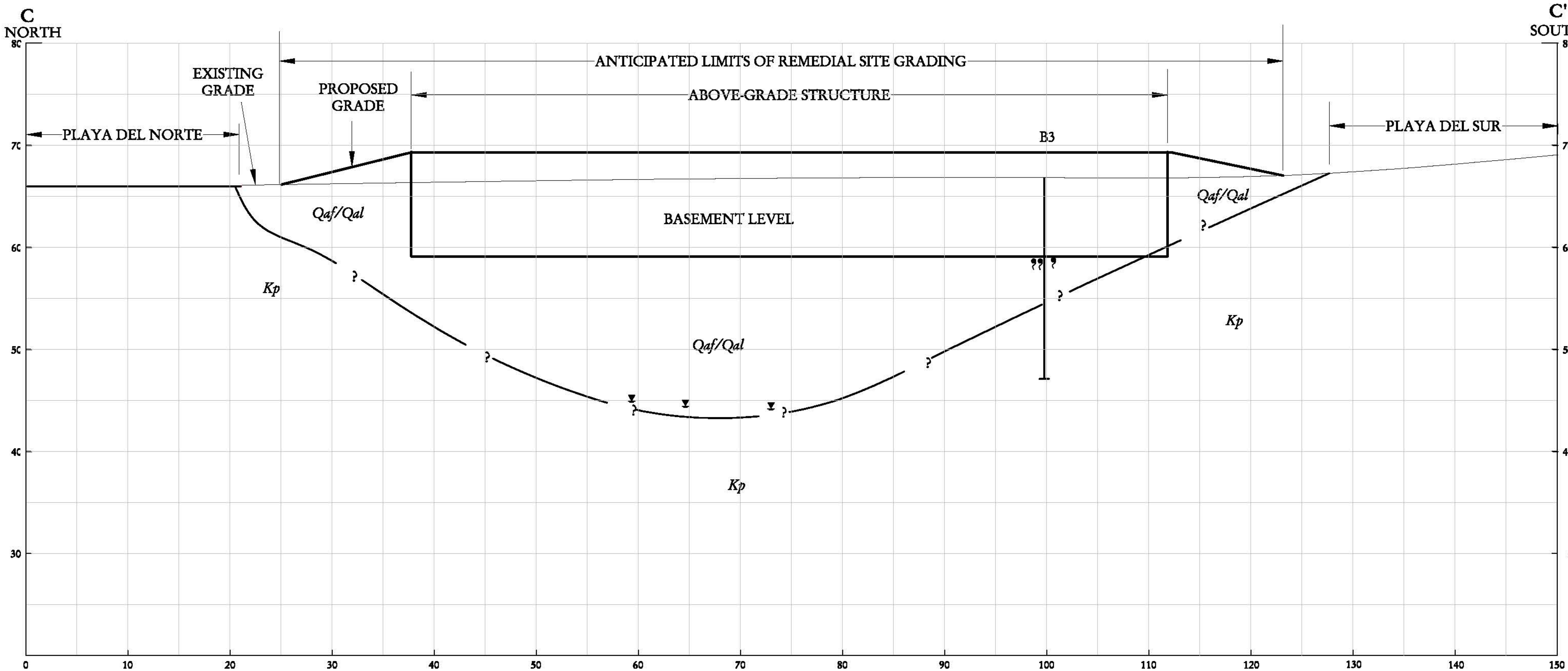
0 10' 20'

SCALE: 1" = 10'

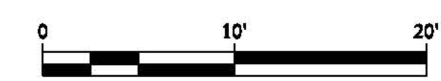
GEOLOGIC CROSS SECTION B-B'

SU CASA 6738 LA JOLLA BOULEVARD LA JOLLA, CALIFORNIA			
DATE:	MAY 2016	JOB NO.:	2150460.04
BY:	SRD	PLATE NO.:	3

CHRISTIAN WHEELER ENGINEERING



CWE LEGEND	
B-1	APPROXIMATE BORING LOCATION
Qaf/Qal	UNDIFFERENTIATED ARTIFICIAL FILL/ALLUVIUM
Kp	POINT LOMA FORMATION
	GROUNDWATER SEEPAGE
	ANTICIPATED PERCHED GROUNDWATER



SCALE: 1" = 10'

GEOLOGIC CROSS SECTION C-C'

SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

DATE:	MAY 2016	JOB NO.:	2150460.04
BY:	SRD	PLATE NO.:	4

CHRISTIAN WHEELER
ENGINEERING

Appendix A

CWE Report 2150460.03

CHRISTIAN WHEELER
ENGINEERING

January 26, 2016

Su Casa Properties
912 Newkirk Drive
La Jolla, California 92037

CWE 2150460.03

Subject: Addendum to Report of Preliminary Geotechnical Investigation
On-Site Storm Water Infiltration, Su Casa, 6738 La Jolla Boulevard, La Jolla, California

References: 1) Christian Wheeler Engineering Report 2150460.01, "Report of Preliminary Geotechnical Investigation, Su Casa, 6738 La Jolla Boulevard, La Jolla, California", dated October 23, 2015.
2) Christian Wheeler Engineering Report 2150460.02, "Addendum to Report of Preliminary Geotechnical Investigation, Su Casa, 6738 La Jolla Boulevard, La Jolla, California", dated December 1, 2015.

Ladies and Gentlemen:

In accordance with your request and our proposal dated January 19, 2016, we have prepared this addendum to our referenced geotechnical reports to address the potential for storm water infiltration at the subject site. Unless specifically addressed or amended herein, all of the findings, conclusions, and recommendations presented in the referenced reports remain applicable to the subject project.

As presented on page 11 of our referenced Report of Preliminary Geotechnical Investigation, "Based on the presence of man-placed fill materials on-site, as well as the geomorphic conditions of the site that include an infilled ravine in which perched water is commonly encountered along the contact with surficial materials of artificial fill/alluvium and underlying and much less permeable Cretaceous-age sedimentary deposits, the use of infiltration facilities to manage storm water discharge at the site are not recommended."

In accordance with guidelines presented in Appendix F of the City of San Diego Guidelines for Geotechnical Reports (2011) our recommendation that infiltration facilities not be used to manage storm water discharge at the site was made due to the following unsuitable conditions, in regards to the feasibility of on-site infiltration, being present at the site:

- High perched groundwater (within 10 feet of the base of infiltration/ percolation)
- Engineered, compacted fill (structural fill) and undocumented fills on and adjacent to the site that are subject to hydro-consolidation.
- Infiltration/percolation rates anticipated to less than 0.52 inches/hour, corresponding to the presence of silt, clay, and clay or silt loam.
- The presence of on-site soils with >20% clay or >40% silt and clay, which are not typically suitable for infiltration.
- The low permeability or impermeable nature of the Cretaceous-age bedrock underlying the site.
- Expectation that changes in soil moisture content or rising groundwater level will adversely impact existing structures or improvements on and adjacent to the site.

It is also our professional opinion and judgment that our recommendation that infiltration facilities not be used to manage storm water discharge is consistent and in accordance with Appendices C and D of the Model BMP Design Manual San Diego Region (2015). A completed "Worksheet C.4-1: Categorization of Infiltration Feasibility Condition" for the subject project is included in Appendix A of this report. As presented on the last page (C-14) of Worksheet C.4-1, our feasibility screening for infiltration for the subject project indicates "No Infiltration." For reference, Appendix B of this report presents logs of our subsurface investigation of the site, geotechnical mapping, and the results of laboratory testing, which were previously included in our referenced Report of Preliminary Geotechnical Investigation and which support the findings of our feasibility screening.

If you have any questions after reviewing this report, please do not hesitate to contact our office. This opportunity to be of professional service is sincerely appreciated.

REGISTERED GEOLOGIST
DAVID R. RUSSELL
No. 2215
CERTIFIED ENGINEERING GEOLOGIST
Exp. 09-17
STATE OF CALIFORNIA

Respectfully submitted,
CHRISTIAN WHEELER ENGINEERING

REGISTERED PROFESSIONAL ENGINEER
DANIEL B. ADLER
No. 36037
Exp. 06-30-16
CIVIL
STATE OF CALIFORNIA

Daniel B. Adler, RCE #36037 David R. Russell, CEG #2215

DBA:drr
cc: CAMarengo@marengomortonarchitects.com; GeanineRollins@marengomortonarchitects.com

Appendix A

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

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?**			
Criteria	Screening Question	**Yes**	**No**
1	**Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		NO
Provide basis: Variable soil infiltration properties across site. Existing alluvium and fill possess layers of silts and clays demonstrating very low infiltration rates. Very low rates of infiltration within Cretaceous-age sediments of Point Loma Formation underlying site. Please refer to subsurface exploration data and laboratory test results presented in CWE Report 2150460.01. 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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		NO
Provide basis: C2.2 Settlement and Volume Change - On- and off-site fills and alluvial soils subject to consolidation as the result of infiltration. Near surface clayey soils subject to expansion. C.2.4 Utility Considerations - Existing and proposed on- and of-site utility trenches considered susceptible to saturation and lateral migration of infiltrated storm water. C.2.6 Retaining Walls and Foundations - The proposed project will include a subterranean level across almost the entirety of the site. Any proposed infiltration facility would infiltrate storm water adjacent to planned foundations and retaining walls. C.2.7 Other Factors - Adjacent subgrade soils in public right-of-ways subject to degradation as the result of infiltration. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			

<table>
<tr><th colspan="4">Worksheet C.4-1 Page 2 of 4</th></tr>
<tr><th>Criteria</th><th>Screening Question</th><th>Yes</th><th>No</th></tr>
<tr><td>3</td><td>Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.</td><td></td><td>NO</td></tr>
<tr><td colspan="4">Provide basis:

C.3.2 Separation to Seasonal High Groundwater - The depth to perched groundwater beneath the site was measured by our firm (see CWE Report 2150460.01) at depths as shallow as 7 feet below existing site grades during the dry season (September 2015). The depth of perched groundwater beneath the site may increase during the wet season.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</td></tr>
<tr><td>4</td><td>Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.</td><td></td><td>N/A</td></tr>
<tr><td colspan="4">Provide basis:

C.3.6 Water Balance Impacts on Stream Flow – Not Applicable. No streams located hydrologically down gradient.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</td></tr>
<tr><td>Part 1 Result*</td><td colspan="2">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</td><td>See Pages C-13 and C-14</td></tr>
</table>

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by [City Engineer] to substantiate findings.

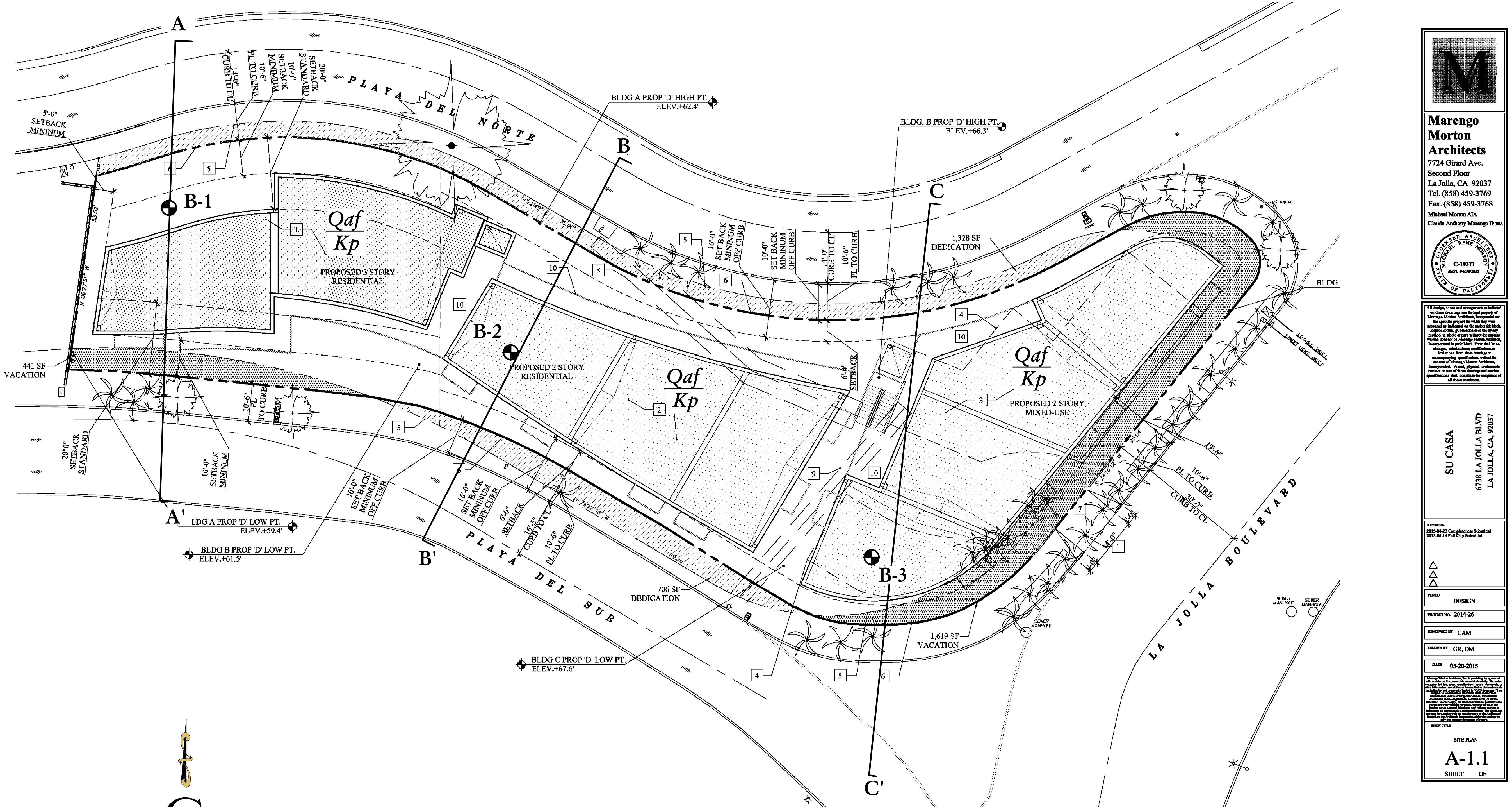
Worksheet C.4-1 Page 3 of 4			
Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria **Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?**			
Criteria	Screening Question	**Yes**	**No**
5	**Do soil and geologic conditions allow for infiltration in any appreciable rate or volume?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		NO
Provide basis: C2.2 Settlement and Volume Change - On- and off-site fills and alluvial soils subject to consolidation as the result of infiltration. Near surface clayey soils subject to expansion. C.2.4 Utility Considerations - Existing and proposed on- and of-site utility trenches considered susceptible to saturation and lateral migration of infiltrated storm water. C.2.6 Retaining Walls and Foundations - The proposed project will include a subterranean level across almost the entirety of the site. Any proposed infiltration facility would infiltrate storm water adjacent to planned foundations and retaining walls. C.2.7 Other Factors - Adjacent subgrade soils in public right-of-ways subject to degradation as the result of infiltration. 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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		NO
Provide basis: C.2.4 Utility Considerations - Existing and proposed on- and of-site utility trenches considered susceptible to saturation and lateral migration of infiltrated storm water. C.2.6 Retaining Walls and Foundations - The proposed project will include a subterranean level across almost the entirety of the site. Any proposed infiltration facility would infiltrate storm water adjacent to planned foundations and retaining walls. C.2.7 Other Factors - Adjacent subgrade soils in public right-of-ways subject to degradation as the result of infiltration. 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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		NO
Provide basis: C.3.2 Separation to Seasonal High Groundwater - The depth to perched groundwater beneath the site was measured by our firm (see CWE Report 2150460.01) at depths as shallow as 7 feet below existing site grades during the dry season (September 2015). The depth of perched groundwater beneath the site may increase during the wet season. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
8	**Can infiltration be allowed without violating downstream water rights**? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	YES	
Provide basis: There are no downstream water bodies before the Pacific Ocean. 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 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is **Partial Infiltration.** If any answer from row 5-8 is no, then infiltration of any volume is considered to be **infeasible** within the drainage area. The feasibility screening category is **No Infiltration.**	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

Appendix B

Data from CWE Report 2150460.01
October 23, 1015



0 40' 80'

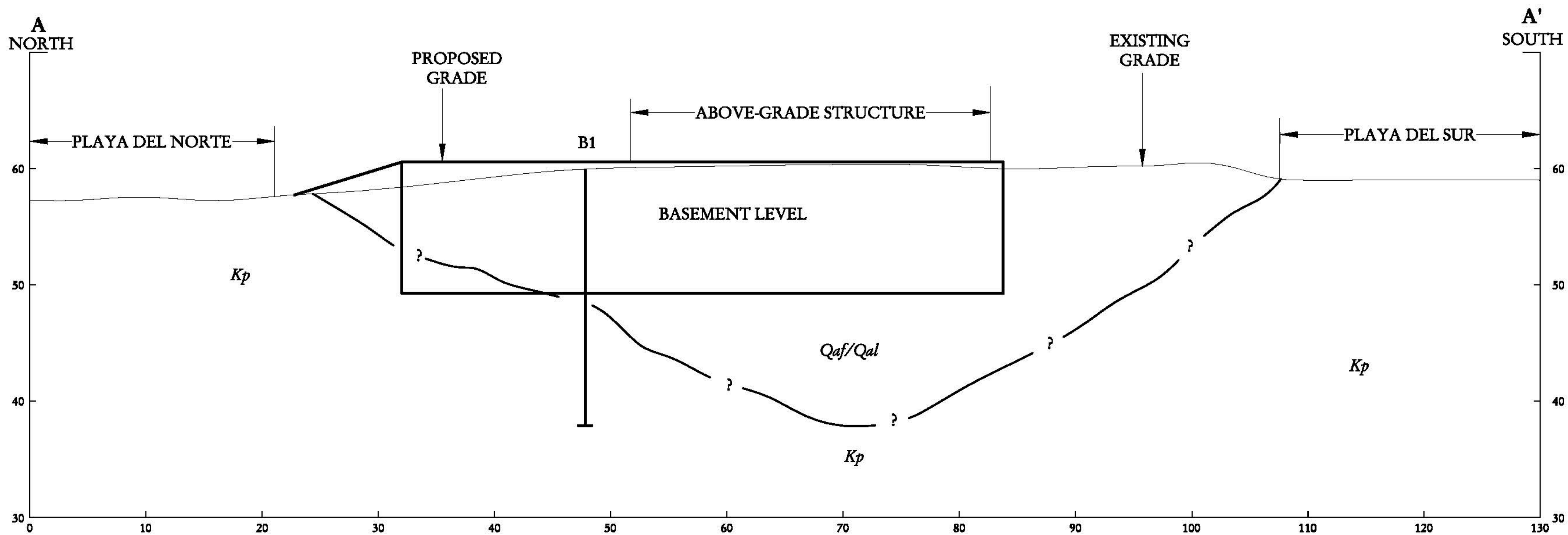
SCALE: 1" = 40'

CWE LEGEND	
B-1	APPROXIMATE BORING LOCATION
Qaf / Kp	ARTIFICIAL FILL OVER POINT LOMA FORMATION
C C'	APPROXIMATE CROSS SECTION LOCATION

SITE PLAN AND GEOTECHNICAL MAP

SU CASA 6738 LA JOLLA BOULEVARD LA JOLLA, CALIFORNIA			
DATE:	OCTOBER 2015	JOB NO.:	2150460.01
BY:	SRD	PLATE NO.:	1

CHRISTIAN WHEELER
ENGINEERING



CWE LEGEND	
B-1	APPROXIMATE BORING LOCATION
Qaf/Qal	UNDIFFERENTIATED ARTIFICIAL FILL/ALLUVIUM
Kp	POINT LOMA FORMATION

0 10' 20'

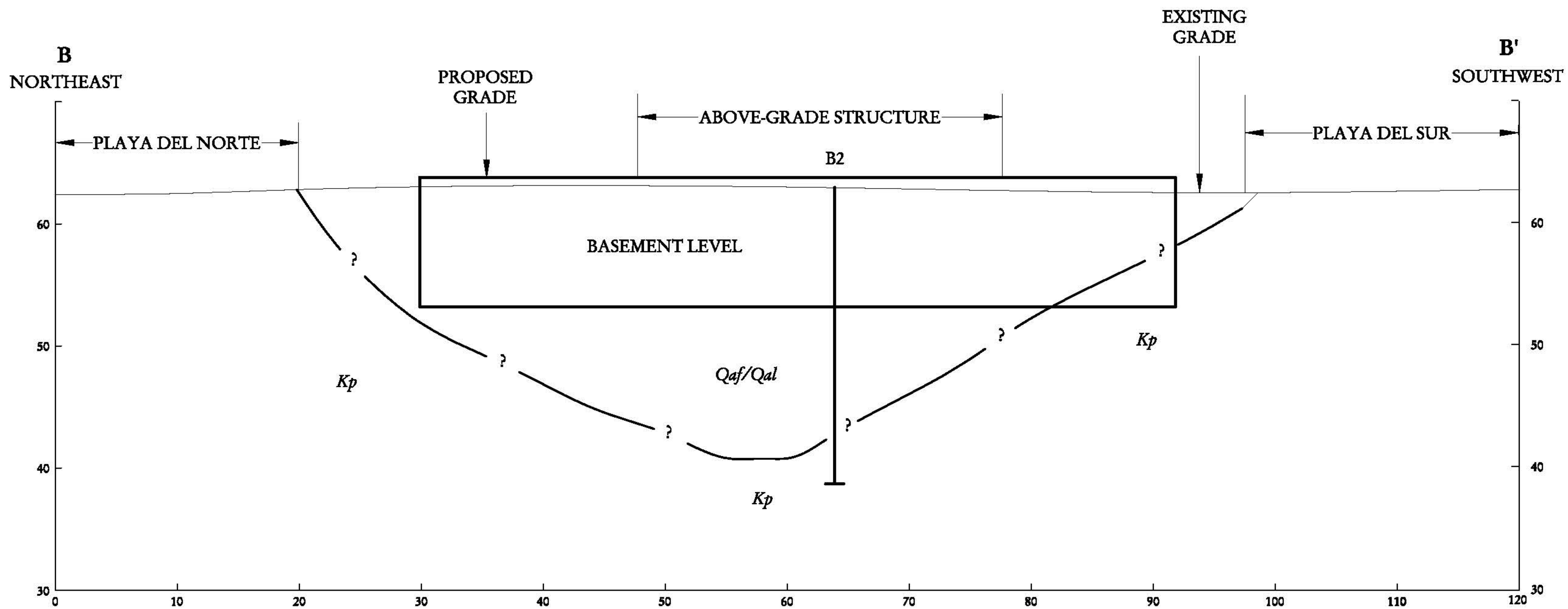
SCALE: 1" = 10'

GEOLOGIC CROSS SECTION A-A'

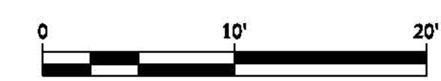
SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

DATE:	OCTOBER 2015	JOB NO.:	2150460
BY:	SRD	PLATE NO.:	2

CHRISTIAN WHEELER
ENGINEERING



CWE LEGEND	
B-1	APPROXIMATE BORING LOCATION
Qaf/Qal	UNDIFFERENTIATED ARTIFICIAL FILL/ALLUVIUM
Kp	POINT LOMA FORMATION



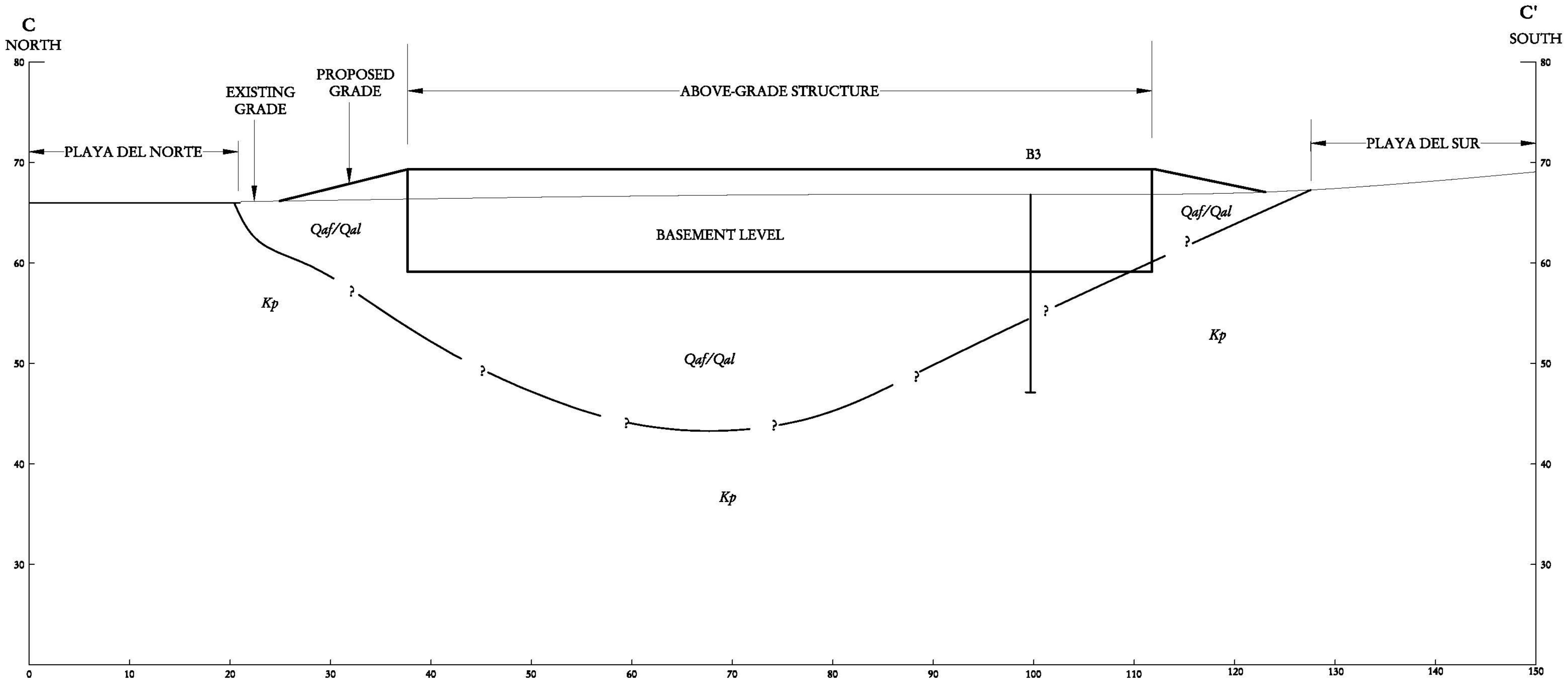
SCALE: 1" = 10'

GEOLOGIC CROSS SECTION B-B'

SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

DATE:	OCTOBER 2015	JOB NO.:	2150460
BY:	SRD	PLATE NO.:	3

CHRISTIAN WHEELER
ENGINEERING



CWE LEGEND	
B-1	APPROXIMATE BORING LOCATION
Qaf/Qal	UNDIFFERENTIATED ARTIFICIAL FILL/ALLUVIUM
Kp	POINT LOMA FORMATION

0 10' 20'

SCALE: 1" = 10'

GEOLOGIC CROSS SECTION C-C'

SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

DATE:	OCTOBER 2015	JOB NO.:	2150460
BY:	SRD	PLATE NO.:	4

CHRISTIAN WHEELER
ENGINEERING

Appendix A

Subsurface Explorations

LOG OF TEST BORING B-1

Sample Type and Laboratory Test Legend

Cal Modified California Sampler
SPT Standard Penetration Test
ST Shelby Tube
CK Chunk Density
DR Density Ring

MD Max Density
SO4 Soluble Sulfates
SA Sieve Analysis
HA Hydrometer
SE Sand Equivalent
PI Plasticity Index
CP Collapse Potential
DS Direct Shear
Con Consolidation
EI Expansion Index
R-Val Resistance Value
Chl Soluble Chlorides
Res pH & Resistivity

Date Logged:	9/22/15	Equipment:	Mobil B-61
Logged By:	DJF	Auger Type:	8 inch Hollow Stem
Existing Elevation:	60.0 feet	Drive Type:	140lbs/30 inches
Proposed Elevation:	49½ feet	Depth to Water:	N/A

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS SYMBOL	SUMMARY OF SUBSURFACE CONDITIONS (based on Unified Soil Classification System)	PENETRATION (blows per foot)	SAMPLE TYPE	BULK	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	RELATIVE COMPACTION (%)	LABORATORY TESTS
0	60			1" of AC over 2" of PCC							
			SM	**Artificial Fill (Qaf):** Brown, moist, loose, very fine- to medium-grained, SILTY SAND with CLAY, trace gravels, brick and concrete debris.	8	Cal					SA MD DS
5	55				30**	Cal		18.9	102.2		
			SC/CL	Grayish-brown, moist, loose to medium stiff, CLAYEY SAND/SANDY CLAY with gravels, brick, and concrete debris.							
			SC	**Subsoil:** Greenish-gray, very moist, medium stiff, VERY SANDY CLAY with rootlets and white precipitate deposits, moderate seepage at 10'.							SA
10	50				10	Cal		22.0	103.2		
			ʻʻ	Saturated.							
			ML	**Point Loma Formation (Kp):** Greenish-gray, very moist to very moist, very stiff, CLAYEY SILT with SAND and white precipitate deposits; moderately weathered.	24	Cal		17.5	110.9		
					51	Cal					DS
			SM	Greenish-gray to yellowish-brown, moist, dense, very fine- to medium-grained, SILTY SAND; micaceous with trace rootlets, slightly weathered to 14 feet.	50/3"	Cal		12.7	117.9		
15	45			Moist, very dense.							
20	40				50/3"	Cal		19.5	107.5		
					50/2"	Cal		13.1	114.6		
25	35			Boring terminated at 24 feet. Seepage encountered at 10 feet.							
30	30										

Notes:

Symbol Legend

Groundwater Level During Drilling
Groundwater Level After Drilling
ʻʻ Apparent Seepage
* No Sample Recovery
** Non-Representative Blow Count (rocks present)

SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

DATE:	OCTOBER 2015	JOB NO.:	2150460.01
BY:	SRD	FIGURE NO.:	A-1

CHRISTIAN WHEELER ENGINEERING

LOG OF TEST BORING B-2

Date Logged:	9/22/15	Equipment:	Mobil B-61
Logged By:	DJF	Auger Type:	8 inch Hollow Stem
Existing Elevation:	63.0 feet	Drive Type:	140lbs/30 inches
Proposed Elevation:	53.6 feet	Depth to Water:	N/A

Sample Type and Laboratory Test Legend

Cal	Modified California Sampler	CK	Chunk Density
SPT	Standard Penetration Test	DR	Density Ring
ST	Shelby Tube		
MD	Max Density	DS	Direct Shear
SO4	Soluble Sulfates	Con	Consolidation
SA	Sieve Analysis	EI	Expansion Index
HA	Hydrometer	R-Val	Resistance Value
SE	Sand Equivalent	Chl	Soluble Chlorides
PI	Plasticity Index	Res	pH & Resistivity
CP	Collapse Potential		

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS SYMBOL	SUMMARY OF SUBSURFACE CONDITIONS (based on Unified Soil Classification System)	PENETRATION (blows per foot)	SAMPLE TYPE	BULK	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	RELATIVE COMPACTION (%)	LABORATORY TESTS
0	63			3" of AC over 4" of Base							
			SC	**Artificial Fill (Qaf):** Dark grayish-brown, moist, loose to medium dense, very fine- to medium-grained, CLAYEY SAND with gravels, organic scent.	15	Cal					
			SM	Greenish-gray, moist, loose, very fine- to medium-grained, SILTY SAND, micaceous, Point Loma derived fill.	9	Cal		17.3	109.7		
5	58			Very moist.							
				Heavy seepage at 7', saturated.							
			SC	Grayish-brown, saturated, loose, very fine- to medium-grained, CLAYEY SAND with gravels and abundant concrete debris (no spoils generated during drilling below 7 feet).	29**	Cal					
10	53										
					5**	Cal		20.5	108.5		
					12**	Cal*					
15	48										
			SM	**Point Loma Formation (Kp):** Yellowish-brown to greenish-gray, moist, very dense, very fine- to medium-grained, SILTY SAND; micaceous.	50/5"	Cal		11.5	123.2		
20	43										
					50/2"	Cal		15.5	113.4		
25	38			Boring terminated at 24 feet. Seepage encountered at 7 feet.							
30	33										

Notes:

Symbol Legend

- ▽ Groundwater Level During Drilling
- ▼ Groundwater Level After Drilling
- Apparent Seepage
- * No Sample Recovery
- ** Non-Representative Blow Count (rocks present)

SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

DATE:	OCTOBER 2015	JOB NO.:	2150460.01
BY:	SRD	FIGURE NO.:	A-2

CHRISTIAN WHEELER ENGINEERING

LOG OF TEST BORING B-3

Sample Type and Laboratory Test Legend

Cal	Modified California Sampler	CK	Chunk Density
SPT	Standard Penetration Test	DR	Density Ring
ST	Shelby Tube		
MD	Max Density	DS	Direct Shear
SO4	Soluble Sulfates	Con	Consolidation
SA	Sieve Analysis	EI	Expansion Index
HA	Hydrometer	R-Val	Resistance Value
SE	Sand Equivalent	Chl	Soluble Chlorides
PI	Plasticity Index	Res	pH & Resistivity
CP	Collapse Potential		

Date Logged:	9/22/15	Equipment:	Mobil B-61
Logged By:	DJF	Auger Type:	8 inch Hollow Stem
Existing Elevation:	67.0 feet	Drive Type:	140lbs/30 inches
Proposed Elevation:	59.5 feet	Depth to Water:	N/A

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS SYMBOL	SUMMARY OF SUBSURFACE CONDITIONS (based on Unified Soil Classification System)	PENETRATION (blows per foot)	SAMPLE TYPE	BULK	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	RELATIVE COMPACTION (%)	LABORATORY TESTS
0	67			5" of AC							
			SM	**Artificial Fill (Qaf):** Dark grayish-brown, moist, loose to medium dense, very fine- to medium-grained, CLAYEY SAND with gravels, organic scent.	8	Cal					
				AC debris at 4 feet.	5	Cal					
5	62		SC/CL	Grayish-brown, moist to very moist, medium stiff, CLAYEY SAND/SANDY CLAY with gravels and concrete debris. EI = 35 (Low)							
				Moderate seepage at 8 feet.	9	Cal		22.5	99.3		
10	57		SM	**Point Loma Formation (Kp):** Yellowish-brown, moist, dense, very fine- to medium-grained, VERY SILTY SAND; micaceous, slightly weathered to 12½ feet.	55	Cal		13.2	114.2		DS
				Very dense.							
15	52				50/5"	Cal		12.7	117.9		
					50/3"	Cal		12.8	117.0		
20	47			Boring terminated at 19½ feet. Seepage encountered at 7 feet.							
25	42										
30	37										

Notes:

Symbol Legend

- Groundwater Level During Drilling
- Groundwater Level After Drilling
- Apparent Seepage
- * No Sample Recovery
- ** Non-Representative Blow Count (rocks present)

SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

DATE:	OCTOBER 2015	JOB NO.:	2150460.01
BY:	SRD	FIGURE NO.:	A-3

CHRISTIAN WHEELER ENGINEERING

Appendix B

Laboratory Test Results

Laboratory tests were performed in accordance with the generally accepted American Society for Testing and Materials (ASTM) test methods or suggested procedures. Brief descriptions of the tests performed are presented below:

a) **CLASSIFICATION:** Field classifications were verified in the laboratory by visual examination. The final soil classifications are in accordance with the Unified Soil Classification System and are presented on the exploration logs in Appendix A.

b) **MOISTURE-DENSITY: MOISTURE-DENSITY:** In-place moisture contents and dry densities were determined for selected soil samples in accordance with ATM D 2937. The results are summarized in the boring logs presented in Appendix A.

c) **MAXIMUM DENSITY & OPTIMUM MOISTURE CONTENT:** The maximum dry density and optimum moisture content of typical soils were determined in the laboratory in accordance with ASTM Standard Test D-1557, Method A.

d) **DIRECT SHEAR:** Direct shear tests were performed on selected samples of the on-site soils in accordance with ASTM D 3080.

e) **EXPANSION INDEX TEST:** Expansion index tests were performed on selected remolded soil samples in accordance with ASTM D 4829.

f) **GRAIN SIZE DISTRIBUTION:** The grain size distributions of selected samples were determined in accordance with ASTM C136 and/or ASTM D 422.

g) **SOLUBLE SULFATE CONTENT:** The soluble sulfate content was determined for representative samples in accordance with California Test Methods 417.

LABORATORY TEST RESULTS

SU CASA

6738 LA JOLLA BOULEVARD

LA JOLLA, CALIFORNIA

MAXIMUM DRY DENSITY AND OPTIMUM MOISTURE CONTENT (ASTM D1557)

Sample Location	**Boring B-1 @ ½'-5'**
Sample Description	Brown Silty Sand with Clay, SM
Maximum Density	123.1 pcf
Optimum Moisture	10.1 %

DIRECT SHEAR (ASTM D3080)

Sample Location	**Boring B-1 @ ½'-5'**	**Boring B-1 @ 12½'**	**Boring B-3 @ 11½'**
Sample Type	Remolded to 90 %	Undisturbed	Undisturbed
Friction Angle	29°	33°	329°
Cohesion	250 psf	250 psf	250 psf

EXPANSION INDEX TESTS (ASTM D4829)

Sample Location	**Boring B-3 @5'-10'**
Initial Moisture:	9.9 %
Initial Dry Density	108.5 pcf
Final Moisture:	20.0 %
Expansion Index:	35 (Low)

GRAIN SIZE DISTRIBUTION (ASTM D422)

Sample Location	**Boring B-1 @ ½'-5'**	**Boring B-1 @ 8½'-11'**	**Boring B-3 @ 10½'-15'**
Sieve Size	*Percent Passing*	*Percent Passing*	*Percent Passing*
2"	100		
1½"	99		
1"	96		
¾"	95		
½"	93		
⅜	92		
#4	90	100	100
#8	87	96	99
#16	85	92	97
#30	78	86	94
#50	59	75	83
#100	47	64	68
#200	40	55	52

LABORATORY TEST RESULTS (CONT)

SOLUBLE SULFATES (CALIFORNIA TEST METHOD 417)

Sample Location	**Boring B-1 @ 12'-17'**	**Boring B-3 @ 5'-10'**
Soluble Sulfate	0.040 % (SO_4)	0.130 % (SO_4)

CHRISTIAN WHEELER
ENGINEERING

August 23, 2016

Su Casa Properties
912 Newkirk Drive
La Jolla, California 92037

CWE 2150460.05r

Subject: **Revised Addendum Geotechnical Report and Response to Cycle 11 LDR-Geology Review of Documents, City Project Nbr. 420956, Su Casa, 6738 La Jolla Boulevard La Jolla, California**

References: 1) Christian Wheeler Engineering Report 2150460.01, "Report of Preliminary Geotechnical Investigation, Su Casa, 6738 La Jolla Boulevard, La Jolla, California", dated October 23, 2015.
2) Christian Wheeler Engineering Report 2150460.02, "Addendum to Report of Preliminary Geotechnical Investigation, Su Casa, 6738 La Jolla Boulevard, La Jolla, California", dated December 1, 2015.
3) Christian Wheeler Engineering Report 2150460.03, "Addendum to Report of Preliminary Geotechnical Investigation On-Site Storm Water Infiltration, Su Casa, 6738 La Jolla Boulevard, La Jolla, California", dated January 26, 2016.
4) City of San Diego, 2016, LDR-Geology Cycle 11 Review Memorandum, Su Casa, Project Nbr. 420956, prepared by James Quinn, CEG, dated June 2, 2016.
5) Marengo Morton Architects, 2016, Conceptual Grading Plans, Su Casa, 6738 La Jolla Boulevard, La Jolla, CA, 92037.

Ladies and Gentlemen:

In accordance with your request and our proposal dated August 3, 2016, we have prepared this revised addendum geotechnical report to present additional information required by the City of San Diego regarding the geotechnical issues at the site. Unless specifically addressed or amended herein, all of the findings, conclusions, and recommendations presented in the referenced reports remain applicable to the subject project.

Based on our discussions with the project's civil engineer and architect as well as our review of the referenced conceptual grading plans, we understand that it is now proposed to install a biofiltration basin within the northwest portion of the site that will be designed to allow for partial infiltration of the on-site storm water through an unlined cistern that will be constructed below the structural mat foundation of the westernmost of the proposed buildings on-site. The use of a partial infiltration system that is sited within the existing undifferentiated fill and alluvium within the central, western portion of the site is considered suitable from a geotechnical perspective. Our firm has previously opined that site conditions are not compatible with storm water infiltration on-site. However, it is our opinion that the siting of the partial infiltration system within the existing fill/alluvium (which was noted to have high moisture contents and saturation percentages) within the westernmost, lowest portion of the site should serve to sufficiently mitigate the potentially adverse geotechnical conditions related to infiltration that were previously described in our referenced reports.

In accordance with the criteria presented in Appendix D, Section D.3 of the Storm Water Standards, Part 1, BMP Design Manual the infiltration rate estimation during the planning level screening phase of the project has been determined by conducting a borehole percolation test (D.3.3.2) in the approximate location of the proposed storm water infiltration BMP. It should be understood that additional infiltration rate estimation testing and subsurface explorations will be required within the area of the proposed cistern prior the ministerial permitting phase of the subject project.

Supplemental geotechnical recommendations pertaining to the construction of the open bottom cistern within the central west portion of the site include siting the proposed cistern in an area entirely underlain by the existing undifferentiated fill/alluvium (as opposed to within much less permeable materials the Cretaceous-age Point Loma Formation) and placing a layer of geogrid reinforcing such as Tensar TriAx® TX 130S (or approved equivalent) below and around the proposed 2-foot-thick layer of ASTM No. 57 crushed stone layer at the bottom of the cistern.

The comments in the City Review Memorandum that remain to be "cleared" and our responses to the comments in the referenced memorandum are presented below.

City Comment No. 15: The project's geotechnical consultant should clarify how the estimated reliable infiltration rate was determined. The consultant should refer to the Storm Water Standards, Part 1, BMP

Design Manual, Appendix D, Section D.3 for guidance (https://www.sandiego.gov/sites/default/files/storm-water-standards-manual-2016-1.pdf).

CWE Response: In accordance with the criteria presented in Appendix D, Section D.3 of the Storm Water Standards, Part 1, BMP Design Manual the infiltration rate estimation during the planning level screening phase of the project has been determined by conducting a borehole percolation test (D.3.3.2) in the approximate location of the proposed storm water infiltration BMP.

Our percolation testing was conducted within a supplemental, small-diameter boring that was drilled using a truck-mounted drill rig on August 4, 2016. The approximate location of the infiltration boring is shown on Plate No. 1 of this report. The infiltration boring was drilled within the area expected to support the infiltration system. Previous borings associated with our geotechnical investigation (CWE Report 2150460.01) at the subject site were drilled to a depth of 19½ and 24 feet below grade, respectively, with samples retrieved during the drilling operation. Logs of the explorations are presented in Appendix B of this report. The borings were logged in detail with emphasis on describing the soil profile. Low permeability and relatively impermeable materials were identified in the borings.

The eight-inch-diameter boring, in which we conducted the percolation testing and which is labelled as IB-1, was drilled to a depth of 120 inches below existing grade and cleaned of all loose material. A four-inch diameter perforated pipe was set in the hole and surrounded by ¾ inch gravel to prevent caving. After pipe installation, the test hole was presoaked. The water was observed to dissipate slowly.
The field infiltration rate was determined the following day by using the falling head test method. The pipe was filled with water and the "Sandy Soil Criteria Test" was performed over two-25 minute periods of time. The tests resulted in water dropping less than 6 inches during each 25 minute period. The initial water level was established by refilling the test hole to near the top of the proposed BMP. The rate of water infiltration was monitored and recorded every 30 minutes over a period of six hours until the infiltration rates stabilized. Measurements were taken using a water level meter (Solinst, Model 101) with an accuracy measured to 0.005 foot increments (0.06 inch increments). The measured field infiltration rates are presented in the following Table.

FIELD INFILTRATION RATES

Test No.	Location	Depth of Testing	Field Infiltration Rate
IB-1	Northeast Portion of BMP	120 inches	0.02 inches per hour

The measured percolation rate was converted to an infiltration rate using the Porchet Method. The spreadsheet used for the conversion is included in Appendix C of this report. The infiltration rate of the soil underlying the area of the proposed cistern below the westernmost of the proposed buildings is 0.02 inches per hour. Based on our conversations with the project civil engineer, the site suitability considerations (soil assessment method, soil type, soil variability, and depth to seasonal high groundwater or impervious layers) and design related considerations (level of pretreatment and expected influent sediment loads, redundancy/resiliency of system, and compaction during construction), we recommend that a factor of safety 2.8125 be used for the design infiltration rates for the proposed storm water infiltration BMP. Worksheet D.5-1 "Factor of Safety and Design Infiltration Rate Worksheet," is included in Appendix C of this report for the proposed BMP facility. Based on this, we recommend that the design infiltration rate of 0.007 inches per hour be used for the proposed cistern that will be constructed below western portion of the westernmost of the proposed buildings.

