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~~Revised December 10, 2016~~
~~March 1, 2016~~

Subject: Biological Resources; the Torrance Street Project, City of San Diego Project No. 519307

Dear Mr. Nakhshab:

This report addresses biological resources, project-related impacts, and mitigation requirements associated with the Torrance Street Project in the City of San Diego (Project No. 519307). The project site (APN 451-292-06), which consists of approximately 0.56 acre, is located in the Uptown area of the City of San Diego, east of Interstate Highway 5, west of Otsego Drive, and south of the future extension of Torrance Street (Figure 1).

PROJECT DESCRIPTION

Development of the Torrance Street Project site will result in the construction of three single family residences (SFR) and associated improvements. Access to the new residence will be either from the east off Otsego Drive or from the west off Torrance Street. The analysis in this report assumes that 100 percent of the subject property will be impacted by development, either directly or indirectly.

PURPOSE OF STUDY

The purpose of this study was to inventory the property for biological resources, identify onsite habitats, and search for signs of rare, endangered, threatened, or otherwise sensitive plants or animals which have a potential to occur here. These data were used in an assessment of biological resource values. This analysis allows a determination of project-related direct and indirect impacts, as required by the California Environmental Quality Act (CEQA), and mitigation, if appropriate and necessary. It further allows a determination of the project's conformance with the City of San Diego's Land Development Code (LDC), Environmentally Sensitive Lands (ESL) Ordinance, and Multiple Species Conservation Program (MSCP) Subarea Plan, including the Multi-Habitat Planning Area (MHPA).

METHODS

A field survey of the Torrance Street Project was completed on 16 and 26 February 2016 between the hours of 09:30 and 11:30 on both survey days. Weather conditions during the survey consisted of clear skies with temperatures in the high 60˚s to mid 70˚s and no measurable wind. Surveys were completed by myself. The entire Torrance Street Project site was slowly walked and examined on both survey days, and all plants, animals, and habitats encountered were inventoried. The locations and identities of all larger shrubs and trees were mapped utilizing a recent aerial site photo (Figure 3). All plants identified in association with the property are listed in Table 2, attached. Floral nomenclature used in this letter follows Hickman (1993) and others. Plant communities follow Holland (1996, as amended).

Wildlife observations were made opportunistically. Binoculars were used to aid in observations and all wildlife species observed were noted (Table 2). Animal nomenclature used in this report is taken from Stebbins (2003) for reptiles and amphibians, American Ornithologist's Union (1998, as updated) for birds, and Jones, et. al (1992) for mammals.

RESULTS

Habitats

The Torrance Street Project site supports two broadly overlapping, disturbance-responsive plant associations or habitats. These are Non-native Grassland (NNG) and Non-native Vegetation (NNV). Neither of these plant associations are of any local or regional biological resource value.

Non-native Grassland (Holland Code 42200) – Tier IIIB – 0.13 acre

The northern and central portion of the site supports a band of non-native, weedy, disturbance-responsive forbs and grasses that qualify as Non-native Grassland (NNG). Indicators observed include Ripgut Brome *(Bromus diandrus)*, Wild Barley (*Hordeum murinum*), Wild Oat *(Avena fatua),* and other herbaceous, weedy annuals. NNG is a Tier IIIB habitat-type in the City of San Diego.

Non-native Vegetation (Holland Code 11000) – Tier IV – 0.43 acre

The majority of the project site supports Non-native Vegetation (NNV) in the form of naturalized ornamentals, such as Jade Plant *(Crassula argentea)*, Hottentot Fig (*Carpobrotus edulis*), Red Apple Iceplant (*Aptenia cordifolia),* and various non-native trees at the periphery. Also qualifiying as NNV are areas dominated by ruderal weeds, such as Cheeseweed *(Malva parviflora)*, Common Sow Thistle *(Sonchus oleraceous)*, and others. A large native shrub, Sugarbush (*Rhus ovata*), is partially overhanging the site at the northwest corner, although this appears to be actually growing slightly offsite on the adjoining property to the west. This specimen may have been planted in this location, as it is outside of the species' normal range. NNV is a Tier IV habitat-type in the City of San Diego.

Plants

The plant species observed on the Torrance Street Project site typify the diversity normally found in NNG and NNV on small parcels in this part of the City. A complete list of the plants observed is presented in Table 2. Most of the plants (80+ percent) are non-native species.

Animals

Very few animals were observed using the project site. This is a reflection of the site's small size and the nature of the surrounding urban area. The species observed are all common forms, abundant in the site's vicinity. Expected/observed species include various common birds, such as House Finch *(Carpodacus mexicanus)*, Lesser Goldfinch *(Carduelis psaltria)* and Black Phoebe *(Sayornis nigricans)*, and a few reptiles and mammals, including Western Fence Lizard *(Sceloporus occidentalis)*, Valley Pocket Gopher *(Thomomys bottae)*, and others. No amphibians were detected, although one or two locally-common species, such as Pacific Slender Salamander *(Batrachoseps pacificus)* and Western Toad *(Bufo boreas)* might be expected. Fish were neither observed nor would be expected. Animals observed on site are listed in Table 2, attached.

SENSITIVE RESOURCES

Sensitive Vegetation Communities

Sensitive vegetation communities are those recognized by the City's MSCP (City of San Diego, 1997) and Land Development Code as depleted, rare within the region, supporting sensitive animal or plant species, and/or serving as important wildlife corridors. These habitats are typically rare throughout their ranges, or are highly localized and/or fragmented.

Neither of the habitats affected by development of the Torrance Street Project Site is considered "sensitive", although impacts to Tier IIIB habitat-types (in this case NNG) are regulated under the City's ESL ordinance.

Sensitive Plants

No sensitive plant species were observed on the Torrance Street Project site, and none would be expected, given the highly disturbed nature of the property. Sensitive plants known from the vicinity are presented in Attachment A.

Sensitive Animals

Two sensitive animals were detected during the site surveys.

A single Monarch Butterfly (*Danaus plexippus)* was observed flying just offsite near the northeastern property edge adjacent to the right-of-way for the continuation of Torrance Street. The Monarch Butterfly is listed as a as a Local Special Status Animal Species by the City of San Diego. The butterfly observed likely represents a migratory specimen because the site does not support any significant roosting or foraging vegetation.

A mature Red-shouldered Hawk (*Buteo lineatus)* was observed roosting on a dead eucalyptus tree near the northeastern property corner. Red-shouldered Hawk is listed as a Local Special Status Animal Species by the City. The hawk observed likely represents a wide-ranging specimen because the site does not support any significant roosting or foraging vegetation, although there are trees in the vicinity (offsite) that could be used as nesting or roosting sites.

A few additional species of sensitive, wide-ranging animals have a moderate probability to utilize this property on at least an occasional basis. These might include various sensitive bats or raptors that could fly over or roost onsite on occasion. No occupied habitat or raptor nests were detected, however. One or two species of locally-abundant but sensitive reptiles, such as Coronado Skink *(Eumeces skiltonianus interparietalis)* and others could occur here in low numbers. In any case, no sensitive animal populations would depend on the resources provided by this small property. Sensitive animals known from the vicinity are presented in Attachment A.

Narrow Endemics

The City of San Diego recognizes a variety of “narrow endemics” within the MSCP, including the following: San Diego Thorn-mint *(Acanthomintha ilicifolia)*, Shaw’s Agave *(Agave shawii)*, San Diego Ambrosia *(Ambrosia pumila),* Aphanisma *(Aphanisma blitoides),* Coastal Dunes Milk Vetch (*Astragalus tener* var. *titi)*, Short-Leaved Dudleya *(Dudleya brevifolia)*, Variegated Dudleya *(Dudleya variegata)*, Otay Tarplant (Hemizonia conjugens), Prostrate Navarretia (*Navarretia fossalis)*, Snake Cholla *(Opuntia serpentina)*, California Orcutt Grass *(Orcuttia*

californica), San Diego Mesa Mint *(Pogogyne abramsii)*, and Otay Mesa Mint *(Pogogyne nudiuscula)*. Most of these occur in habitats, such as vernal pools, maritime sage scrub, coastal dunes, etc., not found on this property. In any case, no narrow endemics are anticipated to occur on the subject property. Three narrow endemics are known from open, herb-dominated habitats: San Diego Thorn-mint, Otay Tarplant, and San Diego Ambrosia. These are highly unlikely to occur on this property, as no occurrences are reported from the vicinity, and distinctive foliage/floral parts would have likely been observed if the species' were present. Narrow endemics and other sensitive species known from the vicinity of this site are listed in Attachment A.

Attachment A lists sensitive plants and animals that are known from the area. Species in Attachment A ranked as "high" probability are expected (at least occasionally); species ranked as "moderate" might or might not occur occasionally; species ranked as "low" are very unlikely to ever occur on or otherwise utilize the site.

Wildlife Corridors

Wildlife corridors are not present on the Torrance Street Project site. No significant impacts to wildlife movement would thus result from the development of this site, as homes are present on adjoining parcels in all directions. Furthermore, because the Torrance Street Project site is not located within the City's Urban Area MHPA, any effort at onsite corridor preservation would be discouraged.

IMPACTS

The determination of the "significance" of project impacts, per the City's Biology Guidelines, is based on one or all of the following criteria:

a. *The site has been identified as part of the MHPA by the City's MSCP Subarea Plan.*
b. *The site supports or could support (e.g. in different seasons/rainfall conditions, etc.) Tier I, II, or IIIA & B vegetation communities (such as grassland, chaparral, coastal sage scrub, etc.). The CEQA determination of significant impacts may be based on what was on the site (e.g. if illegal grading or vegetation removal occurred, etc.), as appropriate.*
c. *The site contains, or comes within 100 feet of a natural or manufactured drainage (determine whether it is vegetated with wetland vegetation). The site occurs within the 100-year flood plain established by the Federal Emergency Management Agency (FEMA) or the Flood Plain Fringe (FPF)/ Flood Way (FW) zones.*
d. *The site does not support a vegetation community identified in Tables 2a, 2b or 3 (Tier I, II, IIIA or IIIB) of the Biology Guidelines (July 2002); however, wildlife species listed as threatened or endangered or other protected species may use the site (e.g. California least terns on dredge spoil, wildlife using agricultural land as a wildlife corridor, etc.).*

Anticipated impacts (Table 1) were calculated by determining the acreage affected by the site development as proposed, including grading, landscaping, brush management, and related improvements.

Direct impacts (anticipated) entail the actual removal of biological features from the site due to clearing and grading. These direct impacts are considered permanent, because they result in a conversion of habitats to landscaped areas, structures, etc. Indirect impacts (not anticipated) are those effects on native habitats, plants, or animals resulting from project implementation that are not the direct result of grading or development. Examples of indirect impacts include introduction of exotic species, human intrusion, lighting, noise, and "edge effects".