City Comment No. 16: Criteria 1 and 5 of Work Sheet C.4-1 should be based on Section C.2.1 and Appendix D of the Storm Water Standards, Part 1, BMP Design Manual (https://www.sandiego.gov/sites/default/files/storm-water-standards-manual-2016-1.pdf).

CWE Response: See response to City Comment No. 15. Additionally, Appendix A of this addendum report presents a revised Work Sheet C.4-1. A log of our supplemental subsurface investigation in which the percolation testing was conducted and geologic data from our referenced reports are presented in Appendix B of this report.

City Comment No. 19: Review comments that have not been cleared remain applicable. Comments regarding the Storm Water Standards are clarified as follows:

CWE Response: Refer to our comments below.

City Comment No. 20: Provide the planning level infiltration rate(s) for the site determined in accordance with Table D.3-1, Appendix D of the Storm Water Standards.

CWE Response: See response to City Comment No. 15 above.

City Comment No. 21: Per the requirements in the current edition of the Storm Water Standards, the site can only be classified as a no infiltration condition if there are geologic or geotechnical constraints that will preclude any amount of infiltration.

CWE Response: As presented on the Work Sheet C.4-1 included in Appendix A of this report, the site is currently classified as demonstrating a Partial Infiltration condition.

City Comment No. 22: Provide a comprehensive evaluation of the geologic or geotechnical hazards related to storm water infiltration listed in Appendix C.2 that cannot be mitigated to an acceptable level of risk. Provide the data and/or analyses that support the comprehensive evaluation.

CWE Response: It is our professional opinion and judgment that no geologic or geotechnical hazards related to storm water infiltration listed in Appendix C.2, which cannot be mitigated to an acceptable level of risk to allow for partial infiltration, exist at the subject site.

If you have any questions regarding this letter, please do not hesitate to contact this office. Christian Wheeler Engineering appreciates this opportunity of providing professional services for you for the subject project.

Respectfully submitted,
CHRISTIAN WHEELER ENGINEERING

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Appendix A

Work Sheet C.4-1

CWE 2150460.05r - Planning Phase

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?			
Criteria	Screening Question	Yes	No
1	Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		NO
Provide basis: Field infiltration rate of 0.02 inches/hour measured. Utilizing recommended factor-of-safety of 2.8125, design infilration rate of 0.007 inches/hour recommended at this time. See Supplement to Worksheet C.4-1 following page C-14. 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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			

CWE 2150460.05r - Planning Phase

Worksheet C.4-1 Page 2 of 4			
Criteria	Screening Question	Yes	No
3	Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: 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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: 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		See C-13 & C-14

*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 City Engineer 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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.	Yes	
Provide basis: Field infiltration rate of 0.02 inches/hour measured. Utilizing recommended factor-of-safety of 2.8125, design infilration rate of 0.007 inches/ hour recommended at this time. See Supplement to Worksheet C.4-1 following page C-14. 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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.	Yes	
Provide basis: No increased risk to geotechnical hazards that cannot be mitigated to an acceptable level, such as those presented in C.2.1 (Soil and Geologic Conditions), C.2.2 (Settlement and Volume Change), C.2.3 (Slope Stability), C.2.4 (Utility Considerations), C.2.5 (Groundwater Mounding), C.2.6 (Retaining Walls and Foundations), and C.2.7 (Other Factors), are known to exist or anticipated as the result of planned Partial Infiltration. See supplement following page C-14. 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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	Yes	
Provide basis: No significant risk for groundwater concerns, such as those presented in C.3.1 (Soil and Groundwater Contamination), C.3.2 (Separation to Seasonal High Groundwater), C.3.3 (Wellhead Protection), C.3.4 (Contamination Risks from Land Use Activities), C.3.5 (Consultation with Applicable Groundwater Agencies), C.3.6 (Water Balance Impacts on Stream Flow), C.3.7 (Downstream Water Rights), and C.3.8 (Other Factors), are known to exist or anticipated as the result of planned Partial Infiltration. See supplement following C-14. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
8	Can infiltration be allowed without violating downstream water rights? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	Yes	
Provide basis: There are no downstream water bodies before the Pacific Ocean. 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 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is Partial Infiltration. If any answer from row 5-8 is no, then infiltration of any volume is considered to be infeasible within the drainage area. The feasibility screening category is No Infiltration.	Partial Infiltration	

*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 City Engineer to substantiate findings

SUPPLEMENT TO WORKSHEET C.4-1

Part 1 – Criteria 1 and

Part 2 – Criteria 5

Infiltration Rate Estimation

In accordance with the criteria presented in Appendix D, Section D.3 of the Storm Water Standards, Part 1, BMP Design Manual the infiltration rate estimation during the planning level screening phase of the project has been determined by conducting a borehole percolation test (D.3.3.2) in the approximate location of the proposed storm water infiltration BMP.

Our percolation testing was conducted within a supplemental, small-diameter boring that was drilled using a truck-mounted drill rig on August 4, 2016. The approximate location of the infiltration boring is shown on Plate B-1 of Appendix B of this report. The infiltration boring was drilled within the area expected to support the infiltration system. Previous borings associated with our geotechnical investigation (CWE Report 2150460.01) at the subject site were drilled to a depth of 19½ and 24 feet below grade, respectively, with samples retrieved during the drilling operation. Logs of the explorations are presented in Appendix B of this report. The borings were logged in detail with emphasis on describing the soil profile. Low permeability and relatively impermeable materials were identified in the borings.

Infiltration Rate Measurement

The eight-inch-diameter boring, which is labelled as IB-1, was drilled to a depth of 120 inches below existing grade and cleaned of all loose material. A four-inch diameter perforated pipe was set in the hole and surrounded by ¾ inch gravel to prevent caving. After pipe installation, the test hole was presoaked. The water was observed to dissipate slowly.

The field infiltration rate was determined the following day by using the falling head test method. The pipe was filled with water and the "Sandy Soil Criteria Test" was performed over two-25 minute periods of time. The tests resulted in water dropping less than 6 inches during each 25 minute period. The initial water level was established by refilling the test hole to near the top of the proposed BMP. The rate of water infiltration was monitored and recorded every 30 minutes over a period of six hours until the infiltration rates stabilized. Measurements were taken using a water level meter (Solinst, Model 101) with an accuracy measured to 0.005 foot increments (0.06 inch increments). The measured field infiltration rates are presented in the following Table.

FIELD INFILTRATION RATES

Test No.	Location	Depth of Testing	Field Infiltration Rate
IB-1	Northeast Portion of BMP	120 inches	0.02 inches per hour

Design Infiltration Rate

The measured percolation rate was converted to an infiltration rate using the Porchet Method. The spreadsheet used for the conversion is included in Appendix C of this report. The infiltration rate of the soil underlying the area of the proposed cistern below the westernmost portion of the proposed building is 0.02 inches per hour. Based on our conversations with the project civil engineer, the site suitability considerations (soil assessment method, soil type, soil variability, and depth to seasonal high groundwater or impervious layers) and design related considerations (level of pretreatment and expected influent sediment loads, redundancy/resiliency of system, and compaction during construction), we recommend that a factor of safety 2.8125 be used for the design infiltration rates for the proposed storm water infiltration BMP. Worksheet D.5-1 "Factor of Safety and Design Infiltration Rate Worksheet," is included in Appendix C of this report for the proposed BMP facility. Based on this, we recommend that the design infiltration rate of 0.007 inches per hour be used for the proposed cistern that will be constructed below western portion of the westerly most of the proposed buildings.

Part 2 – Criteria 6

C.2.1 Soil and Geologic Conditions - Based upon the results of our subsurface investigation of the site and our in-site percolation testing and conversion to a design infiltration rate, the soil and geologic conditions of the site are considered suitable to allow for infiltration in any appreciable quantity.

C.2.2 Settlement and Volume Change - Based upon the high moisture contents and saturation percentages of the existing fill/alluvial soils underlying the area of the proposed infiltration BMP, no significant settlement or volume changes are anticipated as the result of the proposed partial infiltration.

C.2.3 Slope Stability - No significant slopes exist within the vicinity of the subject site.

C.2.4 Utility Considerations - Since the proposed infiltration BMP is proposed below the basement level of the westernmost of the proposed structures, within the lowest area of the site, infiltration in any appreciable quantity is not anticipated to affect existing or proposed utilities which are higher in elevation that the proposed infiltration BMP.

C.2.5 Groundwater Mounding - Regional free groundwater is anticipated approximately 50 feet below existing and proposed site grades. Infiltration in any appreciable quantity is not anticipated to result in free groundwater mounding.

C.2.6 Retaining Walls and Foundations - Since the proposed infiltration BMP is proposed below the basement level of the westernmost of the proposed structures, within the lowest area of the site, infiltration in any appreciable quantity is not anticipated to affect proposed retaining walls. Additionally, based on the foundation recommendations presented in our Report of Preliminary Geotechnical Investigation (CWE2150460.01), infiltration in any appreciable quantity is not anticipated to adversely affect the proposed foundations.

C.2.7 Other Factors - No other factors are known to exist that would preclude infiltration in any appreciable quantity.

Part 2 – Criteria 7

C.3.1 Soil and Groundwater Contamination - We are unaware of any soil or groundwater contamination that would result in significant risk for groundwater related concerns as the result of infiltration in any appreciable quantity.

C.3.2 Separation to Seasonal High Groundwater - Seasonal High Groundwater is anticipated in excess of 30 feet below the bottom of the proposed infiltration BMP. As such, infiltration in any appreciable quantity should not result in a significant risk for groundwater related concerns.

C.3.3 Wellhead Protection - No water wells or springs are located within 100 feet of the proposed infiltration BMP. As such, infiltration in any appreciable quantity should not result in a significant risk for groundwater related concerns.

C.3.4 Contamination Risks from Land Use Activities - The proposed project includes multi-family, residential development. No light industrial or industrial activity is proposed. As such, infiltration in any appreciable quantity should not result in a significant risk for groundwater related concerns.

C.3.5 Consultation with Applicable Groundwater Agencies - We are not aware of any applicable groundwater agencies that will be affected by infiltration in any appreciable quantity. The designer of the infiltration BMP system may wish to contact all applicable groundwater agencies to ascertain that infiltration in any appreciable quantity should not result in a significant risk for groundwater related concerns.

C.3.6 Water Balance Impacts on Stream Flow - No nearby streams exist. As such, infiltration in any appreciable quantity should not result in a significant risk for groundwater related concerns.

C.3.7 Downstream Water Rights - There are no downstream water bodies before the Pacific Ocean. As such, infiltration in any appreciable quantity should not result in a significant risk for groundwater related concerns.

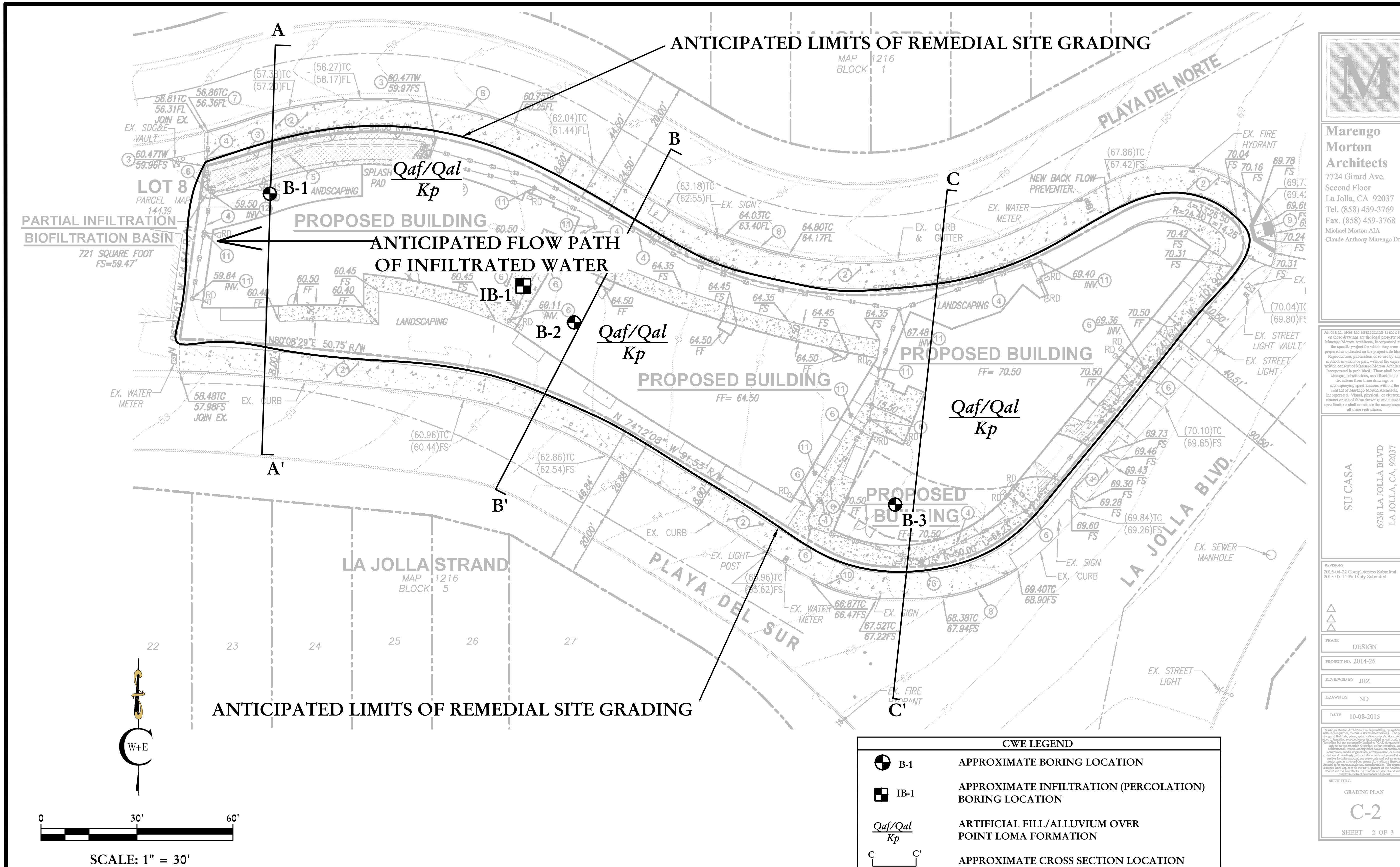
C.3.8 Other Factors - No other factors are known to exist that would result in a significant risk for groundwater related concerns.

Appendix B

Site Plan and Geotechnical Map and
Log of Supplemental Boring (IB-1)

&

Geologic and Geotechnical Data
(CWE Reports 2150460.01 & 2150460.04)



CWE LEGEND	
B-1	APPROXIMATE BORING LOCATION
IB-1	APPROXIMATE INFILTRATION (PERCOLATION) BORING LOCATION
Qaf/Qal / Kp	ARTIFICIAL FILL/ALLUVIUM OVER POINT LOMA FORMATION
C C'	APPROXIMATE CROSS SECTION LOCATION

SITE PLAN AND GEOTECHNICAL MAP

SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

DATE: AUGUST 2016 | JOB NO.: 2150460.05R
BY: SRD | APPENDIX B: B-1

CHRISTIAN WHEELER ENGINEERING

LOG OF INFILTRATION BORING IB-1

Date Logged:	8/4/16	Equipment:	Dietrich
Logged By:	DJF	Auger Type:	8" Hollow Stem
Existing Elevation:	± 61 feet	Drive Type:	140lbs @ 30" drop
Finish Elevation:	± 50 feet	Depth to Water:	9 feet

Sample Type and Laboratory Test Legend

Cal	Modified California Sampler	CK	Chunk
SPT	Standard Penetration Test	DR	Drive Ring
ST	Shelby Tube		
MD	Max Density	DS	Direct Shear
SO4	Soluble Sulfates	Con	Consolidation
SA	Sieve Analysis	EI	Expansion Index
HA	Hydrometer	R-Val	Resistance Value
SE	Sand Equivalent	Chl	Soluble Chlorides
PI	Plasticity Index	Res	pH & Resistivity
CP	Collapse Potential	SD	Sample Density

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS SYMBOL	SUMMARY OF SUBSURFACE CONDITIONS (based on Unified Soil Classification System)	PENETRATION (blows per foot)	SAMPLE TYPE	BULK	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	RELATIVE COMPACTION (%)	LABORATORY TESTS
0				3" of AC over 1" of DG.							
			SC	**Artificial Fill (Qaf):** Dark gray, moist, loose, very fine- to medium-grained, CLAYEY SAND with organic scent, gravels to cobbles at 2 feet.							
3			SC	Olive brown, moist, loose, fine- to medium-grained, CLAYEY SAND with lenses of SANDY CLAY.							
9	⁹⁹			Heavy seepage at 9 feet.							
10				Boring terminated at 10 feet. Perched groundwater at 9 feet.							

Notes:

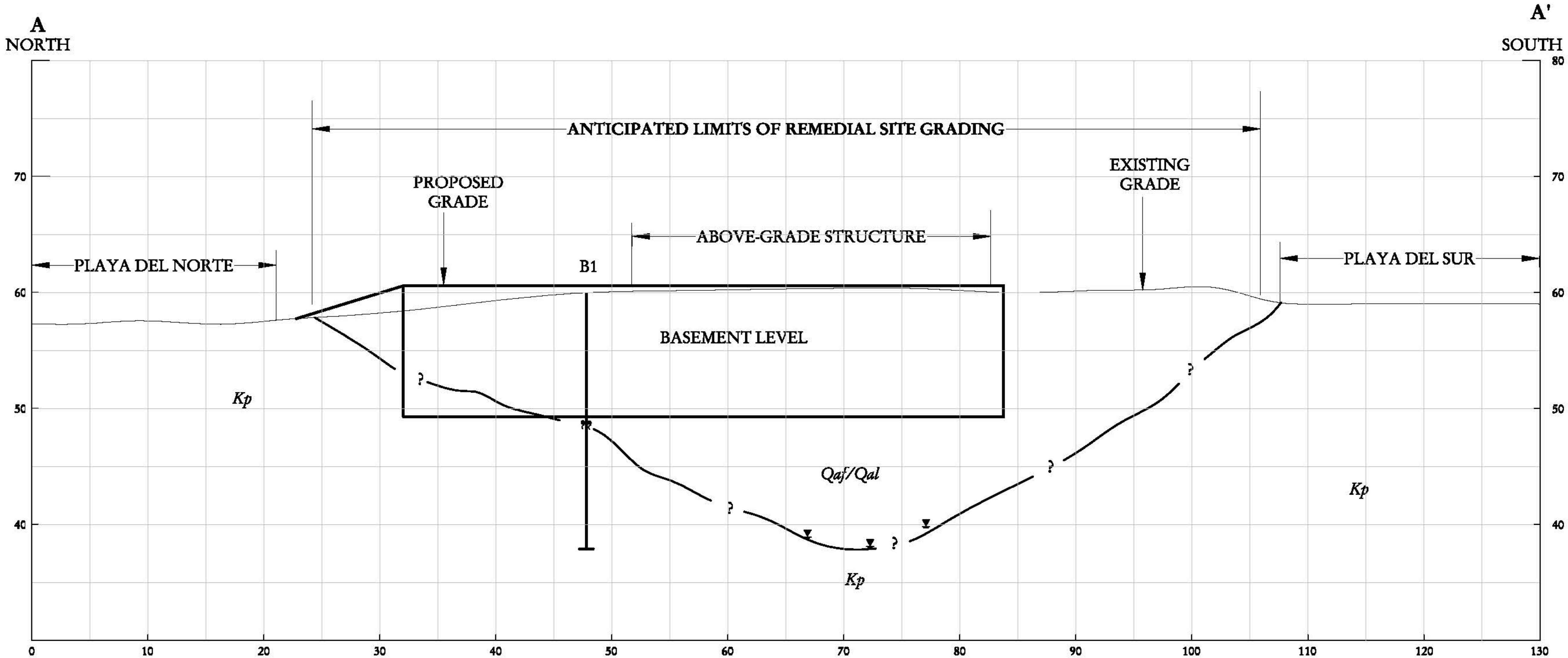
Symbol Legend

- Groundwater Level During Drilling
- Groundwater Level After Drilling
- Apparent Seepage
- * No Sample Recovery
- ** Non-Representative Blow Count (rocks present)

SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

DATE:	AUGUST 2016	JOB NO.:	2150460.05R
BY:	SRD	APPENDIX B:	B-2

CHRISTIAN WHEELER ENGINEERING



CWE LEGEND	
B-1	APPROXIMATE BORING LOCATION
Qaf/Qal	UNDIFFERENTIATED ARTIFICIAL FILL/ALLUVIUM
Kp	POINT LOMA FORMATION
	GROUNDWATER SEEPAGE
	ANTICIPATED PERCHED GROUNDWATER

0 10' 20'

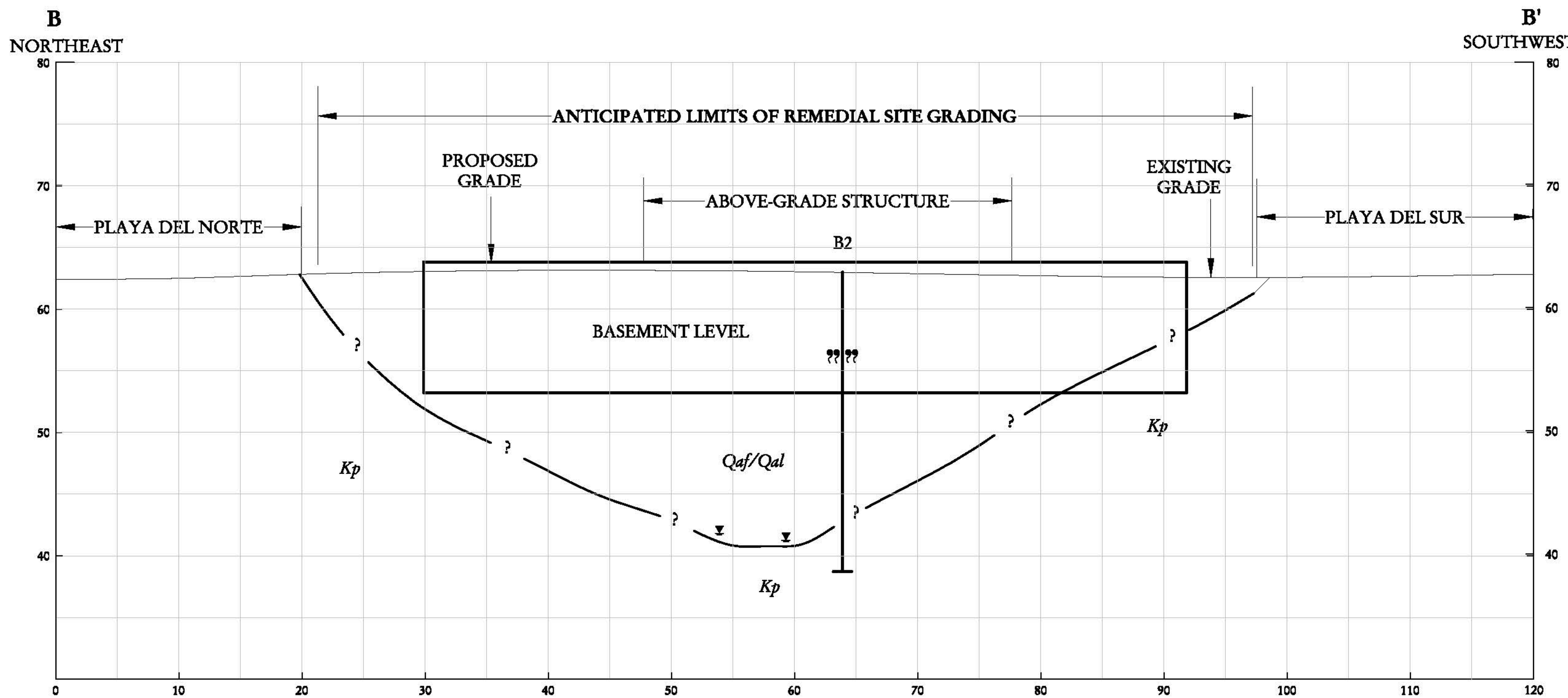
SCALE: 1" = 10'

GEOLOGIC CROSS SECTION A-A'

SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

DATE:	MAY 2016	JOB NO.:	2150460.04
BY:	SRD	PLATE NO.:	2

CHRISTIAN WHEELER
ENGINEERING



CWE LEGEND

B-1	APPROXIMATE BORING LOCATION
Qaf/Qal	UNDIFFERENTIATED ARTIFICIAL FILL/ALLUVIUM
Kp	POINT LOMA FORMATION
	GROUNDWATER SEEPAGE
	ANTICIPATED PERCHED GROUNDWATER

0 10' 20'

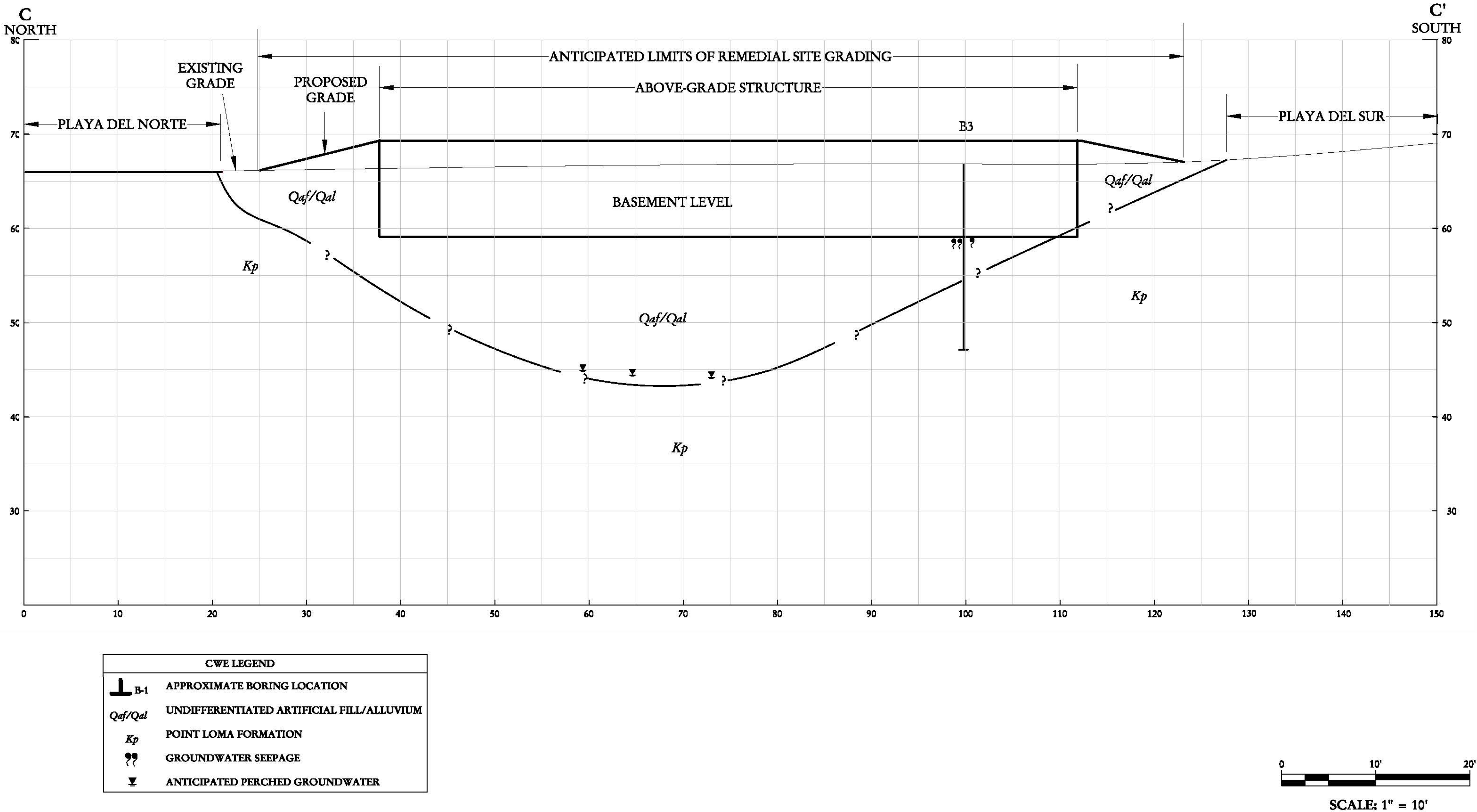
SCALE: 1" = 10'

GEOLOGIC CROSS SECTION B-B'

SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

DATE:	MAY 2016	JOB NO.:	2150460.04
BY:	SRD	PLATE NO.:	3

CHRISTIAN WHEELER
ENGINEERING



GEOLOGIC CROSS SECTION C-C'

SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

DATE:	MAY 2016	JOB NO.:	2150460.04
BY:	SRD	PLATE NO.:	4

CHRISTIAN WHEELER ENGINEERING

LOG OF TEST BORING B-1

Date Logged:	9/22/15	Equipment:	Mobil B-61
Logged By:	DJF	Auger Type:	8 inch Hollow Stem
Existing Elevation:	60.0 feet	Drive Type:	140lbs/30 inches
Proposed Elevation:	49½ feet	Depth to Water:	N/A

Sample Type and Laboratory Test Legend

Cal	Modified California Sampler	CK	Chunk Density
SPT	Standard Penetration Test	DR	Density Ring
ST	Shelby Tube		
MD	Max Density	DS	Direct Shear
SO4	Soluble Sulfates	Con	Consolidation
SA	Sieve Analysis	EI	Expansion Index
HA	Hydrometer	R-Val	Resistance Value
SE	Sand Equivalent	Chl	Soluble Chlorides
PI	Plasticity Index	Res	pH & Resistivity
CP	Collapse Potential		

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS SYMBOL	SUMMARY OF SUBSURFACE CONDITIONS (based on Unified Soil Classification System)	PENETRATION (blows per foot)	SAMPLE TYPE	BULK	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	RELATIVE COMPACTION (%)	LABORATORY TESTS
0	60			1" of AC over 2" of PCC							
			SM	**Artificial Fill (Qaf):** Brown, moist, loose, very fine- to medium-grained, SILTY SAND with CLAY, trace gravels, brick and concrete debris.	8	Cal					SA MD DS
5	55				30**	Cal		18.9	102.2		
			SC/ CL	Grayish-brown, moist, loose to medium stiff, CLAYEY SAND/SANDY CLAY with gravels, brick, and concrete debris.							
			SC	**Subsoil:** Greenish-gray, very moist, medium stiff, VERY SANDY CLAY with rootlets and white precipitate deposits, moderate seepage at 10'.	10	Cal		22.0	103.2		SA
10	50			Saturated.							
			ML	**Point Loma Formation (Kp):** Greenish-gray, very moist to very moist, very stiff, CLAYEY SILT with SAND and white precipitate deposits; moderately weathered.	24	Cal		17.5	110.9		
					51	Cal					DS
			SM	Greenish-gray to yellowish-brown, moist, dense, very fine- to medium-grained, SILTY SAND; micaceous with trace rootlets, slightly weathered to 14 feet.	50/3"	Cal		12.7	117.9		
15	45										
				Moist, very dense.							
20	40				50/3"	Cal		19.5	107.5		
					50/2"	Cal		13.1	114.6		
25	35			Boring terminated at 24 feet. Seepage encountered at 10 feet.							
30	30										

Notes:

Symbol Legend

- Groundwater Level During Drilling
- Groundwater Level After Drilling
- Apparent Seepage
- * No Sample Recovery
- ** Non-Representative Blow Count (rocks present)

SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

DATE:	OCTOBER 2015	JOB NO.:	2150460.01
BY:	SRD	FIGURE NO.:	A-1

CHRISTIAN WHEELER ENGINEERING

LOG OF TEST BORING B-2

Date Logged:	9/22/15	Equipment:	Mobil B-61
Logged By:	DJF	Auger Type:	8 inch Hollow Stem
Existing Elevation:	63.0 feet	Drive Type:	140lbs/30 inches
Proposed Elevation:	53.6 feet	Depth to Water:	N/A

Sample Type and Laboratory Test Legend

Cal	Modified California Sampler	CK	Chunk Density
SPT	Standard Penetration Test	DR	Density Ring
ST	Shelby Tube		
MD	Max Density	DS	Direct Shear
SO4	Soluble Sulfates	Con	Consolidation
SA	Sieve Analysis	EI	Expansion Index
HA	Hydrometer	R-Val	Resistance Value
SE	Sand Equivalent	Chl	Soluble Chlorides
PI	Plasticity Index	Res	pH & Resistivity
CP	Collapse Potential		

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS SYMBOL	SUMMARY OF SUBSURFACE CONDITIONS (based on Unified Soil Classification System)	PENETRATION (blows per foot)	SAMPLE TYPE	BULK	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	RELATIVE COMPACTION (%)	LABORATORY TESTS
0	63			3" of AC over 4" of Base							
			SC	**Artificial Fill (Qaf):** Dark grayish-brown, moist, loose to medium dense, very fine- to medium-grained, CLAYEY SAND with gravels, organic scent.	15	Cal					
			SM	Greenish-gray, moist, loose, very fine- to medium-grained, SILTY SAND, micaceous, Point Loma derived fill.	9	Cal		17.3	109.7		
5	58			Very moist.							
				Heavy seepage at 7', saturated.							
			SC	Grayish-brown, saturated, loose, very fine- to medium-grained, CLAYEY SAND with gravels and abundant concrete debris (no spoils generated during drilling below 7 feet).	29**	Cal					
10	53										
					5**	Cal		20.5	108.5		
15	48				12**	Cal*					
			SM	**Point Loma Formation (Kp):** Yellowish-brown to greenish-gray, moist, very dense, very fine- to medium-grained, SILTY SAND; micaceous.	50/5"	Cal		11.5	123.2		
20	43										
					50/2"	Cal		15.5	113.4		
25	38			Boring terminated at 24 feet. Seepage encountered at 7 feet.							
30	33										

Notes:

Symbol Legend

- Groundwater Level During Drilling
- Groundwater Level After Drilling
- Apparent Seepage
- * No Sample Recovery
- ** Non-Representative Blow Count (rocks present)

SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

DATE:	OCTOBER 2015	JOB NO.:	2150460.01
BY:	SRD	FIGURE NO.:	A-2

CHRISTIAN WHEELER
ENGINEERING

LOG OF TEST BORING B-3

Sample Type and Laboratory Test Legend

Cal	Modified California Sampler	CK	Chunk Density
SPT	Standard Penetration Test	DR	Density Ring
ST	Shelby Tube		
MD	Max Density	DS	Direct Shear
SO4	Soluble Sulfates	Con	Consolidation
SA	Sieve Analysis	EI	Expansion Index
HA	Hydrometer	R-Val	Resistance Value
SE	Sand Equivalent	Chl	Soluble Chlorides
PI	Plasticity Index	Res	pH & Resistivity
CP	Collapse Potential		

Date Logged:	9/22/15	Equipment:	Mobil B-61
Logged By:	DJF	Auger Type:	8 inch Hollow Stem
Existing Elevation:	67.0 feet	Drive Type:	140lbs/30 inches
Proposed Elevation:	59.5 feet	Depth to Water:	N/A

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS SYMBOL	SUMMARY OF SUBSURFACE CONDITIONS (based on Unified Soil Classification System)	PENETRATION (blows per foot)	SAMPLE TYPE	BULK	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	RELATIVE COMPACTION (%)	LABORATORY TESTS
0	67			5" of AC							
			SM	**Artificial Fill (Qaf):** Dark grayish-brown, moist, loose to medium dense, very fine- to medium-grained, CLAYEY SAND with gravels, organic scent.	8	Cal					
				AC debris at 4 feet.	5	Cal					
5	62		SC/CL	Grayish-brown, moist to very moist, medium stiff, CLAYEY SAND/SANDY CLAY with gravels and concrete debris. EI = 35 (Low)							
			❞	Moderate seepage at 8 feet.	9	Cal		22.5	99.3		
10	57		SM	**Point Loma Formation (Kp):** Yellowish-brown, moist, dense, very fine- to medium-grained, VERY SILTY SAND; micaceous, slightly weathered to 12½ feet.	55	Cal		13.2	114.2		DS
				Very dense.							
15	52				50/5"	Cal		12.7	117.9		
					50/3"	Cal		12.8	117.0		
20	47			Boring terminated at 19½ feet. Seepage encountered at 7 feet.							
25	42										
30	37										

Notes:

Symbol Legend

- ▽ Groundwater Level During Drilling
- ▼ Groundwater Level After Drilling
- ❞ Apparent Seepage
- * No Sample Recovery
- ** Non-Representative Blow Count (rocks present)

SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

DATE:	OCTOBER 2015	JOB NO.:	2150460.01
BY:	SRD	FIGURE NO.:	A-3

CHRISTIAN WHEELER ENGINEERING

LABORATORY TEST RESULTS

SU CASA

6738 LA JOLLA BOULEVARD

LA JOLLA, CALIFORNIA

MAXIMUM DRY DENSITY AND OPTIMUM MOISTURE CONTENT (ASTM D1557)

Sample Location	**Boring B-1 @ ½'-5'**
Sample Description	Brown Silty Sand with Clay, SM
Maximum Density	123.1 pcf
Optimum Moisture	10.1 %

DIRECT SHEAR (ASTM D3080)

Sample Location	**Boring B-1 @ ½'-5'**	**Boring B-1 @ 12½'**	**Boring B-3 @ 11½'**
Sample Type	Remolded to 90 %	Undisturbed	Undisturbed
Friction Angle	29°	33°	329°
Cohesion	250 psf	250 psf	250 psf

EXPANSION INDEX TESTS (ASTM D4829)

Sample Location	**Boring B-3 @5'-10'**
Initial Moisture:	9.9 %
Initial Dry Density	108.5 pcf
Final Moisture:	20.0 %
Expansion Index:	35 (Low)

GRAIN SIZE DISTRIBUTION (ASTM D422)

Sample Location	**Boring B-1 @ ½'-5'**	**Boring B-1 @ 8½'-11'**	**Boring B-3 @ 10½'-15'**
Sieve Size	*Percent Passing*	*Percent Passing*	*Percent Passing*
2"	100		
1½"	99		
1"	96		
¾"	95		
½"	93		
⅜	92		
#4	90	100	100
#8	87	96	99
#16	85	92	97
#30	78	86	94
#50	59	75	83
#100	47	64	68
#200	40	55	52

LABORATORY TEST RESULTS (CONT)

SOLUBLE SULFATES (CALIFORNIA TEST METHOD 417)

Sample Location	Boring B-1 @ 12'-17'	Boring B-3 @ 5'-10'
Soluble Sulfate	0.040 % (SO_4)	0.130 % (SO_4)

Appendix C

Percolation to Infiltration Rate Conversion
(Porchet Method)

&

Worksheet D.5-1: Factor of Safety and Design
Infiltration Rate Worksheet

Percolation to Infiltration Rate Conversion (Porchet Method)

Perc Test #	Gravel Adjustment Factor	Effective Radius (inches) r	Depth of Hole Below Existing Grade (inches)	Time Interval (min.) Δt	Height of pipe above surface (feet)	Initial Water Depth without correction (feet)	Final Water Depth without correction (feet)	Initial Water Height with correction (inches) H_o	Final Water Height with correction (inches) H_f	Change in head (inches) ΔH	Average Height (inches) H_{avg}	Tested Infiltration Rate (inch/hour) I_t
1	0.51	4	120	30	0.00	1.76	1.84	98.88	97.92	0.96	98.40	0.02
2												
3												
4												

"Initial and final water depth without correction" are measurements taken from top of pipe if pipe is sticking out of ground (most cases)

"Initial and final water height with correction" factors in the height of pipe above surface, and provides measurement of water above bottom of pipe

If measurements are taken from grade "Height of pipe above surface" = 0

Gravel Adjustment Factor:

1.00 - No Gravel Used (No Caving)

0.51 - 3/4 inch gravel with 8 inch diameter hole

0.64 - 3/4 inch gravel with 6 inch diameter hole

Porchet Method - Tested Percolation Rate Conversion to Tested Infiltration Rate

$$I_t = \frac{\Delta H\ 60\ r}{\Delta t\ (r+2H_{avg})}$$

I_t = tested infiltration rate, inches per hour

ΔH = change in head over the time interval, inches

Δt = time interval, minutes

r = effective radius of test hole

H_{avg} = average head over the time interval, inches

Worksheet D.5-1: Factor of Safety and Design Infiltration Rate Worksheet

Factor of Safety and Design Infiltration Rate Worksheet			Worksheet D.5-1		
Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25	2	0.5
		Predominant soil texture	0.25	2	0.5
		Site soil variability	0.25	2	0.5
		Depth to groundwater / impervious layer	0.25	3	0.75
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			2.25
B	Design	Level of pretreatment/ expected sediment loads	0.5	1	0.5
		Redundancy/resiliency	0.25	1	0.25
		Compaction during construction	0.25	2	0.5
		Design Safety Factor, $S_B = \Sigma p$			1.25
Combined Safety Factor, $S_{total} = S_A \times S_B$					2.8125
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)					0.02
Design Infiltration Rate, in/hr, $K_{design} = K_{observed} / S_{total}$					0.007
Supporting Data					
Briefly describe infiltration test and provide reference to test forms: The field infiltration rate was determined by using the borehole percolation test method in accordance with Appendix D3.3.2.					

CWE 2150460.05r

Planning Phase

City of San Diego
PRIORITY DEVELOPMENT PROJECT (PDP) SWQMP

Project Identification

SU CASA

Project Location: 6738 La Jolla Blvd., La Jolla, CA 92037

ASSESSOR'S PARCEL NUMBER(S): 351-382-16, 351-382-11

ENGINEER OF WORK:

REGISTERED PROFESSIONAL ENGINEER
DANNY ABADA
No. 45381
CIVIL
STATE OF CALIFORNIA

Danny Abada, P.E. RCE 45381

PREPARED FOR:

MB Property Acquisitions, LLC
Contact: Michael Blumenthal
110 Pacific Ave, Suite 350, San Francisco, CA 94111
Phone: (415) 516-0841]

PDP SWQMP & PLANS PREPARED BY:

SPEAR & ASSOCIATES, INC.
CIVIL ENGINEERING & LAND SURVEYING
475 Production Street
San Marcos, CA 92078
Telephone: (760) 736-2040
www.spearinc.net]

DATE OF SWQMP:
8/17/16

TABLE OF CONTENTS

ACRONYMS

APN	Assessor's Parcel Number
BMP	Best Management Practice
HMP	Hydromodification Management Plan
HSG	Hydrologic Soil Group
MS4	Municipal Separate Storm Sewer System
N/A	Not Applicable
NRCS	Natural Resources Conservation Service
PDCI	Private Development Construction Inspection Section
PDP	Priority Development Project
PDS	Planning and Development Services
PE	Professional Engineer
SC	Source Control
SD	Site Design
SDRWQCB	San Diego Regional Water Quality Control Board
SIC	Standard Industrial Classification
SWQMP	Storm Water Quality Management Plan

PDP SWQMP PREPARER'S CERTIFICATION PAGE

Project Name: Su Casa

PREPARER'S CERTIFICATION

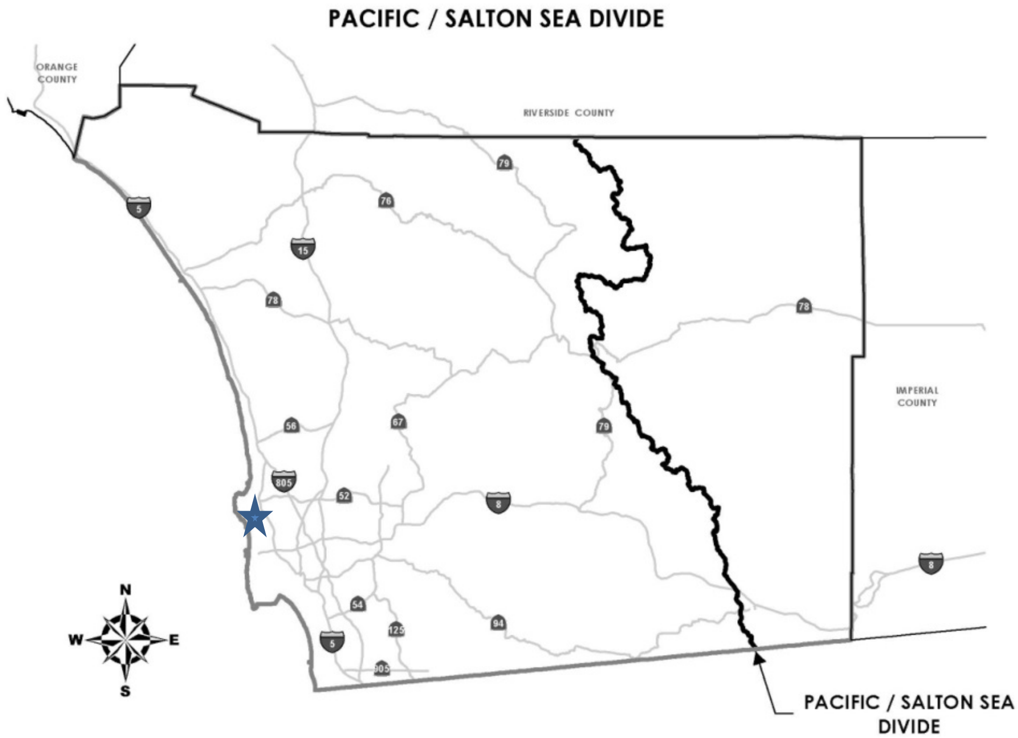
I hereby declare that I am the Engineer in Responsible Charge of design of storm water best management practices (BMPs) for this project, and that I have exercised responsible charge over the design of the BMPs as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with the PDP requirements of the City of San Diego BMP Design Manual, which is a design manual for compliance with local City of San Diego and regional MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2015-0100) requirements for storm water management.

I have read and understand that the City of San Diego has adopted minimum requirements for managing urban runoff, including storm water, from land development activities, as described in the BMP Design Manual. 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 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 City staff is confined to a review and does not relieve me, as the Engineer in Responsible Charge of design of storm water BMPs for this project, of my responsibilities for project design.

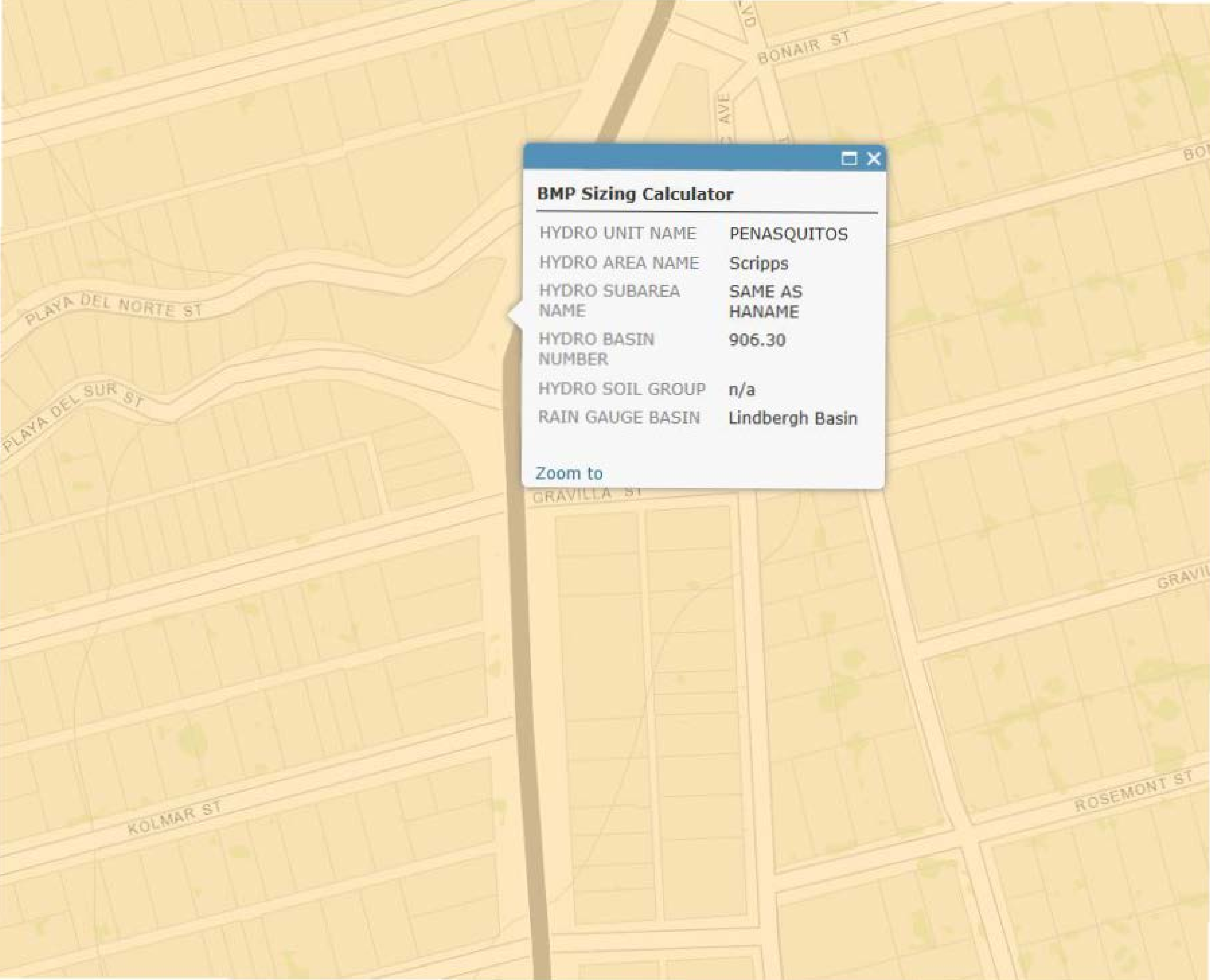
____
Engineer of Work: Spear & Associates Inc. by: Danny Abada, P.E. RCE 45381

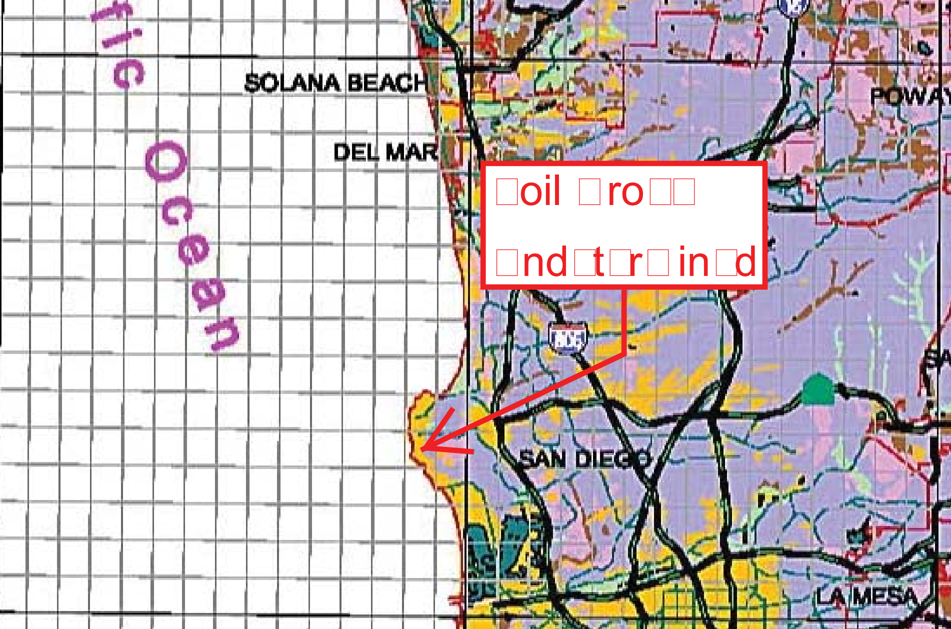
8/17/16
____
Date

PROJECT VICINITY MAP

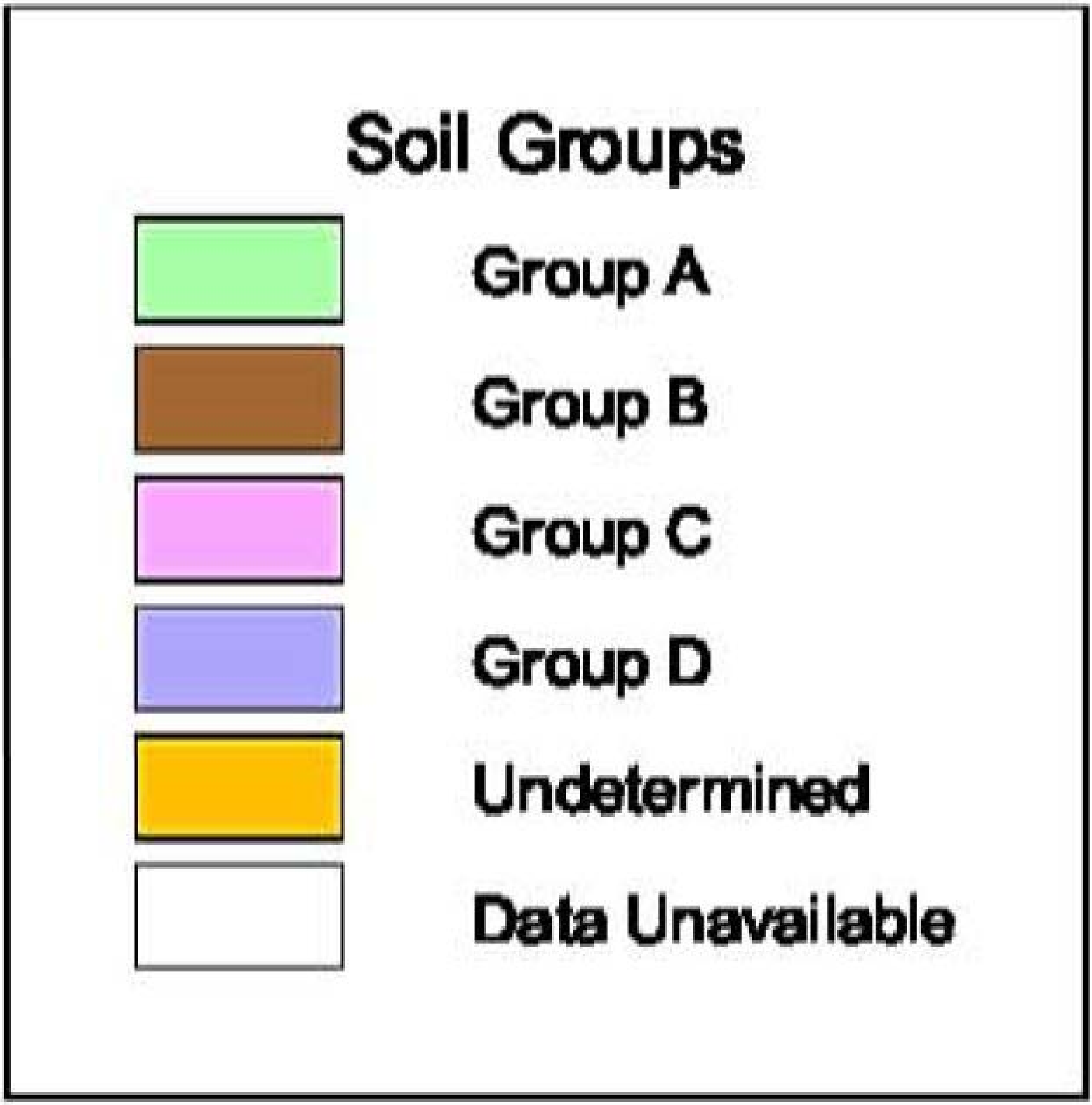


Show with an "X" the Project Location


BMP Sizing Calculator
HYDRO UNIT NAME PENASQUITOS
HYDRO AREA NAME Scripps
HYDRO SUBAREA NAME SAME AS HANAME
HYDRO BASIN NUMBER 906.30
HYDRO SOIL GROUP n/a
RAIN GAUGE BASIN Lindbergh Basin
Zoom to
BONAIR ST
AVE
PLAYA DEL NORTE ST
PLAYA DEL SUR ST
GRAVILLA ST
KOLMAR ST
ROSEMONT ST


fic Ocean
SOLANA BEACH
DEL MAR
POWAY
□oil □ro□□
□nd□t□r□in□d
SAN DIEGO
LA MESA

Legend


Soil Groups
Group A
Group B
Group C
Group D
Undetermined
Data Unavailable

City of San Diego
Storm Water Intake Form for All Permit Applications

This form must be completed in its entirety and accompany applications for any of the discretionary or ministerial permits and approvals of the City of San Diego Watershed Protection, Stormwater Management and Discharge Control Ordinance (WPO). The purpose of this form is to establish the Stormwater Quality Management Plan (SWQMP) requirements applicable to the project.

Step 1: Project identification		
Owner name: MB Property Acquisitions, LLC, c/o Michael Blumenthal	APN: 351-382-16, 351-382-11	Record ID:

Step 2: Geographic location		
Step	**Answer**	**Progression**
Is the project west or east of the Pacific / Salton Sea Divide? See below for discussion and an exhibit of the Pacific / Salton Sea Divide.	X West	**Go to Step 3.**
	☐ East	Standard Project requirements apply, including Standard Project SWQMP. **Complete Standard Project SWQMP.**
PDP requirements in the BMP Design Manual only pertain to projects in areas west of the Pacific/Salton Sea Divide (Region 9 of the Water Quality Control Board). Projects east of the Pacific/Salton Sea Divide are subject to Standard Project requirements in the City BMP Design Manual and, as applicable, Post-Construction Standards of the Construction General Permit.		

Step 3: Project type determination (Standard or Priority Development Project)			
The project is (select one): ☐ New Development X Redevelopment			
The total proposed newly created or replaced impervious area is: 15,766 ft^2			
The total existing (pre-project) impervious area is: 21,538 ft^2			
The total area disturbed by the project is: 22,074 ft^2			
If the total area disturbed by the project is 1 acre (43,560 sq. ft.) or more OR the project is part of a larger common plan of development disturbing 1 acre or more, a Waste Discharger Identification (WDID) number shall be obtained from the State Water Resources Control Board. WDID: ______________________________			
Is the project in any of the following categories, (a) through (f)?			
Yes ☐	No X	(a)	New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.
Yes X	No ☐	(b)	Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site 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 X	No ☐	(c)	New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses: (i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (Standard Industrial Classification (SIC) code 5812). (ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater. (iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce. (iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

Project type determination (continued)			
Yes ☐	No X	(d)	New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging 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). *Note: ESAs are areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees. See BMP Design Manual Section 1.4.2 for additional guidance.*
Yes ☐	No X	(e)	New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses: (i)☐Automotive repair shops. This category is defined as a facility that is categorized in any one of the following SIC codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. (ii)☐Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.
Yes ☐	No X	(f)	New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction. *Note: See BMP Design Manual Section 1.4.2 for additional guidance.*

Does the project meet the definition of one or more of the Priority Development Project categories (a) through (f) listed above?

☐ No – the project is <u>not</u> a Priority Development Project (Standard Project).

X Yes – the project is a Priority Development Project (PDP).

The following is for **redevelopment PDPs only**:

The area of existing (pre-project) impervious area at the project site is: 21,538 ft^2 (A)
The total proposed newly created or replaced impervious area is 15,766 ft^2 (B)
Percent impervious surface created or replaced (B/A)*100: 73.2%
The percent impervious surface created or replaced is (select one based on the above calculation):

☐ less than or equal to fifty percent (50%) – **only new impervious areas are considered a PDP**
OR
X greater than fifty percent (50%) – **the entire project site is considered a PDP**

Step 4: Storm Water Quality Management Plan requirements		
Step	**Answer**	**Progression**
Is the project a Standard Project, Priority Development Project (PDP), or exception to PDP definitions? To answer this item, complete the Project Type Determination Checklist on Pages 5 and 6 of this form, and see PDP exemption information below. For further guidance, see Section 1.4 of the BMP Design Manual *in its entirety*.	☐ Standard Project	Standard Project requirements apply, including Standard Project SWQMP. **Complete Standard Project SWQMP.**
	X PDP	Standard and PDP requirements apply, including PDP SWQMP. **Complete PDP SWQMP.**
	☐ Exception to PDP definitions*	Standard Project requirements apply, and any additional requirements specific to the type of project. *Provide discussion and list any additional requirements below in this form.* **Complete Standard Project SWQMP.**
*Exceptions to PDP definitions: The City staff have the discretion to exempt certain projects from being defined as PDPs, or to apply alternative PDP requirements as follows: (A) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria: (i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR (ii) Designed and constructed to be hydraulically disconnected from paved streets or roads [i.e., runoff from the new improvement does not drain directly onto paved streets or roads]; OR (iii) Designed and constructed with permeable pavements or surfaces in accordance with US EPA Green Streets Guidance; (B) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the US EPA Green Streets Guidance.		
Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:		

Step 5: Certification	
Applicant Certification: I have read and understand that the City of San Diego has adopted minimum requirements for managing urban runoff, including storm water, from construction and land development activities. I certify that this intake form has been completed to the best of my ability and accurately reflects the project being proposed. I also understand that non-compliance with the City's WPO and Grading Ordinance may result in enforcement by the City, including fines, cease and desist orders, or other actions.	
Signature of Applicant:	Date:

City of San Diego PDP SWQMP Site Information Checklist For PDPs	**Form I-3B (PDPs)** **City of San Diego** BMP Design Manual *Form*
Project Summary Information	
Project Name	Su Casa
Project Address	6738 La Jolla Blvd., La Jolla, CA 92037
Assessor's Parcel Number(s) (APN(s))	351-382-16, 351-382-11
Permit Application Number	
Project Hydrologic Unit	Select One: ☐ Santa Margarita 902 ☐ San Luis Rey 903 ☐ Carlsbad 904 ☐ San Dieguito 905 X Penasquitos 906 ☐ San Diego 907 ☐ Pueblo San Diego 908 ☐ Sweetwater 909 ☐ Otay 910 ☐ Tijuana 911
Project Watershed *(Complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)*	Penasquitos Hydrologic Unit HU (906) and Scripps Sub-Area 906.31
Parcel Area *(total area of Assessor's Parcel(s) associated with the project)*	0.51 Acres
Area to be Disturbed by the Project *(Project Area)*	0.51 Acres
Project Proposed Impervious Area *(subset of Project Area)*	0.36 Acres
Project Proposed Pervious Area *(subset of Project Area)*	0.49 Acres
Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Parcel Area.	

City of San Diego BMP Design Manual Form I-3B Page 2 of 10

Description of Existing Site Condition

Current Status of the Site (select all that apply):

X Existing development
☐ Previously graded but not built out
☐ Demolition completed without new construction
☐ Agricultural or other non-impervious use
☐ Vacant, undeveloped/natural

Description / Additional Information:

Existing Land Cover Includes (select all that apply):

☐ Vegetative Cover
☐ Non-Vegetated Pervious Areas
X Impervious Areas

Description / Additional Information:

Underlying Soil belongs to Hydrologic Soil Group (select all that apply):

☐ NRCS Type A
☐ NRCS Type B
☐ NRCS Type C
☐ NRCS Type D
X Undetermined

Approximate Depth to Groundwater (GW):

☐ GW Depth < 5 feet
X 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
X None

Description / Additional Information:

City of San Diego BMP Design Manual Form I-3B Page 3 of 10
Description of Existing Site Drainage Patterns
The existing drainage conveyance is urban and no offsite flows enter through the project site. Site drainage surface drains in a westerly direction on Playa Del Norte and Playa Del Sur and discharge approximately 1000’ to the Pacific Ocean.

City of San Diego BMP Design Manual Form I-3B Page 4 of 10
Description of Proposed Site Development
Project Description / Proposed Land Use and/or Activities: The project consists of the removal of an existing restaurant and parking lot and redeveloping the site with three buildings with two elevators and underground parking, for a mixed use residential and commercial development. The development will also include the associated underground utilities, landscaping, and stormwater treatment BMPs.
List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features): *Impervious features include rooftops and hardscape*
List/describe proposed pervious features of the project (e.g., landscape areas): *Pervious features include landscaped areas*
Does the project include grading and changes to site topography? X Yes ☐ No *Description / Additional Information:*

City of San Diego BMP Design Manual Form I-3B Page 5 of 10
Description of Proposed Site Drainage Patterns
Does the project include changes to site drainage (e.g., installation of new storm water conveyance systems)? X Yes ☐ No *Describe proposed site drainage patterns:* *The development will maintain existing drainage patterns along the site and will include onsite drainage improvements with 6" PVC drains and a biofiltration facility to treat pollutants of concern.*

City of San Diego BMP Design Manual Form I-3B Page 6 of 10
Identify whether any of the following features, activities, and/or pollutant source areas will be present (select all that apply): X On-site storm drain inlets X Interior floor drains and elevator shaft sump pumps X Interior parking garages ☐ Need for future indoor & structural pest control X 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 X Fire Sprinkler Test Water ☐ Miscellaneous Drain or Wash Water X Plazas, sidewalks, and parking lots *Description / Additional Information:*

City of San Diego BMP Design Manual Form I-3B Page 7 of 10
Identification and Narrative of Receiving Water and Pollutants of Concern
Describe flow path of storm water from the project site discharge location(s), through urban storm conveyance systems as applicable, to receiving creeks, rivers, and lagoons as applicable, and ultimate discharge to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable): Site drainage surface drains in a westerly direction on Playa Del Norte and Playa Del Sur and discharge approximately 1000' to the Pacific Ocean
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
Pacific Ocean Shoreline Scripps HA at Playa Del Norte, at Windansea Beach	Enterococcus, Fecal Coliform, Total Coliform	

Identification of Project Site Pollutants*
*Identification of project site pollutants below 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 expected from the project site based on all proposed use(s) of the site (see BMP Design Manual Appendix B.6):

Pollutant	Not Applicable to the Project Site	Anticipated from the Project Site	Also a Receiving Water Pollutant of Concern
Sediment		X	
Nutrients		X	
Heavy Metals	X		
Organic Compounds	X		X
Trash & Debris		X	
Oxygen Demanding Substances			
Oil & Grease			
Bacteria & Viruses			X
Pesticides		X	

City of San Diego BMP Design Manual Form I-3B Page 8 of 10

Hydromodification Management Requirements
Do hydromodification management requirements apply (see Section 1.6 of the BMP Design Manual)? ☐ Yes, hydromodification management flow control structural BMPs required. ☐ No, the project will discharge runoff directly to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. X 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):* The project's drainage surface drains in a westerly direction towards Playa Del Norte and Playa Del Sur and discharge approximately 1000' directly to the Pacific Ocean (an exempt water body).

Critical Coarse Sediment Yield Areas* *This Section only required if hydromodification management requirements apply
Based on the maps provided within the WMAA, do potential critical coarse sediment yield areas exist within the project drainage boundaries? ☐ Yes X No, No critical coarse sediment yield areas to be protected based on WMAA maps If yes, have any of the optional analyses presented in Section 6.2 of the BMP Design Manual been performed? ☐ 6.2.1 Verification of Geomorphic Landscape Units (GLUs) Onsite ☐ 6.2.2 Downstream Systems Sensitivity to Coarse Sediment ☐ 6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite ☐ No optional analyses performed, the project will avoid critical coarse sediment yield areas identified based on WMAA maps If optional analyses were performed, what is the final result? ☐ No critical coarse sediment yield areas to be protected based on verification of GLUs onsite ☐ Critical coarse sediment yield areas exist but additional analysis has determined that protection is not required. Documentation attached in Attachment 2.b of the SWQMP. ☐ Critical coarse sediment yield areas exist and require protection. The project will implement management measures described in Sections 6.2.4 and 6.2.5 as applicable, and the areas are identified on the SWQMP Exhibit. *Discussion / Additional Information:*

City of San Diego BMP Design Manual Form I-3B Page 9 of 10
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.
Has a geomorphic assessment been performed for the receiving channel(s)? ☐ No, the low flow threshold is 0.1Q2 (default low flow threshold) ☐ Yes, the result is the low flow threshold is 0.1Q2 ☐ Yes, the result is the low flow threshold is 0.3Q2 ☐ Yes, the result is the low flow threshold is 0.5Q2 If a geomorphic assessment has been performed, provide title, date, and preparer: *Discussion / Additional Information: (optional)*

City of San Diego BMP Design Manual Form I-3B Page 10 of 10
Other Site Requirements and Constraints
According to a geotechnical report prepared by Christian Wheeler Engineering dated 1/26/16, infiltration facilities are not recommended to be used to manage storm water discharge at the site. There are no adjacent offsite stormdrains and the site drainage discharges into the street
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.

Source Control BMP Checklist for All Development Projects (Standard Projects and Priority Development Projects)				Form I-4 Model BMP Design Manual [August 31, 2015]
Source Control BMPs				
All development projects must implement source control BMPs SC-1 through SC-6 where applicable and feasible. Answer each category below pursuant to the following. • "Yes" means the project will implement the source control BMP 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	X Yes	☐ No	☐ N/A	
Discussion / justification if SC-1 not implemented:				
SC-2 Storm Drain Stenciling or Signage	X Yes	☐ No	☐ N/A	
Discussion / justification if SC-2 not implemented:				
SC-3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	X N/A	
Discussion / justification if SC-3 not implemented: No outdoor storage proposed				
SC-4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	X N/A	
Discussion / justification if SC-4 not implemented: No outdoor storage proposed				

Form I-4 Page 2 of 2, Form Template Date: August 31, 2015			
Source Control Requirement	**Applied?**		
SC-5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐Yes	☐No	X N/A
Discussion / justification if SC-5 not implemented: No outdoor trash storage area proposed			
SC-6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below)			
☐On-site storm drain inlets	X Yes	☐No	☐N/A
☐Interior floor drains and elevator shaft sump pumps	X Yes	☐No	☐N/A
☐Interior parking garages	X Yes	☐No	☐N/A
☐Need for future indoor & structural pest control	☐Yes	☐No	X N/A
☐Landscape/Outdoor Pesticide Use	X Yes	☐No	☐N/A
☐Pools, spas, ponds, decorative fountains, and other water features	☐Yes	☐No	X N/A
☐Food service	☐Yes	☐No	X N/A
☐Refuse areas	☐Yes	☐No	X N/A
☐Industrial processes	☐Yes	☐No	X N/A
☐Outdoor storage of equipment or materials	☐Yes	☐No	X N/A
☐Vehicle and Equipment Cleaning	☐Yes	☐No	X N/A
☐Vehicle/Equipment Repair and Maintenance	☐Yes	☐No	X N/A
☐Fuel Dispensing Areas	☐Yes	☐No	X N/A
☐Loading Docks	☐Yes	☐No	X N/A
☐Fire Sprinkler Test Water	X Yes	☐No	☐N/A
☐Miscellaneous Drain or Wash Water	☐Yes	☐No	X N/A
☐Plazas, sidewalks, and parking lots	X 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. N/A applies to all not proposed potential sources.			

Site Design BMP Checklist for All Development Projects (Standard Projects and Priority Development Projects)			Form I-5 Model BMP Design Manual [August 31, 2015]
Site Design BMPs			
All development projects must implement site design BMPs SD-1 through SD-8 where applicable and feasible. Answer each category below pursuant to the following. • "Yes" means the project will implement the site design BMP / 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.			
Site Design Requirement	**Applied?**		
SD-1 Maintain Natural Drainage Pathways and Hydrologic Features	X Yes	☐ No	☐ N/A
Discussion / justification if SD-1 not implemented:			
SD-2 Conserve Natural Areas, Soils, and Vegetation	☐ Yes	☐ No	X N/A
Discussion / justification if SD-2 not implemented: *There are none existing onsite.*			
SD-3 Minimize Impervious Area	X Yes	☐ No	☐ N/A
Discussion / justification if SD-3 not implemented:			
SD-4 Minimize Soil Compaction	X Yes	☐ No	☐ N/A
Discussion / justification if SD-4 not implemented:			
SD-5 Impervious Area Dispersion	X Yes	☐ No	☐ N/A
Discussion / justification if SD-5 not implemented:			

Form I-5 Page 2 of 2, Form Template Date: August 31, 2015			
Site Design Requirement	**Applied?**		
SD-6 Runoff Collection	X Yes	☐ No	☐ N/A
Discussion / justification if SD-6 not implemented:			
SD-7 Landscaping with Native or Drought Tolerant Species	X Yes	☐ No	☐ N/A
Discussion / justification if SD-7 not implemented:			
SD-8 Harvesting and Using Precipitation	☐ Yes	☐ No	X N/A
Discussion / justification if SD-8 not implemented: Not proposed due to site constraints.			

Summary of PDP Structural BMPs	**Form I-6 (PDPs)** Model BMP Design Manual [August 31, 2015]
Project Identification	
Project Name: Su Casa	
Permit Application Number	
PDP Structural BMPs	
All PDPs must implement structural BMPs for storm water pollutant control. Selection of PDP structural BMPs for storm water pollutant control must be based on the selection process. PDPs subject to hydromodification management requirements must also implement structural BMPs for flow control for hydromodification management. 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 may include requiring the project owner or project owner's representative and engineer of record to certify construction of the structural BMPs. PDP structural BMPs must be maintained into perpetuity, and the City must confirm the maintenance. 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).	

A Biofiltration facility was selected for this development because it is the most efficient BMP to address all potential pollutants generated from this project. It will be lined based on recommendations from a geotechnical report prepared by Christian Wheeler Engineering dated 1/26/16. "infiltration facilities are not recommended to be used to manage storm water discharge at the site"

Biofiltration systems are essentially surface and sub-surface water filtration systems. They function like sand filters; however, whereas sand filters provide water quality treatment via passage of stormwater through a sand medium, biofiltration systems use both plants and underlying filter soils to remove contaminants and reduce stormwater runoff volumes. Due to the variety of treatment mechanisms at work within the system, biofiltration areas consistently provide relatively high load reductions for most pollutants. They have a have high removal efficiency for gross pollutants and pollutants associated with fine particles, and medium removal efficiency for dissolved pollutants.

Biofiltration was selected as the most efficient BMP to treat the project's anticipated and expected pollutants. Bioretention is used for treatment only.

Runoff factors were adjusted to account for the site design BMPs and the DCV was calculated.

Harvest and use of stormwater within the project was found unfeasible because there will be no significant demand with the proposed drought tolerant landscaping and development type, also due to limited space.

Worksheet B5-1 follows the methodology described in the City's Biofiltration Standards and Checklist listed in Appendix B.5 and Appendix F.

The Design Capture Volume was calculated in Worksheet B.2-1,

Worksheet B5-1 shows calculations performed for sizing the Biofiltration to treat 1.5 times the DCV not reliably retained onsite, and the design to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP

(Continue on page 2 as necessary.)

City of San Diego BMP Design Manual 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)

City of San Diego BMP Design Manual Form I-6 Page 3 of X (Copy as many as needed)	
Structural BMP Summary Information **(Copy this page as needed to provide information for each individual proposed structural BMP)**	
Structural BMP ID No. DMA A	
Construction Plan Sheet No. DMA Exhibit	
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) X Partial retention by biofiltration with partial retention (PR-1) Biofiltration (BF-1) ☐ Biofiltration with Nutrient Sensitive Media Design (BF-2) ☐ Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☐ Detention pond or vault for hydromodification management ☐ Other (describe in discussion section below)	
Purpose: X 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 forms (See Section 1.12 of the BMP Design Manual)	MB Property Acquisitions, LLC Contact: Michael Blumenthal 110 Pacific Ave, Suite 350, San Francisco, CA 94111 Phone: (415) 516-0841
Who will be the final owner of this BMP?	Same as above
Who will maintain this BMP into perpetuity?	Same as above
What is the funding mechanism for maintenance?	Same as above

City of San Diego BMP Design Manual Form I-6 Page 4 of X (Copy as many as needed)
Structural BMP ID No.
Construction Plan Sheet No.
Discussion (as needed):

City of San Diego PDP Structural BMP Verification For DPW Permitted Land Development Projects	Form I-12 (PDPs) City of San Diego BMP Design Manual *Form*

Project Summary Information	
Project Name	Su Casa
Permit Application Number (e.g., grading/improvement plan number)	
Project Address	6738 La Jolla Blvd., La Jolla, CA 92037
Assessor's Parcel Number(s) (APN(s))	351-382-16, 351-382-11
Project Watershed (Complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	Penasquitos Hydrologic Unit HU (906) and Scripps Sub-Area 906.31
Maintenance Notification / Agreement No.	
Responsible Party for Construction Phase	
Developer's Name	Michael Blumenthal
Address	110 Pacific Ave, Suite 350 San Francisco, CA 94111
Email Address	mbpropertyacquisitions@gmail.com
Phone Number	(415) 516-0841
Engineer of Work	Spear & Associates Inc.
Engineer's Phone Number	760-736-2040
Responsible Party for Ongoing Maintenance	
Owner's Name(s)*	Same as developer
Address	
Email Address	
Phone Number	
*Note: If a corporation or LLC, provide information for principal partner or Agent for Service of Process. If an HOA, provide information for the Board or property manager at time of project closeout.	

City of San Diego BMP Design Manual Form I-12 Page 2 of 4					
Stormwater Structural Pollutant Control & Hydromodification Control BMPs (S-BMPs)* (List all from SWQMP)					
Description/Type of S-BMP	**Plan Sheet #**	**S-BMP ID#**	**Maint-enance Category**	**Maintenance Agreement Recorded Doc #**	**Revisions**
Biofiltration	BMP map	BMP A	2		
*All Priority Development Projects (PDPs) require a S-BMP					

City of San Diego BMP Design Manual Form I-12 Page 3 of 4

Checklist for Applicant to submit to PDCI:

- ☐ Copy of the final accepted SWQMP and any accepted addendum.
- ☐ Copy of the most current plan showing the Stormwater Structural BMP Table, plans/cross-section sheets of the Structural BMPs and the location of each verified as-built Structural BMP.
- ☐ Photograph of each Structural BMP.
- ☐ Photograph(s) of each Structural BMP during the construction process to illustrate proper construction.
- ☐ Copy of the approved Structural BMP maintenance agreement and associated security

By signing below, I certify that the Structural BMP(s) for this project have been constructed and all BMPs are in substantial conformance with the approved plans and applicable regulations. I understand the City reserves the right to inspect the above BMPs to verify compliance with the approved plans and Watershed Protection Ordinance (WPO). Should it be determined that the BMPs were not constructed to plan or code, corrective actions may be necessary before permits can be closed.

Please sign your name and seal.

Professional Engineer's Printed Name:

____

Professional Engineer's Signed Name:

____

Date: ____

[SEAL]

City of San Diego BMP Design Manual Form I-12 Page 4 of 4

CITY - OFFICIAL USE ONLY:

For PDCI:

PDCI Inspector: ____

Date Project has/expects to close: _____________________________

Date verification received from EOW: ___________________________

By signing below, PDCI Inspector concurs that every noted Structural BMP has been installed per plan.

PDCI Inspector's Signature: ________________________________ Date: ____________________

FOR WPP:

Date Received from PDCI: ______________________________________

WPP Submittal Reviewer:_______________________________________

WPP Reviewer concurs that the information provided for the following Structural BMPs is acceptable to enter into the Structural BMP Maintenance verification inventory:

List **acceptable** Structural BMPs:

WPP Reviewer's Signature: ________________________________ Date: ____________

ATTACHMENT 1
BACKUP FOR PDP POLLUTANT CONTROL BMPS

This is the cover sheet for Attachment 1.

Indicate which Items are Included behind this cover sheet:

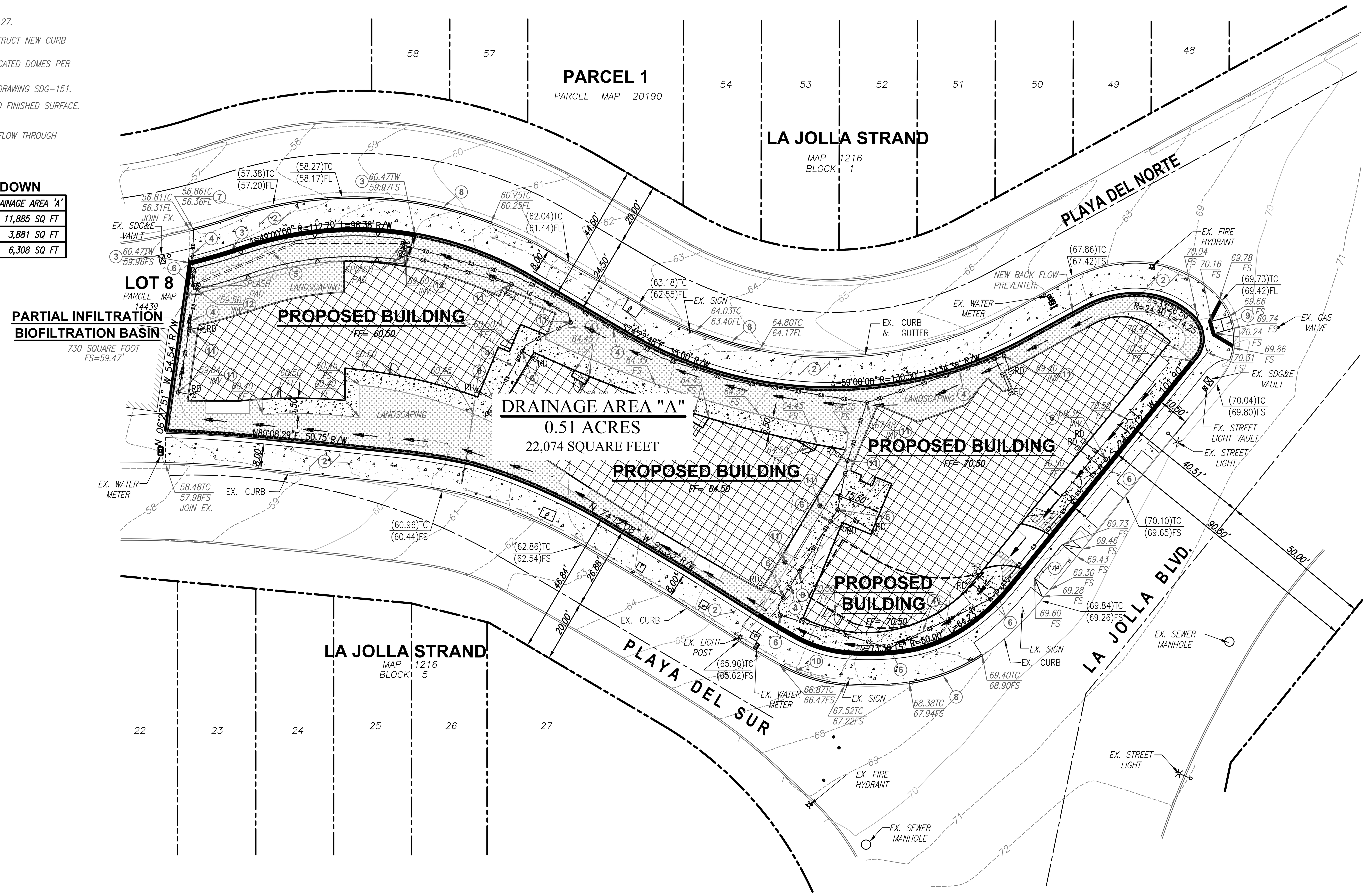
Attachment Sequence	**Contents**	**Checklist**
Attachment 1a	DMA Exhibit (Required) See DMA Exhibit Checklist on the back of this Attachment cover sheet.	X Included
Attachment 1b	Tabular Summary of DMAs Showing DMA ID matching DMA Exhibit, DMA Area, and DMA Type (Required)* *Provide table in this Attachment OR on DMA Exhibit in Attachment 1a	X 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 X 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.	X 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	X Included

CONSTRUCTION NOTES

1. CONSTRUCT 20' DRIVEWAY 7.5" P.C.C. PAVEMENT OVER 95% COMPACTED SOIL (PER SOILS ENGINEER).
2. CONSTRUCT CONCRETE SIDEWALK PER SDG-155, 8.0' WIDE MIN. UNLESS OTHERWISE NOTED.
3. CONSTRUCT RETAINING WALL PER SDRSD C-3.
4. INSTALL 6" PVC SOLID STORM DRAIN @ 0.50% MIN (TYP).
5. INSTALL 6" PVC PERFORATED UNDERDRAIN.
6. INSTALL 6" PVC TEE WITH 6" PVC VERTICAL RISER TO FINISHED SURFACE. INSTALL 6" DIA. CATCH BASIN WITH FLAT GRATE.
7. INSTALL SIDEWALK UNDERDRAIN-PIPE OUTLET PER D-27.
8. SAWCUT AND REMOVE & CLOSE EX. DRIVEWAY. CONSTRUCT NEW CURB AND GUTTER PER STANDARD DRAWING SDG-151.
9. CONSTRUCT SINGLE TYPE ADA ACCESS RAMP W/TRUNCATED DOMES PER SDG-132 TYPE A. SEE DETAIL HEREON.
10. CONSTRUCT NEW CURB AND GUTTER PER STANDARD DRAWING SDG-151.
11. INSTALL 6" PVC TEE WITH 6" PVC VERTICAL RISER TO FINISHED SURFACE. INSTALL 6" DIA. CATCH BASIN WITH ATRIUM GRATE.
12. OUTLET SITE STORM DRAIN @ 3'x3' SPLASH PAD AT FLOW THROUGH PLANTERS FINISHED SURFACE.

DRAINAGE AREA DMA BREAKDOWN

DRAINAGE AREA SURFACE	SYMBOL	SOIL TYPE	DRAINAGE AREA 'A'
BUILDING ROOFTOP		D	11,885 SQ FT
HARSCAPING/SIDEWALK		D	3,881 SQ FT
LANDSCAPING AREA		D	6,308 SQ FT



LEGEND:

EXISTING CONTOURS

EXISTING DIRECTION OF DRAINAGE

DRAINAGE AREA

"A" DRAINAGE MANAGEMENT AREA DESIGNATION

IMPERVIOUS AREAS (POST-DEV):

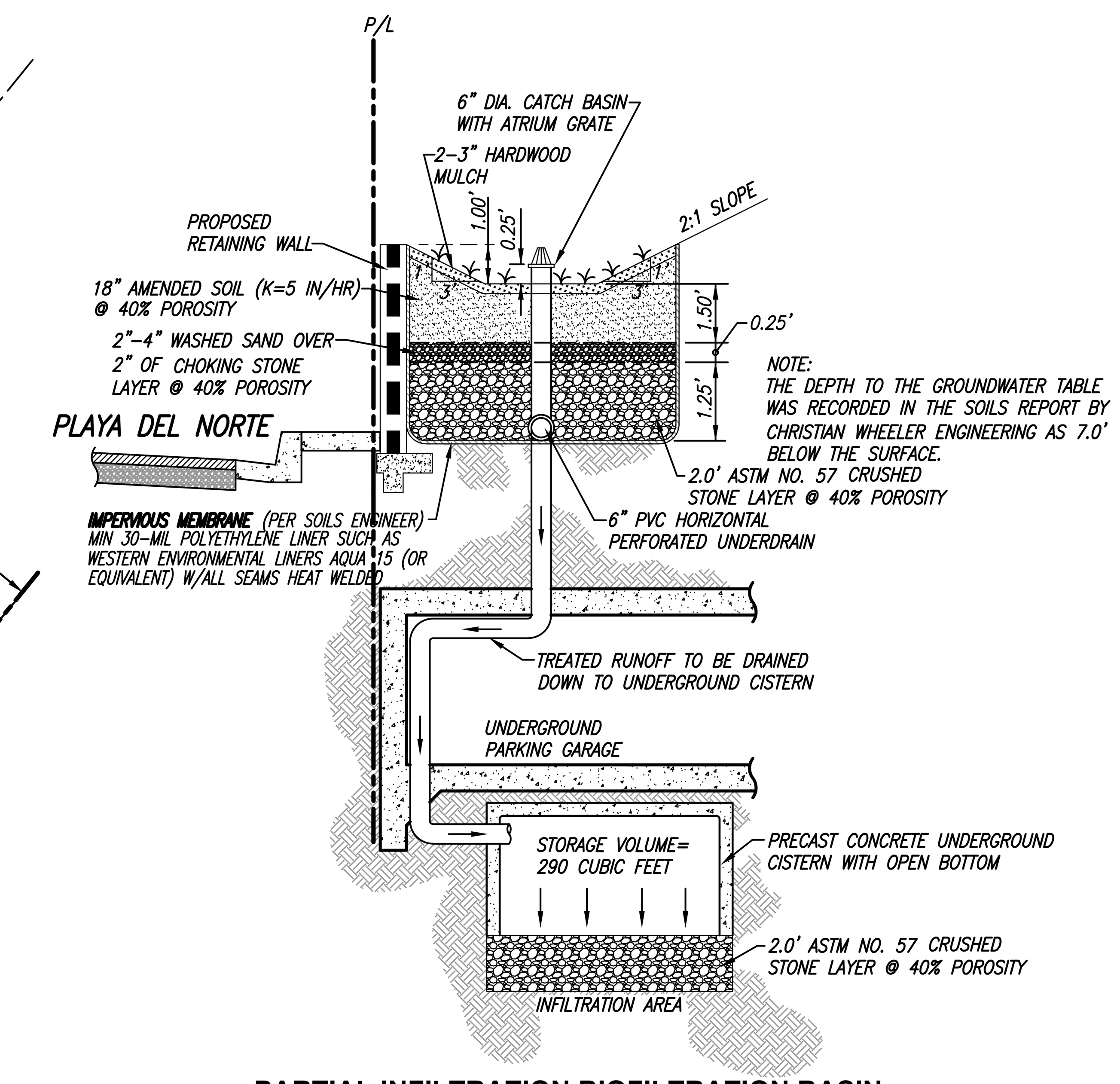
TOTAL LOT AREA = 22,074 sf (0.51 AC)

ROOF TOP AREA = 11,885 sf
PAVEMENT AREA = 3,881 sf
LANDSCAPING = 6,308 sf

IMPERVIOUS AREA:

TOTAL LOT AREA = 22,074 sf (0.51 AC)

EXISTING IMPERVIOUS AREA PRE-CONSTRUCTION = 21,538 sf
PROPOSED IMPERVIOUS AREA POST-CONSTRUCTION = 15,766 sf
IMPERVIOUS AREA DECREASE = 5,772 sf



PARTIAL INFILTRATION BIOFILTRATION BASIN

TYPICAL SECTION & OUTLET CONNECTION
NOT-TO-SCALE

PARTIAL INFILTRATION BIOFILTRATION BASIN MEDIA

18" AMENDED SOIL LAYER
COMPOSITION AND TEXTURE:
65% SAND, 20% SANDY LOAM, & 15% COMPOST (FROM VEGETATION-BASED FEEDSTOCK). ANIMAL WASTES OR BY-PRODUCTS SHOULD NOT BE APPLIED.