Direct Impacts

Grading and development of the Torrance Street Project site will directly impact approximately 0.13 acre of Non-native Grassland and 0.43 acre of Non-native Vegetation. Brush management is not required due to the surrounding lands consisting of urban development with virtually no native vegetation. Also potentially impacted would be sensitive, wide-ranging species, such as various sensitive bats, raptors, or reptiles (see Attachment A), which might be expected to fly over or otherwise utilize this property on an occasional basis. Project impacts to these species are considered less than significant because no resident populations of any of the potential sensitive species considered of moderate probability of occurrence in Attachment A (such as Monarch Butterfly, Red-shouldered Hawk, Coronado Skink, and others) would depend entirely on resources provided by this property, and also because of the very small size of the project site. None of the sensitive species potentially associated with this site would be impacted at a "significant" level as defined by CEQA. Per CEQA, a "significant" effect would "substantially affect an endangered, rare, or threatened species of animal or plant or the habitat of the species, or "interfere substantially with the movement of any resident or migratory fish or wildlife species", or "substantially diminish habitat for fish, wildlife, or plants". All of the anticipated sensitive species are locally-common or widely distributed, and none would be diminished at the species or population level. The project will not substantially diminish any habitats. Attachment A provides a list of these with details as to status, etc.

Indirect Impacts

Indirect impacts associated with site development are not expected because surrounding areas are fully developed. Therefore, noise, lighting, and other related impacts to biological resources are not anticipated.

Environmentally Sensitive Lands

The Torrance Street project site does not support any sensitive resources; no sensitive native vegetation, sensitive native habitats, or any known biological resources essential to support sensitive species, although it does support 0.13 acre of a City of San Diego Tier IIIB habitat-type (Non-native Grassland) and two wide-ranging sensitive animal species.

Compatibility with the MSCP and MHPA

The Torrance Street Project site is not within or adjacent to the City's MHPA (Figure 2). No sensitive habitat will be impacted due to site development. No encroachment into the MHPA will occur. The only direct or indirect project impacts relate to the loss of Non-native Vegetation and Non-native Grassland. Therefore, development as proposed complies with the requirements of both the City's LDC and the MHPA, assuming the adoption of specific mitigation measures described subsequently.

CONCLUSIONS AND RECOMMENDATIONS

No specific habitat-based or species-based mitigation is required in order to reduce projects impacts to "less than significant". All impacts are considered "less than significant", from a local and regional perspective, pursuant to CEQA and the City's Biology Guidelines.

Non-native Grassland is a Tier IIIB habitat in the City of San Diego. Impacts to this habitat-type generally require mitigation at a 0.5:1 ratio. However, the City's Biology Guidelines state: *"Impacts to non-native grasslands totaling less than 1.0 acres which are completely surrounded by existing urban developments are not considered significant*

and do not require mitigation. Examples may include urban infill lots." Therefore, mitigation is not required in this case, because 0.13 acre of Non-native Grassland (which is less than 1.0 acre) is being impacted. No specific mitigation is recommended.

Non-native Vegetation is a Tier IV habitat in the City of San Diego. Impacts to this habitat-type do not require habitat-based or species-based mitigation. No specific mitigation is recommended.

Table 1 (below) summarizes project-related impacts to onsite habitats and mitigation requirements per the City's Biology Guidelines. This assumes that impacts are outside of the MHPA and that offsite mitigation would take place inside of the MHPA.

Table 1. Impact/Mitigation Analysis - the Torrance Street Project

Habitat	Onsite Acreage	Impacted Acreage	Mitigation Ratio	Mitigation Required
Non-native Grassland Tier IIIB	0.13	0.13	0.5:1	none
Non-native Vegetation Tier IV	0.43	0.43	n/a	none
Total	**0.56**	**0.56**	**—**	**none**

Biological resources on the project site are subject to regulation by not only the City, but also the federal government and the State of California. The project must comply with all applicable federal and state statutes and regulations.

Federal Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA) includes provisions for the protection of migratory birds, including the non-permitted take of migratory birds (16 U.S. Code Sections 703-711). The MBTA regulates or prohibits taking, killing, possession of, or harm to migratory bird species listed in Title 50 Code of Federal Regulations Section 10.13. Migratory birds include geese, ducks, shorebirds, raptors, songbirds, and many others (including many not considered sensitive). Disturbance that causes nest destruction or abandonment and/or loss of reproductive effort (killing or abandonment of eggs or young) is considered a "take." The MBTA is enforced by the U.S. Fish and Wildlife Service (FWS). Because migratory birds nest in a wide variety of habitats, including on the bare ground, the MBTA applies to the proposed project.

California Fish and Game Code

Various provisions of the California Fish and Game Code, including Section 3503 and 3513, make it unlawful to take, possess, or destroy the nest or eggs of any bird, except under special permit. These regulations apply to most avian species in California, including those that are not considered sensitive. The California Fish and Game Code is enforced by the California Department of Fish and Wildlife (DFW).

Please contact me if you have any questions or concerns.

Very truly yours,

Vince Scheidt
Certified Biological Consultant

Attachments: Bibliography
Report Preparer Qualifications
Table 2. Plants and Animals Observed
Figure 1. Project Location
Figure 2. Location of Project in Relation to MHPA
Figure 3. Recent Aerial Photograph
Figure 4. Biological Resources on Aerial Photograph
Figure 5. Biological Resources on Topographic Map
Figure 6. Biological Resources on Site Plan
Figure 7. Site Photographs
Attachment A. Sensitive Species Known from Vicinity

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Vincent N. Scheidt — CERTIFIED BIOLOGICAL CONSULTANT

M.A. Biology, University of California, Los Angeles

B.S. Zoology, San Diego State University

Biological Consultant:

- *Baseline Biology Surveys*
- *Zoological Surveys and Inventories*
- *Botanical Surveys and Inventories*
- *Endangered Species Surveys*
- *Forensic Vegetation Surveys*
- *Focused Survey Coordination*
- *Technical Study Reports*
- *Revegetation Planning*
- *Habitat Management Planning*
- *Habitat Mapping*
- *Open Space Management*
- *Jurisdictional Wetland Delineations*

Applicable Experience:

- *Has extensive practical experience in various biologically-related projects in San Diego, Orange, Riverside, Imperial, San Bernardino and Los Angeles Counties. Additional biological studies in northern California.*
- *Has conducted focused surveys for numerous sensitive species of plants and animals over the last thirty years.*
- *Has prepared baseline biological surveys, habitat delineations, and natural community viability analyses on a continuous basis since 1980.*
- *Has conducted biological surveys for private individuals, corporations, partnerships, the military, and numerous public organizations throughout California.*
- *Has authored more than 2,400 biological technical reports and professional papers.*

In addition to extensive field experience, Mr. Scheidt authored the standard reference *"Status of the Indigenous Amphibians of San Diego County"* in 1980 under contract to the San Diego County Fish and Wildlife Committee and San Diego Herpetological Society. All taxa native to San Diego were reviewed and discussed with respect to current and historical distribution, endangerment, listing status at federal, state, and local levels. This text remains the definitive overall text on this group of organisms in San Diego County.

Completed studies include a 1995 vegetative analysis of the biota of the 4,350-acre Monte Vista Ranch property in Central San Diego County. This study defined seventeen discrete habitats occurring on this property. Preliminary definitions were prepared for each plant association. This habitat delineation will allow eventual species complex modeling and biologically-based conservation planning.

Another major project, prepared under contract to HDR Engineering in 2000-2002, involved comprehensive field surveying of a proposed 155 mile fiber-optic line through several southern California counties. Numerous sensitive species surveys were conducted as a part of this study, including Least Bell's Vireo, Arroyo Toad, Willow Flycatcher, Desert Tortoise, Flat-tailed Horned Lizard, and other directed surveys

A recent project, completed under contract to DC&E Planning in 2009-2011, involved biology studies associated with the City of National City's General Plan Update. Included in the scope of work were three project-specific studies for proposed city redevelopment projects. Comprehensive biology surveys were conducted as a part of this study, including floral and faunal inventories, habitat evaluations for sensitive species, and other directed surveys

Mr. Scheidt's professional affiliations include: Member, State Board of Directors; the California Native Plant Society (2008-2012), the San Diego Herpetological Society, and others.

Mr. Scheidt possesses federal Section 10(a) 1(a) Recovery Permit #TE788133 to allow focused field surveying for California Gnatcatcher and Quino Checkerspot Butterfly.

Table 2. Plants and Animals Observed - Torrance Street Project

Scientific Name	Common Name
Plants	
Acacia retinodes *	Ever-blooming Wattle
Aeonium manriqueorum *	Aeonium
Aloe arborescens *	Red-hot Poker
Aloe sp. *	Aloe
Aptenia cordifolia *	Red Apple Iceplant
Avena fatua *	Wild Oat
Bromus diandrus *	Ripgut Brome
Carpobrotus edulis *	Hottentot Fig
Chenopodium murale *	Goosefoot
Crassula argentea *	Jade Plant
Cylindropuntia prolifera	Coast Cholla
Ehrharta calycina *	Veldt Grass
Eucalyptus camaldulensis *	Murray Red Gum
Eucalyptus sideroxylon *	Red Ironbark Eucalyptus
Grevillea robusta *	Silk Oak
Heteromeles arbutifolia	Toyon
Hordeum murinum *	Wild Barley
Lupinus truncatus	Collar Lupine
Malva parviflora *	Cheeseweed
Marah macrocarpus	Man Root
Mesembryanthemum crystallinum *	Ice Plant
Nicotiana glauca *	Tree Tobacco
Olea europa *	European Olive
Opuntia ficus-indica. *	Indian Fig
Oxalis pes-caprae *	Sorrel
Pinus sp. *	Pine
Rhus integrifolia	Lemonadeberry
Rhus ovata	Sugarbush
Schinus molle *	Peruvian Peppertree
Sisymbrium irio *	London Rocket
Solanum americanum	White Nightshade
Sonchus oleraceus *	Sow Thistle
Tropaeolum majus *	Garden Nasturtium
Birds	
Archilochus anna	Anna's Hummingbird
Buteo lineatus	**Red-shouldered Hawk**
Carduelis psaltria	Lesser Goldfinch

Table 2. Plants and Animals Observed - Torrance Street Project

Scientific Name	Common Name
Birds, cont.	
Dendroica coronata	Audubon's Warbler
Carpodacus mexicanus	Housefinch
Zenaida macroura	Mourning Dove
Mammals	
Spermophilus beecheyi	California Ground Squirrel
Thomomys bottae	Valley Pocket Gopher
Butterflies	
Danaus plexippus	**Monarch**

* = non-native or non-indigenous taxon

bold = sensitive taxon

Figure 1. Project Location – The Torrance Street Project
Portion of U.S.G.S. "Point Loma" 7.5' quadrangle