PERMEABILITY:
5 IN/HR INFILTRATION RATE FOR THE FLOW-BASED SUSMP METHOD
(1-6IN/HR FOR ALTERNATIVE DESIGNS, AS APPROVED BY LOCAL JURISDICTION).

CHEMICAL COMPOSITION: TOTAL PHOSPHORUS < 15 PARTS PER MILLION (PPM); PH 6-8; CATION EXCHANGE CAPACITY > 5 MILLIEQUIVALENTS PER 100 GRAMS (MEQ/100 G) OF SOIL; ORGANIC MATTER CONTENT < 5 PERCENT BY WEIGHT.

18" DRAINAGE LAYER
SEPARATE SOIL MEDIA FROM UNDERDRAIN LAYER WITH 2 TO 4 INCHES OF WASHED SAND, FOLLOWED BY 2 INCHES OF CHOKING STONE (ASTM NO. 8) OVER A 1.0-FOOT ENVELOPE OF ASTM NO. 57 STONE.

SURFACE VEGETATION
AS SPECIFIED BY THE LANDSCAPE ARCHITECT PLANS.

N

10 5 0 10 20 30
SCALE: 1" = 10'

PLANS PREPARED BY:
SPEAR & ASSOCIATES, INC.
CIVIL ENGINEERING & LAND SURVEYING
475 PRODUCTION STREET, SAN MARCOS, CA 92078
PHONE (760) 736-2040 FAX (760) 736-4866
WWW.SPEARINC.NET

REGISTERED PROFESSIONAL ENGINEER
DANNY ABADA
No. 45381
CIVIL
STATE OF CALIFORNIA

POST DEVELOPMENT DRAINAGE AREA MAP FOR:
6738 LA JOLLA BLVD.
BLOCK 9, MAP NO.355

PLOT DATE: 8/24/2016 9:04 AM S:\Spear_Projects\2015\15-193 MP ACQUISITIONS - SU CASA, LA JOLLA\CAD\15-193Post Dev.dwg

SPEAR & ASSOCIATES JOB No. 15-223 JRZ

Appendix B: Storm Water Pollutant Control Hydrologic Calculations and Sizing Methods
Worksheet B.2-1 DCV

DMA A

Design Capture Volume		Worksheet B.2-1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.5	inches
2	Area tributary to BMP (s)	A=	0.51	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.67	unitless
4	Trees Credit Volume	TCV=		cubic-feet
5	Rain barrels Credit Volume	RCV=		cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=	620	cubic-feet

Runoff Factors

DMA 6A	s.f.	(A) acres	**(C) Runoff**	C x A
Rooftop	11,885.00	**0.273**	0.9	0.25
Hardscape	3,881.00	**0.089**	0.9	0.08
Pkg lot	0.00	**0.000**	0.9	0.00
Landscaping	6,308.00	**0.145**	0.1	0.01
total	22074	**0.507**		0.34
			Composite C	**0.67**

Worksheet B.3-1. Harvest and Use Feasibility Screening

<table>
<tr><th colspan="2">Harvest and Use Feasibility Screening</th><th>Form I-7</th></tr>
<tr><td colspan="3">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:______________</td></tr>
<tr><td colspan="3">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.
Toilet & Urinal Flushing: 7 employees (36 hour total) = 20 c.f.

Toilet & Urinal Flushing: 28 residents (36 hour total) = 104 c.f.

Landscape Irrigation: Total Planted Area 6308 s.f., w/drought tolerant low water use
(36 hour total) = 5 c.f.

Anticipated Total Use Over 36 hours = 129 c.f.</td></tr>
<tr><td colspan="3">3. Calculate the DCV using worksheet B-2.1.
620 c.f.
0.25 DCV = 155 c.f.</td></tr>
<tr><td>3a. Is the 36-hour demand greater than or equal to the DCV?
Yes / X No ⇨
⇩</td><td>3b. Is the 36-hour demand greater than 0.25DCV but less than the full DCV?
Yes /X No ⇨
⇩</td><td>3c. Is the 36-hour demand less than 0.25DCV?
X Yes
⇩</td></tr>
<tr><td>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.</td><td>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.</td><td>Harvest and use is considered to be infeasible.
X</td></tr>
</table>

Harvested Water Demand Calculation
Per City of San Diego Storm Water Standards, B.3.2

Landscape Irrigation Harvesting

Modified Estimated Total Water Usage
Modified ETWU = EToWet × [[Σ(PF x HA)/IE] + SLA] x 0.015

ET owet =	2.7	
PF =	0.2	Low (drought tolerant vegetation)
Landscaped Area =	6308.0	s.f.
Hydrozone =	390	(36 hr) gal/acre
Σ(PF x HA) =	11.29532	
IE =	0.9	
SLA	0	
Modified ETWU =	5	ft^3/36hr

Toilet & Urinal Flushing

Land Use Type =	Residential	
# of Resident/emp=	28	
Total Use/person =	9.3	gal/day
Total Use =	104.4	ft^3/36hr

Toilet & Urinal Flushing

Land Use Type =	Retail	
# of Resident/emp=	7	
Total Use/person =	7	gal/day
Total Use =	19.7	ft^3/36hr

Total Estimated Demand = 129.2 ft^3/36hr

Worksheet B.5-1: Simple Sizing Method for Biofiltration BMPs

DMA A

Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1	
1	Remaining DCV after implementing retention BMPs	620.00	cubic- feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0.007	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36	hours
4	Depth of runoff that can be infiltrated [Line 2 x Line 3]	0.252	inches
5	Aggregate pore space	0.4	in/in
6	Required depth of gravel below the underdrain [Line 4/ Line 5]	0.63	inches
7	Assumed surface area of the biofiltration BMP	730.00	sq-ft
8	Media retained pore storage	0.2	in/in
9	Volume retained by BMP [[Line 4 + (Line 12 x Line 8)]/12] x Line 7	234.33	cubic- feet
10	DCV that requires biofiltration [Line 1 – Line 9]	385.67	cubic- feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	6.00	inches
12	Media Thickness [18 inches minimum], also add mulch layer thickness to this line for sizing calculations	18.00	inches
13	Aggregate Storage above underdrain invert (12 inches typical) – use 0 inches for sizing if the aggregate is not over the entire bottom surface area	18.00	inches
14	Freely drained pore storage	0.2	in/in
15	Media filtration rate to be used for sizing (5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate which will be less than 5 in/hr.)	5	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6	hours
17	Depth filtered during storm [Line 15 x Line 16]	30	inches
18	Depth of Detention Storage [Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5)]	16.8	inches
19	Total Depth Treated [Line 17 + Line 18]	46.8	inches
Option 1 – Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]	578.51	cubic- feet
21	Required Footprint [Line 20/ Line 19] x 12	148.33	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume [0.75 x Line 10]	289.25	cubic- feet
23	Required Footprint [Line 22/ Line 18] x 12	206.61	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	22,074.00	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and	0.67	
26	BMP Footprint Sizing Factor (Default 0.03 or an alternative)	0.03	
27	Minimum BMP Footprint [Line 24 x Line 25 x Line 26]	444	sq-ft
28	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 27)	444	sq-ft
Check for Volume Reduction [Not applicable for No Infiltration Condition]			
29	Calculate the fraction of DCV retained in the BMP [Line 9/Line 1]	0.38	unitless
30	Minimum required fraction of DCV retained for partial infiltration	0.375	unitless
31	Is the retained DCV ≥ 0.375? If the answer is no increase the footprint sizing	X Yes ☐ No	

Worksheet D.5-1: Factor of Safety and Design Infiltration Rate Worksheet

Factor of Safety and Design Infiltration Rate Worksheet			Worksheet D.5-1		
Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25	2	0.5
		Predominant soil texture	0.25	2	0.5
		Site soil variability	0.25	2	0.5
		Depth to groundwater / impervious layer	0.25	3	0.75
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			2.25
B	Design	Level of pretreatment/ expected sediment loads	0.5		0.5
		Redundancy/resiliency	0.25		0.25
		Compaction during construction	0.25		0.5
		Design Safety Factor, $S_B = \Sigma p$			1.25
Combined Safety Factor, $S_{total} = S_A \times S_B$				2.8125	
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)				0.02	
Design Infiltration Rate, in/hr, $K_{design} = K_{observed} / S_{total}$				0.007	
Supporting Data					
Briefly describe infiltration test and provide reference to test forms:					

CWE 2150460.06

Planning Phase

Percolation to Infiltration Rate Conversion (Porchet Method)

Perc Test #	Gravel Adjustment Factor	Effective Radius (inches) r	Depth of Hole Below Existing Grade (inches)	Time Interval (min.) Δt	Height of pipe above surface (feet)	Initial Water Depth without correction (feet)	Final Water Depth without correction (feet)	Initial Water Height with correction (inches) H_o	Final Water Height with correction (inches) H_f	Change in head (inches) ΔH	Average Height (inches) H_{avg}	Tested Infiltration Rate (inch/hour) I_t
1	0.51	4	120	30	0.00	1.76	1.84	98.88	97.92	0.96	98.40	0.02
2												
3												
4												

"Initial and final water depth without correction" are measurements taken from top of pipe if pipe is sticking out of ground (most cases)

"Initial and final water height with correction" factors in the height of pipe above surface, and provides measurement of water above bottom of pipe

If measurements are taken from grade "Height of pipe above surface" = 0

Gravel Adjustment Factor:

1.00 - No Gravel Used (No Caving)

0.51 - 3/4 inch gravel with 8 inch diameter hole

0.64 - 3/4 inch gravel with 6 inch diameter hole

Porchet Method - Tested Percolation Rate Conversion to Tested Infiltration Rate

$$I_t = \frac{\Delta H \; 60 \; r}{\Delta t \; (r + 2H_{avg})}$$

I_t = tested infiltration rate, inches per hour

ΔH = change in head over the time interval, inches

Δt = time interval, minutes

r = effective radius of test hole

H_{avg} = average head over the time interval, inches

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?**			
Criteria	Screening Question	**Yes**	**No**
1	**Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		NO
Provide basis: Variable soil infiltration properties across site. Existing alluvium and fill possess layers of silts and clays demonstrating very low infiltration rates. Very low rates of infiltration within Cretaceous-age sediments of Point Loma Formation underlying site. Please refer to subsurface exploration data and laboratory test results presented in CWE Report 2150460.01. 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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		NO
Provide basis: C2.2 Settlement and Volume Change - On- and off-site fills and alluvial soils subject to consolidation as the result of infiltration. Near surface clayey soils subject to expansion. C.2.4 Utility Considerations - Existing and proposed on- and of-site utility trenches considered susceptible to saturation and lateral migration of infiltrated storm water. C.2.6 Retaining Walls and Foundations - The proposed project will include a subterranean level across almost the entirety of the site. Any proposed infiltration facility would infiltrate storm water adjacent to planned foundations and retaining walls. C.2.7 Other Factors - Adjacent subgrade soils in public right-of-ways subject to degradation as the result of infiltration. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			

<table>
<tr><th colspan="4">Worksheet C.4-1 Page 2 of 4</th></tr>
<tr><td>Criteria</td><td>Screening Question</td><td>Yes</td><td>No</td></tr>
<tr><td>3</td><td>Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.</td><td></td><td>NO</td></tr>
<tr><td colspan="4">Provide basis:

C.3.2 Separation to Seasonal High Groundwater - The depth to perched groundwater beneath the site was measured by our firm (see CWE Report 2150460.01) at depths as shallow as 7 feet below existing site grades during the dry season (September 2015). The depth of perched groundwater beneath the site may increase during the wet season.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</td></tr>
<tr><td>4</td><td>Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.</td><td></td><td>N/A</td></tr>
<tr><td colspan="4">Provide basis:

C.3.6 Water Balance Impacts on Stream Flow – Not Applicable. No streams located hydrologically down gradient.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</td></tr>
<tr><td>Part 1 Result*</td><td colspan="2">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</td><td>See Pages C-13 and C-14</td></tr>
</table>

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by [City Engineer] 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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		NO
Provide basis: C2.2 Settlement and Volume Change - On- and off-site fills and alluvial soils subject to consolidation as the result of infiltration. Near surface clayey soils subject to expansion. C.2.4 Utility Considerations - Existing and proposed on- and of-site utility trenches considered susceptible to saturation and lateral migration of infiltrated storm water. C.2.6 Retaining Walls and Foundations - The proposed project will include a subterranean level across almost the entirety of the site. Any proposed infiltration facility would infiltrate storm water adjacent to planned foundations and retaining walls. C.2.7 Other Factors - Adjacent subgrade soils in public right-of-ways subject to degradation as the result of infiltration. 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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		NO
Provide basis: C.2.4 Utility Considerations - Existing and proposed on- and of-site utility trenches considered susceptible to saturation and lateral migration of infiltrated storm water. C.2.6 Retaining Walls and Foundations - The proposed project will include a subterranean level across almost the entirety of the site. Any proposed infiltration facility would infiltrate storm water adjacent to planned foundations and retaining walls. C.2.7 Other Factors - Adjacent subgrade soils in public right-of-ways subject to degradation as the result of infiltration. 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.			

<table>
<tr><th colspan="4">Worksheet C.4-1 Page 4 of 4</th></tr>
<tr><th>Criteria</th><th>Screening Question</th><th>Yes</th><th>No</th></tr>
<tr><td>7</td><td>Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.</td><td></td><td>NO</td></tr>
<tr><td colspan="4">Provide basis:

C.3.2 Separation to Seasonal High Groundwater - The depth to perched groundwater beneath the site was measured by our firm (see CWE Report 2150460.01) at depths as shallow as 7 feet below existing site grades during the dry season (September 2015). The depth of perched groundwater beneath the site may increase during the wet season.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.</td></tr>
<tr><td>8</td><td>Can infiltration be allowed without violating downstream water rights? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.</td><td>YES</td><td></td></tr>
<tr><td colspan="4">Provide basis:

There are no downstream water bodies before the Pacific Ocean.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.</td></tr>
<tr><td>Part 2 Result*</td><td colspan="2">If all answers from row 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is Partial Infiltration.

If any answer from row 5-8 is no, then infiltration of any volume is considered to be infeasible within the drainage area. The feasibility screening category is No Infiltration.</td><td>No Infiltration</td></tr>
</table>

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by Agency/Jurisdictions to substantiate findings

E.12. PR-1 Biofiltration with Partial Retention

Location: 805 and Bonita Road, Chula Vista, CA.

MS4 Permit Category
NA
Manual Category
Partial Retention
Applicable Performance Standard
Pollutant Control Flow Control
Primary Benefits
Volume Reduction Treatment Peak Flow Attenuation

Description

Biofiltration with partial retention (partial infiltration and biofiltration) facilities are vegetated surface water systems that filter water through vegetation, and soil or engineered media prior to infiltrating into native soils, discharge via underdrain, or overflow to the downstream conveyance system. Where feasible, these BMPs have an elevated underdrain discharge point that creates storage capacity in the aggregate storage layer. Biofiltration with partial retention facilities are commonly incorporated into the site within parking lot landscaping, along roadsides, and in open spaces. They can be constructed in ground or partially aboveground, such as planter boxes with open bottoms to allow infiltration. Treatment is achieved through filtration, sedimentation, sorption, infiltration, biochemical processes and plant uptake.

Typical biofiltration with partial retention components include:

- Inflow distribution mechanisms (e.g, perimeter flow spreader or filter strips)
- Energy dissipation mechanism for concentrated inflows (e.g., splash blocks or riprap)
- Shallow surface ponding for captured flows
- Side Slope and basin bottom vegetation selected based on climate and ponding depth
- Non-floating mulch layer
- Media layer (planting mix or engineered media) capable of supporting vegetation growth
- Filter course layer (aka choking layer) consisting of aggregate to prevent the migration of fines into uncompacted native soils or the optional aggregate storage layer
- Aggregate storage layer with underdrain(s)
- Uncompacted native soils at the bottom of the facility
- Overflow structure

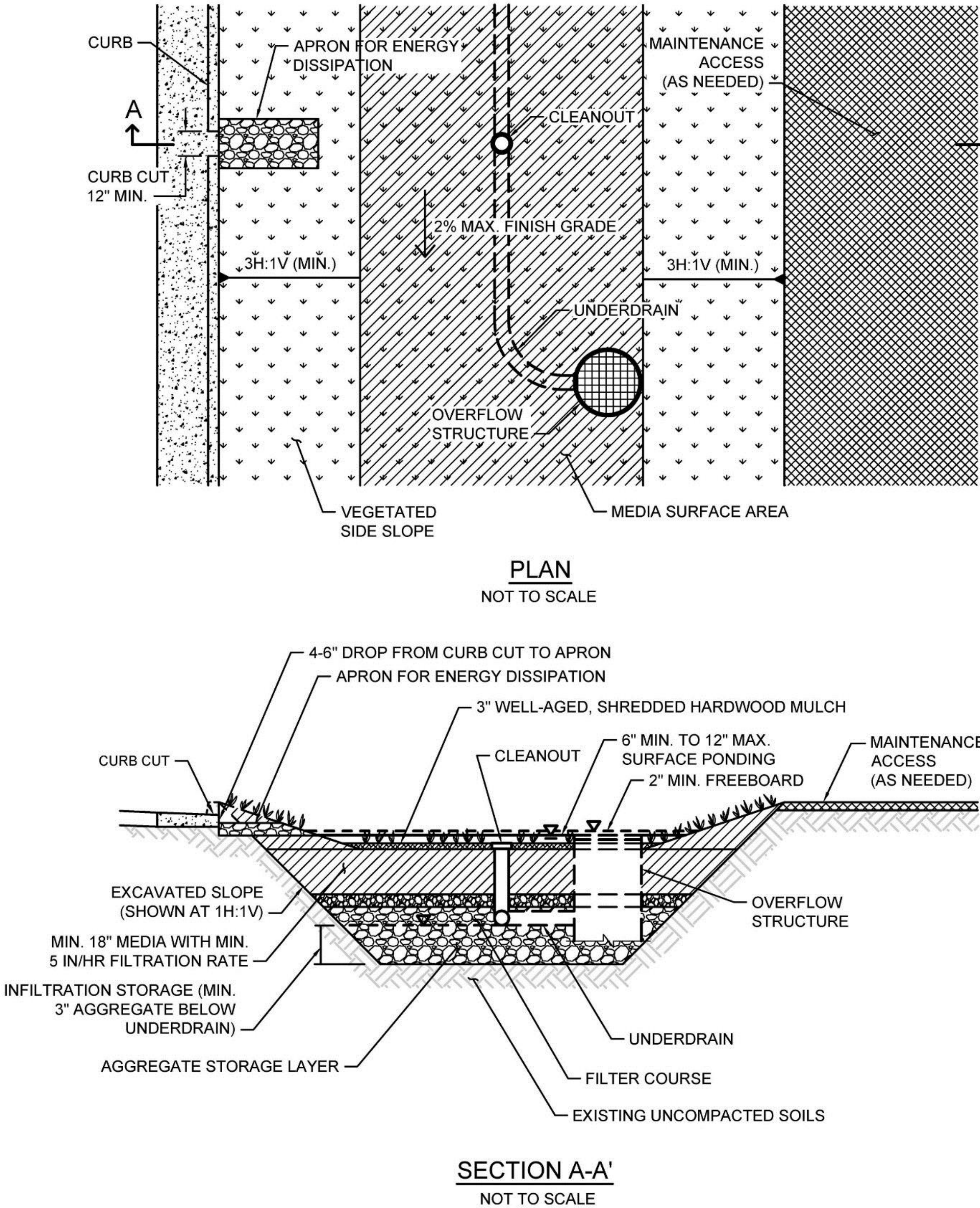


Figure E.12-E.12-1: Typical plan and Section view of a Biofiltration with Partial Retention BMP

Design Adaptations for Project Goals

Partial infiltration BMP with biofiltration treatment for storm water pollutant control. Biofiltration with partial retention can be designed so that a portion of the DCV is infiltrated by providing infiltration storage below the underdrain invert. The infiltration storage depth should be determined by the volume that can be reliably infiltrated within drawdown time limitations. Water discharged through the underdrain is considered biofiltration treatment. Storage provided above the underdrain within surface ponding, media, and aggregate storage is included in the biofiltration treatment volume.

Integrated storm water flow control and pollutant control configuration. The system can be designed to provide flow rate and duration control by primarily providing increased surface ponding and/or having a deeper aggregate storage layer. This will allow for significant detention storage, which can be controlled via inclusion of an orifice in an outlet structure at the downstream end of the underdrain.

Design Criteria and Considerations

Biofiltration with partial retention must meet the following design criteria and considerations. Deviations from the below criteria may be approved at the discretion of the City Engineer if it is determined to be appropriate:

	Siting and Design	Intent/Rationale
☐	Placement observes geotechnical recommendations regarding potential hazards (e.g., slope stability, landslides, liquefaction zones) and setbacks (e.g., slopes, foundations, utilities).	Must not negatively impact existing site geotechnical concerns.
☒	Selection and design of basin is based on infiltration feasibility criteria and appropriate design infiltration rate (See Appendix C and D).	Must operate as a partial infiltration design and must be supported by drainage area and in-situ infiltration rate feasibility findings.
☒	Contributing tributary area shall be ≤ 5 acres (≤ 1 acre preferred).	Bigger BMPs require additional design features for proper performance. Contributing tributary area greater than 5 acres may be allowed at the discretion of the City Engineer if the following conditions are met: 1) incorporate design features (e.g. flow spreaders) to minimizing short circuiting of flows in the BMP and 2) incorporate additional design features requested by the City Engineer for proper performance of the regional BMP.
☒	Finish grade of the facility is ≤ 2%.	Flatter surfaces reduce erosion and channelization within the facility.
Surface Ponding		
☒	Surface ponding is limited to a 24-hour drawdown time.	Surface ponding limited to 24 hours for plant health. Surface ponding drawdown time greater than 24-hours but less than 96 hours may be allowed at the discretion of the City Engineer if certified by a landscape architect or agronomist.

	Siting and Design	Intent/Rationale
☒	Surface ponding depth is ≥ 6 and ≤ 12 inches.	Surface ponding capacity lowers subsurface storage requirements. Deep surface ponding raises safety concerns. Surface ponding depth greater than 12 inches (for additional pollutant control or surface outlet structures or flow-control orifices) may be allowed at the discretion of the City Engineer if the following conditions are met: 1) surface ponding depth drawdown time is less than 24 hours; and 2) safety issues and fencing requirements are considered (typically ponding greater than 18" will require a fence and/or flatter side slopes) and 3) potential for elevated clogging risk is considered.
☒	A minimum of 2 inches of freeboard is provided.	Freeboard provides room for head over overflow structures and minimizes risk of uncontrolled surface discharge.
☐	Side slopes are stabilized with vegetation and are = 3H:1V or shallower.	Gentler side slopes are safer, less prone to erosion, able to establish vegetation more quickly and easier to maintain.
Vegetation		
☒	Plantings are suitable for the climate and expected ponding depth. A plant list to aid in selection can be found in Appendix E.20	Plants suited to the climate and ponding depth are more likely to survive.
☒	An irrigation system with a connection to water supply should be provided as needed.	Seasonal irrigation might be needed to keep plants healthy.
Mulch (Mandatory)		
☒	A minimum of 3 inches of well-aged, shredded hardwood mulch that has been stockpiled or stored for at least 12 months is provided. Mulch must be non-floating to avoid clogging of overflow structure.	Mulch will suppress weeds and maintain moisture for plant growth. Aging mulch kills pathogens and weed seeds and allows the beneficial microbes to multiply.
Media Layer		

	Siting and Design	Intent/Rationale
X☐	Media maintains a minimum filtration rate of 5 in/hr over lifetime of facility. Additional Criteria for media hydraulic conductivity described in the bioretention soil media model specification (Appendix F.4)	A filtration rate of at least 5 inches per hour allows soil to drain between events, and allows flows to relatively quickly enter the aggregate storage layer, thereby minimizing bypass. The initial rate should be higher than long term target rate to account for clogging over time. However an excessively high initial rate can have a negative impact on treatment performance, therefore an upper limit is needed.
X☐	Media is a minimum 18 inches deep, meeting the following media specifications: Model bioretention soil media specification provided in Appendix F.4 <u>or</u> County of San Diego Low Impact Development Handbook: Appendix G - Bioretention Soil Specification (June 2014, unless superseded by more recent edition). Alternatively, for proprietary designs and custom media mixes not meeting the media specifications, the media meets the pollutant treatment performance criteria in Section F.1.	A deep media layer provides additional filtration and supports plants with deeper roots. Standard specifications shall be followed. For non-standard or proprietary designs, compliance with Appendix F.1 ensures that adequate treatment performance will be provided.
X☐	Media surface area is 3% of contributing area times adjusted runoff factor or greater. Unless demonstrated that the BMP surface area can be smaller than 3%.	Greater surface area to tributary area ratios: a) maximizes volume retention as required by the MS4 Permit and b) decrease loading rates per square foot and therefore increase longevity. Adjusted runoff factor is to account for site design BMPs implemented upstream of the BMP (such as rain barrels, impervious area dispersion, etc.). Refer to Appendix B.2 guidance. Use Worksheet B.5-1 Line 26 to estimate the minimum surface area required per this criteria.
☐	Where receiving waters are impaired or have a TMDL for nutrients, the system is designed with nutrient sensitive media design (see fact sheet BF-2).	Potential for pollutant export is partly a function of media composition; media design must minimize potential for export of nutrients, particularly where receiving waters are impaired for nutrients.
Filter Course Layer		

	Siting and Design	Intent/Rationale
☒	A filter course is used to prevent migration of fines through layers of the facility. Filter fabric is not used.	Migration of media can cause clogging of the aggregate storage layer void spaces or subgrade and can result in poor water quality performance for turbidity and suspended solids. Filter fabric is more likely to clog.
☐	Filter course is washed and free of fines.	Washing aggregate will help eliminate fines that could clog the facility
☐	To reduce clogging potential, a two-layer filter course (aka choking stone system) is used consisting of one 3" layer of clean and washed ASTM 33 Fine Aggregate Sand overlying a 3" layer of ASTM No 8 Stone (Appendix F.5)	This specification has been developed to maintain permeability while limiting the migration of media material into the stone reservoir and underdrain system.
Aggregate Storage Layer		
☒	ASTM #57 open graded stone is used for the storage layer and a two layer filter course (detailed above) is used above this layer	This layer provides additional storage capacity. ASTM #8 stone provides an acceptable choking/bridging interface with the particles in ASTM #57 stone.
☐	Maximum aggregate storage layer depth below the underdrain invert is determined based on the infiltration storage volume that will infiltrate within a 36-hour drawdown time.	A maximum drawdown time is needed for vector control and to facilitate providing storm water storage for the next storm event.
Inflow, Underdrain, and Outflow Structures		
☒	Inflow, underdrains and outflow structures are accessible for inspection and maintenance.	Maintenance will prevent clogging and ensure proper operation of the flow control structures.
☒	Inflow velocities are limited to 3 ft/s or less or use energy dissipation methods. (e.g., riprap, level spreader) for concentrated inflows.	High inflow velocities can cause erosion, scour and/or channeling.
☐	Curb cut inlets are at least 12 inches wide, have a 4-6 inch reveal (drop) and an apron and energy dissipation as needed.	Inlets must not restrict flow and apron prevents blockage from vegetation as it grows in. Energy dissipation prevents erosion.
☒	Underdrain outlet elevation should be a minimum of 3 inches above the bottom elevation of the aggregate storage layer.	A minimal separation from subgrade or the liner lessens the risk of fines entering the underdrain and can improve hydraulic performance by allowing perforations to remain unblocked.
☐	Minimum underdrain diameter is 8 inches.	Smaller diameter underdrains are prone to clogging.

	Siting and Design	Intent/Rationale
☐	Underdrains should be affixed with an upturned elbow to an elevation at least 9 to 12 inches above the invert of the underdrain.	An upturned elbow reduces velocity in the underdrain pipe and can help reduce mobilization of sediments from the underdrain and media bed.
☐	Underdrains are made of slotted, PVC pipe conforming to ASTM D 3034 or equivalent or corrugated, HDPE pipe conforming to AASHTO 252M or equivalent.	Slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.
☐	An underdrain cleanout with a minimum 8-inch diameter and lockable cap is placed every 50 feet as required based on underdrain length.	Properly spaced cleanouts will facilitate underdrain maintenance.
☒	Overflow is safely conveyed to a downstream storm drain system or discharge point. Size overflow structure to pass 100-year peak flow for on-line infiltration basins and water quality peak flow for off-line basins.	Planning for overflow lessens the risk of property damage due to flooding.

Conceptual Design and Sizing Approach for Storm Water Pollutant Control Only

To design biofiltration with partial retention and an underdrain for storm water pollutant control only (no flow control required), the following steps should be taken:

1. Verify that siting and design criteria have been met, including placement requirements, contributing tributary area, maximum side and finish grade slopes, and the recommended media surface area tributary ratio.
2. Calculate the DCV per Appendix B based on expected site design runoff for tributary areas.
3. Generalized sizing procedure is presented in Appendix B.5. The surface ponding should be verified to have a maximum 24-hour drawdown time. Surface ponding drawdown time greater than 24-hours but less than 96 hours may be allowed at the discretion of the City Engineer if certified by a landscape architect or agronomist.

Conceptual Design and Sizing Approach when Storm Water Flow Control is Applicable

Control of flow rates and/or durations will typically require significant surface ponding and/or aggregate storage volumes, and therefore the following steps should be taken prior to determination of storm water pollutant control design. Pre-development and allowable post-project flow rates and durations should be determined as discussed in Chapter 6 of the manual.

1. Verify that siting and design criteria have been met, including placement requirements, contributing tributary area, maximum side and finish grade slopes, and the recommended media surface area tributary ratio.
2. Iteratively determine the facility footprint area, surface ponding and/or aggregate storage layer depth required to provide detention and/or infiltration storage to reduce flow rates and durations to allowable limits. Flow rates and durations can be controlled from detention

storage by altering outlet structure orifice size(s) and/or water control levels. Multi-level orifices can be used within an outlet structure to control the full range of flows.

3. If biofiltration with partial retention cannot fully provide the flow rate and duration control required by this manual, an upstream or downstream structure with significant storage volume such as an underground vault can be used to provide remaining controls.
4. After biofiltration with partial retention has been designed to meet flow control requirements, calculations must be completed to verify if storm water pollutant control requirements to treat the DCV have been met.

be classified as biofiltration BMPs if they (1) meet the minimum design criteria listed in this appendix, including the pollutant treatment performance standard in Appendix F.1, (2) are designed and maintained in a manner consistent with their performance certifications (See explanation in Appendix F.2), if applicable, and (3) are acceptable at the discretion of the City Engineer. The applicant may be required to provide additional studies and/or required to meet additional design criteria beyond the scope of this document in order to demonstrate that these criteria are met.

Organization

The checklist in this appendix is organized into the seven (7) main objectives associated with biofiltration BMP design. It describes the associated minimum criteria that must be met in order to qualify a biofiltration BMP as meeting the biofiltration standard. The seven main objectives are listed below. Specific design criteria and associated manual references associated with each of these objectives is provided in the checklist in the following section.

1. Biofiltration BMPs shall be allowed only as described in the BMP selection process in this manual (i.e., retention feasibility hierarchy).
2. Biofiltration BMPs must be sized using acceptable sizing methods described in this manual.
3. Biofiltration BMPs must be sited and designed to achieve maximum feasible infiltration and evapotranspiration.
4. Biofiltration BMPs must be designed with a hydraulic loading rate to maximize pollutant retention, preserve pollutant control/sequestration processes, and minimize potential for pollutant washout.
5. Biofiltration BMPs must be designed to promote appropriate biological activity to support and maintain treatment processes.
6. Biofiltration BMPs must be designed to prevent erosion, scour, and channeling within the BMP.
7. Biofiltration BMP must include operations and maintenance design features and planning considerations to provide for continued effectiveness of pollutant and flow control functions.

Biofiltration Criteria Checklist

The applicant shall provide documentation of compliance with each criterion in this checklist as part of the project submittal. The right column of this checklist identifies the submittal information that is recommended to document compliance with each criterion. Biofiltration BMPs that substantially meet all aspects of Fact Sheets PR-1 or BF-1 should still use this checklist; however additional documentation (beyond what is already required for project submittal) should not be required.

1	**Biofiltration BMPs shall be allowed to be used only as described in the BMP selection process based on a documented feasibility analysis.** Intent: This manual defines a specific prioritization of pollutant treatment BMPs, where BMPs that retain water (retained includes evapotranspired, infiltrated, and/or harvested and used) must be used before considering BMPs that have a biofiltered discharge to the MS4 or surface waters. Use of a biofiltration BMP in a manner in conflict with this prioritization (i.e., without a feasibility analysis justifying its use) is not permitted, regardless of the adequacy of the sizing and design of the system.	
☒	The project applicant has demonstrated that it is not technically feasible to retain the full DCV onsite.	Document feasibility analysis and findings in SWQMP per Appendix C.
2	**Biofiltration BMPs must be sized using acceptable sizing methods.** Intent: The MS4 Permit and this manual defines specific sizing methods that must be used to size biofiltration BMPs. Sizing of biofiltration BMPs is a fundamental factor in the amount of storm water that can be treated and also influences volume and pollutant retention processes.	
☒	The project applicant has demonstrated that biofiltration BMPs are sized to meet one of the biofiltration sizing options available (Appendix B.5).	Submit sizing worksheets (Appendix B.5) or other equivalent documentation with the SWQMP.
3	**Biofiltration BMPs must be sited and designed to achieve maximum feasible infiltration and evapotranspiration.** Intent: Various decisions about BMP placement and design influence how much water is retained via infiltration and evapotranspiration. The MS4 Permit requires that biofiltration BMPs achieve maximum feasible retention (evapotranspiration and infiltration) of storm water volume.	
☐	The biofiltration BMP is sited to allow for maximum infiltration of runoff volume based on the feasibility factors considered in site planning efforts. It is also designed to maximize evapotranspiration through the use of amended media and plants (biofiltration designs without amended media and plants may be permissible; see Item 5).	Document site planning and feasibility analyses in SWQMP per Section 5.4.
☒	For biofiltration BMPs categorized as "Partial Infiltration Condition," the infiltration storage depth in the biofiltration design has been selected to drain in 36 hours (+/-25%) or an alternative value shown to maximize infiltration on the site.	Included documentation of estimated infiltration rate per Appendix D; provide calculations using Appendix B.4 and B.5 to show that the infiltration storage depth meets this criterion. Note, depths that are too shallow or too deep may not be acceptable.

☒	For biofiltration BMP locations categorized as "Partial Infiltration Condition," the infiltration storage is over the entire bottom of the biofiltration BMP footprint.	Document on plans that the infiltration storage covers the entire bottom of the BMP (i.e., not just underdrain trenches); or an equivalent footprint elsewhere on the site.
☒	For biofiltration BMP locations categorized as "Partial Infiltration Condition," the sizing factor used for the infiltration storage area is not less than the minimum biofiltration BMP sizing factors calculated using Worksheet B.5.1.	Provide a table that compares the minimum sizing factor per Worksheet B.5.1 to the provided sizing factor. Note: The infiltration storage area could be a separate storage feature located downstream of the biofiltration BMP, not necessarily within the same footprint.
☒	An impermeable liner or other hydraulic restriction layer is only used when needed to avoid geotechnical and/or subsurface contamination issues in locations identified as "No Infiltration Condition."	If using an impermeable liner or hydraulic restriction layer, provide documentation of feasibility findings per Appendix C that recommend the use of this feature.
☐	The use of "compact" biofiltration BMP design[8] is permitted only in conditions identified as "No Infiltration Condition" and where site-specific documentation demonstrates that the use of larger footprint biofiltration BMPs would be infeasible.	Provide documentation of feasibility findings that recommend no infiltration is feasible. Provide site-specific information to demonstrate that a larger footprint biofiltration BMP would not be feasible.
4	**Biofiltration BMPs must be designed with a hydraulic loading rate to maximize pollutant retention, preserve pollutant control processes, and minimize potential for pollutant washout.** Intent: Various decisions about biofiltration BMP design influence the degree to which pollutants are retained. The MS4 Permit requires that biofiltration BMPs achieve maximum feasible retention of storm water pollutants.	

[8]Compact biofiltration BMPs are defined as features with infiltration storage footprint less than the minimum sizing factors required to achieve 40% volume retention. Note that if a biofiltration BMP is accompanied by an infiltrating area downstream that has a footprint equal to at least the minimum sizing factors calculated using Worksheet B.5.1 assuming a partial infiltration condition, then it is not considered to be a compact biofiltration BMP for the purpose of Item 4 of the checklist. For potential configurations with a higher rate biofiltration BMP upstream of an larger footprint infiltration area, the BMP would still need to comply with Item 5 of this checklist for pollutant treatment effectiveness.

☒	Media selected for the biofiltration BMP meets minimum quality and material specifications per Appendix F.4 or County LID Manual, including the maximum allowable design filtration rate and minimum thickness of media.	Provide documentation that media meets the specifications in Appendix F.4 or County LID Manual.
	OR	
☐	Alternatively, for proprietary designs and custom media mixes not meeting the media specifications contained in Appendix F.4 or County LID Manual, field scale testing data are provided to demonstrate that proposed media meets the pollutant treatment performance criteria in Section F.1 below.	Provide documentation of performance information as described in Section F.1.
☒	To the extent practicable, filtration rates are outlet controlled (e.g., via an underdrain and orifice/weir) instead of controlled by the infiltration rate of the media.	Include outlet control in designs or provide documentation of why outlet control is not practicable.
☒	The water surface drains to at least 12 inches below the media surface within 24 hours from the end of storm event flow to preserve plant health and promote healthy soil structure.	Include calculations to demonstrate that drawdown rate is adequate. Surface ponding drawdown time greater than 24-hours but less than 96 hours may be allowed at the discretion of the City Engineer if certified by a landscape architect or agronomist.
☒	If nutrients are a pollutant of concern, design of the biofiltration BMP follows nutrient-sensitive design criteria.	Follow specifications for nutrient sensitive design in Fact Sheet BF-2. Or provide alternative documentation that nutrient treatment is addressed and potential for nutrient release is minimized.
☒	Media gradation calculations demonstrate that migration of media between layers will be prevented and permeability will be preserved.	Follow specification for choking layer in Fact Sheet PR-1 or BF-1. Or include calculations to demonstrate that choking layer is appropriately specified.
5	**Biofiltration BMPs must be designed to promote appropriate biological activity to support and maintain treatment processes.** Intent: Biological processes are an important element of biofiltration performance and longevity.	

☒	Plants have been selected to be tolerant of project climate, design ponding depths and the treatment media composition.	Provide documentation justifying plant selection. Refer to the plant list in Appendix E.20.
☒	Plants have been selected to minimize irrigation requirements.	Provide documentation describing irrigation requirements for establishment and long term operation.
☒	Plant location and growth will not impede expected long-term media filtration rates and will enhance long term infiltration rates to the extent possible.	Provide documentation justifying plant selection. Refer to the plant list in Appendix E.20.
☐	If plants are not part of the biofiltration design, other biological processes are supported as needed to sustain treatment processes (e.g., biofilm in a subsurface flow wetland).	For biofiltration designs without plants, describe the biological processes that will support effective treatment and how they will be sustained. Refer to Appendix F.3
6	**Biofiltration BMPs must be designed with a hydraulic loading rate to prevent erosion, scour, and channeling within the BMP.** Intent: Erosion, scour, and/or channeling can disrupt treatment processes and reduce biofiltration effectiveness.	
☒	Scour protection has been provided for both sheet flow and pipe inflows to the BMP, where needed.	Provide documentation of scour protection as described in Fact Sheets PR-1 or BF-1 or approved equivalent.
☐	Where scour protection has not been provided, flows into and within the BMP are kept to non-erosive velocities.	Provide documentation of design checks for erosive velocities as described in Fact Sheets PR-1 or BF-1 or approved equivalent.
☐	For proprietary BMPs, the BMP is used in a manner consistent with manufacturer guidelines and conditions of its third-party certification[9] (i.e., maximum tributary area, maximum inflow velocities, etc., as applicable).	Provide copy of manufacturer recommendations and conditions of third-party certification.

[9]Certifications or verifications issued by the Washington Technology Acceptance Protocol-Ecology program and the New Jersey Corporation for Advanced Technology programs are typically accompanied by a set of guidelines regarding appropriate design and maintenance conditions that would be consistent with the certification/verification

7	**Biofiltration BMP must include operations and maintenance design features and planning considerations for continued effectiveness of pollutant and flow control functions.** Intent: Biofiltration BMPs require regular maintenance in order provide ongoing function as intended. Additionally, it is not possible to foresee and avoid potential issues as part of design; therefore plans must be in place to correct issues if they arise.	
☒	The biofiltration BMP O&M plan describes specific inspection activities, regular/periodic maintenance activities and specific corrective actions relating to scour, erosion, channeling, media clogging, vegetation health, and inflow and outflow structures.	Include O&M plan with project submittal as described in Chapter 7.
☒	Adequate site area and features have been provided for BMP inspection and maintenance access.	Illustrate maintenance access routes, setbacks, maintenance features as needed on project water quality plans.
☐	For proprietary biofiltration BMPs, the BMP maintenance plan is consistent with manufacturer guidelines and conditions of its third-party certification (i.e., maintenance activities, frequencies).	Provide copy of manufacturer recommendations and conditions of third-party certification.

City of San Diego
TRANSPORTATION & STORM WATER

ATTACHMENT 2
BACKUP FOR PDP HYDROMODIFICATION CONTROL MEASURES

This is the cover sheet for Attachment 2.

X Mark this box if this attachment is empty because the project is exempt from PDP hydromodification management requirements.

Indicate which Items are Included behind this cover sheet:

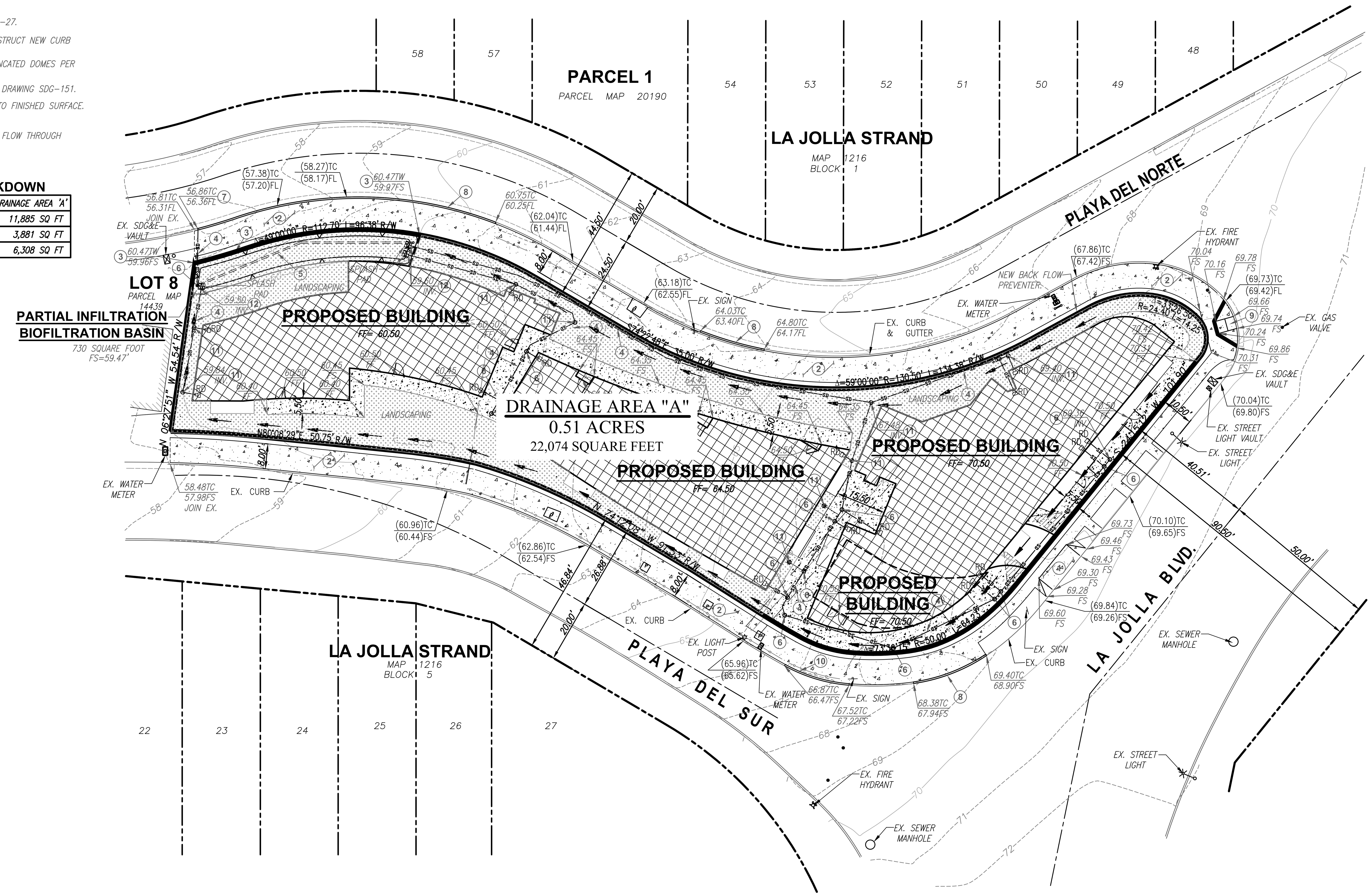
Attachment Sequence	Contents	Checklist
Attachment 2a	Hydromodification Management Exhibit (Required)	☐ Included See Hydromodification Management Exhibit Checklist on the back of this Attachment cover sheet.
Attachment 2b	Management of Critical Coarse Sediment Yield Areas (WMAA Exhibit is required, additional 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, including Structural BMP Drawdown Calculations and Overflow Design Summary (Required)	☐ 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

CONSTRUCTION NOTES

1. CONSTRUCT 20' DRIVEWAY 7.5" P.C.C. PAVEMENT OVER 95% COMPACTED SOIL (PER SOILS ENGINEER).
2. CONSTRUCT CONCRETE SIDEWALK PER SDG-155, 8.0' WIDE MIN. UNLESS OTHERWISE NOTED.
3. CONSTRUCT RETAINING WALL PER SDRSD C-3.
4. INSTALL 6" PVC SOLID STORM DRAIN @ 0.50% MIN (TYP).
5. INSTALL 6" PVC PERFORATED UNDERDRAIN.
6. INSTALL 6" PVC TEE WITH 6" PVC VERTICAL RISER TO FINISHED SURFACE. INSTALL 6" DIA. CATCH BASIN WITH FLAT GRATE.
7. INSTALL SIDEWALK UNDERDRAIN-PIPE OUTLET PER D-27.
8. SAWCUT AND REMOVE & CLOSE EX. DRIVEWAY. CONSTRUCT NEW CURB AND GUTTER PER STANDARD DRAWING SDG-151.
9. CONSTRUCT SINGLE TYPE ADA ACCESS RAMP W/TRUNCATED DOMES PER SDG-132 TYPE A. SEE DETAIL HEREON.
10. CONSTRUCT NEW CURB AND GUTTER PER STANDARD DRAWING SDG-151.
11. INSTALL 6" PVC TEE WITH 6" PVC VERTICAL RISER TO FINISHED SURFACE. INSTALL 6" DIA. CATCH BASIN WITH ATRIUM GRATE.
12. OUTLET SITE STORM DRAIN @ 3'x3' SPLASH PAD AT FLOW THROUGH PLANTERS FINISHED SURFACE.

DRAINAGE AREA DMA BREAKDOWN

DRAINAGE AREA SURFACE	SYMBOL	SOIL TYPE	DRAINAGE AREA 'A'
BUILDING ROOFTOP		D	11,885 SQ FT
HARSCAPING/SIDEWALK		D	3,881 SQ FT
LANDSCAPING AREA		D	6,308 SQ FT



LEGEND:

- EXISTING CONTOURS
- EXISTING DIRECTION OF DRAINAGE
- DRAINAGE AREA
- "A" DRAINAGE MANAGEMENT AREA DESIGNATION

IMPERVIOUS AREAS (POST-DEV):

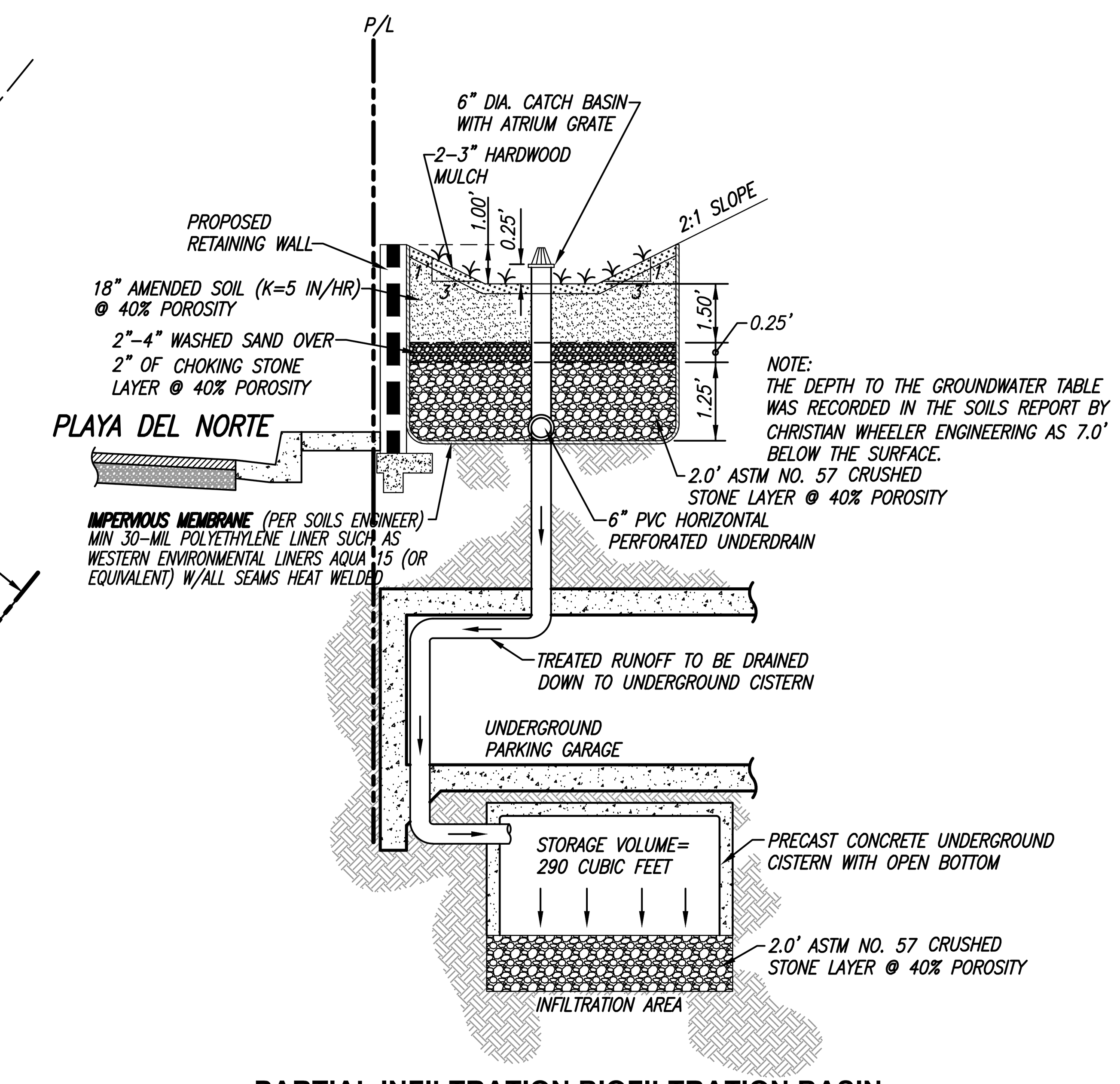
TOTAL LOT AREA = 22,074 sf (0.51 AC)

ROOF TOP AREA = 11,885 sf
PAVEMENT AREA = 3,881 sf
LANDSCAPING = 6,308 sf

IMPERVIOUS AREA:

TOTAL LOT AREA = 22,074 sf (0.51 AC)

EXISTING IMPERVIOUS AREA PRE-CONSTRUCTION = 21,538 sf
PROPOSED IMPERVIOUS AREA POST-CONSTRUCTION = 15,766 sf
IMPERVIOUS AREA DECREASE = 5,772 sf



PARTIAL INFILTRATION BIOFILTRATION BASIN

TYPICAL SECTION & OUTLET CONNECTION
NOT-TO-SCALE

PARTIAL INFILTRATION BIOFILTRATION BASIN MEDIA

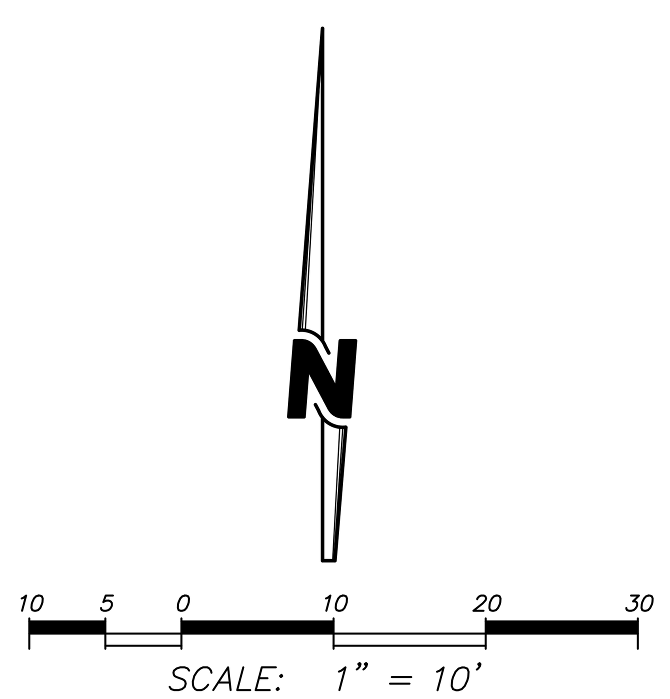
18" AMENDED SOIL LAYER
COMPOSITION AND TEXTURE:
65% SAND, 20% SANDY LOAM, & 15% COMPOST (FROM VEGETATION-BASED FEEDSTOCK). ANIMAL WASTES OR BY-PRODUCTS SHOULD NOT BE APPLIED.

PERMEABILITY:
5 IN/HR INFILTRATION RATE FOR THE FLOW-BASED SUSMP METHOD
(1-6IN/HR FOR ALTERNATIVE DESIGNS, AS APPROVED BY LOCAL JURISDICTION).

CHEMICAL COMPOSITION: TOTAL PHOSPHORUS < 15 PARTS PER MILLION (PPM); PH 6-8; CATION EXCHANGE CAPACITY > 5 MILLIEQUIVALENTS PER 100 GRAMS (MEQ/100 G) OF SOIL; ORGANIC MATTER CONTENT < 5 PERCENT BY WEIGHT.

18" DRAINAGE LAYER
SEPARATE SOIL MEDIA FROM UNDERDRAIN LAYER WITH 2 TO 4 INCHES OF WASHED SAND, FOLLOWED BY 2 INCHES OF CHOKING STONE (ASTM NO. 8) OVER A 1.0-FOOT ENVELOPE OF ASTM NO. 57 STONE.

SURFACE VEGETATION
AS SPECIFIED BY THE LANDSCAPE ARCHITECT PLANS.



PLANS PREPARED BY:
SPEAR & ASSOCIATES, INC.
CIVIL ENGINEERING & LAND SURVEYING
475 PRODUCTION STREET, SAN MARCOS, CA 92078
PHONE (760) 736-2040 FAX (760) 736-4866
WWW.SPEARINC.NET

REGISTERED PROFESSIONAL ENGINEER
DANNY ABADA
No. 45381
CIVIL
STATE OF CALIFORNIA

POST DEVELOPMENT DRAINAGE AREA MAP FOR:
6738 LA JOLLA BLVD.
BLOCK 9, MAP NO.355

PLOT DATE: 8/24/2016 9:04 AM S:\Spear_Projects\2015\15-193 MP ACQUISITIONS - SU CASA, LA JOLLA\CAD\15-193Post Dev.dwg

SPEAR & ASSOCIATES JOB No. 15-223 JRZ


Nautilus St
South Ln
Bonair St
Neptune Pl
Playa Del Norte
Playa Del Sur
Vista Del Mar Ave
Gravilla St
La Jolla Blvd
Electric Ave
15-193 Su Casa
SITE
PACIFIC OCEAN
EXISTING CURB OUTLET
EXISTING CURB INLET
© 2016 INEGI
© 2016 Google
1994
N
LEGEND:
HARDENED CONVEYANCE SYSTEM
(City Curb & Gutter)

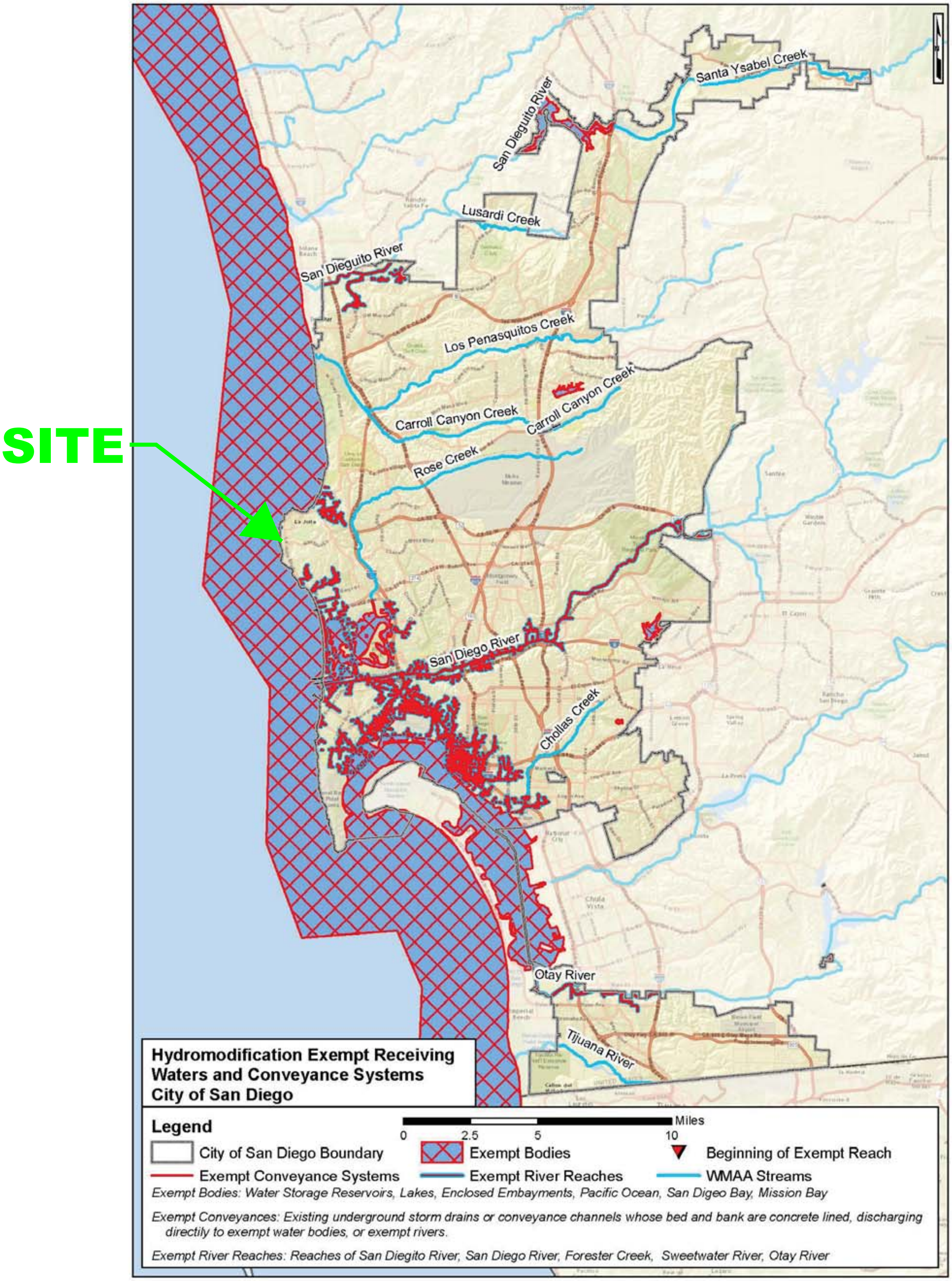


Figure H-G.2-2 Hydromodification Exempt Areas

Receiving Waters and Conveyance Systems Exempt from Hydromodification Management Requirements

Exhibit Date: Sept. 8, 2014

Geosyntec consultants

RICK ENGINEERING COMPANY

ATTACHMENT 3
Structural BMP Maintenance Information

This is the cover sheet for Attachment 3.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	**Contents**	**Checklist**
Attachment 3a	Structural BMP Maintenance Thresholds and Actions (Required)	Included See Structural BMP Maintenance Information Checklist on the back of this Attachment cover sheet.
Attachment 3b	Draft Maintenance Agreement (when applicable)	☐ Included ☐ Not Applicable

ATTACHMENT 3a

Structural BMP Maintenance Thresholds and Actions

OPERATION & MAINTENANCE (O&M)

1. Contents

ATTACHMENTS

A1. Inspection & Maintenance Schedule

B1. Cost Estimate

C1. BMP Training Log

D1. Inspection & Maintenance Log

E1. BMP Specifications

1. PROJECT DESCRIPTION

The project consists of the removal of an existing restaurant and parking lot and redeveloping the site with three buildings with two elevators and underground parking, for a mixed use residential and commercial development. The development will also include the associated underground utilities, landscaping, and stormwater treatment BMPs.

2. OPERATION & MAINTENANCE PLAN

The Operation and Maintenance Plan (O&M) needs to address construction and post-construction concerns as shown in the Storm Water Mitigation Plan. Refer to this project's Storm Water Management Plan (SWMP) for additional information on BMPs. (See enclosed attachment for location of BMPs)

3. Operation & Maintenance of BMP'S

It shall be the responsibility of the owner to maintain and to train all employees for the maintenance and operation of all BMPs, to achieve the maximum pollutant reduction they are designed for, as addressed in the approved Project's SWMP. The following schedule of (O&M's) must be followed to satisfy the Conditions of Concern and the Pollutants of Concern as addressed in the approved Project's SWMP and the City's SUSMP. This schedule shall include periodic inspections of all Source Control and Treatment Control BMP's. All maintenance records for training, inspection and maintenance shall be kept for a minimum of five (5) years.

All BMPs shall be inspected 30 days prior to October 1st each year and certified to the City Engineering Department as to their readiness to receive runoff from the annual rainfall season (See enclosed attachment for a more detailed schedule of maintenance)

The owner will also, provide to the City as part of the maintenance and operation agreement an executed access easement that shall be binding on the land throughout the life of the project, until such time that the storm water BMPs requiring access are replaced satisfactory to the City Engineer.

Responsible Party for O&M and For Training

MB Property Acquisitions, LLC
Contact: Michael Blumenthal
110 Pacific Ave, Suite 350, San Francisco, CA 94111
Phone: (415) 516-0841

A. Training

Training of Operation and Maintenance personnel is of primary importance to provide knowledge of the operation and maintenance of BMPs. Proper training shall provide information that will enable employees to in place an effective preventive maintenance
Program as described in this O & M manual. The responsible party mentioned above should take the course provided by the “BULDING INDUSTRIES ASSOCIATION of SAN DIEGO COUNTY” to be trained in the purpose and use of BMPs and the maintenance thereof. Proper preventive maintenance will prevent environmental incidents that may be a health and safety hazard. Also, the responsible party should refer to the following web site for resource information: www.caBMPhanbooks.com

New employees should be trained as to the purpose and proper maintenance within the first week of their employment.

Employee training shall include receiving a copy of this O & M manual; a discussion on the location and purpose of site specific BMPs, such as Source Control and Treatment Control BMPs; trained on how to inspect and report maintenance problems and to whom they report to; They shall be trained in site specific Pollutants of Concern so that they can evaluate the functioning of all on-site BMPs this to avoid environmental incidents. These Pollutants of are given in this report under Section 2.

A log of all training and reported inspections and maintenance problems along with what was done to correct the problem shall be keep on the premises at all times for a minimum of five (5) years.

Employees shall be periodically trained, at a minimum of once a year, to refresh their abilities to Operate and Maintain all on-site BMPs.

B. Landscaping

Operational and maintenance needs include:

- Vegetation management to maintain adequate hydraulic functioning and to limit habitat for disease-carrying animals.
- Animal and vector control.
- Periodic sediment removal to optimize performance.

- Trash, debris, grass trimmings, tree pruning, and leaf collection and removal to prevent obstruction of a landscape areas so as not to prohibit their use as a BMP and monitoring irrigation equipment.
- Removal of standing water, which may contribute to the development of aquatic plant communities or mosquito breeding areas.
- Preventive maintenance on sampling, flow measurement, and associated BMP equipment and structures.
- Erosion and structural maintenance to prevent the loss of soil and maintain the performance of all landscaping.

Inspection Frequency

The facility will be inspected and inspection visits will be completely documented:
Once a month at a minimum.
After every large storm (after every storm monitored or these storms with more than 0.50 inch of precipitation.)
On a weekly basis during extended periods of wet weather.

Inspect for proper irrigation and fertilizer use, and ensure that all landscaped areas have minimum of 80% coverage.

Aesthetic Maintenance

The following activities will be included in the aesthetic maintenance program:

Grass Trimming: Trimming of grass will be done on all landscaped areas, around fences, at the inlet and outlet structures, and sampling structures.
Weed Control. Weeds will be removed through mechanical means. Herbicide will not be used because these chemicals may impact the water quality monitoring.

Functional Maintenance

Functional maintenance has two components:

- Preventive maintenance
- Corrective maintenance

Preventive Maintenance

Preventive maintenance activities to be instituted for landscaped areas are:

- Grass Mowing: Vegetation seed, mix within the landscaped areas, are to be designed to be kept short to maintain adequate hydraulic functioning and to limit the development of faunal habitats.
- Trash and Debris: During each inspection and maintenance visit to the site, debris and trash removal will be conducted to reduce the potential for inlet and outlet structures and other components from becoming clogged and inoperable during storm events.

- Sediment Removal: Sediment accumulation, as part of the operation and maintenance program at of landscaped areas, will be monitored once a month during the dry season, after every large storm (0.50 inch), and monthly during the wet season. Specifically, if sediment reaches a level at or near plant height, or could interfere with flow or operation, the sediment will be removed. If accumulation of debris or sediment is determined to be the cause of decline in design performance, prompt action (i.e., within ten working days) will be taken to restore the landscaped areas to design performance standards. Actions will include using additional fill and vegetation and/or removing accumulated sediment to correct channeling or ponding. Characterization and Appropriate disposal of sediment will comply with applicable local, county, state, or federal requirements. The landscaped areas will be re-graded, if the flow gradient has changed, and then replanted with sod.
- Removal of Standing Water: Standing water must be removed if it contributes to the development of aquatic plant communities or mosquito breeding areas.
- Fertilization and Irrigation: The vegetation seed mix is to been designed so that fertilization and irrigation is to be keep at a minimum. Elimination of Mosquito Breeding Habitats. The most effective mosquito control program is one that eliminates potential breeding habitats.

Corrective Maintenance

Corrective maintenance is required on an emergency or non-routine basis to correct problems and to restore the intended operation and safe function of all landscaped areas.

Corrective maintenance activities include:
Removal of Debris and Sediment: Sediment, debris, and trash, which impede the hydraulic functioning of landscaping and prevent vegetative growth, will be removed and properly disposed. Temporary arrangements will be made for handling the sediments until a permanent arrangement is made. Vegetation will be re-established after sediment removal.
Structural Repairs: Once deemed necessary, repairs to structural components of landscaping will be done within 10 working days. Qualified individuals (i.e., the designers or contractors) will conduct repairs where structural damage has occurred.
Embankment and Slope Repairs: Once deemed necessary, damage to the embankments and slopes of landscaped areas will be repaired within 10 working days.
Erosion Repair: Where a reseeding program has been ineffective, or where other factors have created erosive conditions (i.e., pedestrian traffic, concentrated flow, etc.), corrective steps will be taken to prevent loss of soil and any subsequent danger to the performance and use of landscaped areas as BMPs. There are a number of corrective actions than can be taken.
These include erosion control blankets, riprap, sodding, or reduced flow through the area. Designers or contractors will be consulted to address erosion problems if the solution is not evident.

Elimination of Animal Burrows

Animal burrows will be filled and steps taken to remove the animals if burrowing problems continue to occur (filling and compacting). If the problem persists, vector control specialists will be consulted regarding removal steps. This consulting is necessary as the threat of rabies in some areas may necessitate the animals being destroyed rather than relocated. If the BMP performance is affected, abatement will begin. Otherwise, abatement will be performed annually in September.

General Facility Maintenance: In addition to the above elements of corrective maintenance, general corrective maintenance will address the overall facility and its associated components. If corrective maintenance is being done to one component, other components will be inspected to see if maintenance is needed.

Maintenance Frequency

The maintenance indicator document included in enclosed attachment for all BMPs lists the schedule of maintenance activities to be implemented.

Debris and Sediment Disposal

Waste generated at Swales is ultimately the responsibility of the Owner. Disposal of sediments, debris, and trash will comply with applicable local, county, state, and federal waste control programs.

Hazardous Waste

Suspected hazardous wastes will be analyzed to determine disposal options. Hazardous wastes generated onsite will be handled and disposed of according to applicable local, state, and federal regulations. A solid or liquid waste is considered a hazardous waste if it exceeds the criteria listed in the CCR, Title 22, Article 11.

C. Irrigation System

Inspection Frequency and Procedure

The Irrigation system shall be checked each week as a minimum. The following items shall be checked to insure that they are functioning properly:

- Shut-off devices.
- All piping and sprinkler heads to insure there are no leaks and that proper water spread is maintained.
- All flow reducers.
- Check for overspray/runoff

D. Roof Drains

All roof drains shall be inspected 30 days prior to October 1st of each year to insure that they are clean and free from trash and in good repair. They shall be flushed and any leaks or damages piping shall be either replaced or repaired. Where roof drains flow onto grass areas splash structures and or rock rip-rap shall be maintained so the flow from the roof drains do not cause erosion or damage to the grass area. During the rain season roof drains shall be inspected weekly and after each rain storm to insure that there is no trash and or silt build up that will restrict the run-off flow from the roof. All trash and/or silt build up shall be removed immediately.

E. Storm Water Conveyance System Stenciling and Signing

- Signage/stenciling are to be inspected for legibility and visual obstruction and shall be Repaired and cleared of any obstruction within 5 working day of inspection.

F. Structural BMP: Biofiltration

Vegetated Infiltration or Filtration BMP

Maintenance Indicators and Actions for Vegetated BMPs

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 (e.g. a vegetated swale may require a minimum vegetation height).
Erosion due to concentrated irrigation flow	Repair/re-seed/re-plant eroded areas and adjust the irrigation system.
Erosion due to concentrated storm water runoff flow	Repair/re-seed/re-plant eroded areas, and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, The County must be contacted prior to any additional repairs or reconstruction.
Standing water in vegetated swales	Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, loosening or replacing top soil to allow for better infiltration, or minor re-grading for proper drainage. If the issue is not corrected by restoring the BMP to the original plan and grade, City staff in the Watershed Protection Program must be contacted prior to any additional repairs or reconstruction.
Standing water in bioretention, biofiltration with partial retention, or biofiltration areas, or flow-through planter boxes for longer than 96 hours following a storm event*	Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, clearing underdrains (where applicable), or repairing/replacing clogged or compacted soils.
Obstructed inlet or outlet structure	Clear obstructions.
Damage to structural components such as weirs, inlet or outlet structures	Repair or replace as applicable.
*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 Frequency

The facility will be inspected and inspection visits will be completely documented:
- Once a month at a minimum.
- After every large storm (after every storm monitored or these storms with more than 0.50 inch of precipitation.)
- On a weekly basis during extended periods of wet weather.

Maintenance is needed if vegetation height is greater than 5” (height shall be kept between 2” and 5”); if there is standing water; if debris are present or if sedimentation is occurring at the vegetation height; ensure that all landscaped areas have minimum of 80% coverage and that no animal burrows are present.

<u>Visual Inspection as part of landscape maintenance</u>
- Inspect before and after the rainy season (October 1 through April 30).

Maintenance Category 2
Minimally, the responsible party must provide annual documentation to the County verifying that the BMPs are maintained and functioning properly. However, if the responsible party fails to perform maintenance, the County (in a "backup" role) may be required to perform the maintenance; therefore security funding is required. Maintenance securities are required for an interim 5-year period. However, maintenance responsibilities remain in perpetuity.

Category 2 Mechanisms to Assure Maintenance

1. Watershed Protection Ordinance Requirement: WPO Section 67.812 requires ongoing maintenance of BMPs. In the event that the mechanisms below prove ineffective, or in addition to enforcing those mechanisms, civil action, criminal action or administrative citation could also be pursued for violations of the ordinance.

2. Public Nuisance Abatement: Under the WPO failure to maintain a BMP would constitute a public nuisance, which may be abated under the Uniform Public Nuisance Abatement Procedure. This provides an enforcement mechanism additional to the above, and would allow costs of maintenance to be billed to the owner, a lien placed on the property, and the tax collection process to be used.

3. Notice to Purchasers: Section 67.812(e) of the WPO requires developers to provide clear written notification to persons acquiring land upon which a BMP is located, or others assuming a BMP maintenance obligation, of the maintenance duty.

4. Conditions in Ongoing Land Use Permits: For those applications (listed in WPO Section 67.810(a)) upon whose approval ongoing conditions may be imposed, a condition will be added which requires the owner of the land upon which the stormwater facility is located to maintain that facility in accordance with the requirements specified in the maintenance plan. Failure to perform maintenance may then be addressed as a violation of the permit, under the ordinance governing that permit process.

5. Subdivision Public Report: Tentative Map and Tentative Parcel Map approvals will be conditioned to require that, prior to approval of a Final or Parcel Map, the subdivider must provide evidence to the County , that the subdivider to be issued for the sales of lots within the subdivision, a notification regarding the maintenance requirement. (The requirement for this condition would not be applicable to specific subdivisions which are exempt from regulation under the Subdivided Lands Act, or for which no public report will be issued.)

6. BMP Maintenance Agreement with Easement and Covenant: WPO Section 67.812(f) requires that an agreement will be entered into with the County, which will function in three ways:

a. It will commit the land to being used only for purposes of the BMP;

b. It will include an agreement by the landowner to maintain the BMPs in accordance with the maintenance plan (this obligation would be passed on to future purchasers or successors of the landowner, as a covenant); and

c. It will include an easement giving the County the right to enter onto the land (and any necessary adjacent land needed for access) to maintain the BMPs. This would be required of all applications listed in WPO Section 67.810 with Category 2 BMPs. In the case of subdivisions, this easement and covenant would be recorded on or prior to the Final or Parcel Map.

Funding:
The developer must provide the County with security to substantiate the maintenance agreement; security will remain in place for an interim period of 5 years from the date of approval of the structural BMP Verification Acceptance Package. The amount of the security would equal the estimated cost of 2 years of maintenance activities. The security may be a Cash Deposit, Letter of Credit, or other form acceptable to the County. If at any time, owners fail to maintain BMPs and the County must perform any of the maintenance activities, then owners must pay all of County's costs incurred in performing the maintenance as defined in the maintenance agreement.

ATTACHMENT "A1"
INSPECTION & MAINTENANCE SCHEDULE

PREVENTATIVE MAINTENANCE AND ROUTINE INSPECTION					
TYPE BMP	Routine Action	Measurement Indicator	Measurement Frequency	MAINTENANCE ACTIVITY	SITE-SPECIFIC REQUIREMENTS
Landscaping & irrigation	Proper irrigation & Fertilizer.	Less than 80% coverage	30 days prior to October 1st each year	Re-seed or Re-plant. Repair Irrigation system with-in 5-days.	All slopes and landscaped areas are to have a minimum coverage of 80%
Trash storage areas	Trash free and removal of silt		Daily inspection	Remove trash and silt Daily.	All trash storage areas to be free from trash and silt at all times
Roof drain	Trash free and removal of silt, sedimentation & Debris	Silt build up of more than 1" no trash	30 days prior to October 1st each year and weekly during rain season.	Remove all trash and silt and repair any damage to roof drains,	All Roof to be free from trash and silt and in good repair
Storm Water Conveyance system	Must be legible at all times and have a clear view.	Fading of paint or illegible letters or	30 days prior to October 1st each year and weekly during rain	Repaint stenciling and/or replace signs 30	All stenciling and signs

Stenciling & Signing			season & semi-annual	days prior to October 1st.	
Biofiltration Facilities	Trash free and removal of silt. Clear Clogged outlets and Standing Water.	Silt build up of more than 2" no trash, Exposed soils, dead vegetation, ponded water, and excessive vegetation (see TC-30)	30 days prior to October 1st each year, monthly during rainy season, and after Storm Event	Remove trash and silt –repair and reseed exposed areas, maintain grass height so as not be shorter than 2" or higher than 5" remove all ponded water weekly inspections, (See TC-30)	All bio-filters to be free from trash and silt at all times, grass area to be free from exposed soil and maintained to proper height, removal of any ponding of water for more than 72 hours.

ATTACMENT "B1"

Annual Estimate to Maintain all BMPs	Annual	10-Year
Landscaping & Biofiltration		
Maintenance of landscaping is already included in the		
property management responsibilities. Additional cost:	$400	$4,000
Irrigation System:		
Inspection and maintenance of the irrigation system is already included		
in the property management responsibilities, Additional cost:	$100	$1,000
Roof Drains:		
Roof drain inspection and maintenance is already included in the		
property management responsibilities.		
Training:		
Once a year & training of new employees within their first		
week of employment.	$100	$1,000
Stormdrain Signage (As needed or every 2 years)	$100	$1,000
Total Estimated Annual Cost to Maintain BMPs	$700	$7,000

ATTACHMENT "C1"

BMP TRAINING LOG

Date MO/Day/Yr	**Type of Training**	**Personnel Trained**	**Trainer**

ATTACHMENT "D1"

INSPECTION AND MAINTENANCE LOG				
BMP TYP & LOCATION	DATE M/D/Y	Name of Person Inspecting	Description of BMP Condition/ Description repair required if any	Date Repair made and Description repair made and by who

ATTACHMENT “D1”

BMP SPECIFICATIONS

We All Live Downstream!

Clean Water is Important to All of Us!

When rain flows over streets and other surfaces, it picks up pollutants and carries them into the stormwater conveyance "storm drain" system.

Did you know that storm drains are **NOT** connected to sanitary sewer systems and treatment plants?

The storm drain system is designed to prevent flooding by transporting water away from developed areas.

However, this water is not filtered or treated, and all the contaminants it contains eventually flow to our streams, lakes, and ocean where we swim and fish.

Once there, polluted runoff can harm wildlife and habitats. In some cases, it can even cause beach closures or make fish and shellfish unsafe to eat.

Why do we need Clean Water?

Clean water is essential for every aspect of life. In addition to sustaining our local water resources it ensures economic growth and prosperity. Population growth has impacted water quality and placed increasing pressure on supplies. Controlling pollution is critical to preserving our aquatic resources and the economic viability of this region.

How you can help keep our water clean...

Residents of San Diego County can make a difference. Becoming aware of ways to prevent stormwater pollution is the first step toward

We All Live Downstream!

County of San Diego, Watershed Protection Program
Stormwater HOTLINE: (888) 846-0800

project clean water

We All Live Downstream!

Easy Steps to Clean Water

Sweep or Rake

Conserve water.
Do not use a hose to wash off sidewalks, driveways, and patios. Sweep up debris and put it in a trash can. Rake up yard waste to compost or recycle.

Reduce the Use of Landscape Chemicals

Decrease the use of lawn and garden care products such as pesticides, weed killers, and chemical fertilizers. Consider using non-toxic pest control methods. Avoid over watering which may wash these products into the gutter and storm drains.

Buy Non-Toxic Products

When possible, use non-toxic products for household cleaning. If you must use a toxic cleaning product, buy small quantities, use it sparingly, and properly dispose of unused portions. For the Household Hazardous Waste collection facility nearest you, call 1-800 CLEANUP
1(800) 253-2687.

Recycle Used Motor Oil and Earn $$

Certified used oil collection centers will pay a few cents per gallon for used oil. Collect used oil in sealed containers and take it to a certified center. For the certified center nearest you, call 1-800 CLEANUP
1(800) 253-2687.

Dispose of Yard Waste Frequently

By disposing of grass, leaves, shrubs, and other organic matter more frequently — less will wash into storm drains. Request a green waste bin from your trash hauler, or compost your yard waste.

Clean up After Your Pets

Take a bag when you walk your pets and always clean up after them. Flush pet waste down the toilet or dispose of it in a sealed plastic bag and throw it in the trash.

Care for Your Vehicles

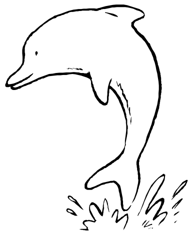
Change your oil routinely.
Fix fluid leaks immediately.
Keep your vehicles tuned-up.
Wash your vehicle at home on an unpaved area, such as lawn or gravel. Use very little soap. Pour remaining soapy water to an indoor sink or toilet. Conserve water by using a shut-off nozzle. Consider using a car wash designed to collect the wash water.

For more information on how you can prevent the pollution of our creeks, rivers, lakes, and ocean or to report a problem, please call the **Stormwater HOTLINE** at **(888) 846-0800** or visit **www.projectcleanwater.org**.

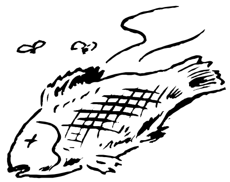
County of San Diego Watershed Protection, Stormwater Management, and Discharge Control Ordinance section 67.805 prohibits the discharge of pollutants to the stormwater conveyance system.

WHAT IS STORMWATER POLLUTION?

When rain flows over streets and other surfaces, it picks up pollutants and carries them into the stormwater conveyance ("storm drain") system. This system is designed to prevent flooding by transporting water away from developed areas.



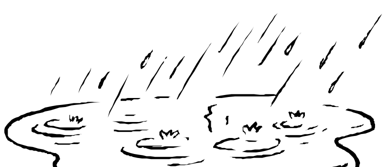
However, this water is not filtered or treated, and all the contaminants it contains eventually flow to our streams, lakes, and ocean where we swim and fish.



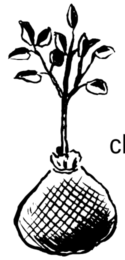
Once there, polluted runoff can harm wildlife and habitats. In some cases, it can even cause beach closures or make fish and shellfish unsafe to eat.

Wastes from yard work are among the many common stormwater pollutants that can degrade water quality. Other examples include paint, oil and automotive fluids, construction debris, pet waste, litter, pool chemicals, and dirty wash water.

ONLY RAIN IN THE STORM DRAIN



HOW DOES YARD WORK POLLUTE STORMWATER?



What you do in the yard can directly impact the quality of our local waters. When soil, organic wastes, and chemicals leave your yard, they flow directly into streams, lakes, and the ocean where they can harm human health and the environment.

OVERWATERING
Over watering washes fertilizers, pesticides, and herbicides into storm drains. In your yard these chemicals kill garden invaders, but when washed into local waters they poison fish and contaminate water.

CHEMICALS The "chemical only" approach to pest control often causes more problems than it solves. Over 90% of the insects in your lawn and garden are not harmful. Many gardeners use pesticides, herbicides, and fertilizers at over 20 times the rate necessary, greatly increasing polluted runoff.

ORGANIC WASTES
Grass clippings, leaves, and tree trimmings swept or blown into streets and gutters carry chemicals into our waterways and can clog catch basins, increasing the risk of flooding. Once they settle into water bodies, these materials begin to decompose, absorbing oxygen fish need to survive.

SEDIMENT Soil and dirt washed from yards can also harm aquatic life by clogging the gills of fish, blocking light transmission, lowering water temperatures, and inhibiting photosynthesis.

WHAT CAN I DO?

Here are some things you can do to keep contaminants out of runoff.

GENERAL LANDSCAPING TIPS

1. Schedule big projects for dry weather.
2. Store stockpiles under plastic tarps to protect them from wind and rain.
3. Store pesticides, fertilizers and other chemicals in a covered area.
4. Use plants that require less water.
5. Prevent erosion by planting fast-growing grasses to shield and bind the soil.

LAWN and GARDEN MAINTENANCE

1. Don't overwater. Use drip irrigation, soaker hoses, or micro-spray systems.
2. Use curbside yard waste recycling or take clippings to a landfill for composting.
3. Don't blow or rake leaves into the street or gutter. Avoid hosing down the pavement.
4. Don't overfertilize or apply chemicals near ditches, streams, or water bodies.

CHEMICAL ALTERNATIVES

1. Don't kill insects that aren't harmful.
2. Use less toxic products, for example dehydrating dusts (such as silica gel), insecticidal soaps, boric acid powder, horticultural oils, pyrethrin-based insecticides, bacterial insecticides, and organic or non-toxic fertilizers.
3. Use predatory insects when possible.
4. If you must use a pesticide, use one that is specifically designed to control your pest (listed on the label). Always read the label and use only as directed.

REFERRAL NUMBERS

For more information on stormwater management

(888) 846-0800

For information on recycling, composting and household toxics

(877) R-1 Earth
(877) 713-2784

To schedule a presentation for your community group or organization

(888) 846-0800

For residential gardening tips or questions please contact the Master Gardener Program

(858) 694-2860

For a daily update on beach and bay closures

(619) 338-2073

project clean water

"clean water through local commitment and action"

Call us for more information:

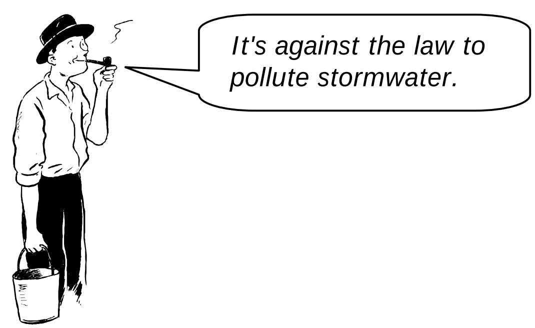
(888) 846-0800

or visit us at our web site:

www.sdcdpw.org

or

www.projectcleanwater.org



County Code §67.805 prohibits the discharge of anything but rainwater to the stormwater conveyance system or receiving waters.

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06/03

STORMWATER POLLUTION PREVENTION

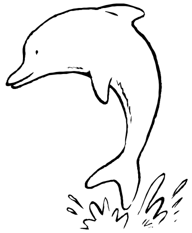
YARD WORK

LANDSCAPING
GARDENING
PEST CONTROL

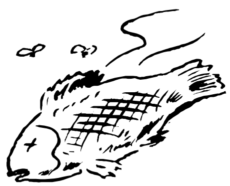
County of San Diego
Watershed Protection Program

WHAT IS STORMWATER POLLUTION?

When rain flows over streets and other surfaces, it picks up pollutants and carries them into the stormwater conveyance ("storm drain") system. This system is designed to prevent flooding by transporting water away from developed areas.



However, this water is not filtered or treated, and all the contaminants it contains eventually flow to our streams, lakes, and ocean where we swim and fish.

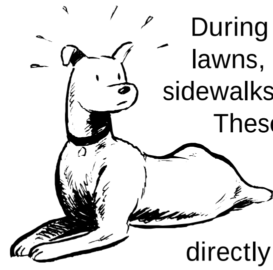


Once there, polluted runoff can harm wildlife and habitats. In some cases, it can even cause beach closures or make fish and shellfish unsafe to eat.

Pet wastes are among the many common stormwater pollutants that can degrade water quality. Other examples include paint, oil and automotive fluids, construction debris, yard wastes, pesticides, litter, pool chemicals, and dirty wash water.

ONLY RAIN IN THE STORM DRAIN

WHY IS IT SO IMPORTANT TO PICK UP AFTER YOUR PET?



During rainfall, pet waste left on lawns, beaches, trails and sidewalks washes into storm drains. These wastes and the pathogens they contain (bacteria, parasites, and viruses) end up flowing directly into streams, lakes and the ocean where they can harm human health and the environment.

As they decompose, pet wastes demand a high level of oxygen from water. This demand can kill fish and plant life by reducing the amount of dissolved oxygen available to them.

Recent studies have shown dogs and cats are sources of fecal contamination at local beaches.

In addition to causing beach closures, this contamination can make people sick with sore throats, intestinal problems, rashes, nausea, and eye and ear infections.

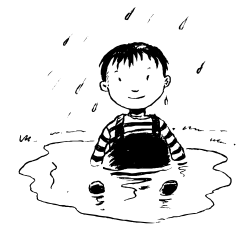
County Code §67.805 prohibits the discharge of anything but rainwater to the stormwater conveyance system or receiving waters.

WHAT CAN I DO?

The next time you're caught outside in the rain, take a look at what's running off the street, into the gutters, and down storm drain inlets.

Clean up pet waste in your yard on a regular basis, to prevent polluted runoff.

Carry a bag or "scooper" when you take your pet on walks, to the park or other public places. Be prepared and clean up the pet waste.

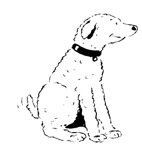


Do your part to help keep our water clean!

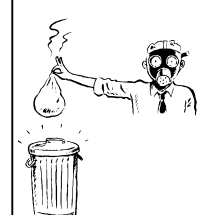
PICK UP AFTER YOUR PET!