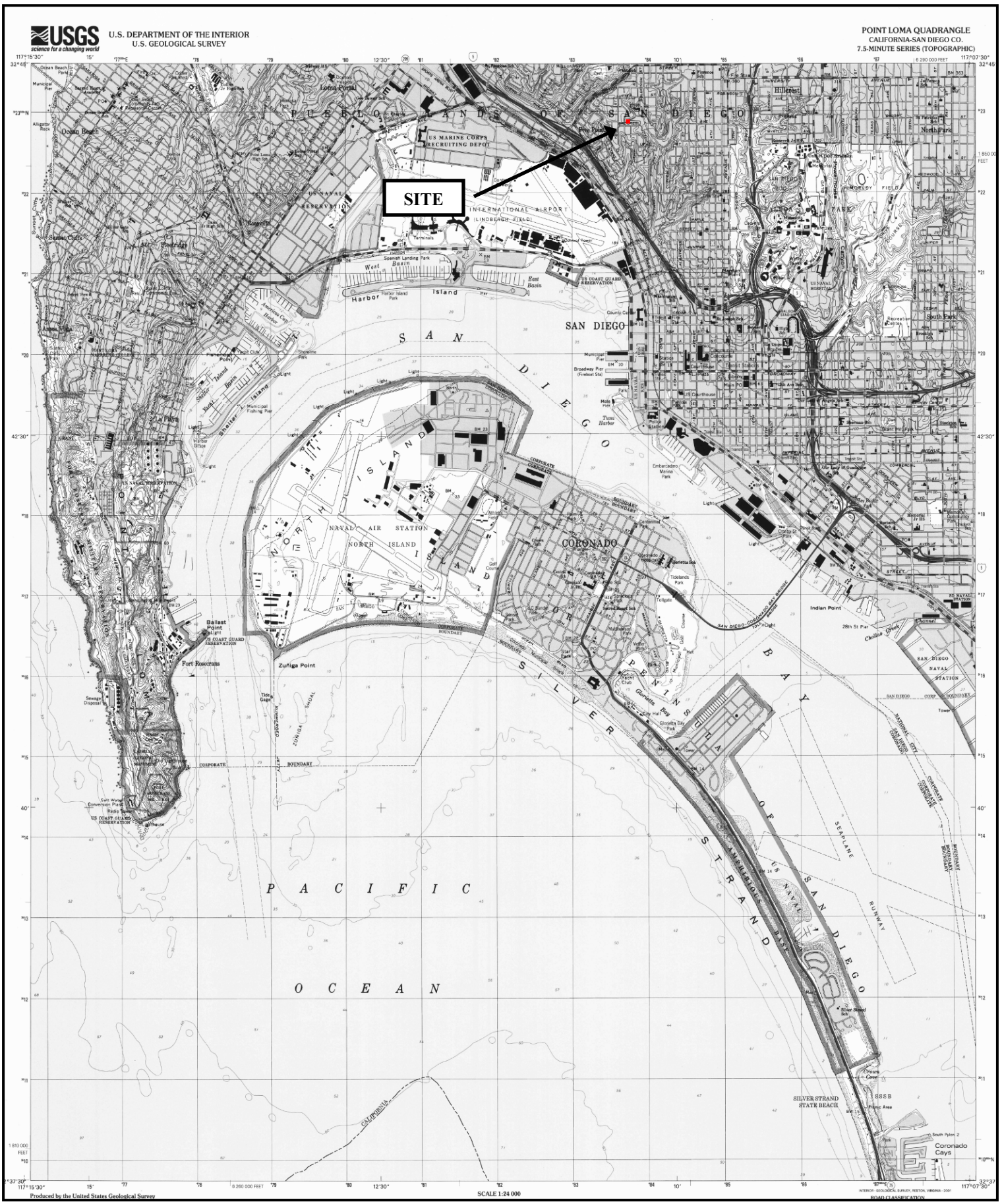

Figure 2. Location of Project in Relation to MHPA – The Torrance Street Project

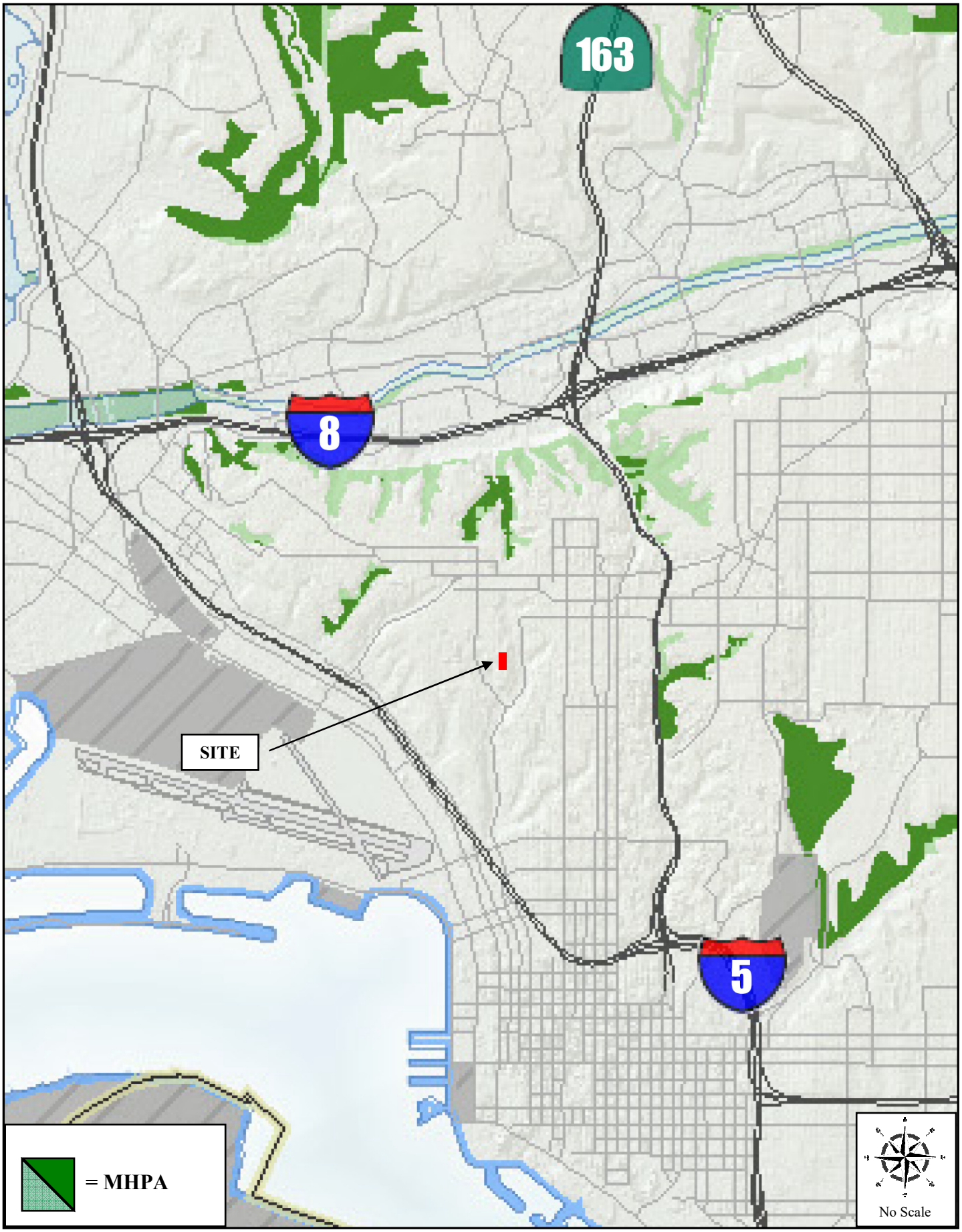

Figure 3. Recent Aerial Photo showing Surrounding Development – The Torrance Street Project

Figure 4. Biological Resources on Aerial Photo – The Torrance Street Project

Legend

= Non-Native Vegetation

= Non-Native Grassland

= Red-shouldered Hawk

Monarch Butterfly (*offsite to north*)

No Scale

Figure 5. Biological Resources on Site Topographic Exhibit – The Torrance Street Project

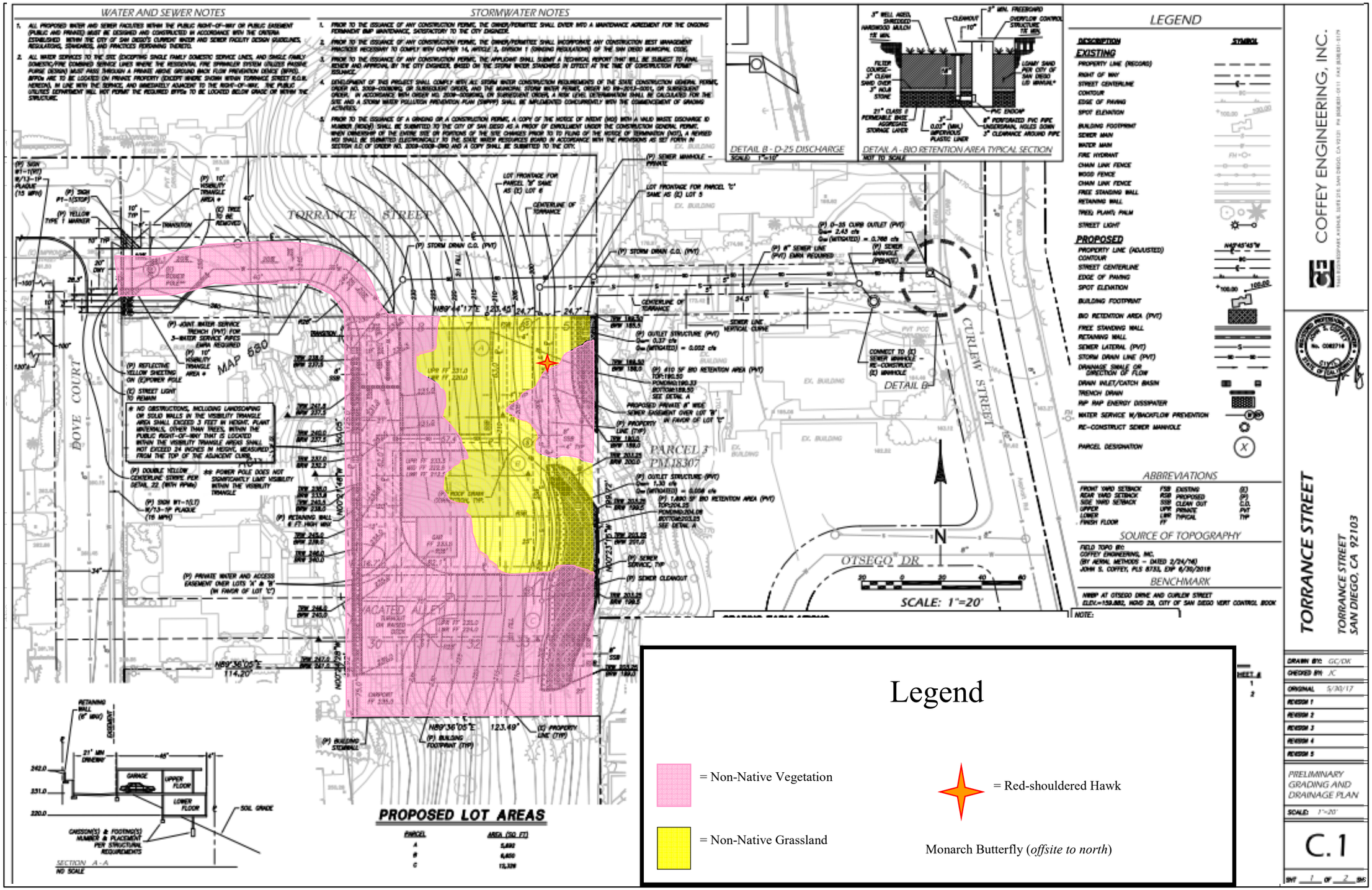

Figure 6. Site Photos - February 2016

Photo 1. Looking south onto the site from the Torrance Street right-of-way. Note complete lack of native vegetation and dense thatch of weeds covering the entire slope. Most of the trees in the periphery of this photo are located offsite.