It's as easy as 1 - 2 - 3

1. **Bring a bag**



2. **Clean it up**



3. **Dispose of it properly (toilet or trash)**

REFERRAL NUMBERS

For more information on stormwater management

(888) 846-0800

To reach the County Department of Environmental Health

(619) 338-2222

For information on recycling, composting and household toxics

(877)-R-1 Earth
(877) 713-2784

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Or visit us at our web site:

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or

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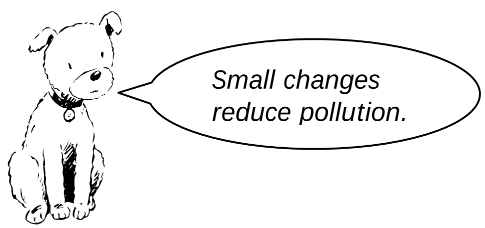
For pet licensing information, visit the

Department of Animal Services web site:

www.sddac.com



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08/03

STORMWATER POLLUTION PREVENTION

PET WASTE

County of San Diego
Watershed Protection Program

Trash Can and Street Sweeping Facts:

- ✓ Street sweepers regularly clean your neighborhood streets of trash, dirt, and leaves as part of El Cajon's Storm Water Pollution Prevention Program. Keeping litter and debris out of the storm drains, streams and the ocean is the purpose of the city's street sweeping program.
- ✓ The sweepers cannot sweep the streets and gutters if there are trash cans or other objects in the way. You can help us be effective in keeping your neighborhood clean by moving your vehicles and removing trash cans from the curbside or street during the hours your street is swept.
- ✓ The El Cajon Municipal Code requires that trash cans not be placed curbside prior to four p.m. on the day prior to the collection and that they be removed from the curb prior to noon on the day following the collection.
- ✓ Although street sweepers do NOT clean streets that do NOT have curbs and gutters, citizens are encouraged to help keep our streets clean by removing trash, soil and debris.

What You Can Do To Help Sweep Our Streets!

DOs	DON'Ts
DO move your trash can, car, boat or RV to allow cleaning at the curb & gutter.	**DON'T** place large trash items, i.e. tree branches, wood, tires, etc. in the sweeper path that can damage the sweeper.
DO remove any and all obstructions from the curb and gutter, i.e., cans, bicycles, skateboards, etc. before sweepers arrive.	**DON'T** sweep litter into the storm drain catch basins and inlets.
DO place all litter/garbage in the proper trash and recycling containers.	**DON'T** allow your gardener to blow trash & debris from your property into the streets. Instead REQUIRE proper disposal & place in Yard Waste Containers.
DO place garbage cans and recycling containers on the curb, not in the gutter/street.	**DON'T** place large leaf piles at the curb.
DO tell your neighbors to support street cleaning by observing the DOs and DON'Ts.	

What's New In Street Sweeping, and

How Street Sweeping Keeps Our Water Clean

The City has purchased new **Elgin Crosswind Street Sweepers**. The Elgin Crosswind is a regenerative type (vacuum) sweeper and uses an airflow system that recirculates and filters air used to carry debris to the internal hopper. A minimum amount of dust is returned to the environment through a dust suppression system that has been tested and certified to collect and retain particles ten microns in diameter or larger. Ten microns is approximately one-seventh the thickness of a human hair.

The Elgin Crosswind recirculating vacuum sweeper efficiently cleans our City streets and provides two primary benefits to the City. The more obvious benefit is the collection and removal of paper, leaves, and other visible debris that collect in gutters and on the streets. In addition to being unsightly, this debris can block catch basins and other storm water facilities, causing localized flooding during heavy rains. An equally important but less visible benefit is the removal of minute metal particles and other hazardous waste products left by cars and trucks. Although they are virtually invisible, these particles can be extremely harmful to fish and other wildlife if they reach creeks, rivers, and eventually the ocean.

Street Cleaning is an integral part of street maintenance and helps the City meet the Clean Water and National Pollution Discharge Elimination System standards set by Federal, State and City laws. Street cleaning is a multi-purpose operation with three primary objectives:

1. Prevent leaves, debris and litter from clogging the storm drain system.
2. Reduce the amount of pollutants that get into storm water runoff and pollute our storm drains, waterways and the ocean.
3. Provide a clean, aesthetically pleasing appearance to City neighborhoods.

The Environmental Protection Agency has named sweeping as one of the "best management practices" to help improve the quality of storm water runoff. The City[1]s new sweepers will help us meet and exceed future EPA regulations.

Street sweeping is an effective method of removing both large and microscopic pollutants that collect on city streets and is paid for through the El Cajon Pollution Prevention Program.

For more information about street cleaning in your neighborhood, call the Public Works Department at (619) 441-1653.

Clean Business Program Fact Sheet

VEHICLE AND EQUIPMENT WASHING AND CLEANING

You are responsible to wash or clean vehicles and equipment (machinery, air filters, grease traps, etc.) properly to avoid contributing pollutants to runoff.

WHY IS WASHING AND CLEANING A CONCERN?

Your facility can contribute contaminants to runoff if waste water from equipment and vehicle cleaning is rinsed onto parking lots or into gutters or storm drains. Improperly stored contaminated rags may also result in an illegal discharge.

WHAT CAN I DO?

PREVENT POLLUTED RUNOFF BY:

- Implementing Best Management Practices (BMPs) as listed below
- Training employees on BMPs, good housekeeping practices & spill response

BEST MANAGEMENT PRACTICES

- If possible use off-site commercial washing and steam cleaning.
- Use designated wash areas, preferably covered, to prevent contact with stormwater. berm wash areas or use other measures to contain waste water.
- Use alternative washing and cleaning methods to reduce the potential for non-stormwater discharges. If possible, use "dry" cleaning methods, such as wiping down, rather than hosing vehicles or equipment.
- Never discharge wastewater to the storm drain. Discharge it to the sanitary sewer after contacting your local sewering agency to find out if pre-treatment is required.
- Properly contain and dispose of cleanup materials (rags, towels, absorbent materials, etc.)
- Clean up spills immediately to minimize safety hazards and prevent discharge to the storm drain system.
- Train all employees. Your success depends on a well-trained staff.

Landscape Maintenance

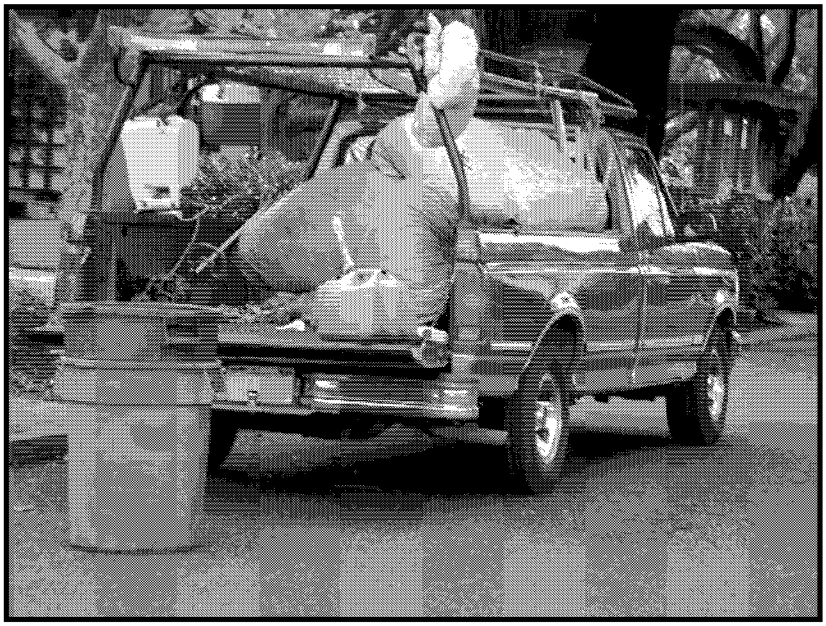

Photo Credit: Geoff Brosseau

Description

This category includes businesses that provide landscaping and landscape maintenance/gardening services.

Pollutant Sources

The following are sources of pollutants:

- Selecting plants or landscape design
- Installing new landscaping
- Maintaining landscapes
- Using pesticides and fertilizers
- Using gas-powered equipment
- Working near waterbodies

Pollutants can include:

- Nutrients (fertilizers, yard wastes)
- Pesticides
- Heavy metals (copper, lead, and zinc)
- Hydrocarbons (fuels, oils and grease)
- Sediments

Approach

Minimize the potential for stormwater pollution and the need for resources/controls (water, pesticides, fertilizers) by creating and maintaining landscapes in a way that is compatible with the local soils, climate, and amount of rain and sun. Make stormwater

CASQA
California Stormwater Quality Association

pollution prevention BMPs a part of standard operating procedures and the employee training program. Provide employee education materials in the first language of employees, as necessary.

Source Control BMPs

The best management practices are listed by activity or area.

Landscape Design

- Specify native, low maintenance, and insectary (attract beneficial insects) plants and landscape designs.
- Design zoned, water-efficient irrigation systems using technologies such drip irrigation, soaker hoses, or microspray systems.
- Do not landscape riparian areas, except to remove non-native plants and replace them with native riparian landscaping.
- Replant with native species where possible when landscaping or building an ornamental pond. Do not assume something is native because you have seen it in your area. Contact the local nursery for information or visit the California Exotic Pest Plant Council website (www.caleppc.org).

Landscape Installation

- Protect stockpiles and landscaping materials from wind and rain by storing them under tarps or secured plastic sheeting.
- Schedule grading and excavation projects during dry weather.
- Divert runoff from exposed soils or lower its velocity by leveling and terracing.
- Use temporary check dams or ditches to divert runoff away from storm drains.
- Protect storm drains with sandbags or other sediment controls.
- Revegetation is an excellent form of erosion control for any site. Keep soils covered with vegetation or temporary cover material (mulch) to control erosion.
- Check plant roots before buying a plant. Do not buy plants with roots are that kinked or circling around the container. Do not buy plants with soft, rotten, or deformed root crowns.
- Do not pile soil around the plant any higher than the root crown.

Landscape Maintenance

Yard Waste

- Allow leaf drop to become part of the mulch layer in tree, shrub, and groundcover areas.
- Keep lawn mower blades sharp and grasscycle.
- Grasscycle – leave grass clippings on the lawn when mowing. Once cut, grass clippings first dehydrate, then decompose, quickly disappearing from view. Proper mowing is required for successful grasscycling. Cut grass when the surface is dry, and keep mower blades sharp. Follow the "1/3 Rule": mow the lawn often enough so that no more than 1/3 of the length of the grass blade is cut in any one mowing. Frequent mowing will produce short clippings that will not cover up the grass surface. The lawn may have to be cut every seven days when the lawn is growing fast but only every 7 to 14 days when the lawn is growing slowly.

- Do not leave clippings on pavement or sidewalks where they can wash off into the street, gutter, or storm drain.
- Collect lawn and garden clippings, pruning waste, and tree trimmings. Chip if necessary, and compost or take to the local municipal yard waste recycling/composting facility.
- In communities with curbside pick-up of yard waste, place clippings and pruning waste at the curb in approved bags or containers. No curbside pickup of yard waste is available for commercial properties.
- Do not blow or rake leaves or other yard waste into the street, or place yard waste in gutters or on dirt shoulders, unless it is being piled up for recycling (allowed by some municipalities). After pick-up, sweep up any leaves, litter, or residue in gutters or on street.

Fertilizing and Pruning

- Perform soil analysis seasonally to determine actual fertilization need and application rates.
- Fertilize garden areas with a mulch of leaves, bark, or composted manure and/or garden waste.
- Apply chemical fertilizer only as needed, when plants can best use it, and when the potential for it being carried away by runoff is low. Make sure the fertilizer spreader is calibrated.
- Prune plants sparingly, if at all. A healthy plant – one that is native to the area and growing under the right conditions – should not need pruning, except when it is not in the right location (where safety or liability is a concern).

Watering

- Use soil probes to determine soil moisture depth, overall moisture levels, and the need to adjust irrigation schedules.

Pest and Weed Control

- Anyone who is in the business of landscape maintenance and performs pest control as part of providing that service must have a license from the state to apply pesticides. Contact the Department of Pesticide Regulation for more information.
- Become trained in and offer customers less-toxic pest control or Integrated Pest Management (IPM).
- The label on a pesticide container is a legal document. Use a pesticide only as instructed on the label.
- Store pesticides, fertilizers, and other chemicals indoors or in a shed or storage cabinet.
- Use pesticides sparingly, according to instructions on the label. Rinse empty containers, and use rinsewater as product.
- Dispose of rinsed, empty containers in the trash. Dispose of unused pesticides as hazardous waste.
- To control weeds, use drip irrigation and mulch. Hand-pull weeds including roots or cut down to ground. Repeat cutting before they flower, grow new leaves, or go to seed. Use herbicides containing pelargonic acid or herbicidal soap as a last resort.

Handling Gasoline

- Use only containers approved by a nationally recognized testing lab, such as Underwriters Laboratories (UL). Keep the container tightly sealed. Containers should be fitted with a spout to allow pouring without spilling and to minimize the generation of vapors.
- Fill cautiously. Always use a funnel and/or spout to prevent spilling or splashing when fueling power mowers, blowers, and all other gas-powered equipment.
- Avoid spilling gasoline on the ground, especially near wells. If a spill occurs use kitty litter, saw dust, or an absorbent towel to soak up the spill, then dispose of it properly.
- Store carefully. Gasoline moves quickly through soil and into groundwater, therefore, store and use gasoline and fuel equipment as far away from your drinking water well as possible. Be certain to keep a closed cap on the gasoline container. Store at ground level, not on a shelf to minimize the danger of falling and spilling.
- Do not dispose of gasoline down the drain, into surface water, onto the ground, or in the trash. Contact the local municipality for directions on proper disposal of excess or old gasoline. Transport old gas in an approved gasoline container.

Working Near Waterbodies

- Do not dump lawn clippings, other yard waste, or soil along creek banks or in creeks.
- Do not store stockpiles of materials (soil, mulch) along creek banks. These piles can erode over time into a creek.
- Do not spray pesticides or fertilizers by creeks.
- Do not over water near streams. The excess water may carry pesticides, fertilizers, sediments, and anything else in its path directly into the creek.
- Do not remove native vegetation along creek banks or remove large woody debris from creek banks or creeks. Instead, contact the local municipal planning department and Department of Fish & Game for guidance.

Treatment Control BMPs

Not applicable.

More Information

Bay Area Stormwater Management Agencies Association, 1999. Start at the Source – Design Guidance Manual for Stormwater Quality Protection. (http://www.basmaa.org).

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San Francisquito Watershed Council and San Mateo Countywide Stormwater Pollution Prevention Program, no date. Streamside Planting Guide for San Mateo and Santa Clara County Streams. (http://www.acterra.org/watershed/)

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Videos

California Integrated Waste Management Board, 1999. Grasscycle! Make the Most of Your Lawn. Make the Most of Your Time. (http://www.ciwmb.ca.gov/organics/Pubs.htm).

CCCSD, 2001. The Healthy Home & Garden - Less-Toxic Pest Control (for residents). (http://www.centralsan.org/education/ipm/hgonlineguide.html).

References

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Efficient Irrigation SD-12

Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Irrigation water provided to landscaped areas may result in excess irrigation water being conveyed into stormwater drainage systems.

Approach

Project plan designs for development and redevelopment should include application methods of irrigation water that minimize runoff of excess irrigation water into the stormwater conveyance system.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Designing New Installations

The following methods to reduce excessive irrigation runoff should be considered, and incorporated and implemented where determined applicable and feasible by the Permittee:

- Employ rain-triggered shutoff devices to prevent irrigation after precipitation.
- Design irrigation systems to each landscape area's specific water requirements.
- Include design featuring flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.
- Implement landscape plans consistent with County or City water conservation resolutions, which may include provision of water sensors, programmable irrigation times (for short cycles), etc.

- Design timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the storm water drainage system.

- Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. Choose plants with low irrigation requirements (for example, native or drought tolerant species). Consider design features such as:

  - Using mulches (such as wood chips or bar) in planter areas without ground cover to minimize sediment in runoff

  - Installing appropriate plant materials for the location, in accordance with amount of sunlight and climate, and use native plant materials where possible and/or as recommended by the landscape architect

  - Leaving a vegetative barrier along the property boundary and interior watercourses, to act as a pollutant filter, where appropriate and feasible

  - Choosing plants that minimize or eliminate the use of fertilizer or pesticides to sustain growth

- Employ other comparable, equally effective methods to reduce irrigation water runoff.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define “redevelopment” in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of “ redevelopment” must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under “designing new installations” above should be followed.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Trash Storage Areas SD-32

Design Objectives

Maximize Infiltration

Provide Retention

Slow Runoff

Minimize Impervious Land Coverage

Prohibit Dumping of Improper Materials

☑ Contain Pollutants

Collect and Convey

Description

Trash storage areas are areas where a trash receptacle (s) are located for use as a repository for solid wastes. Stormwater runoff from areas where trash is stored or disposed of can be polluted. In addition, loose trash and debris can be easily transported by water or wind into nearby storm drain inlets, channels, and/or creeks. Waste handling operations that may be sources of stormwater pollution include dumpsters, litter control, and waste piles.

Approach

This fact sheet contains details on the specific measures required to prevent or reduce pollutants in stormwater runoff associated with trash storage and handling. Preventative measures including enclosures, containment structures, and impervious pavements to mitigate spills, should be used to reduce the likelihood of contamination.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Design requirements for waste handling areas are governed by Building and Fire Codes, and by current local agency ordinances and zoning requirements. The design criteria described in this fact sheet are meant to enhance and be consistent with these code and ordinance requirements. Hazardous waste should be handled in accordance with legal requirements established in Title 22, California Code of Regulation.

Wastes from commercial and industrial sites are typically hauled by either public or commercial carriers that may have design or access requirements for waste storage areas. The design criteria in this fact sheet are recommendations and are not intended to be in conflict with requirements established by the waste hauler. The waste hauler should be contacted prior to the design of your site trash collection areas. Conflicts or issues should be discussed with the local agency.

Designing New Installations

Trash storage areas should be designed to consider the following structural or treatment control BMPs:

- Design trash container areas so that drainage from adjoining roofs and pavement is diverted around the area(s) to avoid run-on. This might include berming or grading the waste handling area to prevent run-on of stormwater.

- Make sure trash container areas are screened or walled to prevent off-site transport of trash.

- Use lined bins or dumpsters to reduce leaking of liquid waste.
- Provide roofs, awnings, or attached lids on all trash containers to minimize direct precipitation and prevent rainfall from entering containers.
- Pave trash storage areas with an impervious surface to mitigate spills.
- Do not locate storm drains in immediate vicinity of the trash storage area.
- Post signs on all dumpsters informing users that hazardous materials are not to be disposed of therein.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Additional Information

Maintenance Considerations

The integrity of structural elements that are subject to damage (i.e., screens, covers, and signs) must be maintained by the owner/operator. Maintenance agreements between the local agency and the owner/operator may be required. Some agencies will require maintenance deed restrictions to be recorded of the property title. If required by the local agency, maintenance agreements or deed restrictions must be executed by the owner/operator before improvement plans are approved.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Checklist for Minimizing Vector Production in Stormwater Management Structures

Management of mosquitoes and other vectors in stormwater management structures, such as flood control basins and Best Management Practices, is critical for protecting public health. With careful planning, such structures can be designed, built, operated, and maintained in a manner that minimizes opportunities for the proliferation of vectors. This publication provides checklists of action items intended to lessen the short and long-term potential for vector production in stormwater management structures while reducing dependence on pesticides to the maximum extent possible. With the wide variety of structures and build locations, it is anticipated that not all action items will apply to every project. Answers to frequently asked questions follow the checklist.

For simplicity, stormwater management structures have been divided into three categories, each with specific considerations. Certain structures may require reference to more than one checklist.

Dry Systems. Any structure designed to drain completely following capture and/or treatment of runoff. Examples include flood control basins, extended detention basins, infiltration basins and trenches, Austin sand filters, swales and strips, drain inlet inserts, linear-radial gross solids removal devices. Permanent-water features sometimes included as part of dry system design, such as micropools, should be considered separately using the checklist for "wetlands".

Wet Systems. Any structure designed with features such as sumps, vaults, and/or basins that hold water permanently, or longer than 4 days. Examples include open catch basins, concrete retention basins, Delaware sand filters, and a variety of belowground proprietary devices.

Wetlands. Any structure constructed as a naturalistic system with permanent surface waters, regardless of the formal given name (e.g., stormwater pond, retention basin, wet basin, constructed wetlands, treatment wetlands, etc.). This section also applies to permanent-water features sometimes included as part of dry system design such as micropools.

Additional information is available from the California Department of Public Health
http://www.cdph.ca.gov/HealthInfo/discond/Pages/MosquitoBorneDiseases.aspx
and from the University of California, Division of Agriculture and Natural Resources (UCANR)
http://www.ipm.ucdavis.edu/PDF/MOSQ/mosquitostormwater.pdf

To facilitate public health mosquito control, it is strongly recommended that project locations be provided to the local vector control agency. To locate your local mosquito and vector control agency, go to http://westnile.ca.gov and search by zip code.

DRY SYSTEMS

Recommended strategy: Complete discharge of all captured water in 4 days or less.

- ☐ Is the structure designed to discharge all captured water in 4 days or less?

- ☐ Has every effort been made to trace and eliminate persistent non-stormwater flows (e.g. irrigation runoff) that may enter the system and jeopardize non-chemical vector control efforts?

- ☐ Has groundwater depth been carefully evaluated to ensure that the structure will not be permanently or seasonally flooded (i.e. is the base of the basin higher than the local groundwater table)?

- ☐ Does the design provide an adequate slope between the inlets and outlets, with special attention given to ensure corners are above grade?

- ☐ Has soil been compacted adequately during grading to minimize subsidence, which can result in pools of standing water?

- ☐ Does the design slope take into consideration the inevitable accumulation of sediment and debris between maintenance periods that can result in standing water, especially in and around the inlet?

- ☐ Does the design minimize the use of features that increase the potential for standing water, such as loose riprap and concrete curbs?

- ☐ Does the structure include a concrete or earthen low-flow channel to concentrate (i.e. minimize available surface area) and direct non-stormwater flows to the outlet?

- ☐ Is the distribution piping sloped adequately and smooth (not corrugated) on the inside to prevent standing water?

- ☐ Are the inlet structures and energy dissipaters designed and sloped sufficiently to prevent scour depressions?

- ☐ Are the outlets designed with debris screens or other features that reduce the potential for clogging?

- ☐ Is the structure designed with safe and sufficient access for inspection, maintenance, and/or vector control activities when needed?

- ☐ Does the operation and maintenance plan include a minimum of quarterly inspections to ensure that vegetation overgrowth, sediment accumulation, or other factors have not created areas of standing water?

- ☐ Does the operation and maintenance plan include a minimum annual maintenance to remove vegetation overgrowth, remove sediment and debris accumulation, and otherwise return the structure to “as-designed” conditions?

- ☐ Is signage provided and clearly visible with minimum information indicating the type of structure (e.g. extended detention basin), ownership, and contact information?

WET SYSTEMS

Recommended strategy: Deny mosquito access to standing water by using covers, screens, and/or other barriers.

- ☐ Have sumps, vaults, or basins that hold water permanently, or longer than 4 days, been completely or partially sealed against adult mosquito entry?

- ☐ If used, are covers tight fitting, with gaps or holes of no greater than 1/16” (2 mm)?

- ☐ If used, are aluminum or nylon screens for sealing small openings secured with gaps or holes of no greater than 1/16” (2 mm)?

- ☐ If cast iron manhole covers are used, are pick holes sealed or is a mosquito-proof insert provided below?

- ☐ Where feasible, are the inlet and/or outlet conveyance pipes submerged to prevent adult mosquito entry into the main water storage area?

- ☐ Where feasible, are conveyance pipes fitted with flapper valves, collapsible fabric tubes, or other barriers to prevent adult mosquito entry into the main water storage area?

- ☐ Is the structure designed with safe and sufficient access to permanent water areas for inspection, maintenance, and/or vector control activities when needed?

- ☐ Does the operation and maintenance plan include a minimum of quarterly inspections to ensure that barriers to mosquito entry are intact and in place as designed?

- ☐ Where possible, is signage provided with minimum information indicating type of structure (e.g. CDS™), ownership, and contact information?

WETLANDS

Recommended strategy: Create and maintain habitat least-suitable for mosquito breeding.

- ☐ Is the system designed with features that minimize the areas suitable for mosquito production?
- ☐ Does the design discourage emergent vegetation in shallow water zones where vegetation is not needed or desired, for example by using concrete liners in sediment forebays?
- ☐ Are slopes designed as steep and uniform as possible to discourage invasive, emergent vegetation?
- ☐ Does the system include deep water zones, in excess of 4 ft, to reduce available area for emergent vegetation and provide refuge for natural mosquito predators such as mosquitofish and certain invertebrates?
- ☐ Where permitted, have mosquitofish been introduced to help control mosquitoes?
- ☐ Does the system include provisions for rapid dewatering if needed for emergency control of mosquitoes?
- ☐ Is the structure designed with safe and sufficient access for inspection, maintenance, and/or vector control activities when needed?
- ☐ Are access roads built close to the shoreline and around the perimeter of the wetland to the extent feasible?
- ☐ Are access points incorporated at regular intervals along the perimeter to allow for vector monitoring and control when necessary.
- ☐ Does the operation and maintenance plan include a minimum of quarterly inspections to ensure that vegetation overgrowth, sediment accumulation, or other factors have not created areas suitable for mosquito production?
- ☐ Does the operation and maintenance plan include a minimum annual maintenance to remove vegetation overgrowth, remove sediment and debris accumulation, and otherwise return the structure to “as-designed” conditions?
- ☐ Is signage provided and clearly visible with minimum information indicating type of structure (e.g. stormwater treatment pond), ownership, and contact information?

Frequently Asked Questions

DRY SYSTEMS

1. Why is it important to drain all captured water in 4 days or less?
Most mosquito species important to public health require at least 6 days to develop from egg to adult. Designing dry systems to drain completely in 4 days ensures that no mosquitoes will be produced with a built-in margin of safety of several days.

2. Our stormwater treatment BMPs were designed to dewater in 4 days, but persistent non-stormwater flows result in areas of standing water that routinely produce mosquitoes. How do we address this problem?
Dry-weather urban runoff is a major contributor to mosquito production in urban areas everywhere. If the source(s) cannot be traced and eliminated, the best alternate solution is to minimize the surface area available to mosquitoes by cutting a low-flow channel through the BMP to direct the water to the outlet as efficiently as possible.

3. Will very shallow areas of standing water that remain in our detention basins after a storm event provide a potential source of mosquito production?
Certain species of mosquitoes important to public health are very adaptable. Water as shallow as 1/16”, and sometimes less, can be sufficient to allow mosquito larvae to develop.

WET SYSTEMS

1. Our stormwater treatment BMPs are installed belowground and covered. Why should we be concerned about mosquitoes?
Unfortunately, certain species of mosquitoes capable of transmitting disease are well-adapted for finding and breeding in belowground habitats. These mosquitoes can access belowground sources through openings as small as 1/16” (2mm) and they can fly great distances through pipes.

2. We wish to install a belowground proprietary BMP in a new housing development. If we seal the access covers against mosquitoes, how far away should we design the inlet grates to keep mosquitoes from accessing the permanent-water sump?
The absolute flight limits of mosquitoes that can breed belowground are unknown; however, recent studies found that females could fly at least 80 feet through 4” diameter pipe to reach a source of standing water and were unaffected by changes in pipe course. It is unlikely that mosquitoes can be excluded from underground sources using conveyance pipe length alone.

3. We are considering the addition of weep holes to our belowground sumps to allow them to dewater between storms so they do not produce mosquitoes. Will this work?
Weep holes are typically not a reliable choice for preventing mosquito production due to their high probability of failure due to clogging.

4. I was told that mosquitoes can not breed in water with a visible oil sheen on the water surface. Is this true or false?
With some exceptions, this is false. In most cases, the oil sheen visible on the water surface is not uniform, but is broken. Certain species of mosquitoes capable of transmitting disease can exploit these habitats by using the oil-free areas for egg laying and larval development. In addition, surface oils are broken down over time, disappearing altogether if not regularly replenished by oily runoff.

5. We are considering a provision to dewater our belowground sumps after every storm event to prevent mosquito production. Will this be effective?
It has the potential to be effective, but there are several complicating factors to consider: 1) dry-weather urban runoff frequently replenishes belowground sumps making pumping efforts futile, and 2) pumps often leave a small amount of residual water in the bottom of the sumps, and water as shallow as 1/16” or less can be sufficient to allow mosquito larvae to develop.

6. Our stormwater sumps contain very deep water. Will this prevent mosquito production?
Unlike deep water zones in ponds and wetlands where mosquitoes generally do not develop due to predators, wind, and wave action, mosquitoes are unaffected by water depth and/or surface area in belowground systems.

7. *Will flowing water prevent mosquito production?*
Flowing water will discourage females from laying eggs and can kill larvae. For example, a vortex separator receiving year-round flow from an urban stream should not produce mosquitoes due to constant movement of the entire water surface area. However, water flow through systems with square sumps (or sumps of other geometrical shapes) may not completely eliminate mosquito production due to the stagnant zones created in the corners where water movement is minimal.

8. *Will surface agitators prevent mosquito production?*
Agitators, sprinklers, or other means of disturbing the water surface will discourage females from laying eggs and can kill larvae, however, in order to be effective the *entire* surface must be disturbed.

9. *It seems that controlling mosquitoes in belowground stormwater systems without resorting to chemical treatment is rarely successful. How do we deal with this problem?* Field research has documented the difficulty in controlling mosquitoes in belowground stormwater systems without chemicals (i.e. exclusion of mosquitoes was successful in a few systems studied, but the vast majority of attempts resulted in only marginal reductions). However, for reasons that are not entirely understood, not all belowground systems produce mosquitoes equally; some are sporadic and some are year-round producers. It is strongly recommended that the local vector control agency be consulted to determine site-specific monitoring and control needs.

WETLANDS

1. Why are mosquitoes still being detected in well designed and maintained wetlands?
Mosquitoes are difficult to eliminate completely from wetlands due to the complexity of the created environment. The goal should be to minimize mosquito production by making the habitat less desirable for them.

2. Will the deep areas of stormwater ponds where no emergent vegetation can grow produce mosquitoes?
Deep, open areas of water are typically unsuitable for mosquito production due to surface disturbance caused by wind and exposure to predators. However, if the deep zones become colonized by floating vegetation such as water hyacinth or by clumps of floating filamentous algae, mosquitoes may breed in the shelters created among these plants.

3. Why is it important to keep emergent vegetation such as cattails and bulrush from getting overly dense?
Dense emergent vegetation, especially along perimeter margins, will prevent predators such as mosquitofish from accessing these areas, creating ideal habitats for mosquitoes.

4. Why is it important to eliminate floating vegetation such as water hyacinth and maintain water quality to discourage clumps of floating filamentous algae?
Not only are certain floating plants such as water hyacinth considered exotic invasive species harmful to North American ecosystems, but these plants provide excellent habitats for mosquitoes sheltered from predators.

5. How do I determine if mosquitofish are permissible for use in my area?
As a general rule, if the stormwater wetland is self contained, and does not empty into a natural waterway, mosquitofish can be used to control mosquitoes. If in doubt, it is best to consult with the local office of the Department of Fish and Game before stocking fish.

6. How often should mosquitofish be restocked to reduce mosquito numbers?
In general, mosquitofish are very hardy and will rapidly increase in numbers to form a stable population. Large game fish such as bluegill and bass may negatively impact or eradicate mosquitofish populations, as can large numbers of fishing birds; however, low temperatures are the leading cause of population failures. In cold climates, mosquitofish may need to be restocked each spring following the last frost.

7. Do we need to be concerned with mosquito production during "cold snaps" or winter periods?
Most mosquitoes important to public health can develop successfully in water ranging from approximately 45 to 100 °F, with the ability to survive short periods outside this spectrum. Short cold snaps may not be lethal to larvae if the habitat provides a buffer area, however, extended periods of cold below 45 °F will halt mosquito production.

8. Will encouraging nesting and roosting habitat for certain birds and bats around our stormwater wetland reduce the population of adult mosquitoes appreciatively?
Although certain birds (e.g. swallows, martins) and bats have been reported to consume large numbers of adult mosquitoes, these animals do not preferentially feed on mosquitoes and there is no evidence to show that they substantially reduce mosquito populations.

Vector-Borne Disease Section
California Department of Public Health
(916) 552-9730
September 2010

ATTACHMENT 3b

Draft Maintenance Agreement (when applicable)

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:
	351-382-16, 351-382-11	

This agreement is made by and between the City of San Diego, a municipal corporation [City] and MB Property Acquisitions, LLC, c/o Michael Blumenthal,

the owner or duly authorized representative of the owner [Property Owner] of property located at
6738 La Jolla Blvd., La Jolla, CA 92037
(PROPERTY ADDRESS)

and more particularly described as: Parcels A and B in the City of San Diego, County of San Diego, State of California, Map No. 1127, Recorded In San Diego County Recorder 11/28/1972.
(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 Water Quality Technical Report [WQTR] 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

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 WQTR 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): ___________________________

____
(Owner Signature)

Michael Blumenthal, Owner
(Print Name and Title)

MB Property Acquisitions, LLC
(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

City of San Diego
Development Services
1222 First Ave., MS-501
San Diego, CA 92101
(619) 236-5500

THE CITY OF SAN DIEGO

Permanent BMP Construction

Self Certification Form

FORM **DS-563**

FEBRUARY 2013

Date Prepared:	Project No.:
Project Applicant:	Phone:
Project Address:	
Project Engineer:	Phone:

The purpose of this form is to verify that the site improvements for the project, identified above, have been constructed in conformance with the approved Standard Urban Storm Water Mitigation Plan (SUSMP) 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. R9-2007-0001. 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 treatment control BMP's required per the approved SUSMP and Construction Permit No. ________________________; and that said BMP's have been constructed in compliance with the approved plans and all applicable specifications, permits, ordinances and Order No. R9-2007-0001 of the San Diego Regional Water Quality Control Board.

I understand that this BMP certification statement does not constitute an operation and maintenance verification.

Signature: ____

Date of Signature: ______________________________________

Printed Name: ____

Title: ____

Phone No. ____

Clear Form

Engineer's Stamp

ATTACHMENT 5
Copy of Project's Drainage Report

This is the cover sheet for Attachment 5.

HYDROLOGY & HYDRAULIC REPORT

DATED: 11/12/15, REVISED: 2/2/16

For

SU CASA

Prepared for:
MB Property Acquisitions, LLC
Contact: Michael Blumenthal
110 Pacific Ave, Suite 350, San Francisco, CA 94111
Phone: (415) 516-0841

Project Location:
6738 La Jolla Blvd., La Jolla, CA 92037

Prepared By:
SPEAR & ASSOCIATES, INC.
CIVIL ENGINEERS AND LAND SURVEYORS
457 Production Street
San Marcos, CA 92078

PHONE: (760) 736-2040
FAX: (760) 736-4866

DATE: 2/2/16

Danny Abada, PE

DECLARATION OF RESPONSIBLE CHARGE

I, HEREBY DECLARE THAT I AM THE CIVIL ENGINEER OF WORK FOR THIS PROJECT, THAT I HAVE EXERCISED RESPONSIBLE CHARGE OVER THE DESIGN OF THIS PROJECT AS DEFINED IN SECTION 6703 OF THE BUSINESS AND PROFESSIONAL CODE AND THAT THE DESIGN IS CONSISTENT WITH CURRENT DESIGN STANDARDS.

I UNDERSTAND THAT THE CHECK OF PROJECT DRAWINGS AND SPECIFICATIONS BY THE CITY OF SAN DIEGO IS CONFINED TO A REVIEW ONLY AND DOES NOT RELIEVE ME, AS ENGINEER OF WORK, OF MY RESPONSIBILITIES FOR PROJECT DESIGN.

2/2/16

Danny Abada
REGISTERED CIVIL ENGINEER
Spear & Associates Inc.

DATE

TABLE OF CONTENTS

I. INTRODUCTION

This hydrology report is prepared for Su Casa, located at 6738 La Jolla Blvd., La Jolla, CA 92037. The site encompasses approximately 0.51 acres.

The project consists of the removal of an existing restaurant and parking lot and redeveloping the site with three buildings with two elevators and underground parking, for a mixed use residential and commercial development. The development will also include the associated underground utilities, landscaping, and stormwater treatment BMPs. Total impervious area before construction 0.49 Acres or 98% impervious.

The site was previously developed with buildings and a parking lot to be replaced with this new development. The existing topography slopes in a westerly direction with elevations ranging from approximately 70 to 58. Total impervious area after construction 0.36 Acres, or 71% impervious

Site drainage surface drains in a westerly direction on Playa Del Norte and Playa Del Sur and discharge approximately 1000' to the Pacific Ocean. The development will maintain existing drainage patterns along the site and will include onsite drainage improvements, including a bioretention to treat pollutants of concern

We have used the City of San Diego Hydrology Manual for this report. The report calculates the 2, 10, and 50yr flows generated from the site. The project soil uniformly consists of type D across all sub areas.

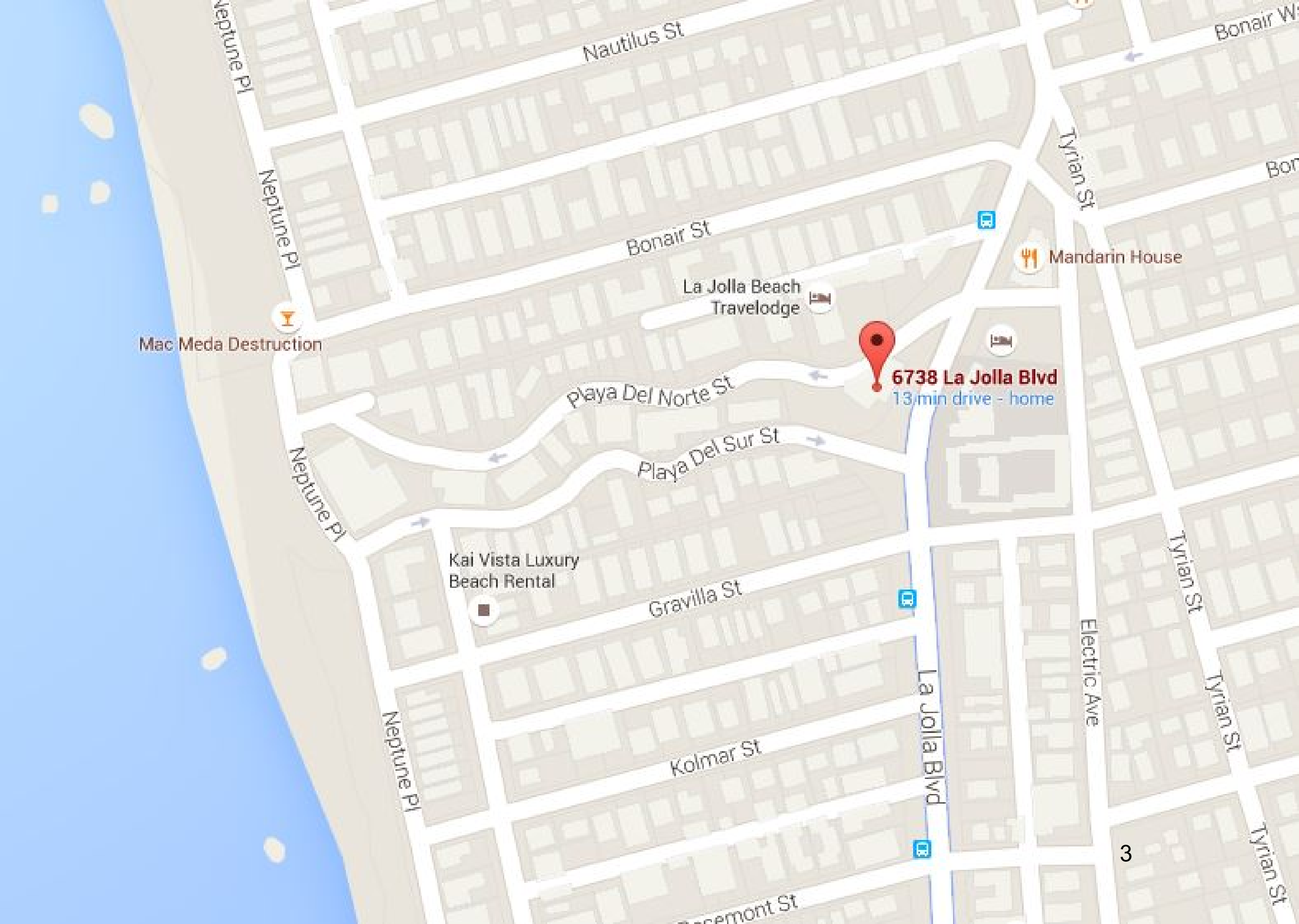
II. DISCUSSION/CONCLUSION

Post development peak flows, flow volumes and velocities for the 2, 10, and 50yr events will not exceed pre-development rates with increased landscaping and pervious areas, the use of an efficient site design and maximizing onsite times of concentration. No downstream impact is anticipated from this development.

Summary flow rates (see areas delineated in the Drainage Map)

Storm Event	***50-year (cfs)***	***10-year (cfs)***	***2-year (cfs)***
Pre-Development	2.4	1.8	1.2
Post-Dev. w/ Det. Pond	1.9	1.4	1.0

ATTACHMENT A


Nautilus St
Bonair St
Bonair Way
Neptune Pl
Neptune Pl
Neptune Pl
Neptune Pl
Tyrian St
Tyrian St
Tyrian St
Tyrian St
Mandarin House
La Jolla Beach Travelodge
Mac Meda Destruction
6738 La Jolla Blvd
13 min drive - home
Playa Del Norte St
Playa Del Sur St
Kai Vista Luxury Beach Rental
Gravilla St
Kolmar St
La Jolla Blvd
Electric Ave


6738 La Jolla Blvd
La Jolla Blvd
Playa Del Sur

ATTACHMENT B

Post-Development Conditions **50-yr Event**

R□A□□	T□	□	A	□A	∑CA	□□	I	**Q cfs**
□it□	□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	**1.9**

Pre-Development Conditions

R□A□□	T□	□	A	□A	∑CA	□□	I	**Q cfs**
□it□	□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	**2.4**

***Rational Method**

Post-Development Conditions **10-yr Event**

R□A□□	T□	□	A	□A	∑CA	□□	I	**Q cfs**
□it□	□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	**1.4**

Pre-Development Conditions

R□A□□	T□	□	A	□A	∑CA	□□	I	**Q cfs**
□it□	□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	**1.8**

***Rational Method**

Post-Development Conditions **2-yr Event**

R□A□□	T□	□	A	□A	∑CA	□□	I	**Q cfs**
□it□	□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	**1.0**

Pre-Development Conditions

R□A□□	T□	□	A	□A	∑CA	□□	I	**Q cfs**
□it□	□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	**1.2**

***Rational Method**

NOAA Atlas 14, Volume 6, Version 2
Location name: San Diego, California, US*
Latitude: 32.8297°, Longitude: -117.2772°
Elevation: 73 ft*
* source: Google Maps

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.114** (0.096-0.138)	**0.143** (0.120-0.173)	**0.181** (0.151-0.220)	**0.213** (0.176-0.260)	**0.256** (0.204-0.324)	**0.289** (0.226-0.374)	**0.324** (0.246-0.429)	**0.359** (0.266-0.491)	**0.409** (0.289-0.583)	**0.447** (0.306-0.662)
10-min	**0.164** (0.137-0.198)	**0.205** (0.172-0.248)	**0.260** (0.217-0.315)	**0.305** (0.252-0.373)	**0.367** (0.293-0.464)	**0.415** (0.324-0.536)	**0.464** (0.353-0.615)	**0.515** (0.381-0.704)	**0.586** (0.415-0.836)	**0.641** (0.438-0.948)
15-min	**0.198** (0.166-0.239)	**0.248** (0.208-0.300)	**0.314** (0.262-0.381)	**0.369** (0.305-0.451)	**0.443** (0.354-0.561)	**0.501** (0.392-0.649)	**0.561** (0.427-0.744)	**0.623** (0.461-0.851)	**0.708** (0.501-1.01)	**0.775** (0.530-1.15)
30-min	**0.275** (0.231-0.332)	**0.345** (0.289-0.417)	**0.437** (0.364-0.529)	**0.512** (0.424-0.626)	**0.616** (0.492-0.780)	**0.697** (0.544-0.901)	**0.780** (0.593-1.03)	**0.866** (0.640-1.18)	**0.984** (0.697-1.40)	**1.08** (0.736-1.59)
60-min	**0.390** (0.327-0.471)	**0.489** (0.409-0.590)	**0.619** (0.516-0.749)	**0.726** (0.600-0.886)	**0.872** (0.696-1.10)	**0.987** (0.771-1.28)	**1.10** (0.840-1.47)	**1.23** (0.906-1.68)	**1.39** (0.987-1.99)	**1.53** (1.04-2.26)
2-hr	**0.543** (0.455-0.655)	**0.670** (0.561-0.810)	**0.838** (0.699-1.01)	**0.975** (0.806-1.19)	**1.16** (0.929-1.47)	**1.31** (1.02-1.69)	**1.46** (1.11-1.94)	**1.61** (1.19-2.21)	**1.83** (1.29-2.61)	**1.99** (1.36-2.95)
3-hr	**0.653** (0.547-0.788)	**0.803** (0.672-0.970)	**1.00** (0.835-1.21)	**1.16** (0.961-1.42)	**1.38** (1.10-1.75)	**1.55** (1.21-2.01)	**1.73** (1.31-2.29)	**1.91** (1.41-2.60)	**2.15** (1.52-3.07)	**2.34** (1.60-3.46)
6-hr	**0.882** (0.739-1.06)	**1.09** (0.910-1.31)	**1.35** (1.13-1.64)	**1.57** (1.30-1.92)	**1.86** (1.49-2.36)	**2.09** (1.63-2.70)	**2.31** (1.76-3.07)	**2.54** (1.88-3.47)	**2.85** (2.02-4.07)	**3.10** (2.12-4.58)
12-hr	**1.16** (0.974-1.40)	**1.45** (1.22-1.76)	**1.82** (1.52-2.21)	**2.12** (1.75-2.59)	**2.51** (2.00-3.17)	**2.80** (2.19-3.62)	**3.09** (2.35-4.10)	**3.39** (2.50-4.63)	**3.77** (2.67-5.38)	**4.07** (2.78-6.02)
24-hr	**1.45** (1.27-1.68)	**1.84** (1.61-2.14)	**2.33** (2.04-2.72)	**2.71** (2.35-3.19)	**3.21** (2.71-3.90)	**3.58** (2.96-4.43)	**3.95** (3.19-4.99)	**4.31** (3.39-5.58)	**4.78** (3.62-6.44)	**5.13** (3.77-7.14)
2-day	**1.78** (1.56-2.07)	**2.27** (2.00-2.65)	**2.89** (2.53-3.38)	**3.38** (2.93-3.97)	**4.01** (3.38-4.86)	**4.47** (3.70-5.53)	**4.93** (3.98-6.23)	**5.38** (4.24-6.98)	**5.97** (4.53-8.04)	**6.41** (4.71-8.92)
3-day	**2.00** (1.75-2.32)	**2.56** (2.24-2.98)	**3.26** (2.85-3.81)	**3.82** (3.31-4.49)	**4.54** (3.82-5.50)	**5.07** (4.19-6.26)	**5.59** (4.52-7.07)	**6.11** (4.81-7.92)	**6.79** (5.15-9.15)	**7.30** (5.36-10.2)
4-day	**2.16** (1.90-2.51)	**2.79** (2.44-3.24)	**3.57** (3.12-4.16)	**4.18** (3.63-4.92)	**4.98** (4.20-6.04)	**5.57** (4.60-6.88)	**6.15** (4.97-7.77)	**6.73** (5.30-8.73)	**7.49** (5.67-10.1)	**8.05** (5.91-11.2)
7-day	**2.55** (2.24-2.97)	**3.35** (2.94-3.90)	**4.35** (3.81-5.08)	**5.14** (4.46-6.05)	**6.18** (5.20-7.49)	**6.94** (5.74-8.58)	**7.70** (6.22-9.72)	**8.45** (6.65-11.0)	**9.44** (7.15-12.7)	**10.2** (7.47-14.2)
10-day	**2.85** (2.51-3.32)	**3.79** (3.33-4.42)	**4.98** (4.36-5.81)	**5.92** (5.14-6.95)	**7.14** (6.02-8.66)	**8.06** (6.66-9.96)	**8.96** (7.24-11.3)	**9.87** (7.77-12.8)	**11.1** (8.38-14.9)	**12.0** (8.78-16.6)
20-day	**3.41** (2.99-3.96)	**4.60** (4.03-5.36)	**6.12** (5.35-7.14)	**7.32** (6.36-8.61)	**8.91** (7.51-10.8)	**10.1** (8.35-12.5)	**11.3** (9.12-14.3)	**12.5** (9.84-16.2)	**14.1** (10.7-19.0)	**15.3** (11.2-21.3)
30-day	**4.00** (3.51-4.65)	**5.42** (4.75-6.31)	**7.24** (6.33-8.44)	**8.69** (7.54-10.2)	**10.6** (8.94-12.9)	**12.1** (9.96-14.9)	**13.5** (10.9-17.1)	**15.0** (11.8-19.4)	**17.0** (12.9-22.9)	**18.5** (13.6-25.7)
45-day	**4.73** (4.15-5.50)	**6.38** (5.60-7.43)	**8.51** (7.45-9.93)	**10.2** (8.87-12.0)	**12.5** (10.5-15.2)	**14.2** (11.8-17.6)	**16.0** (12.9-20.2)	**17.8** (14.0-23.1)	**20.2** (15.3-27.2)	**22.1** (16.2-30.7)
60-day	**5.46** (4.79-6.34)	**7.30** (6.40-8.50)	**9.69** (8.47-11.3)	**11.6** (10.1-13.7)	**14.2** (12.0-17.2)	**16.2** (13.4-20.0)	**18.2** (14.7-23.0)	**20.3** (16.0-26.3)	**23.1** (17.5-31.1)	**25.3** (18.5-35.1)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.
Please refer to NOAA Atlas 14 document for more information.