Photo 2. Looking northeast from near the southwestern property corner. Foreground shows NNV in the form of naturalized non-natives and weedy forbs.

Figure 6. Site Photos - February 2016

Photo 3. Solid ground cover of annual weeds, dominated by Sow Thistle (*Sonchus oleraceus)*. This ruderal area qualifies as NNV. Note near complete absence of

Photo 4. Solid ground cover of annual grasses, dominated by Ripgut Brome (*Bromus diandrus)*. This portion of the property qualifies as NNG.

Attachment A. Sensitive Species Known from the Vicinity – The Torrance Street Project

Scientific Name	*Common Name*	Federally Endangered	Federally Threatened	City "Narrow Endemic"	Coastal Sage Scrub	Mixed Chaparral	Grassland	Riparian	Oak Woodland	Chamise Chaparral	Mixed Conifer	Closed Cone Forest	Piñon-Juniper	Freshwater Marsh	Desert Scrub	Desert Wash	Salt or Alkali Marsh	Vernal Pools	Montane Meadow	Coastal or Desert Dune	Lakes and Bays	**Probability of Occurrence**
Accipiter cooperii	Cooper's Hawk						✓	✓	✓													**M**
Accipiter striatus	Sharp-shinned Hawk				✓				✓		✓											**L**
Acanthomintha ilicifolia	San Diego Thorn-mint			✓			✓															**L**
Adolphia californica	California Adolphia				✓	✓	✓															**L**
Agave shawii	Shaw's Agave			✓	✓	✓																**L**
Aimophila ruficeps canescens	Rufous-crowned Sparrow				✓					✓												**L**
Ambrosia pumila	San Diego Ambrosia			✓			✓	✓														**L**
Anniella pulchra pulchra	Silvery Legless Lizard				✓		✓	✓												✓		**L**
Antrozous pallidus	Pallid Bat				✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓			✓			**M**
Aphanisma blitoides	Aphanisma			✓																✓		**L**
Astragalus tener var. titi	Coastal Dunes Milk-vetch			✓																✓		**L**
Brodiaea orcuttii	Orcutt's Brodiaea						✓	✓	✓	✓								✓				**L**
Bufo microscaphus californicus	Arroyo Toad	✓			✓	✓	✓	✓	✓	✓									✓			**L**
Buteo lineatus	Red-shouldered Hawk							✓	✓													**O**
Cathartes aura	Turkey Vulture				✓	✓	✓	✓	✓	✓	✓	✓										**M**
Chaetodipus californicus femoralis	Dulzura CA Pocket Mouse				✓	✓	✓		✓	✓	✓											**L**
Cnemidophorus hyperythrus	Orange-throated Whiptail				✓	✓	✓	✓		✓												**L**
Cnemidophorus tigris multiscutatus	Coastal Western Whiptail					✓		✓	✓	✓												**L**
Coleonyx variegatus abbotti	San Diego Banded Gecko				✓		✓			✓												**L**
Corynorhinus townsendii	Townsend's Big-Eared Bat					✓	✓	✓	✓	✓	✓	✓	✓		✓	✓			✓			**M**
Crotalus ruber ruber	Red Diamond Rattlesnake				✓	✓				✓			✓		✓							**L**
Danaus plexippus	Monarch Butterfly						✓		✓										✓			**O**
Diadophis punctatus similis	San Diego Ringneck Snake				✓	✓		✓	✓	✓	✓	✓										**M**
Dudleya blochmaniae ssp. brevifolia	Short-leaved Dudleya			✓		✓																**L**
Dudleya variegata	Variegated Dudleya			✓			✓															**L**
Eumeces skiltonianus interparietalis	Coronado Skink				✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓			✓	✓		**M**
Eumops perotis californicus	Greater Western Mastiff Bat				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	**M**
Harpagonella palmeri	Palmer's Grappling Hook				✓		✓			✓												**L**
Hemizonia conjugens	Otay Tarplant			✓			✓															**L**
Lanius ludovicianus	Loggerhead Shrike				✓		✓	✓	✓						✓	✓						**M**
Lasiurus blossevillii	Western Red Bat							✓	✓		✓	✓							✓			**M**
Lepus californicus bennettii	SD Black-tailed Jackrabbit				✓	✓	✓		✓	✓	✓	✓										**L**
Myotis ciliolabrum	Small-footed Myotis					✓		✓	✓	✓	✓	✓	✓			✓			✓			**M**
Myotis yumanensis	Yuma Myotis				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓		✓	**M**
Navarretia fossalis	Prostrate Navarretia			✓														✓				**L**
Neotoma lepida intermedia	San Diego Desert Woodrat				✓			✓	✓	✓												**L**
Nyctinomops macrotis	Big Free-tailed Bat				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	**M**
Nyctinomops femorosaccus	Pocketed Free-tailed Bat				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	**M**
Onychomys torridus ramona	Southern Grasshopper Mouse				✓	✓	✓			✓												**L**
Opuntia parryi var. serpentina	Snake Cholla			✓	✓	✓																**L**
Orcuttia californica	California Orcutt Grass																					**L**
Phrynosoma coronatum blainvillei	San Diego Horned Lizard				✓	✓	✓	✓		✓	✓											**L**
Pogogyne abramsii	San Diego Mesa Mint			✓														✓				**L**
Pogogyne nudiuscula	Otay Mesa Mint			✓														✓				**L**
Polioptila californica	California Gnatcatcher		✓		✓																	**L**
Piperia leptopetala	Narrow-petaled Rein Orchard				✓	✓	✓	✓		✓	✓											**L**
Salvadora hexalepis virgultea	Coast Patch-Nosed Snake				✓	✓				✓			✓									**L**
Sialia mexicana	Western Bluebird							✓	✓													**M**

Probability of Occurrence Codes:

L – Low Probability; rare species in area, and no significant habitat (animals); *or* distinctive perennial that would not have been missed if present onsite (plants). **M** – Moderate Probability; could be expected to occur onsite on at least an occasional basis, based on habitat quality (animals); *or* could occur onsite, but very rare, and/or poorly known (plants). **H** – High Probability; nearly certain to occur onsite on a regular basis (animals), but cryptic; *or* ephemeral species known from the immediate vicinity, but seasonal in occurrence (plants). **O** – Observed; see report

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ROBERT CHAN, P.E.

GEOTECHNICAL INVESTIGATION

FIVE PROPOSED SINGLE-FAMILY RESIDENTIAL BUILDING SITES

SOUTH SIDE OF TORRANCE STREET,

BETWEEJ CURLEWE STREET AND DOVE COURT

SAN DIEGO, CALIFORNIA

NAKHSHAB DEVELOPMENT & DESIGN INC.

PROJECT NO. 16-1268J6

MARCH 4, 2016

ALLIED EARTH TECHNOLOGY

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ROBERT CHAN, P.E.

March 4, 2016

Nakhshab Development & Design, Inc.
2900 4th Avenue, Suite 100
San Diego, CA. 92103

Subject : Project No. 16-1268J6
Geotechnical Investigation
Five Proposed Residential Building Sites
South Side of Torrance Street, between Curlew Street and Dove Court
San Diego, California

Gentlemen :

In accordance with your request, we have completed the geotechnical investigation for the five proposed residential building sites on subject property, more specifically referred to as being a portion of Block No. 444 of Seaman's point, according to Map thereof No. 530, , in the City and County of San Diego, State of California.

We are pleased to submit the accompanying geotechnical investigation report to present our findings, conclusions and recommendations relative to the proposed development of the site.

The geotechnical investigation was conducted under the supervision of the undersigned. The scope of our investigation included field exploration, laboratory testing and soil engineering analysis.

No major adverse geotechnical conditions were encountered which would prohibit the currently proposed development of the site.

This opportunity to be of service is sincerely appreciated. Should you have any questions, please do not hesitate to contact our office.

Respectfully submitted,
ALLIED EARTH TECHNOLOGY

ROBERT CHAN, P.E.

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March 4, 2016

GEOTECHNICAL INVESTIGATION

INTRODUCTION

This report presents the findings and conclusions of a geotechnical investigation conducted at the site of five proposed residential buildings on subject property, located on the south side of Torrance Street, between Curlew Street and Dove Court, in the City and County of San Diego, State of California.

Subject property is more specifically referred to as being a portion of Block No. 444 of Seaman's Point, according to Map thereof No. 530 (APN 451-292-06-00)

The location of the property is shown on Figure No. 1, entitled, "Site Location Map".

DESCRIPTION OF PROJECT

It is our understanding that five single-family residences are to be constructed on the Property. The proposed structures will be two stories in height; of wood-frame/stucco and slab-on-grade construction.

SCOPE OF WORK

The objectives of the investigation were to inspect and determine the subsurface soil conditions and certain physical engineering properties of the soils beneath the site, and to evaluate any potential adverse geotechnical conditions that could affect the

proposed project, in order that engineering recommendations could be presented relative to the safe and economical development of the site; and checking and design of foundation for the proposed residential structures.

In order to accomplish these objectives, four exploratory borings were excavated and inspected, and representative samples of the subsurface soils were collected for laboratory testing and analysis.

The data derived from the field observations and laboratory test results were reviewed and analyzed, and a summary of our preliminary findings, opinions and recommendations is presented in this report.

FIELD INVESTIGATION

The field exploratory phase of our investigation was performed on February 9, 2016, and involved a reconnaissance of the site, and the excavation of four exploratory borings with a portable motorized continuous flight auger.

The exploratory borings were excavated at various locations on the site where the most useful information relative to subsurface soil conditions may be obtained. The exploratory borings were excavated to depths varying from 6 to 7 feet below existing ground surface. The locations of the exploratory borings is shown on Figure No. 2, entitled, "Approximate Location of Exploratory Borings".

The drilling operation was performed under the direction of our field personnel, and a

continuous log of the soil types encountered in the borings was recorded at the time of excavation, and is shown on Figure Nos. 3 to 6, inclusive, each entitled, "Boring Log Sheet".

The soils were visually and texturally classified by the field identification procedures set forth on the Unified Soil Classification Chart. Representative samples were obtained and the in-situ densities of the soils encountered were determined.

LABORATORY TESTS

The samples collected during our field investigation were subjected to various tests in the laboratory to evaluate their engineering characteristics. The tests were performed in accordance with current A.S.T.M. testing standards or other regulatory agency testing procedures. A summary of the tests that were performed and the final test results are presented in Appendix II hereto.

The tests that were performed included determinations of the maximum dry densities and optimum moisture contents; the sulfate contents and Expansion Indices of the soils encountered.

SITE DESCRIPTION

Subject property is a rectangular-shaped property of approximately 0.57 acres, situated on the south side of the Torrance Street right-of-way, between Curlew Street and Dove Court. The general topography of the site may be described as sloping relatively steeply in an easterly direction at gradients on the order of 35 to 40 percent.

The site is currently vacant, and covered with a thick growth of grass and weeds. Several eucalyptus and palm trees were also observed on the site. There were signs of past grading on the site. Undocumented fill soils were encountered in the upper, east portion of the property, as well

as excavations and cut slopes. Maximum thickness of the undocumented fill soils is on the order of 6 to 7 feet; with excavations on the order of 5 to 6 feet. However, due to the thickness of the existing vegetation, accurate quantities of excavation and fill placed on the site cannot be determined at this time. the remnants of a structure in the upper southwest portion of the property. Approximate location of the existing cut and fill areas are delineated on Figure No. 2

The properly is located in a developed area of the City of San Diego. The site is bounded on the north by the Torrance Street right-of-way and residences beyond; and on the east, south and west by existing residences.

PROPOSED SITE DEVELOPMENT

Site development will consist of the construction of five single-family residences. The proposed structures will be two stories in height; of wood-frame/stucco and slab-on-grade construction. The residences will generally follow the contour of the land, with minimum grading proposed.

GENERAL GEOLOGY AND SUBSURFACE SOIL CONDITIONS

Regional Geology

The subject property is located within the southern coastal strip region of the Peninsular Range Geomorphic Province of California. This geomorphic province is characterized by mountainous terrain to the east composed mostly of Mesozoic igneous and metamorphic rocks and relatively low-lying coastal terraces to the west underlain by late Cretaceous, Tertiary and Quaternary sedimentary rocks. The southeast portion of the City of San Diego, including the site, occurs within the westerly region and is underlain by sedimentary rocks.

Site Geology and Subsurface Soil Conditions

A review of geologic maps as well as observations made during our subsurface exploration indicated that the general area is underlain by Pliocene San Diego Formation. On subject property, as encountered in the exploratory borings, the San Diego Formation was encountered in the form of medium dense to dense light gray/tan silty sands, overlain by approximately 24 to 30 inches of slopewash or colluvium, in the form of loose and porous, brown silty sands

Tectonic Setting

No evidence of faulting was noted during our surface reconnaissance or in our exploratory borings. A review of available geologic literature did not reveal any major faulting in the area. It should be noted that much of southern California, including the City of San Diego area, is characterized by a series of Quaternary-age fault zones which typically 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.

A review of available geologic maps indicate that the subject property is approximately 2.1 km (1.3 miles) from the Rose Canyon Fault zone, and 63.0 km (39.4 miles) from the Elsinore-Julian Fault zone.

GROUNDWATER

No groundwater was encountered in the exploratory borngs to the maximum

depth of exploration at 7 feet. Based on our knowledge of groundwater level in this area of the City of San Diego, the depth to groundwater is on the order of 35 to 40 feet below existing ground level. No groundwater related problems, either during or after construction, are anticipated. However, it should be recognized that minor seepage problems may occur after development of a site even where none were present before development. These are usually minor phenomena and are often the results of an alteration of the permeability characteristics of the soils; an alteration in drainage patterns due to grading; and an increase in the use of irrigation water. Based on the permeability characteristics of the soils and anticipated usage of the development, it is our opinion that any seepage problems which 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 develop.

GEOLOGIC HAZARDS

Ground shaking – The most likely geologic hazard to affect the site is ground shaking as a result of movement along one of the active fault zones mentioned above.

For seismic design purposes, soil parameters in accordance with the 2013 edition of the California Building Code were determined, and presented hereinafter.

Surface Rupture - Surface rupture is the result of movement of an active fault reaching the surface. No faults were observed during our investigation of the site. Based on our observations, experience and review of the referenced geotechnical and geologic literature, it is our opinion that

there is little probability of surface rupture due to faulting beneath the site. However, lurching and ground cracking are a possibility as a result of a significant seismic event on a regional active fault.

Liquefaction Potential - In consideration of the dense sedimentary rocks underlying the site, and the lack of a high groundwater level, it is our opinion that soil liquefaction does not present a significant geotechnical hazard to the proposed site development.

Landslides – Subject property is situated on relatively steep terrain, and underlain by competent formational rocks. Available geologic maps did not reveal the presence of any ancient landslides on subject or adjacent properties. The potential for landslides on subject and adjacent properties is considered minimal.

FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

General

1. Based on the results of the investigation, it is our opinion that the currently proposed site development is feasible from a geotechnical engineering standpoint, provided that the recommendations presented in this report are incorporated into the design plan(s) and are properly implemented during the construction phase.

2. It is noted that some of the recommendations may have to be modified and supplemental recommendations may have to be presented, depending on the actual subsurface conditions encountered during construction.

3. Site grading and earthwork constructions will not impact the adjacent properties provided our recommendations are incorporated into the final designs and

implemented during the construction phase. Additional field recommendations, however, may also be necessary and should be given by the project geotechnical consultant for the protection of adjacent properties and should be anticipated.

4. Prior to commencement of construction, a preconstruction conference should be held at the site with the owner, grading contractor, civil engineer and geotechnical engineer in attendance. Special soil handling and/or grading improvement plan requirements can be discussed at that time

Expansion Index of On-Site Soils

5. The soils encountered on the site possess low expansion potential (Expansion Index = 33). Recommendations presented hereinafter reflects this on-site soil condition

Sulfate Content of On-Site Soils

6. The soils encountered on the site are subject to negligible sulfate exposure (sulfate content of 38 ppm).

Grading

7. It is recommended that all earthwork be accomplished in accordance with the Grading Ordinance of the City of San Diego, current edition of the California Building Code, Appendix I attached hereto, entitled, "General Grading and Earthwork Specifications", and recommendations as presented in this Section.

8. Where the recommendations of this Section of the report conflict with those of

Appendix I, this Section of the report takes precedence.

9. Grading operations should begin with the clearing and grubbing of the site, and hauling away of the debris to an approved dump site.

10. Only minor grading will be required for the development of the site, primarily creating level pads for the garages along the front, east side of the property. It is anticipated that cuts on the order of 10 feet in height will be made during the excavation. It is recommended that cuts into the formational soils be accomplished at near vertical for a height of 5 feet. Above a height of 5 feet, especially in the loose colluvial soils, the excavation should be flattened to a slope ratio of ½ : 1 (horizontal : vertical).

11. The excavated soils should be properly exported to a City-approved dump site.

12. Backfill soils behind the basement retaining walls will be necessary. On-site non-expansive soils may be used as backfill.

13. All fill soils should be compacted to at least 90 percent of maximum dry density at near optimum moisture content, in accordance with A.S.T.M. D1557.

Foundation and Slab Design

14. It is recommended that a safe allowable soil bearing value of 2,000 pounds per square foot be used for the design and checking of continuous footings that are 12 inches in minimum horizontal dimension, and isolated pier footings that are 15 inches in minimum horizontal dimension; and are embedded 12 inches (for single

story) or 18 inches (for two stories) below the lowest adjacent ground surface.

15. The above safe allowable soil bearing value may be increased by one-third when considering wind and/or seismic forces.

16. The settlements of foundation, when designed and loaded as outlined above, are expected to be less than 1 ½ inch total and 1 inch differential over a span of 40 eet.

17. It is recommended that all continuous footings be reinforced with a minimum of 4 #5 rebars; two rebars located near the top, and the other two rebars near the bottom of the footings. All isolated pier footings should be reinforced with a minimum of 2 #5 rebars in both directions, placed near the bottom of the footings.

18. The concrete slab-on-grade should be 4 ½ inches in thickness, and be reinforced with #3 rebars @ 18 inches on center in both directions, placed at mid-height of concrete slab. The slab reinforcement should extend into the perimeter footings at least 6 inches.

Under-Slab Vapor Retarders

19. The concrete slab should be underlain by 4 inches of clean sand, a 10-mil plastic membrane moisture barrier, and another one inch of clean sand cover. The seams of the plastic membrane should be sealed and should extend at least 12 inches down the placed in accordance with the recommendation and consideration of ACI 302, "Guide for

Concrete Floor and Slab Construction" and ASTM 1643, "Standard Practice for Installation of Water Vapor Retarder Used in Contact with Earth or Granular Fill Under Concrete Slabs". The above foundation and slab reinforcement requirements are based on soil characteristics, and should be superseded by the requirements of the project architect.

20 It is recommended that our firm inspect the foundation trench excavations for the proposed residential structures to ensure proper embedment into competent natural or compacted fill soils.

Retaining Wall Design

21. It is recommended that retaining walls be designed to withstand the pressure exerted by equivalent fluid weights given below :

Backfill Surface (horizontal : vertical)	Equivalent Fluid Pressure (pcf)
Level	35
2 : 1	50
1 ½ : 1	58

The above values assume that the retaining walls are unrestrained from movement, and have a granular backfill. For retaining walls restrained from movement at the top, such as basement retaining walls, an uniform horizontal pressure of 7H (where H is the height of the retaining wall in feet) should be applied in addition to the active pressures recommended above.

22. All retaining walls should be supplied with a backfill drainage system adequate to prevent the buildup of hydrostatic pressure. The subdrain should consist of one-inch gravel and a perforated pipe near the bottom of the retaining wall. The width of this subdrain should be at least 12 inches, and extend at least 2/3 height of the retaining wall. The subdrain should be enclosed in a geotextile fabric such as Mirafi 140N or equal. Prefabricated subdrains such as Miradrain 2000 series or "J" Drains 400 series may also be used.

Seismic Earth Pressure

23. Seismic earth pressures can be taken as an inverted triangular distribution with a maximum pressure at the top equal to 12H pound per square foot (with H being the height of retained earth in feet). This pressure is in addition to the static design wall load. The allowable passive pressure and bearing capacity can be increased by 1/3 in determining the stability of the wall. A factor-of-safety of 1.2 can be used in determining the stability of the retaining wall under seismic conditions.

Lateral Loading

24. To resist lateral loads, it is recommended that the pressure exerted by an equivalent fluid weight of 300 pcf be used for footings or shear keys poured neat against competent natural or compacted fill soils. The upper 12 inches of material in areas not protected by floor slabs or pavements should not be included in the design for passive resistance. This value assumes that the horizontal distance of the soil mass extends at least 10 feet or three times the height of the surface generating the passive pressure, whichever is greater.

25. A coefficient of sliding friction of 0.35 may be used for cast-in-place concrete on competent natural or compacted fill soils. Footings can be designed to resist lateral loads by using a combination of sliding friction and passive resistance. The coefficient of friction should be applied to dead load forces only.

Seismic Coefficients

26. The seismic design factors were determined in accordance with the 2013 California Building Code, and presented below :

Site Coordinates :		Latitude	=	32.7377
		Longitude	=	- 117.1708
Site Class :			=	D
Site Coefficient Fa			=	1.00
Site Coefficient Fv			=	1.50
Spectral Response Acceleration				
At Short Periods		Ss	=	1.581
Spectral Response Acceleration				
At 1-second Period		S1	=	0.617
Sms	= FaSs		=	1.581
Sm1	= FvS1		=	0.926
Sds	= 2/3*Sms		=	1.955
Sd1	= 2/3*Sm1		=	0.618

Concrete Flatwork

27. In consideration of the on-site soil conditions, it is recommended that concrete flatwork be a minimum of 3 ½ inches in thickness, and be reinforced with 6x6-W1.4xW1.4 (6x6-10/10) welded wire mesh, placed at mid-height of concrete slab. One inch expansion joints should be provided at 15-foot intervals, with ¼ inch weakened plane contraction joints at 5-foot intervals.

Surface Drainage and Maintenance

28. Adequate drainage control and proper maintenance of all drainage facilities are imperative to minimize infiltration of surface water into the underlying soil mass in order to reduce settlement potential and to minimize erosion. The building pad should have drainage swales which direct storm and excess irrigation water away from the structures and into the street gutters or other drainage facilities. No surface runoff should be allowed to pond adjacent to the foundation of structures.