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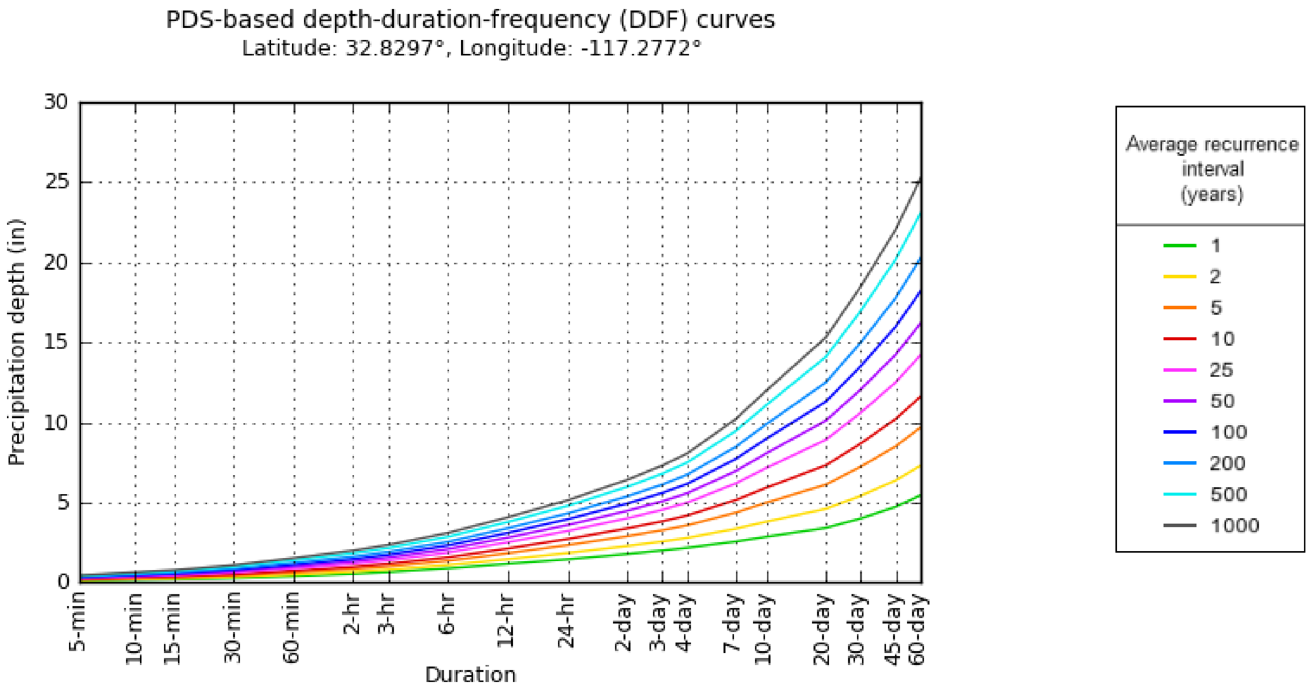
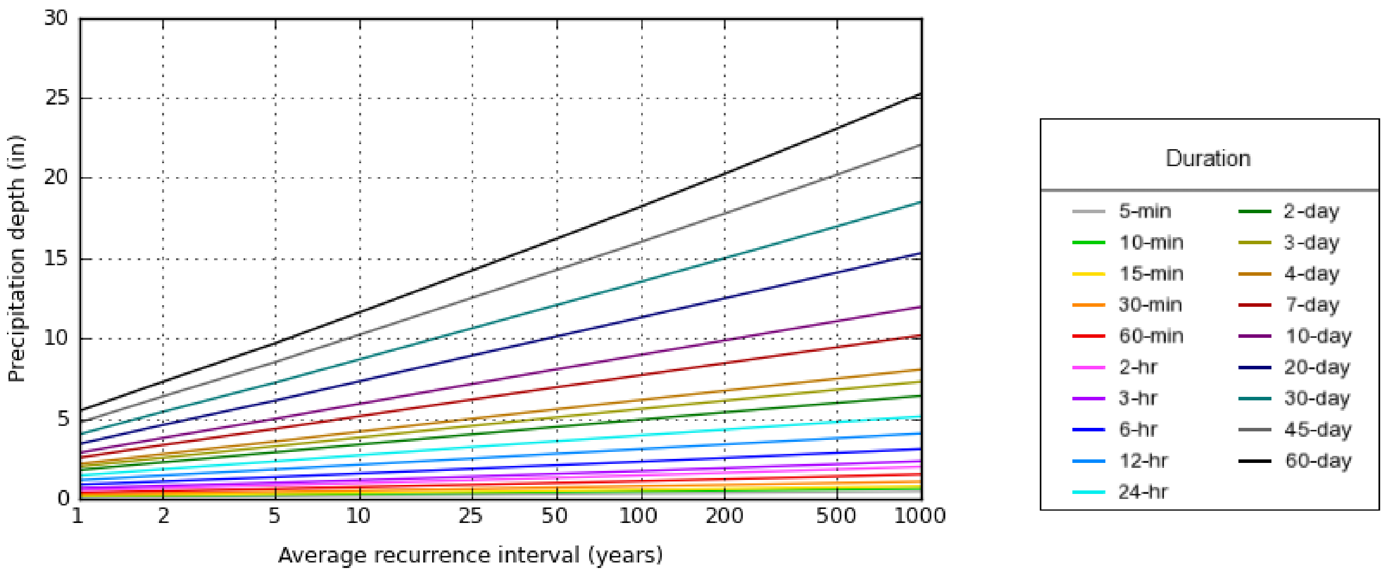
PF graphical





NOAA Atlas 14, Volume 6, Version 2

Created (GMT): Thu Nov 12 21:41:36 2015

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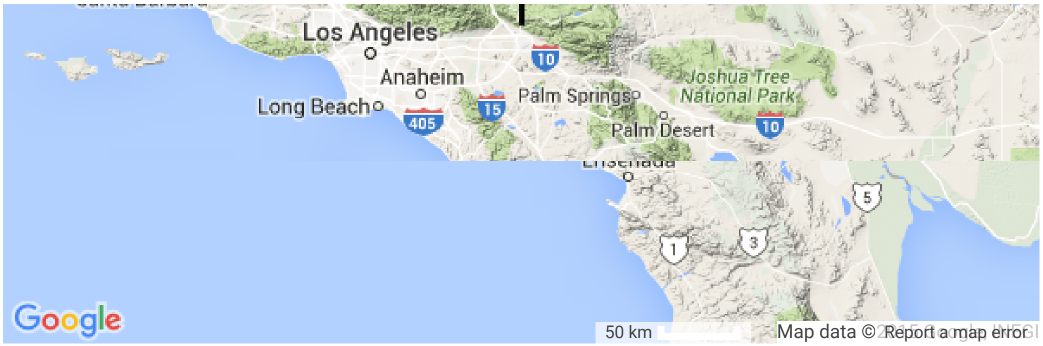
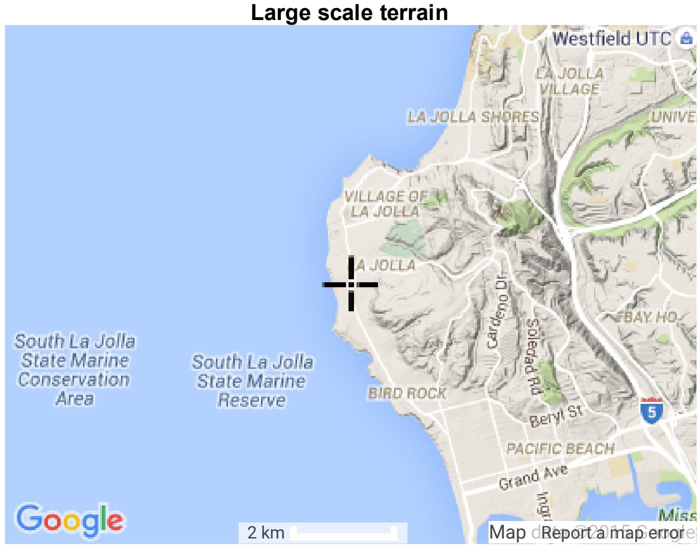
Maps & aerials

Small scale terrain



Large scale terrain



Large scale map

Large scale aerial

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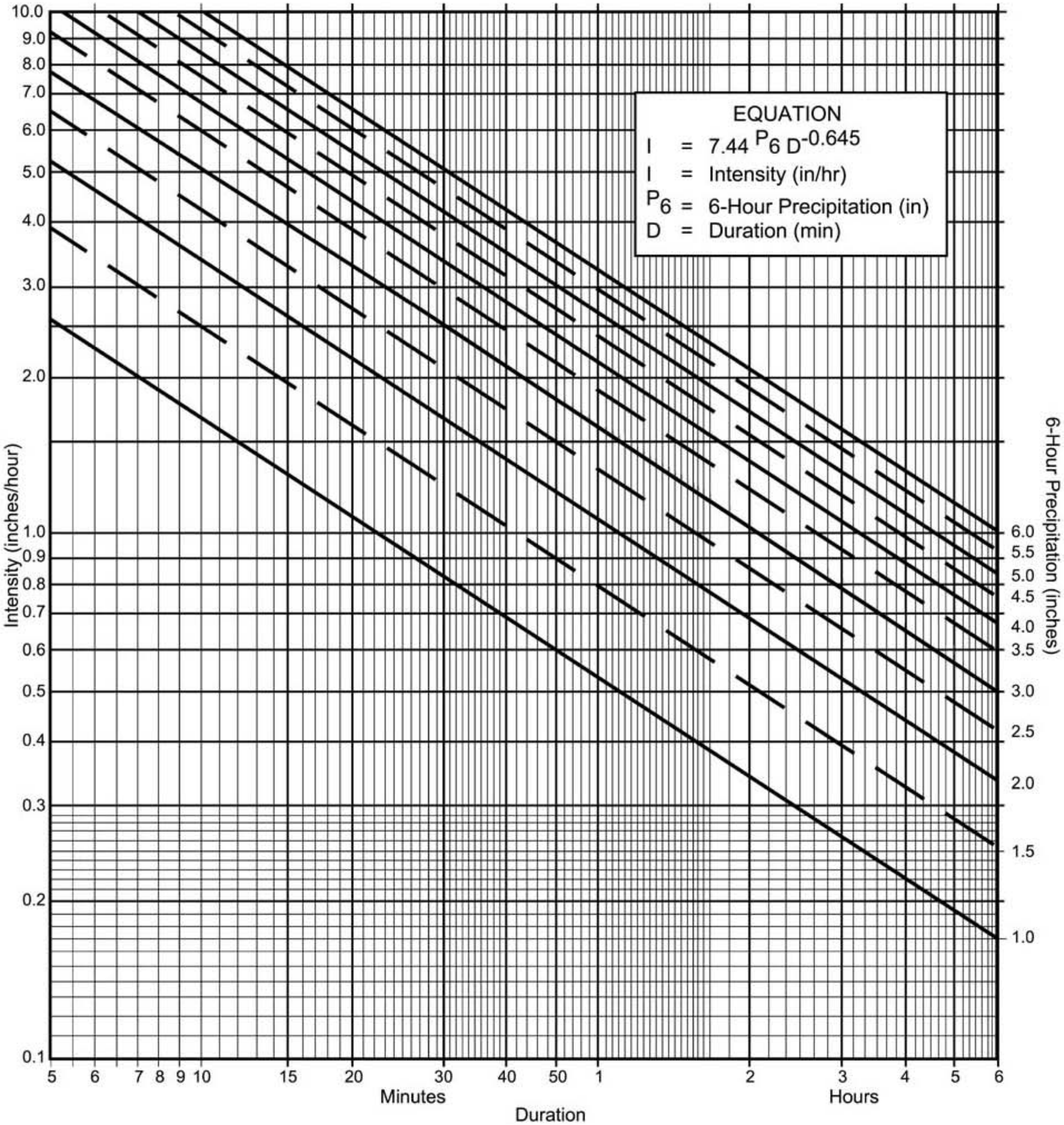
US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
Office of Hydrologic Development
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov



Directions for Application:

(1) From precipitation maps determine 6 hr and 24 hr amounts for the selected frequency. These maps are included in the County Hydrology Manual (10, 50, and 100 yr maps included in the Design and Procedure Manual).

(2) Adjust 6 hr precipitation (if necessary) so that it is within the range of 45% to 65% of the 24 hr precipitation (not applicable to Desert).

(3) Plot 6 hr precipitation on the right side of the chart.

(4) Draw a line through the point parallel to the plotted lines.

(5) This line is the intensity-duration curve for the location being analyzed.

Application Form:

(a) Selected frequency 50 year

(b) P_6 = 2.09 in., P_{24} = 3.58, $\frac{P_6}{P_{24}}$ = ______ %(2)

(c) Adjusted $P_6^{(2)}$ = 2.09 in.

(d) t_x = ______ min.

(e) I = ______ in./hr.

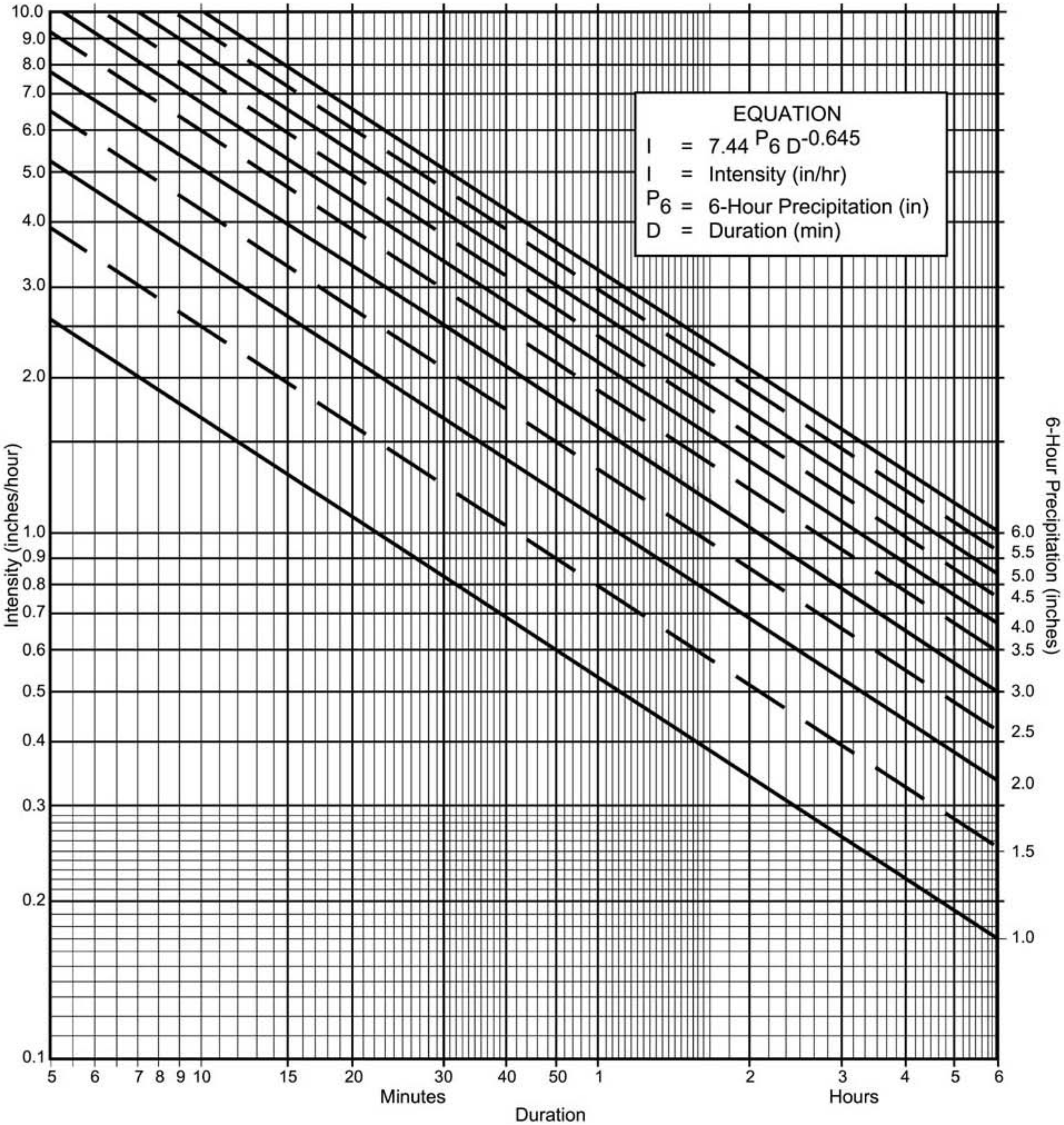
Note: This chart replaces the Intensity-Duration-Frequency curves used since 1965.

P6	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
Duration	I	I	I	I	I	I	I	I	I	I	I
5	2.63	3.95	5.27	6.59	7.90	9.22	10.54	11.86	13.17	14.49	15.81
7	2.12	3.18	4.24	5.30	6.36	7.42	8.48	9.54	10.60	11.66	12.72
10	1.68	2.53	3.37	4.21	5.05	5.90	6.74	7.58	8.42	9.27	10.11
15	1.30	1.95	2.59	3.24	3.89	4.54	5.19	5.84	6.49	7.13	7.78
20	1.08	1.62	2.15	2.69	3.23	3.77	4.31	4.85	5.39	5.93	6.46
25	0.93	1.40	1.87	2.33	2.80	3.27	3.73	4.20	4.67	5.13	5.60
30	0.83	1.24	1.66	2.07	2.49	2.90	3.32	3.73	4.15	4.56	4.98
40	0.69	1.03	1.38	1.72	2.07	2.41	2.76	3.10	3.45	3.79	4.13
50	0.60	0.90	1.19	1.49	1.79	2.09	2.39	2.69	2.98	3.28	3.58
60	0.53	0.80	1.06	1.33	1.59	1.86	2.12	2.39	2.65	2.92	3.18
90	0.41	0.61	0.82	1.02	1.23	1.43	1.63	1.84	2.04	2.25	2.45
120	0.34	0.51	0.68	0.85	1.02	1.19	1.36	1.53	1.70	1.87	2.04
150	0.29	0.44	0.59	0.73	0.88	1.03	1.18	1.32	1.47	1.62	1.76
180	0.26	0.39	0.52	0.65	0.78	0.91	1.04	1.18	1.31	1.44	1.57
240	0.22	0.33	0.43	0.54	0.65	0.76	0.87	0.98	1.08	1.19	1.30
300	0.19	0.28	0.38	0.47	0.56	0.66	0.75	0.85	0.94	1.03	1.13
360	0.17	0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.84	0.92	1.00

Intensity-Duration Design Chart - Template

FIGURE

3-1



Directions for Application:

(1) From precipitation maps determine 6 hr and 24 hr amounts for the selected frequency. These maps are included in the County Hydrology Manual (10, 50, and 100 yr maps included in the Design and Procedure Manual).

(2) Adjust 6 hr precipitation (if necessary) so that it is within the range of 45% to 65% of the 24 hr precipitation (not applicable to Desert).

(3) Plot 6 hr precipitation on the right side of the chart.

(4) Draw a line through the point parallel to the plotted lines.

(5) This line is the intensity-duration curve for the location being analyzed.

Application Form:

(a) Selected frequency 10 year

(b) P_6 = 1.57 in., P_{24} = 2.71, $\frac{P_6}{P_{24}}$ = 58 %[(2)]

(c) Adjusted $P_6^{(2)}$ = 1.57 in.

(d) t_x = ______ min.

(e) I = ______ in./hr.

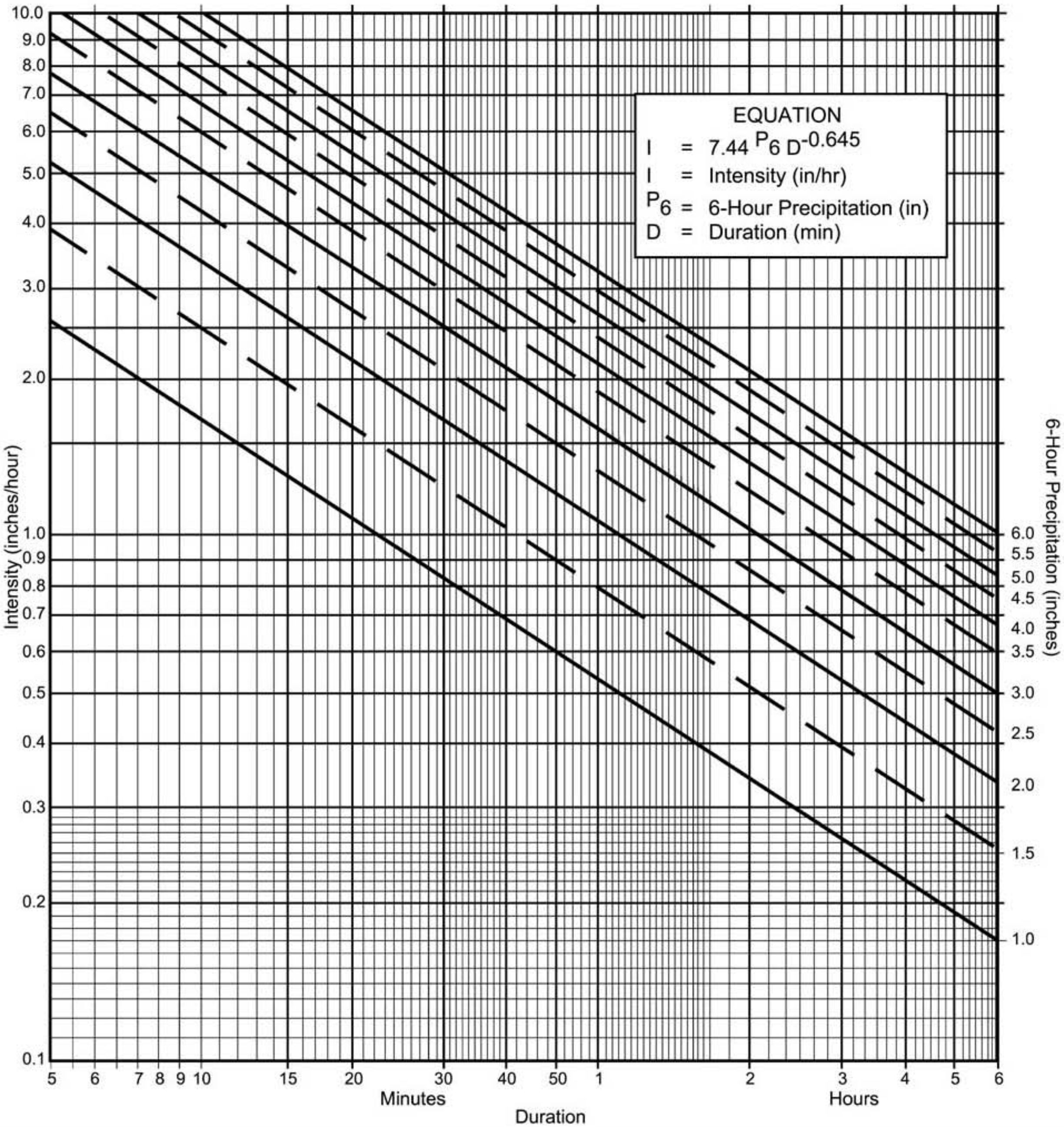
Note: This chart replaces the Intensity-Duration-Frequency curves used since 1965.

P6	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
Duration	I	I	I	I	I	I	I	I	I	I	I
5	2.63	3.95	5.27	6.59	7.90	9.22	10.54	11.86	13.17	14.49	15.81
7	2.12	3.18	4.24	5.30	6.36	7.42	8.48	9.54	10.60	11.66	12.72
10	1.68	2.53	3.37	4.21	5.05	5.90	6.74	7.58	8.42	9.27	10.11
15	1.30	1.95	2.59	3.24	3.89	4.54	5.19	5.84	6.49	7.13	7.78
20	1.08	1.62	2.15	2.69	3.23	3.77	4.31	4.85	5.39	5.93	6.46
25	0.93	1.40	1.87	2.33	2.80	3.27	3.73	4.20	4.67	5.13	5.60
30	0.83	1.24	1.66	2.07	2.49	2.90	3.32	3.73	4.15	4.56	4.98
40	0.69	1.03	1.38	1.72	2.07	2.41	2.76	3.10	3.45	3.79	4.13
50	0.60	0.90	1.19	1.49	1.79	2.09	2.39	2.69	2.98	3.28	3.58
60	0.53	0.80	1.06	1.33	1.59	1.86	2.12	2.39	2.65	2.92	3.18
90	0.41	0.61	0.82	1.02	1.23	1.43	1.63	1.84	2.04	2.25	2.45
120	0.34	0.51	0.68	0.85	1.02	1.19	1.36	1.53	1.70	1.87	2.04
150	0.29	0.44	0.59	0.73	0.88	1.03	1.18	1.32	1.47	1.62	1.76
180	0.26	0.39	0.52	0.65	0.78	0.91	1.04	1.18	1.31	1.44	1.57
240	0.22	0.33	0.43	0.54	0.65	0.76	0.87	0.98	1.08	1.19	1.30
300	0.19	0.28	0.38	0.47	0.56	0.66	0.75	0.85	0.94	1.03	1.13
360	0.17	0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.84	0.92	1.00

Intensity-Duration Design Chart - Template

FIGURE

3-1



Directions for Application:

(1) From precipitation maps determine 6 hr and 24 hr amounts for the selected frequency. These maps are included in the County Hydrology Manual (10, 50, and 100 yr maps included in the Design and Procedure Manual).

(2) Adjust 6 hr precipitation (if necessary) so that it is within the range of 45% to 65% of the 24 hr precipitation (not applicable to Desert).

(3) Plot 6 hr precipitation on the right side of the chart.

(4) Draw a line through the point parallel to the plotted lines.

(5) This line is the intensity-duration curve for the location being analyzed.

Application Form:

(a) Selected frequency 2 year

(b) P_6 = 1.09 in., P_{24} = 1.84, $\frac{P_6}{P_{24}}$ = 59 %(2)

(c) Adjusted $P_6^{(2)}$ = 1.09 in.

(d) t_x = ______ min.

(e) I = ______ in./hr.

Note: This chart replaces the Intensity-Duration-Frequency curves used since 1965.

P6	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
Duration	I	I	I	I	I	I	I	I	I	I	I
5	2.63	3.95	5.27	6.59	7.90	9.22	10.54	11.86	13.17	14.49	15.81
7	2.12	3.18	4.24	5.30	6.36	7.42	8.48	9.54	10.60	11.66	12.72
10	1.68	2.53	3.37	4.21	5.05	5.90	6.74	7.58	8.42	9.27	10.11
15	1.30	1.95	2.59	3.24	3.89	4.54	5.19	5.84	6.49	7.13	7.78
20	1.08	1.62	2.15	2.69	3.23	3.77	4.31	4.85	5.39	5.93	6.46
25	0.93	1.40	1.87	2.33	2.80	3.27	3.73	4.20	4.67	5.13	5.60
30	0.83	1.24	1.66	2.07	2.49	2.90	3.32	3.73	4.15	4.56	4.98
40	0.69	1.03	1.38	1.72	2.07	2.41	2.76	3.10	3.45	3.79	4.13
50	0.60	0.90	1.19	1.49	1.79	2.09	2.39	2.69	2.98	3.28	3.58
60	0.53	0.80	1.06	1.33	1.59	1.86	2.12	2.39	2.65	2.92	3.18
90	0.41	0.61	0.82	1.02	1.23	1.43	1.63	1.84	2.04	2.25	2.45
120	0.34	0.51	0.68	0.85	1.02	1.19	1.36	1.53	1.70	1.87	2.04
150	0.29	0.44	0.59	0.73	0.88	1.03	1.18	1.32	1.47	1.62	1.76
180	0.26	0.39	0.52	0.65	0.78	0.91	1.04	1.18	1.31	1.44	1.57
240	0.22	0.33	0.43	0.54	0.65	0.76	0.87	0.98	1.08	1.19	1.30
300	0.19	0.28	0.38	0.47	0.56	0.66	0.75	0.85	0.94	1.03	1.13
360	0.17	0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.84	0.92	1.00

Intensity-Duration Design Chart - Template

FIGURE

3-1

TABLE 2

RUNOFF COEFFICIENTS (RATIONAL METHOD)

DEVELOPED AREAS (URBAN)

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

NOTES:

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

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

Actual imperviousness = 50%

Tabulated imperviousness = 80%

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

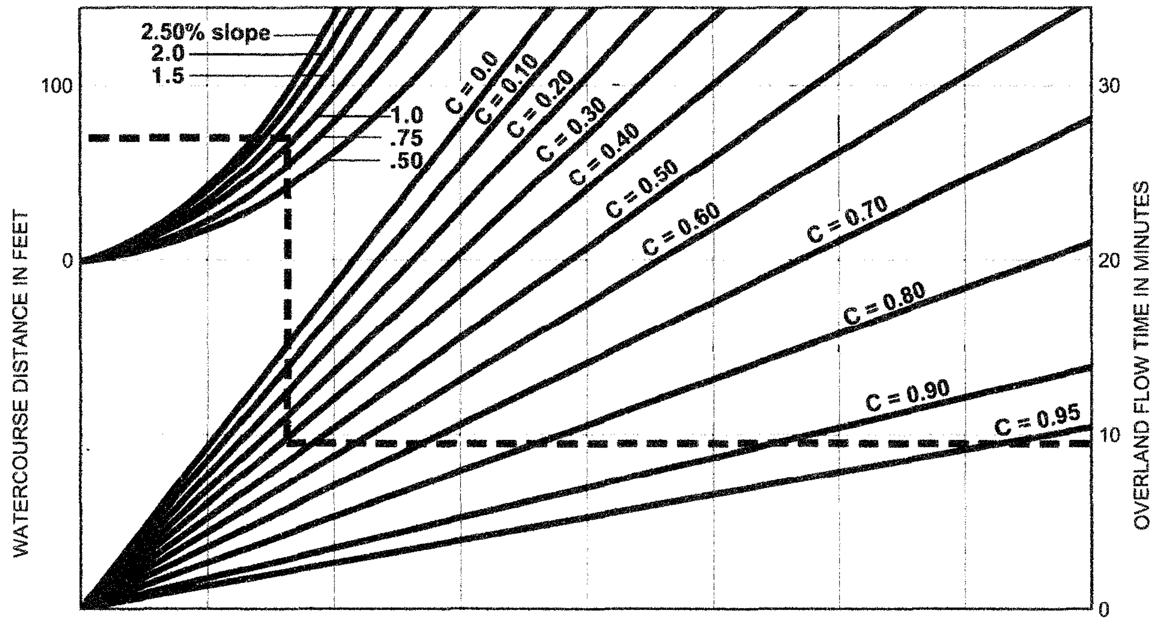
<u>Runoff Coefficient Adjustment</u>

Tabulated Runoff Coefficient: [illegible]
Tabulated % Imperviousness: [illegible]

[illegible]

Post Development

	ft²	acres
Total Area		[illegible]
Post Development Impervious Area		[illegible]
Actual % Imperviousness		[illegible]
Revised C		[illegible]



EXAMPLE:

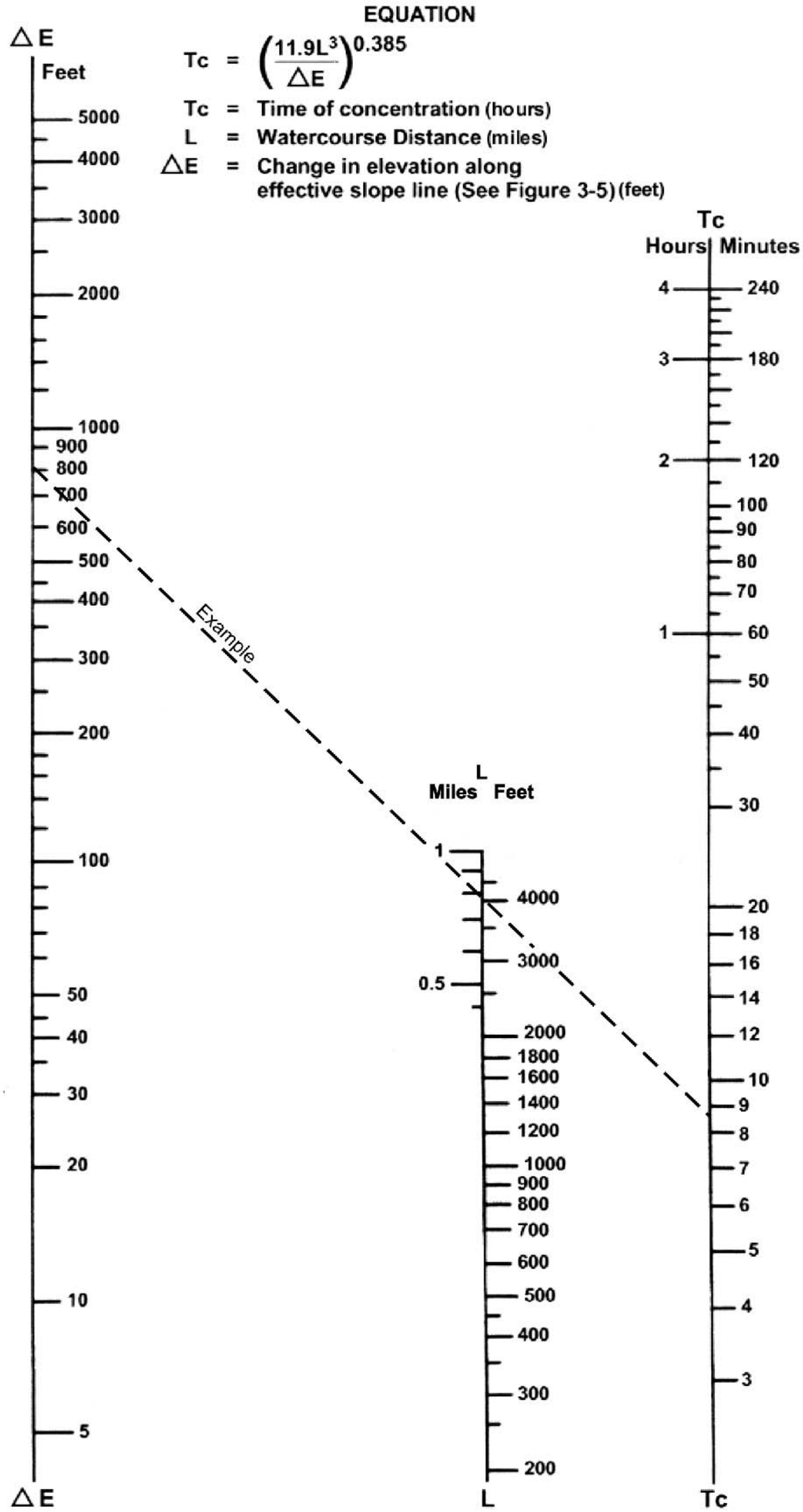
Given: Watercourse Distance (D) = 70 Feet
Slope (s) = 1.3%
Runoff Coefficient (C) = 0.41
Overland Flow Time (T) = 9.5 Minutes

$$T = \frac{1.8\,(1.1-C)\sqrt{D}}{\sqrt[3]{s}}$$

SOURCE: Airport Drainage, Federal Aviation Administration, 1965

Rational Formula - Overland Time of Flow Nomograph

FIGURE **3-3**



SOURCE: California Division of Highways (1941) and Kirpich (1940)

FIGURE **3-4**

Nomograph for Determination of
Time of Concentration (Tc) or Travel Time (Tt) for Natural Watersheds

Ti□ □of□on□ntration□□it□of□an□Di□□o□

	Initial A□□ra□□		Initial TC		A□□ra□□			Mannin□□	Additional TC (travel time)	
Lo□ation	□lo□□□	Initial L□ft□	Initial T (min)	Add□l L□ft□	□lo□□□	ar□a□a□□	□□ □□f□□	□ft□□	Inc. T (min)	total T (min)
							□□□ □t□			
							A□□ra□□□□ □			
□r□D□□										
	□□□	□□	□□□	□□□	□□□			□	□□□	□□□
□o□t□D□□										
	□□□	□□	□□□	□□□	□□□			□	□□□	□□□

	Pre-dev		Post-dev	
	Initial□T□		Initial□T□	
Initial□T□	□□□	□□□□	□□□	□□□□
□Fi□□r□□□□□	D□ft□□	□□	D□ft□□	□□
T□□ in□ $\frac{□□□□□□□□□ □D^{□□}}{□^{□□}}$	□□□ □□	□□□	□□□ □□	□□□
	T =	**2.70**	**T =**	**3.67**

Channel Report

TC Calculation Overland Flow Average Q

Triangular

[illegible]	[illegible]
Total [illegible]	[illegible]
In[illegible]rt[illegible]l [illegible]	[illegible]
[illegible]lo[illegible]	[illegible]
N[illegible]al [illegible]	[illegible]

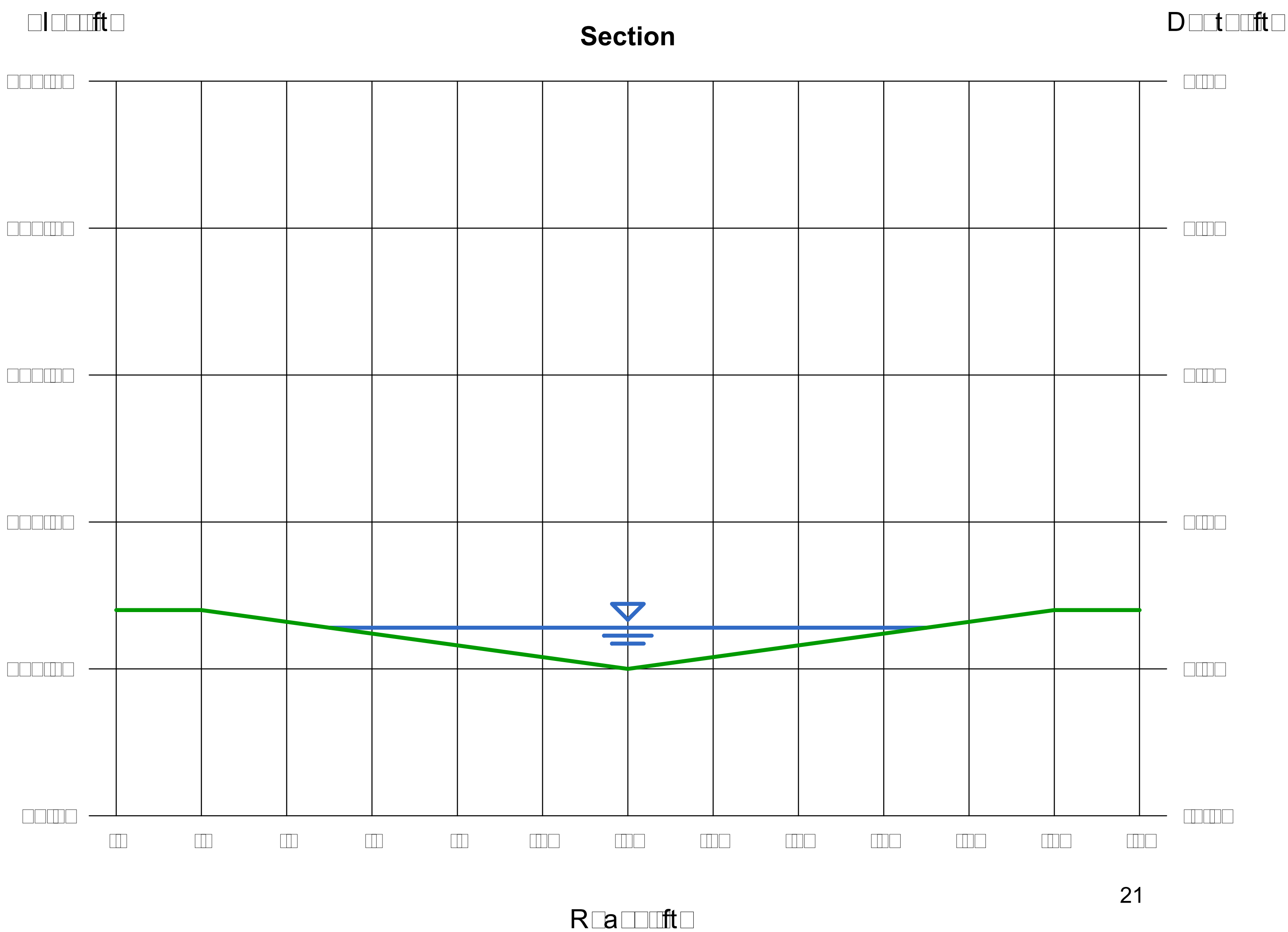
Calculations

[illegible]	[illegible]no[illegible]n[illegible]
[illegible]no[illegible]n [illegible]	[illegible]

Highlighted

D[illegible]	[illegible]
[illegible]	[illegible]
Ar[illegible]a [illegible]	[illegible]
[illegible]lo[illegible]it[illegible]	[illegible]
[illegible]	[illegible]
[illegible]rit D[illegible]	[illegible]
To[illegible] idt[illegible]	[illegible]
[illegible] L[illegible]	[illegible]

Section



ATTACHMENT C

CONSTRUCTION NOTES

1. CONSTRUCT 20' DRIVEWAY 7.5" P.C.C. PAVEMENT OVER 95% COMPACTED SOIL (PER SOILS ENGINEER).
2. CONSTRUCT CONCRETE SIDEWALK PER SDG-155, 8.0' WIDE MIN. UNLESS OTHERWISE NOTED.
3. CONSTRUCT RETAINING WALL PER SDRSD C-3.
4. INSTALL 6" PVC SOLID STORM DRAIN @ 0.50% MIN (TYP).
5. INSTALL 6" PVC PERFORATED UNDERDRAIN.
6. INSTALL 6" PVC TEE WITH 6" PVC VERTICAL RISER TO FINISHED SURFACE. INSTALL 6" DIA. CATCH BASIN WITH FLAT GRATE.
7. INSTALL SIDEWALK UNDERDRAIN-PIPE OUTLET PER D-27.
8. SAWCUT AND REMOVE & CLOSE EX. DRIVEWAY. CONSTRUCT NEW CURB AND GUTTER PER STANDARD DRAWING SDG-151.
9. CONSTRUCT SINGLE TYPE ADA ACCESS RAMP W/TRUNCATED DOMES PER SDG-132 TYPE A. SEE DETAIL HEREON.
10. CONSTRUCT NEW CURB AND GUTTER PER STANDARD DRAWING SDG-151.
11. INSTALL 6" PVC TEE WITH 6" PVC VERTICAL RISER TO FINISHED SURFACE. INSTALL 6" DIA. CATCH BASIN WITH ATRIUM GRATE.
12. OUTLET SITE STORM DRAIN @ 3'x3' SPLASH PAD AT FLOW THROUGH PLANTERS FINISHED SURFACE.