Grading and Foundation Plans Review

29. It is recommended that our firm review the final grading and foundation plans for the proposed site development to verify their compliance with our recommendations.

LIMITATION AND UNIFORMITY OF CONDITIONS

1. The preliminary findings and recommendations contained in this report pertain only to the site investigated and are based on the assumption that the soil conditions beneath the entire site do not deviate substantially from those disclosed in the exploratory trenches. If any variations or undesirable conditions are encountered during grading, or if the scope of the project differs from that planned at the present time, our firm should be notified in order that supplemental recommendations can be presented, if necessary.

2. This report is issued with the understanding that it is the responsibility of the Owner, or his representative, to ensure that the information and recommendations presented herein are brought to the attention of the Project Architect and Engineer

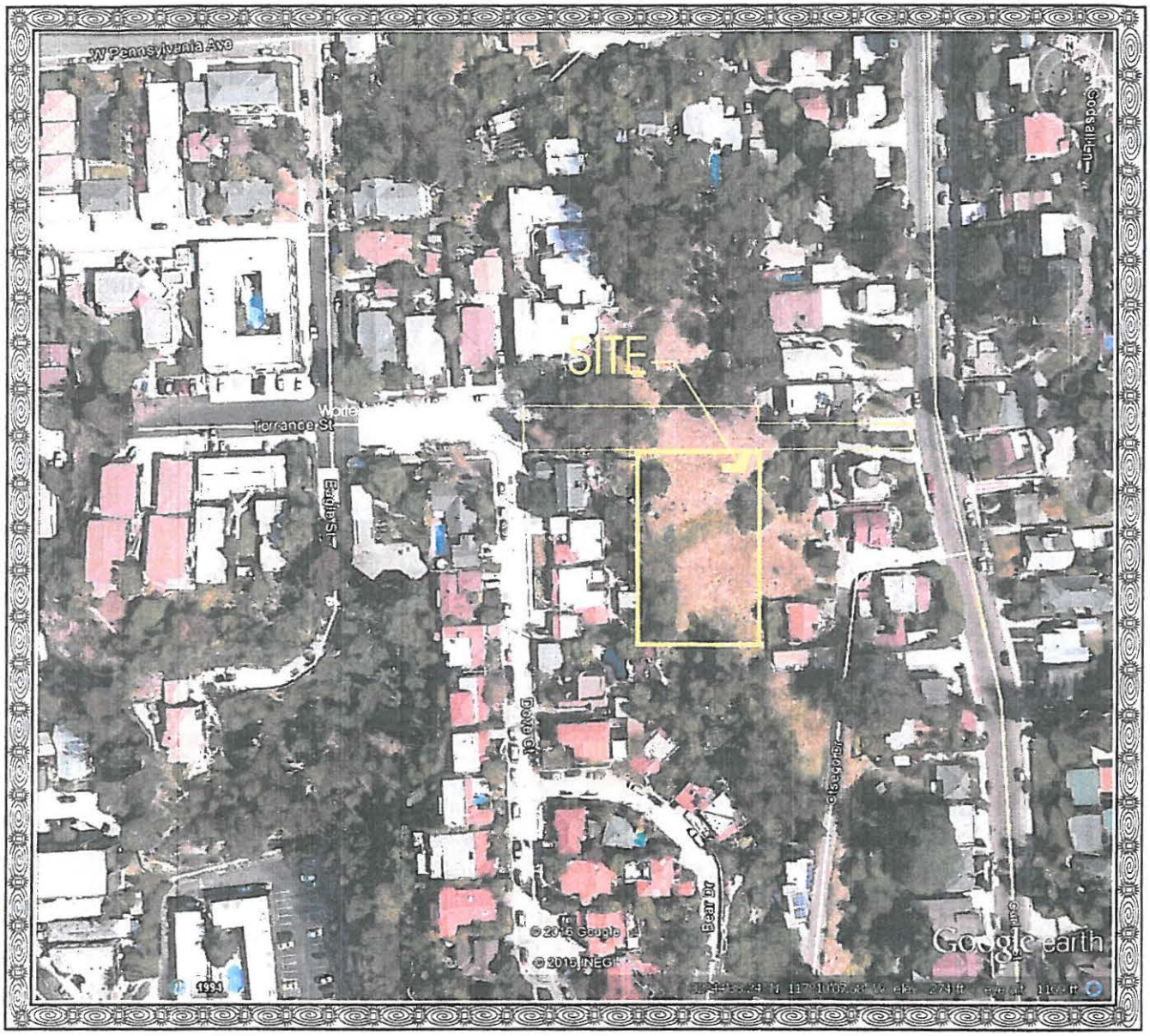
and are incorporated into the plans and specifications for the project. Furthermore, the Owner, or his representative, will also be responsible for taking the necessary measures to ensure that the Contractor and subcontractors properly carry out the recommendations in the field.

3. Professional opinions and recommendations presented in this report are based partly on our evaluation and analysis of the technical information gather during the study, partly on the currently available information regarding the proposed project, and partly on our previous experience with similar soil conditions and projects of similar scope. Our study has been performed in accordance with the minimum standards of car exercised by other professional geotechnical consultants currently practicing in the same locality. We do not, however, guarantee the performance of the proposed project in any respect, and no warranties of any kind, expressed or implied, are made or intended in connection with the study performed by our firm.

4. The findings and recommendations contained in this report are valid as of the present date. However, changes in the conditions of the property could occur with the passage of time, whether they be due to natural processes or due to man-made actions on the subject and/or adjacent properties. In addition, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this

report may be invalidated, wholly or partially, by changes outside of our control. Therefore, this report is subject to review by our firm and should not be relied upon after a period of two years.

Figure Nos. 1 to 6, inclusive, and Appendices I to III are parts of this report.

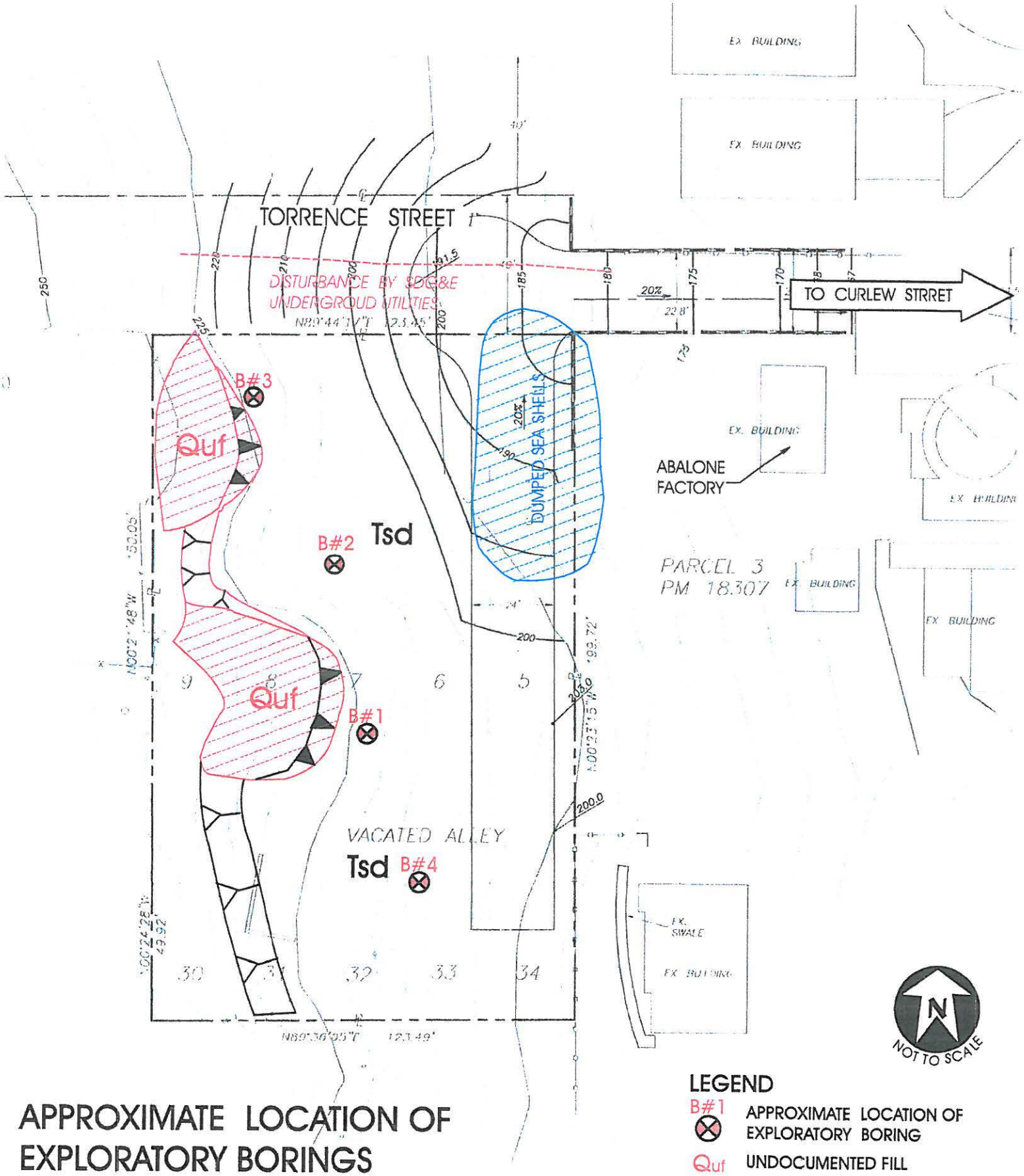


SITE LOCATON MAP

NOT TO SCALE

PROJECT NO. 16-1268 J6

FIGURE NO.1



APPROXIMATE LOCATION OF EXPLORATORY BORINGS

LEGEND

B#1 ⊗	APPROXIMATE LOCATION OF EXPLORATORY BORING
Quf	UNDOCUMENTED FILL
Tsd	SAN DIEGO FORMATION

PROJECT NO. 16- 1268 J6

FIGURE NO.2

BORING LOG SHEET

BORING NO. 1
Elev. 220' msl

FT.		DESCRIPTION		SOIL TYPE
0		Brown, damp, loose (Colluvium)		SILTY FINE SANDS (SM)
1				
2			5*	
3	(1)	Tan/light gray, moist, medium (San Diego Formation)		SILTY FINE SANDS (SM))
4			12*	
5			18*	
6			16*	
7			22*	

BOTTOM OF BORING (No Refusal)

LEGEND
========

◯ - Indicates representative sample
* - Indicates blowcount/10 cm/Triggs penetrometer

	Granular		Cohesive
0	Very loose	0	Very soft
5	Loose	2	Soft
11	Medium dense	5	Medium stiff
31	Dense	9	Stiff
51	Very dense	16	Very stiff
		31	Hard

Project No. 16-1268J6

Figure No. 3

BORING LOG SHEET

BORING NO. 2
Elev. 214' msl

FT.		DESCRIPTION		SOIL TYPE
0		Brown, damp, loose (Colluvium)		SILTY FINE SANDS (SM)
1				
2	①			
3				
4		Tan/light gray, moist, medium (San Diego Formation)	21*	SILTY FINE SANDS (SM))
5			18*	
6			26*	

BOTTOM OF BORING (No Refusal)

BORING LOG SHEET

BORING NO. 3
Elev. 217' msl

FT.	DESCRIPTION		SOIL TYPE
0	Brown, damp, loose (Colluvium)		SILTY FINE SANDS (SM)
1			
2			
3			
4	Tan/light gray, moist, medium (San Diego Formation)	19*	SILTY FINE SANDS (SM))
5		18*	
6		27*	

BOTTOM OF BORING (No Refusal)

Project No. 16-1268J6

Figure No. 5

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APPENDIX I

GENERAL GRADING AND EARTHWORK SPECIFICATIONS

1.0 General

1.1 All earthwork shall be accomplished in accordance with the Grading Ordinance of the City of San Diego; Chapter 18 and 18A, and Appendix J of the 2010 edition of the California Building Code; Appendix I hereinafter, and recommendations as presented in the Geotechnical Report.

1.2 These recommended grading and earthwork specifications are intended to be a part of and to supplement the Geotechnical Report(s). In the event of a conflict, the recommendations of the Geotechnical Report(s) will supercede these specifications. Observations during the course of earthwork operations may result in addition, new or revised recommendations that could supercede these specifications and/or the recommendations in the Geotechnical Report(s).

1.3 The Owner or his authorized representative shall procure the services of a qualified Geotechnical Consulting Firm, hereinafter to be referred to as the "Geotechnical Consultant" (often the same entity that produced the Geotechnical Report(s).

1.4 The Geotechnical Consultant shall be given a schedule of work by the Earthwork contractor for the subject project, so as to be able to perform required observations; testing and mapping of work in progress in a timely manner.

1.5 The work herein includes all activities from clearing and grubbing through fine grading. Included are trenching, excavating, backfilling compacting and grading. All work shall be as shown on the approved project drawings.

1.6 The Geotechnical Consultant or a qualified representative shall be present on the site as required, to observe, map and document the subsurface exposures so as to verify the geotechnical design suppositions. In the event that observed conditions are found to be significantly different from the interpreted conditions during the design phase, the Geotechnical

Consultant shall notify the Owner, recommend appropriate changes in the design to suit the observed conditions and notify the agenc(ies) having jurisdiction, where required. Subsurface areas to be geotechnically observed, mapped, record elevations or tested included cleared natural ground for receiving fill or structures, "remedial removal" areas, key bottoms and benches.

1.7 The guidelines contained herein and any standard details attached herewith represent this firm's recommendations for the grading and all associated operations on the subject project. These guidelines shall be considered to be a part of these Specifications.

1.8 If interpretation of these guidelines or standard details result in a dispute(s), the Geotechnical Consultant shall conclude the appropriate interpretation.

1.9 The Geotechnical Consultant shall observe the processing of subgrade and fill materials and perform the necessary compaction testing. The test results shall be provided to the Owner and the Contractor and if so required, to the agenc(ies) having jurisdiction.

1.10 The Geotechnical Consultant shall not provide "supervision" or any "direction" of work in progress to the Earthwork Contractor, or to any of the Contractor's employees or to any of the Contractor's agent.

1.11 The Earthwork Contractor : The Earthwork Contractor (contractor) shall be qualified, experienced and knowledgeable in earthwork logistics; preparation and processing of ground to receive fill, moisture conditioning and processing of fill, and compacting fill. The Contractor shall review and accept the plans, geotechnical report(s), and these Specifications prior to commencement of grading. The Contractor shall be solely responsible for performing the grading in accordance with the plans and specifications.

The Contractor shall prepare and submit to the Owner and the Geotechnical Consultant a work plan that indicates the sequence of earthwork grading, the number of "spreads" of work and the estimated quantities of daily earthwork contemplated for the site prior to commencement of grading. The Contractor shall inform the Owner and the Geotechnical Consultant of change in work schedules and updates to the work plan at least 24 hours in advance of such changes so that appropriate observations and tests can be planned and accomplished. The

Contractor shall not assume that the Geotechnical Consultant is aware of all grading operations.

The Contractor shall have the sole responsibility to provide adequate equipment and methods to accomplish the earthwork in accordance with the applicable grading codes and agency ordinances, these Specifications and the recommendations in the approved geotechnical report (s) and grading plan(s). If, in the opinion of the Geotechnical Consultant, unsatisfactory conditions, such as unsuitable soils, improper moisture conditions, inadequate compaction, insufficient buttress key size, adverse weather, etc. are resulting in a quality of work less than required in these specifications, the Geotechnical Consultant shall reject the work and may recommend to the Owner that construction be stopped until the conditions are rectified.

2.0 Preparation of Areas to be Filled

2.1 Clearing and grubbing : vegetation, such as brush, grass, roots, and other deleterious materials shall be sufficiently removed and properly disposed of in a method acceptable to the Owner, governing agencies, and the Geotechnical Consultant.

The Geotechnical Consultant shall evaluate the extent of these removals depending on specific site conditions. Earth fill material shall not contain more than 1 percent of organic materials (by volume). No fill lifts shall contain more than 5 percent of organic matter. Nesting of the organic materials shall not be allowed.

If potentially hazardous materials are encountered, the Contractor shall stop work in the affected area, and a hazardous material specialist shall be informed immediately for proper evaluation and handling of these materials prior to continuing to work in that area.

As presently defined by the State of California, most refined petroleum products (gasoline, diesel fuel, motor oil, grease, coolant, etc.) have chemical constituents that are considered to be hazardous waste. As such, the indiscriminate dumping or spillage of these fluids onto the ground may constitute a misdemeanor, punishable by fine and/or imprisonment and shall not be allowed.

Materials used for fill, either imported or on-site, shall not contain hazardous materials as defined by the California Code of Regulations, Title 22, Division 4, Chapter 30, Article 9 and 10; 40 CRF; and any other

applicable local, state or federal laws. The Consultant shall not be responsible for the identification or analysis of the potential presence of hazardous materials. However, if observations, odors or soil discoloration cause Consultant to suspect the presence of hazardous materials, the Consultant may request from the Owner the termination of grading operations within the affected area. Prior to resuming grading operations, the Owner shall provide a written report to the Consultant indicating that the suspected materials are not hazardous as defined by applicable laws and regulations.

2.2 Any asphaltic pavement material removed during clearing operations should be properly disposed of at an approved off-site facility. Concrete fragments which are free of reinforcing steel may be placed in fills, provided that they are placed in accordance with Section 3.1 of this document.

2.3 During grading, soil or groundwater conditions other than those identified in the Geotechnical Report may be encountered by the Contractor. The Consultant shall be notified immediately to evaluate the significance of the unanticipated conditions.

2.4 Processing : Existing ground that has been declared satisfactory for support of fill by the Geotechnical Consultant shall be scarified to a minimum depth of 6 inches. Existing ground that is not satisfactory shall be over-excavated as specified in the following section. Scarification shall continue until soils are broken down and free of large clay humps or clods and the working surface is reasonable uniform, flat, and free of uneven features that would inhibit uniform compaction.

2.5 Over-excavation : In addition to removals and over-excavations recommended in the approved geotechnical report(s) and the grading plan, Soft, loose, dry, saturated, spongy, organic-rich highly fractured or otherwise unsuitable ground shall be over-excavated to competent ground as evaluated by the Geotechnical Consultant during grading.

2.6 Benching : Where fills are to be placed on ground with slopes steeper than 5 : 1 (horizontal : vertical), the ground shall be stepped or benched. Please see the Standard Details for a graphic illustration. The lowest bench or key shall be a minimum of 15 feet wide and at least 2 feet deep into competent material as evaluated by the Geotechnical Consultant. Other benches shall be excavated a minimum height of 4 feet into competent material or as otherwise recommended by the Geotechnical Consultant. Fill placed on ground sloping flatter than 5 :1 (horizontal :

vertical) shall also be benched or otherwise over-excavated to provide a flat subgrade for the fill.

2.7 Evaluation/Acceptance of Fill Areas : All areas to receive fill, including removal and processed areas, key bottoms, and benches, shall be observed, mapped, elevations recorded, and/or tested prior to being accepted by the Geotechnical Consultant as suitable to receive fill. The Contractor shall obtain a written acceptance from the Geotechnical Consultant prior to fill placement. A licensed surveyor shall provide the survey control for determining elevations of processed areas, keys and benches.

3.0 Fill Material

3.1 General : Materials to be used as fill shall be essentially free of organic matter and other deleterious substances evaluated and accepted by the Geotechnical Consultant prior to placement. Soils of poor quality, such as those with unacceptable gradation, high expansion potential or low strength shall be placed in areas acceptable to the Geotechnical Consultant or mixed with other soils to achieve satisfactory fill materials.

3.2 Oversized Material : Oversize material defined as rock, or other irreducible material with a maximum dimension greater than 8 inches shall not be buried or placed in fill unless location, materials and placement methods are specifically accepted by the Geotechnical Consultant. Placement operations shall be such that nesting of oversized material does not occur and such that oversize material is completely surrounded by compacted or densified fill. Oversize material shall not be placed within 10 vertical feet of finish grade or within 2 feet of future utilities or underground construction.

3.3 Import : If importing of fill materials is required for grading, proposed import material shall meet the requirements of Section 3.1. The potential import source shall be given to the Geotechnical Consultant as least 48 hours (2 working days) before importing begins so that its suitability can be determined and appropriate tests performed.

4.0 Fill Placement and Compaction

4.1 Fill Layer : Approved fill material shall be placed in areas prepared to receive fill (per Section 3.0) in near vertical layers generally not exceeding

8 inches in thickness when compacted. The Geotechnical Consultant may accept thicker layers if testing indicates that the grading procedure can adequately compact the thicker layers. Each layer shall be spread evenly and mixed thoroughly to attain relative uniformity of material and moisture throughout.

4.2 Fill Moisture Conditioning : Fill soils shall be watered, dried back, blended, and/or mixed, as necessary to attain a relatively uniform moisture content at or slightly over optimum. Maximum density and optimum moisture content tests shall be performed in accordance with the American Society of Testing and Materials (ASTM Test Method D1557).

4.3 Compaction of Fill : After each layer has been moisture-conditioned, mixed and evenly spread, it shall be uniformly compacted to not less than 90 percent of maximum dry density (ASTM D1557). Compaction equipment shall be adequately sized and be either specifically designed for soil compaction or of proven reliability to efficiently achieve the specified level of compaction with uniformity.

4.4 Compaction of Fill Slopes : In addition to normal compaction procedures specified above, compaction of slopes shall be accomplished by backrolling of slopes with sheepsfoot rollers at increment of 3 to 4 feet in fill elevation, or by other methods producing satisfactory results acceptable to the Geotechnical Consultant. Upon completion of grading, relative compaction of the fill, out to the slope face, shall be at least 90 percent of maximum dry density per ASTM Test Method D1557.

4.5 Compaction Testing : Field tests for moisture content and relative compaction of the fill soils shall be performed by the Geotechnical Consultant. Location and frequency of tests shall be at the Consultant's discretion based on field conditions encountered. Compaction test locations will not necessarily be selected on a random basis. Test locations shall be selected to verify adequacy of compaction levels in areas that are judged to be prone to inadequate compaction (such as close to slope faces and at the fill/bedrock benches).