DRAINAGE AREA DMA BREAKDOWN

DRAINAGE AREA SURFACE	SYMBOL	SOIL TYPE	DRAINAGE AREA 'A'
BUILDING ROOFTOP		D	11,885 SQ FT
HARSCAPING/SIDEWALK		D	3,881 SQ FT
LANDSCAPING AREA		D	6,308 SQ FT

LEGEND:

- EXISTING CONTOURS
- EXISTING DIRECTION OF DRAINAGE
- DRAINAGE AREA
- "A" DRAINAGE MANAGEMENT AREA DESIGNATION

IMPERVIOUS AREAS (POST-DEV):

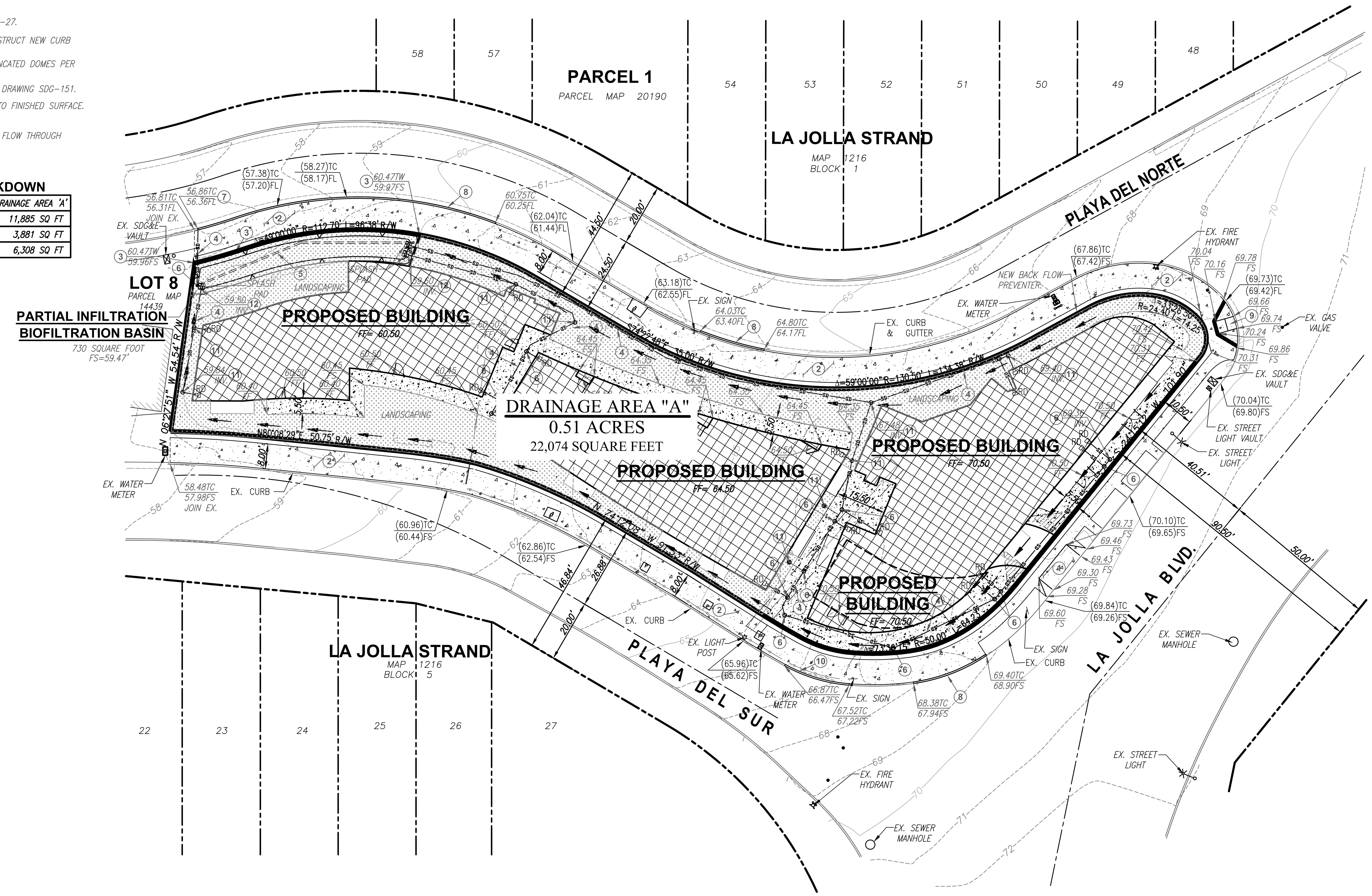
TOTAL LOT AREA = 22,074 sf (0.51 AC)

ROOF TOP AREA = 11,885 sf
PAVEMENT AREA = 3,881 sf
LANDSCAPING = 6,308 sf

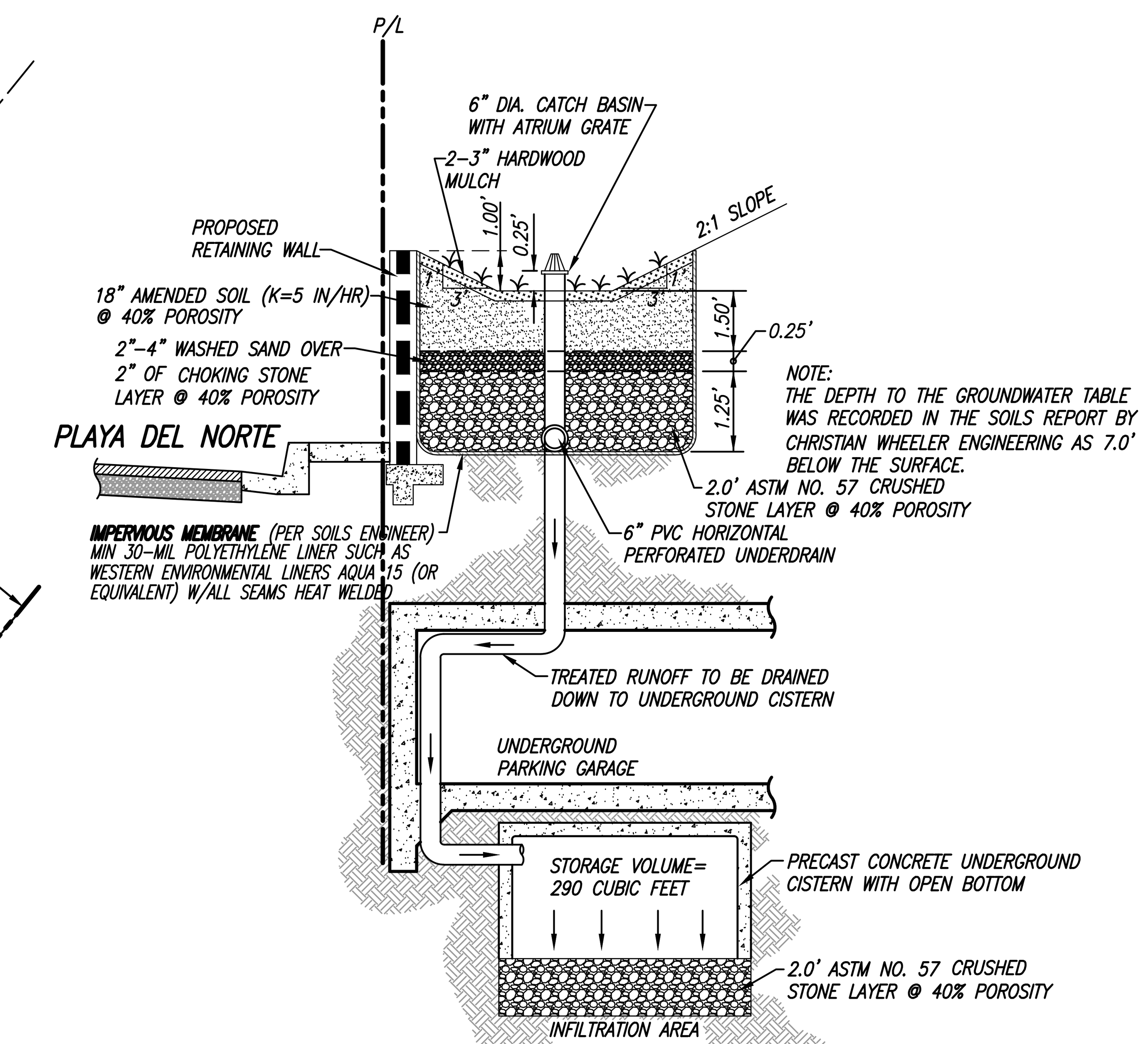
IMPERVIOUS AREA:

TOTAL LOT AREA = 22,074 sf (0.51 AC)

EXISTING IMPERVIOUS AREA PRE-CONSTRUCTION = 21,538 sf
PROPOSED IMPERVIOUS AREA POST-CONSTRUCTION = 15,766 sf
IMPERVIOUS AREA DECREASE = 5,772 sf



SCALE: 1" = 10'



PARTIAL INFILTRATION BIOFILTRATION BASIN
TYPICAL SECTION & OUTLET CONNECTION
NOT-TO-SCALE

PARTIAL INFILTRATION BIOFILTRATION BASIN MEDIA

18" AMENDED SOIL LAYER
COMPOSITION AND TEXTURE:
65% SAND, 20% SANDY LOAM, & 15% COMPOST (FROM VEGETATION-BASED FEEDSTOCK). ANIMAL WASTES OR BY-PRODUCTS SHOULD NOT BE APPLIED.

PERMEABILITY:
5 IN/HR INFILTRATION RATE FOR THE FLOW-BASED SUSMP METHOD
(1-6IN/HR FOR ALTERNATIVE DESIGNS, AS APPROVED BY LOCAL JURISDICTION).

CHEMICAL COMPOSITION: TOTAL PHOSPHORUS < 15 PARTS PER MILLION (PPM); PH 6-8; CATION EXCHANGE CAPACITY > 5 MILLIEQUIVALENTS PER 100 GRAMS (MEQ/100 G) OF SOIL; ORGANIC MATTER CONTENT < 5 PERCENT BY WEIGHT.

18" DRAINAGE LAYER
SEPARATE SOIL MEDIA FROM UNDERDRAIN LAYER WITH 2 TO 4 INCHES OF WASHED SAND, FOLLOWED BY 2 INCHES OF CHOKING STONE (ASTM NO. 8) OVER A 1.0-FOOT ENVELOPE OF ASTM NO. 57 STONE.

SURFACE VEGETATION
AS SPECIFIED BY THE LANDSCAPE ARCHITECT PLANS.

PLANS PREPARED BY:
SPEAR & ASSOCIATES, INC.
CIVIL ENGINEERING & LAND SURVEYING
475 PRODUCTION STREET, SAN MARCOS, CA 92078
PHONE (760) 736-2040 FAX (760) 736-4866
WWW.SPEARINC.NET

REGISTERED PROFESSIONAL ENGINEER DANNY ABADA No. 45381 CIVIL STATE OF CALIFORNIA

POST DEVELOPMENT DRAINAGE AREA MAP FOR:
6738 LA JOLLA BLVD.
BLOCK 9, MAP NO.355

SPEAR & ASSOCIATES JOB No. 15-223 JRZ

ATTACHMENT 6
Copy of Project's Geotechnical and Groundwater Investigation Report

This is the cover sheet for Attachment 6.

CHRISTIAN WHEELER
ENGINEERING

January 26, 2016

Su Casa Properties
912 Newkirk Drive
La Jolla, California 92037

CWE 2150460.03

Subject: Addendum to Report of Preliminary Geotechnical Investigation
On-Site Storm Water Infiltration, Su Casa, 6738 La Jolla Boulevard, La Jolla, California

References: 1) Christian Wheeler Engineering Report 2150460.01, "Report of Preliminary Geotechnical Investigation, Su Casa, 6738 La Jolla Boulevard, La Jolla, California", dated October 23, 2015.
2) Christian Wheeler Engineering Report 2150460.02, "Addendum to Report of Preliminary Geotechnical Investigation, Su Casa, 6738 La Jolla Boulevard, La Jolla, California", dated December 1, 2015.

Ladies and Gentlemen:

In accordance with your request and our proposal dated January 19, 2016, we have prepared this addendum to our referenced geotechnical reports to address the potential for storm water infiltration at the subject site. Unless specifically addressed or amended herein, all of the findings, conclusions, and recommendations presented in the referenced reports remain applicable to the subject project.

As presented on page 11 of our referenced Report of Preliminary Geotechnical Investigation, "Based on the presence of man-placed fill materials on-site, as well as the geomorphic conditions of the site that include an infilled ravine in which perched water is commonly encountered along the contact with surficial materials of artificial fill/alluvium and underlying and much less permeable Cretaceous-age sedimentary deposits, the use of infiltration facilities to manage storm water discharge at the site are not recommended."

In accordance with guidelines presented in Appendix F of the City of San Diego Guidelines for Geotechnical Reports (2011) our recommendation that infiltration facilities not be used to manage storm water discharge at the site was made due to the following unsuitable conditions, in regards to the feasibility of on-site infiltration, being present at the site:

3980 Home Avenue ✦ San Diego, CA 92105 ✦ 619-550-1700 ✦ FAX 619-550-1701

- High perched groundwater (within 10 feet of the base of infiltration/ percolation)
- Engineered, compacted fill (structural fill) and undocumented fills on and adjacent to the site that are subject to hydro-consolidation.
- Infiltration/percolation rates anticipated to less than 0.52 inches/hour, corresponding to the presence of silt, clay, and clay or silt loam.
- The presence of on-site soils with >20% clay or >40% silt and clay, which are not typically suitable for infiltration.
- The low permeability or impermeable nature of the Cretaceous-age bedrock underlying the site.
- Expectation that changes in soil moisture content or rising groundwater level will adversely impact existing structures or improvements on and adjacent to the site.

It is also our professional opinion and judgment that our recommendation that infiltration facilities not be used to manage storm water discharge is consistent and in accordance with Appendices C and D of the Model BMP Design Manual San Diego Region (2015). A completed "Worksheet C.4-1: Categorization of Infiltration Feasibility Condition" for the subject project is included in Appendix A of this report. As presented on the last page (C-14) of Worksheet C.4-1, our feasibility screening for infiltration for the subject project indicates "No Infiltration." For reference, Appendix B of this report presents logs of our subsurface investigation of the site, geotechnical mapping, and the results of laboratory testing, which were previously included in our referenced Report of Preliminary Geotechnical Investigation and which support the findings of our feasibility screening.

If you have any questions after reviewing this report, please do not hesitate to contact our office. This opportunity to be of professional service is sincerely appreciated.

Respectfully submitted,
CHRISTIAN WHEELER ENGINEERING

REGISTERED PROFESSIONAL ENGINEER DANIEL B. ADLER No. 36037 Exp. 06-30-16 CIVIL STATE OF CALIFORNIA

REGISTERED GEOLOGIST DAVID R. RUSSELL No. 2215 CERTIFIED ENGINEERING GEOLOGIST Exp. 09-17 STATE OF CALIFORNIA

Daniel B. Adler, RCE #36037 David R. Russell, CEG #2215

DBA:drr
cc: CAMarengo@marengomortonarchitects.com; GeanineRollins@marengomortonarchitects.com

Appendix A

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

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?**			
Criteria	Screening Question	**Yes**	**No**
1	**Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		NO
Provide basis: Variable soil infiltration properties across site. Existing alluvium and fill possess layers of silts and clays demonstrating very low infiltration rates. Very low rates of infiltration within Cretaceous-age sediments of Point Loma Formation underlying site. Please refer to subsurface exploration data and laboratory test results presented in CWE Report 2150460.01. 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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		NO
Provide basis: C2.2 Settlement and Volume Change - On- and off-site fills and alluvial soils subject to consolidation as the result of infiltration. Near surface clayey soils subject to expansion. C.2.4 Utility Considerations - Existing and proposed on- and of-site utility trenches considered susceptible to saturation and lateral migration of infiltrated storm water. C.2.6 Retaining Walls and Foundations - The proposed project will include a subterranean level across almost the entirety of the site. Any proposed infiltration facility would infiltrate storm water adjacent to planned foundations and retaining walls. C.2.7 Other Factors - Adjacent subgrade soils in public right-of-ways subject to degradation as the result of infiltration. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			

<table>
<tr><th colspan="4">Worksheet C.4-1 Page 2 of 4</th></tr>
<tr><th>Criteria</th><th>Screening Question</th><th>Yes</th><th>No</th></tr>
<tr><td>3</td><td>Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.</td><td></td><td>NO</td></tr>
<tr><td colspan="4">Provide basis:

C.3.2 Separation to Seasonal High Groundwater - The depth to perched groundwater beneath the site was measured by our firm (see CWE Report 2150460.01) at depths as shallow as 7 feet below existing site grades during the dry season (September 2015). The depth of perched groundwater beneath the site may increase during the wet season.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</td></tr>
<tr><td>4</td><td>Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.</td><td></td><td>N/A</td></tr>
<tr><td colspan="4">Provide basis:

C.3.6 Water Balance Impacts on Stream Flow – Not Applicable. No streams located hydrologically down gradient.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</td></tr>
<tr><td>Part 1 Result*</td><td colspan="2">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</td><td>See Pages C-13 and C-14</td></tr>
</table>

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by [City Engineer] to substantiate findings.

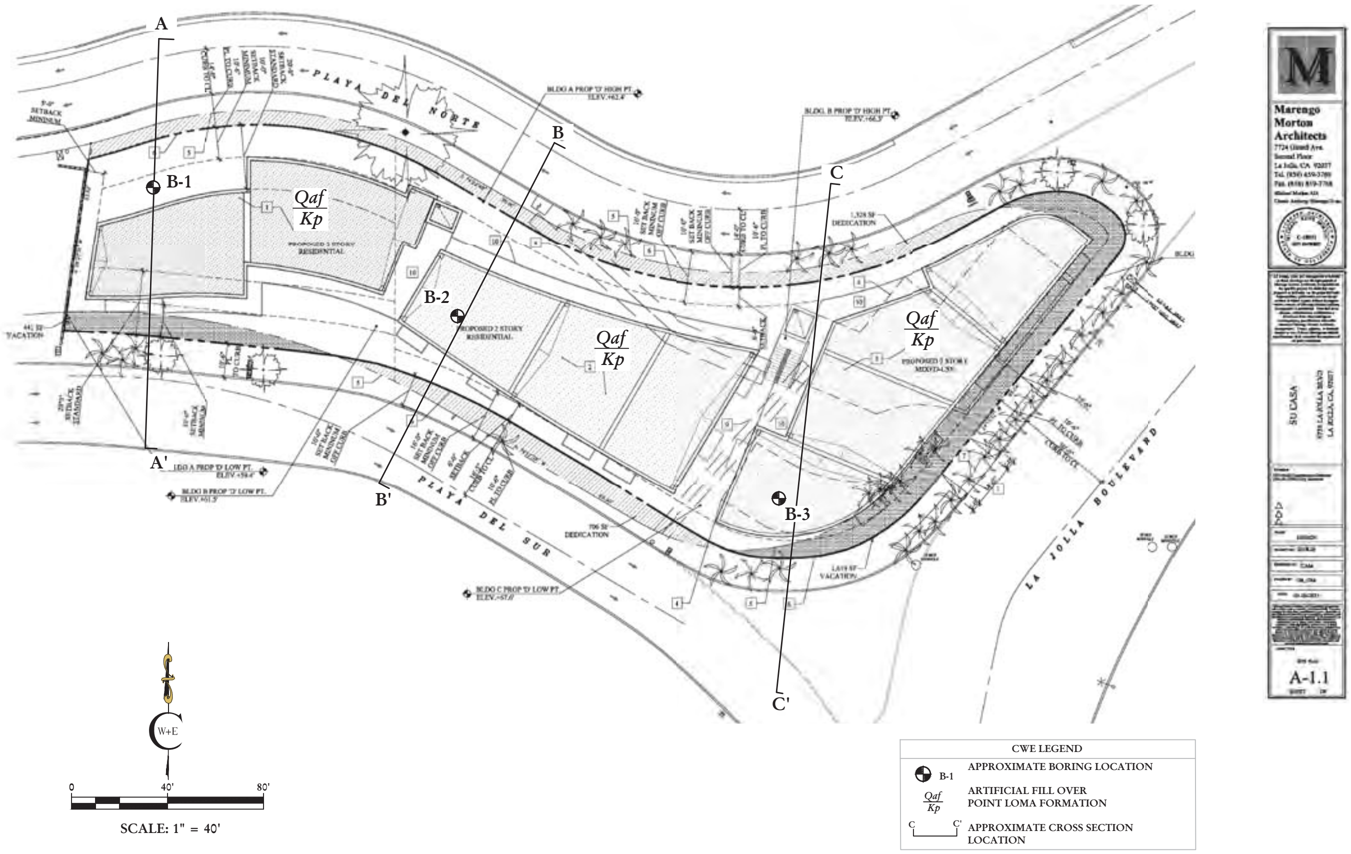
Worksheet C.4-1 Page 3 of 4			
Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria **Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?**			
Criteria	Screening Question	**Yes**	**No**
5	**Do soil and geologic conditions allow for infiltration in any appreciable rate or volume?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		NO
Provide basis: C2.2 Settlement and Volume Change - On- and off-site fills and alluvial soils subject to consolidation as the result of infiltration. Near surface clayey soils subject to expansion. C.2.4 Utility Considerations - Existing and proposed on- and of-site utility trenches considered susceptible to saturation and lateral migration of infiltrated storm water. C.2.6 Retaining Walls and Foundations - The proposed project will include a subterranean level across almost the entirety of the site. Any proposed infiltration facility would infiltrate storm water adjacent to planned foundations and retaining walls. C.2.7 Other Factors - Adjacent subgrade soils in public right-of-ways subject to degradation as the result of infiltration. 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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		NO
Provide basis: C.2.4 Utility Considerations - Existing and proposed on- and of-site utility trenches considered susceptible to saturation and lateral migration of infiltrated storm water. C.2.6 Retaining Walls and Foundations - The proposed project will include a subterranean level across almost the entirety of the site. Any proposed infiltration facility would infiltrate storm water adjacent to planned foundations and retaining walls. C.2.7 Other Factors - Adjacent subgrade soils in public right-of-ways subject to degradation as the result of infiltration. 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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		NO
Provide basis: C.3.2 Separation to Seasonal High Groundwater - The depth to perched groundwater beneath the site was measured by our firm (see CWE Report 2150460.01) at depths as shallow as 7 feet below existing site grades during the dry season (September 2015). The depth of perched groundwater beneath the site may increase during the wet season. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
8	**Can infiltration be allowed without violating downstream water rights**? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	YES	
Provide basis: There are no downstream water bodies before the Pacific Ocean. 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 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is **Partial Infiltration.** If any answer from row 5-8 is no, then infiltration of any volume is considered to be **infeasible** within the drainage area. The feasibility screening category is **No Infiltration.**	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

Appendix B

Data from CWE Report 2150460.01
October 23, 1015

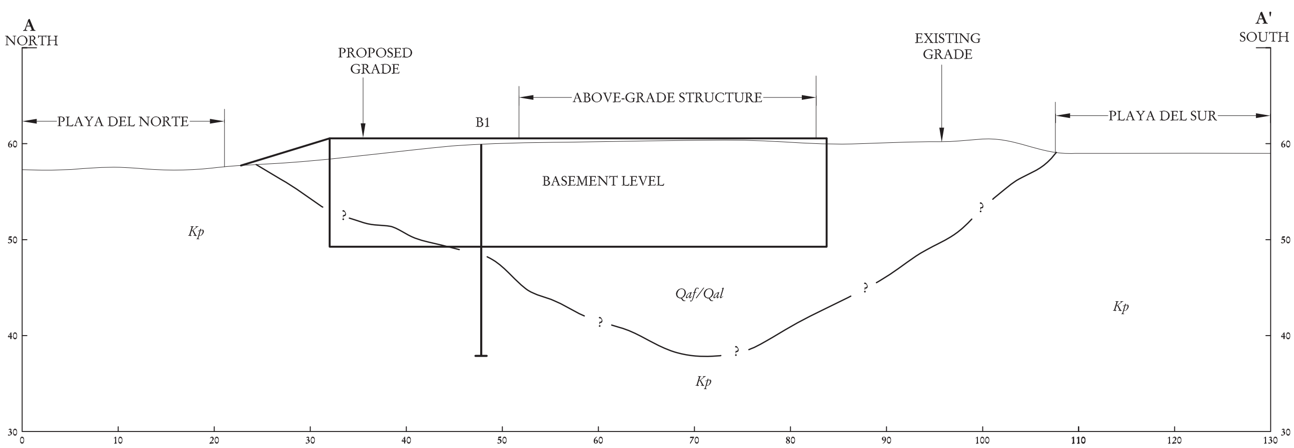


SITE PLAN AND GEOTECHNICAL MAP

SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

DATE:	OCTOBER 2015	JOB NO.:	2150460.01
BY:	SRD	PLATE NO.:	1

CHRISTIAN WHEELER ENGINEERING



CWE LEGEND	
B-1	APPROXIMATE BORING LOCATION
Qaf/Qal	UNDIFFERENTIATED ARTIFICIAL FILL/ALLUVIUM
Kp	POINT LOMA FORMATION

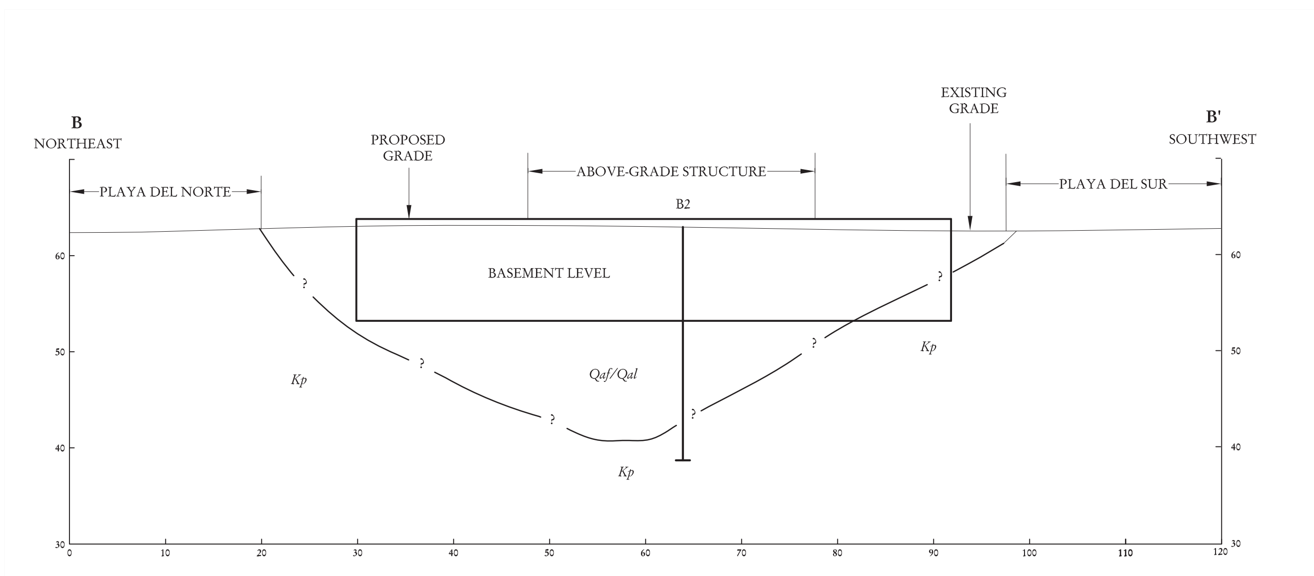
0 10' 20'

SCALE: 1" = 10'

GEOLOGIC CROSS SECTION A-A'

SU CASA 6738 LA JOLLA BOULEVARD LA JOLLA, CALIFORNIA			
DATE:	OCTOBER 2015	JOB NO.:	2150460
BY:	SRD	PLATE NO.:	2

CHRISTIAN WHEELER
ENGINEERING



CWE LEGEND	
B-1	APPROXIMATE BORING LOCATION
Qaf/Qal	UNDIFFERENTIATED ARTIFICIAL FILL/ALLUVIUM
Kp	POINT LOMA FORMATION

0 10' 20'

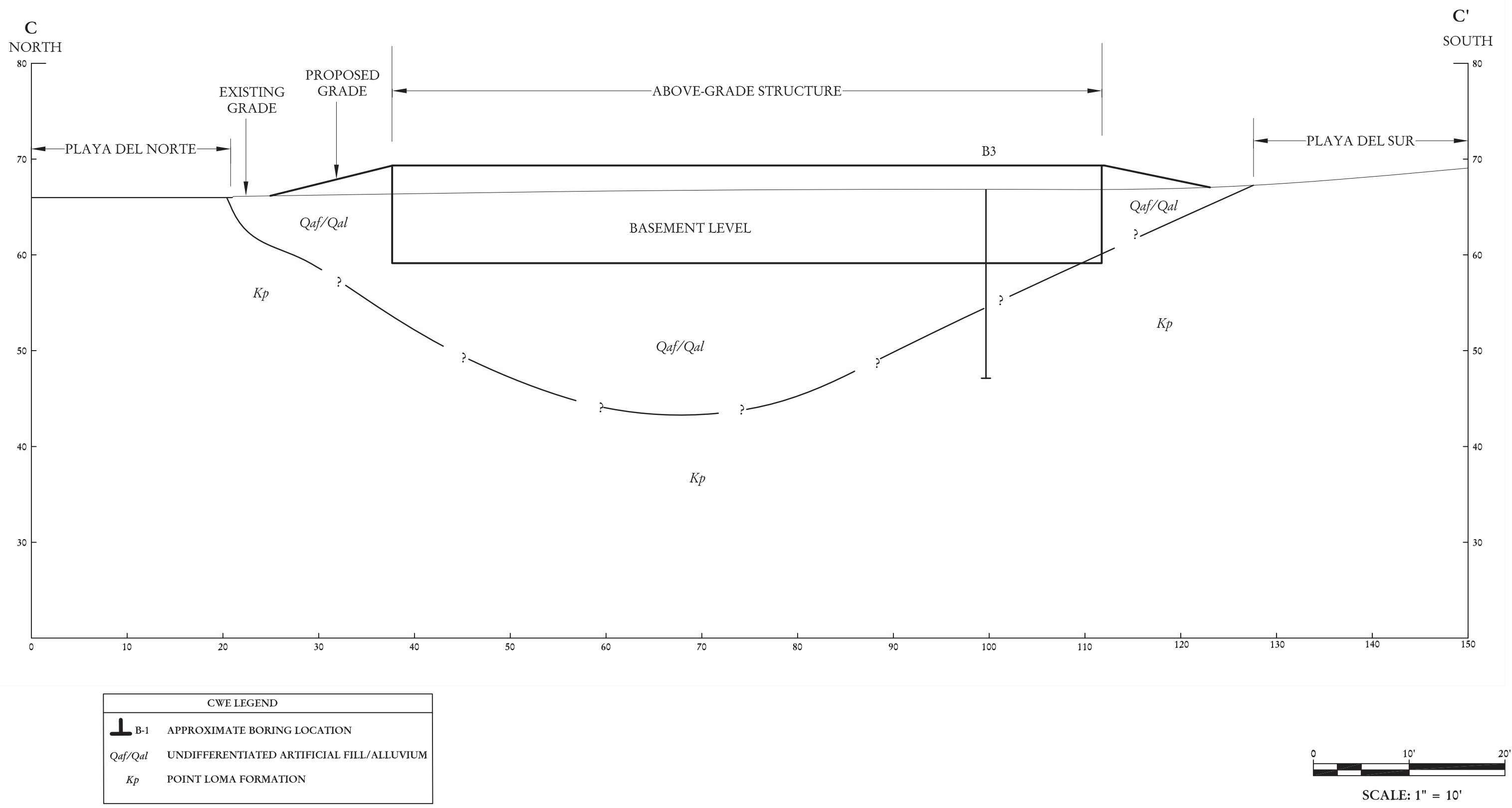
SCALE: 1" = 10'

GEOLOGIC CROSS SECTION B-B'

SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

DATE:	OCTOBER 2015	JOB NO.:	2150460
BY:	SRD	PLATE NO.:	3

CHRISTIAN WHEELER
ENGINEERING



GEOLOGIC CROSS SECTION C-C'

SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

DATE:	OCTOBER 2015	JOB NO.:	2150460
BY:	SRD	PLATE NO.:	4

CHRISTIAN WHEELER ENGINEERING

Appendix A

Subsurface Explorations

LOG OF TEST BORING B-1

Date Logged:	9/22/15	Equipment:	Mobil B-61
Logged By:	DJF	Auger Type:	8 inch Hollow Stem
Existing Elevation:	60.0 feet	Drive Type:	140lbs/30 inches
Proposed Elevation:	49½ feet	Depth to Water:	N/A

Sample Type and Laboratory Test Legend

Cal	Modified California Sampler	CK	Chunk Density
SPT	Standard Penetration Test	DR	Density Ring
ST	Shelby Tube		
MD	Max Density	DS	Direct Shear
SO4	Soluble Sulfates	Con	Consolidation
SA	Sieve Analysis	EI	Expansion Index
HA	Hydrometer	R-Val	Resistance Value
SE	Sand Equivalent	Chl	Soluble Chlorides
PI	Plasticity Index	Res	pH & Resistivity
CP	Collapse Potential		

DEPTH (ft)	ELEVATION (ft)	USCS SYMBOL	SUMMARY OF SUBSURFACE CONDITIONS (based on Unified Soil Classification System)	PENETRATION (blows per foot)	SAMPLE TYPE	BULK	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	RELATIVE COMPACTION (%)	LABORATORY TESTS
0	60		1" of AC over 2" of PCC							
		SM	**Artificial Fill (Qaf):** Brown, moist, loose, very fine- to medium-grained, SILTY SAND with CLAY, trace gravels, brick and concrete debris.	8	Cal					SA MD DS
5	55			30**	Cal		18.9	102.2		
		SC/ CL	Grayish-brown, moist, loose to medium stiff, CLAYEY SAND/SANDY CLAY with gravels, brick, and concrete debris.							
		SC	**Subsoil:** Greenish-gray, very moist, medium stiff, VERY SANDY CLAY with rootlets and white precipitate deposits, moderate seepage at 10'.	10	Cal		22.0	103.2		SA
10	50		Saturated.							
		ML	**Point Loma Formation (Kp):** Greenish-gray, very moist to very moist, very stiff, CLAYEY SILT with SAND and white precipitate deposits; moderately weathered.	24	Cal		17.5	110.9		
				51	Cal					DS
		SM	Greenish-gray to yellowish-brown, moist, dense, very fine- to medium-grained, SILTY SAND; micaceous with trace rootlets, slightly weathered to 14 feet.	50/3"	Cal		12.7	117.9		
15	45		Moist, very dense.							
20	40			50/3"	Cal		19.5	107.5		
				50/2"	Cal		13.1	114.6		
25	35		Boring terminated at 24 feet. Seepage encountered at 10 feet.							
30	30									

Notes:

Symbol Legend

- Groundwater Level During Drilling
- Groundwater Level After Drilling
- Apparent Seepage
- * No Sample Recovery
- ** Non-Representative Blow Count (rocks present)

SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

DATE:	OCTOBER 2015	JOB NO.:	2150460.01
BY:	SRD	FIGURE NO.:	A-1

CHRISTIAN WHEELER
ENGINEERING

LOG OF TEST BORING B-2

Date Logged:	9/22/15	Equipment:	Mobil B-61
Logged By:	DJF	Auger Type:	8 inch Hollow Stem
Existing Elevation:	63.0 feet	Drive Type:	140lbs/30 inches
Proposed Elevation:	53.6 feet	Depth to Water:	N/A

Sample Type and Laboratory Test Legend

Cal	Modified California Sampler	CK	Chunk Density
SPT	Standard Penetration Test	DR	Density Ring
ST	Shelby Tube		
MD	Max Density	DS	Direct Shear
SO4	Soluble Sulfates	Con	Consolidation
SA	Sieve Analysis	EI	Expansion Index
HA	Hydrometer	R-Val	Resistance Value
SE	Sand Equivalent	Chl	Soluble Chlorides
PI	Plasticity Index	Res	pH & Resistivity
CP	Collapse Potential		

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS SYMBOL	SUMMARY OF SUBSURFACE CONDITIONS (based on Unified Soil Classification System)	PENETRATION (blows per foot)	SAMPLE TYPE	BULK	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	RELATIVE COMPACTION (%)	LABORATORY TESTS
0	63			3" of AC over 4" of Base							
			SC	**Artificial Fill (Qaf):** Dark grayish-brown, moist, loose to medium dense, very fine- to medium-grained, CLAYEY SAND with gravels, organic scent.	15	Cal					
			SM	Greenish-gray, moist, loose, very fine- to medium-grained, SILTY SAND, micaceous, Point Loma derived fill.	9	Cal		17.3	109.7		
5	58			Very moist.							
				Heavy seepage at 7', saturated.							
			SC	Grayish-brown, saturated, loose, very fine- to medium-grained, CLAYEY SAND with gravels and abundant concrete debris (no spoils generated during drilling below 7 feet).	29**	Cal					
10	53				5**	Cal		20.5	108.5		
15	48				12**	Cal*					
20	43		SM	**Point Loma Formation (Kp):** Yellowish-brown to greenish-gray, moist, very dense, very fine- to medium-grained, SILTY SAND; micaceous.	50/5"	Cal		11.5	123.2		
					50/2"	Cal		15.5	113.4		
25	38			Boring terminated at 24 feet. Seepage encountered at 7 feet.							
30	33										

Notes:

Symbol Legend

- Groundwater Level During Drilling
- Groundwater Level After Drilling
- Apparent Seepage
- * No Sample Recovery
- ** Non-Representative Blow Count (rocks present)

SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

DATE:	OCTOBER 2015	JOB NO.:	2150460.01
BY:	SRD	FIGURE NO.:	A-2

CHRISTIAN WHEELER ENGINEERING

LOG OF TEST BORING B-3

Date Logged:	9/22/15	Equipment:	Mobil B-61
Logged By:	DJF	Auger Type:	8 inch Hollow Stem
Existing Elevation:	67.0 feet	Drive Type:	140lbs/30 inches
Proposed Elevation:	59.5 feet	Depth to Water:	N/A

Sample Type and Laboratory Test Legend

Cal	Modified California Sampler	CK	Chunk Density
SPT	Standard Penetration Test	DR	Density Ring
ST	Shelby Tube		
MD	Max Density	DS	Direct Shear
SO4	Soluble Sulfates	Con	Consolidation
SA	Sieve Analysis	EI	Expansion Index
HA	Hydrometer	R-Val	Resistance Value
SE	Sand Equivalent	Chl	Soluble Chlorides
PI	Plasticity Index	Res	pH & Resistivity
CP	Collapse Potential		

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS SYMBOL	SUMMARY OF SUBSURFACE CONDITIONS (based on Unified Soil Classification System)	PENETRATION (blows per foot)	SAMPLE TYPE	BULK	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	RELATIVE COMPACTION (%)	LABORATORY TESTS
0	67			5" of AC							
			SM	**Artificial Fill (Qaf):** Dark grayish-brown, moist, loose to medium dense, very fine- to medium-grained, CLAYEY SAND with gravels, organic scent.	8	Cal					
				AC debris at 4 feet.	5	Cal					
5	62		SC/ CL	Grayish-brown, moist to very moist, medium stiff, CLAYEY SAND/SANDY CLAY with gravels and concrete debris. EI = 35 (Low)							
				Moderate seepage at 8 feet.	9	Cal		22.5	99.3		
10	57		SM	**Point Loma Formation (Kp):** Yellowish-brown, moist, dense, very fine- to medium-grained, VERY SILTY SAND; micaceous, slightly weathered to 12½ feet.	55	Cal		13.2	114.2		DS
				Very dense.	50/5"	Cal		12.7	117.9		
15	52										
					50/3"	Cal		12.8	117.0		
20	47			Boring terminated at 19½ feet. Seepage encountered at 7 feet.							
25	42										
30	37										

Notes:

Symbol Legend

- Groundwater Level During Drilling
- Groundwater Level After Drilling
- Apparent Seepage
- * No Sample Recovery
- ** Non-Representative Blow Count (rocks present)

SU CASA
6738 LA JOLLA BOULEVARD
LA JOLLA, CALIFORNIA

DATE:	OCTOBER 2015	JOB NO.:	2150460.01
BY:	SRD	FIGURE NO.:	A-3

CHRISTIAN WHEELER ENGINEERING

Appendix B

Laboratory Test Results

Laboratory tests were performed in accordance with the generally accepted American Society for Testing and Materials (ASTM) test methods or suggested procedures. Brief descriptions of the tests performed are presented below:

a) **CLASSIFICATION:** Field classifications were verified in the laboratory by visual examination. The final soil classifications are in accordance with the Unified Soil Classification System and are presented on the exploration logs in Appendix A.

b) **MOISTURE-DENSITY: MOISTURE-DENSITY:** In-place moisture contents and dry densities were determined for selected soil samples in accordance with ATM D 2937. The results are summarized in the boring logs presented in Appendix A.

c) **MAXIMUM DENSITY & OPTIMUM MOISTURE CONTENT:** The maximum dry density and optimum moisture content of typical soils were determined in the laboratory in accordance with ASTM Standard Test D-1557, Method A.

d) **DIRECT SHEAR:** Direct shear tests were performed on selected samples of the on-site soils in accordance with ASTM D 3080.

e) **EXPANSION INDEX TEST:** Expansion index tests were performed on selected remolded soil samples in accordance with ASTM D 4829.

f) **GRAIN SIZE DISTRIBUTION:** The grain size distributions of selected samples were determined in accordance with ASTM C136 and/or ASTM D 422.

g) **SOLUBLE SULFATE CONTENT:** The soluble sulfate content was determined for representative samples in accordance with California Test Methods 417.

LABORATORY TEST RESULTS

SU CASA

6738 LA JOLLA BOULEVARD

LA JOLLA, CALIFORNIA

MAXIMUM DRY DENSITY AND OPTIMUM MOISTURE CONTENT (ASTM D1557)

Sample Location	**Boring B-1 @ ½'-5'**
Sample Description	Brown Silty Sand with Clay, SM
Maximum Density	123.1 pcf
Optimum Moisture	10.1 %

DIRECT SHEAR (ASTM D3080)

Sample Location	**Boring B-1 @ ½'-5'**	**Boring B-1 @ 12½'**	**Boring B-3 @ 11½'**
Sample Type	Remolded to 90 %	Undisturbed	Undisturbed
Friction Angle	29°	33°	329°
Cohesion	250 psf	250 psf	250 psf

EXPANSION INDEX TESTS (ASTM D4829)

Sample Location	**Boring B-3 @5'-10'**
Initial Moisture:	9.9 %
Initial Dry Density	108.5 pcf
Final Moisture:	20.0 %
Expansion Index:	35 (Low)

GRAIN SIZE DISTRIBUTION (ASTM D422)

Sample Location	**Boring B-1 @ ½'-5'**	**Boring B-1 @ 8½'-11'**	**Boring B-3 @ 10½'-15'**
Sieve Size	*Percent Passing*	*Percent Passing*	*Percent Passing*
2"	100		
1½"	99		
1"	96		
¾"	95		
½"	93		
⅜"	92		
#4	90	100	100
#8	87	96	99
#16	85	92	97
#30	78	86	94
#50	59	75	83
#100	47	64	68
#200	40	55	52

LABORATORY TEST RESULTS (CONT)

SOLUBLE SULFATES (CALIFORNIA TEST METHOD 417)

Sample Location	**Boring B-1 @ 12'-17'**	**Boring B-3 @ 5'-10'**
Soluble Sulfate	0.040 % (SO_4)	0.130 % (SO_4)