4.6 Frequency of Compaction Testing : Tests shall be taken at intervals not exceeding 2 feet in vertical rise and/or 1,000 cubic yards of compacted fill soils embankment. In addition as a guideline, at least one test shall be taken on slope faces for each 5,000 square feet of slope face and/or each 10 feet of vertical height of slope. The Contractor shall assure that fill construction is such that the testing schedule can be accomplished by the

Geotechnical Consultant. The Contractor shall stop or slow down the earthwork construction if these minimum standards are not met.

4.7 Compaction Test Locations : The Geotechnical Consultant shall document the approximate elevation and horizontal coordinates of each test location. The Contractor shall coordinate with the project surveyor to assure that sufficient grade stakes are established so that the Geotechnical Consultant can determine the test locations with sufficient accuracy. At a minimum, two grade stakes within a horizontal distance of 100 feet and vertically less than 5 feet apart from potential test locations shall be provided.

5.0 Subdrain Installation

Subdrain systems shall be installed in accordance with the approved geotechnical report(s), the grading plan, and the Standard Details. The Geotechnical Consultant may recommend additional subdrains and/or changes in subdrain extent, location, grade, or material depending on conditions encountered during grading. All subdrains shall be surveyed by a land surveyor/civil engineer for line and grade after installation and prior to burial. Sufficient time should be allowed by the Contractor for these surveys.

6.0 Excavation

Excavations, as well as over-excavation for remedial purposes, shall be evaluated by the Geotechnical Consultant during grading. Remedial removal depths shown on geotechnical plans are estimates only. The actual extent of removal shall be determined by the Geotechincal Consultant based on the field evaluation of exposed conditions during grading. Where fill-overcut slopes are to be graded, the cut portion of the slopes shall be made, evaluated, and accepted by the Geotechnical Consultant prior to placement of materials for construction of the fill portion of the slope, unless otherwise recommended by the Geotechnical Consultant.

7.0 Trench Backfill

7.1 The Contractor shall follow all OSHA and Cal/OSHA requirements for safety of trench excavations.

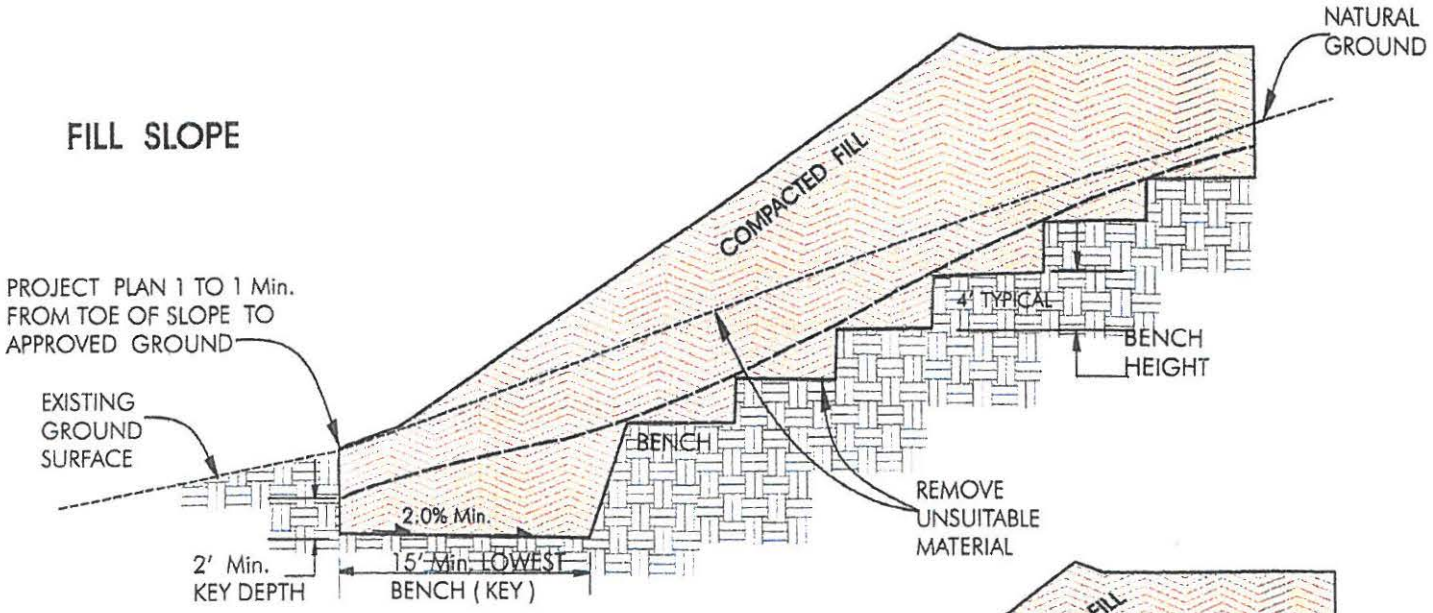
7.2 All bedding and backfill of utility trenches shall be done in accordance with the applicable provisions of Standard Specifications of Public Works Construction. Bedding material shall have a Sand Equivalent greater than 30 (SE>30). The bedding shall be placed and compacted to a minimum of 90 percent of maximum dry density from 1 foot above the top of the conduit to the surface.

7.3 The jetting of the bedding around the conduits shall be observed by the Geotechnical Consultant.

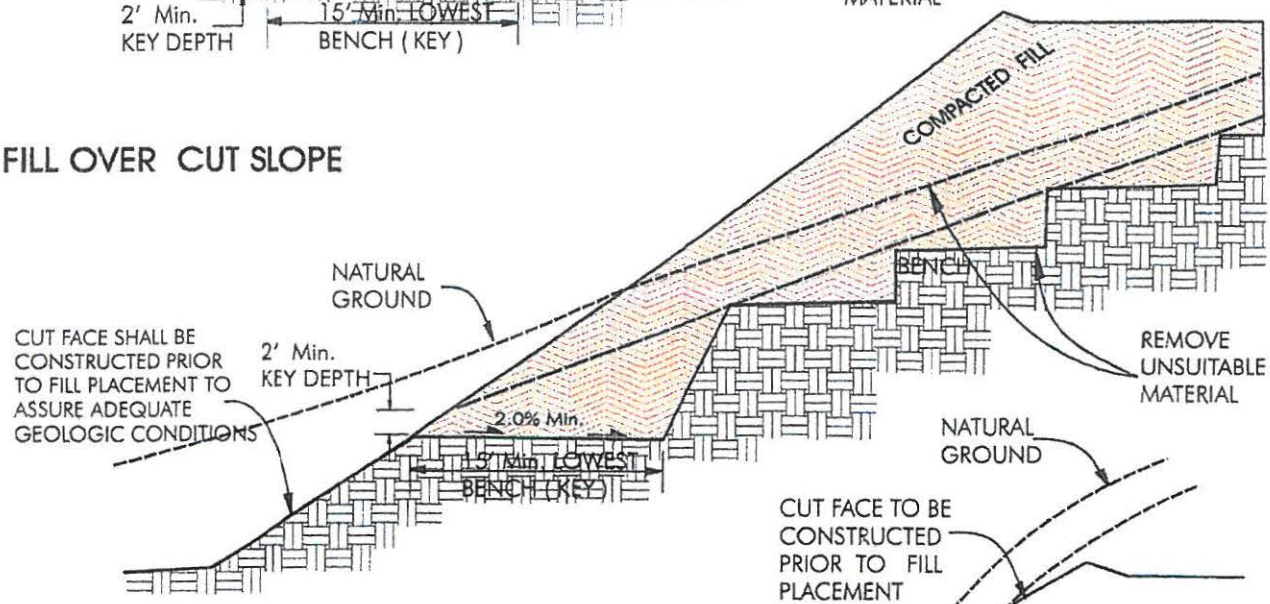
7.4 The Geotechnical Consultant shall test the trench backfill for relative compaction. At least one test should be made for every 300 feet of trench and 2 feet of fill.

7.5 Lift thickness of trench backfill shall not exceed those allowed in the Standard Specifications of Public Works Construction unless the Contractor can demonstrate to the Geotechnical Consultant that the fill lift can be compacted to the minimum relative compaction by his alternative equipment and method.

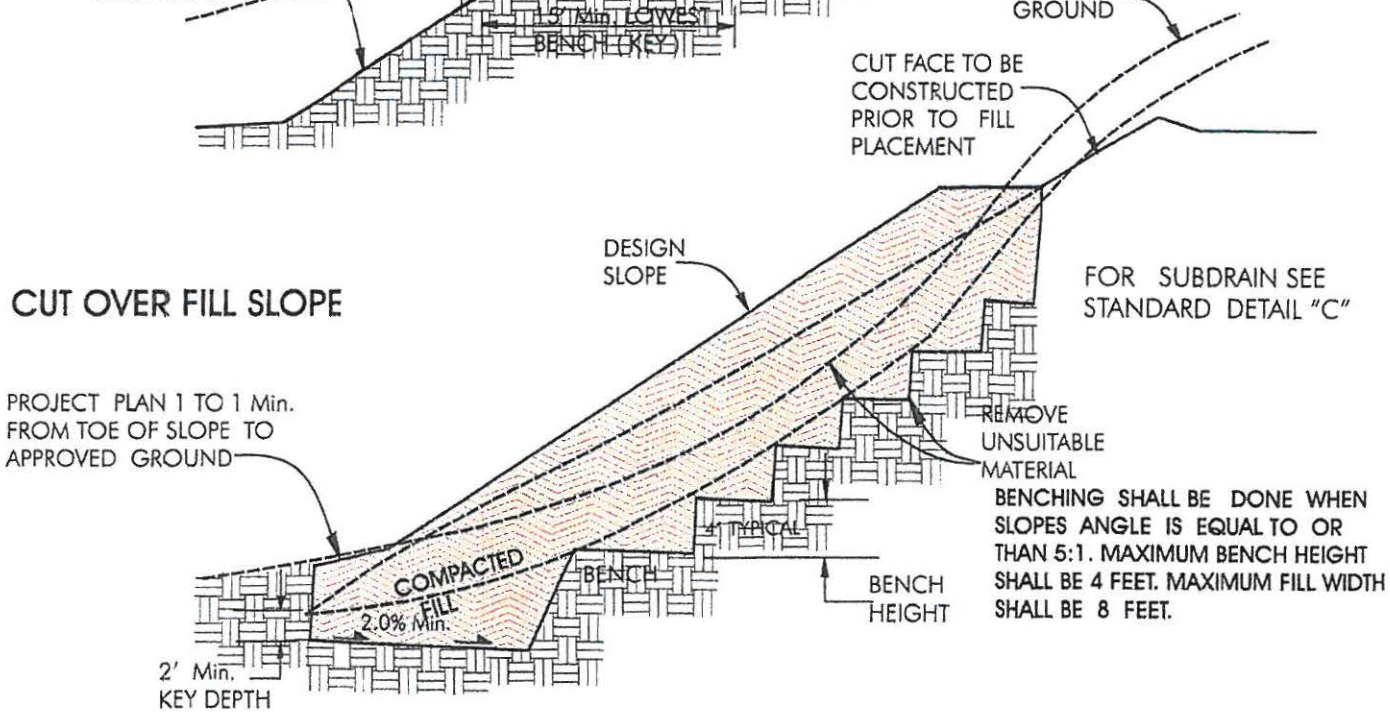
FILL SLOPE



FILL OVER CUT SLOPE



CUT OVER FILL SLOPE

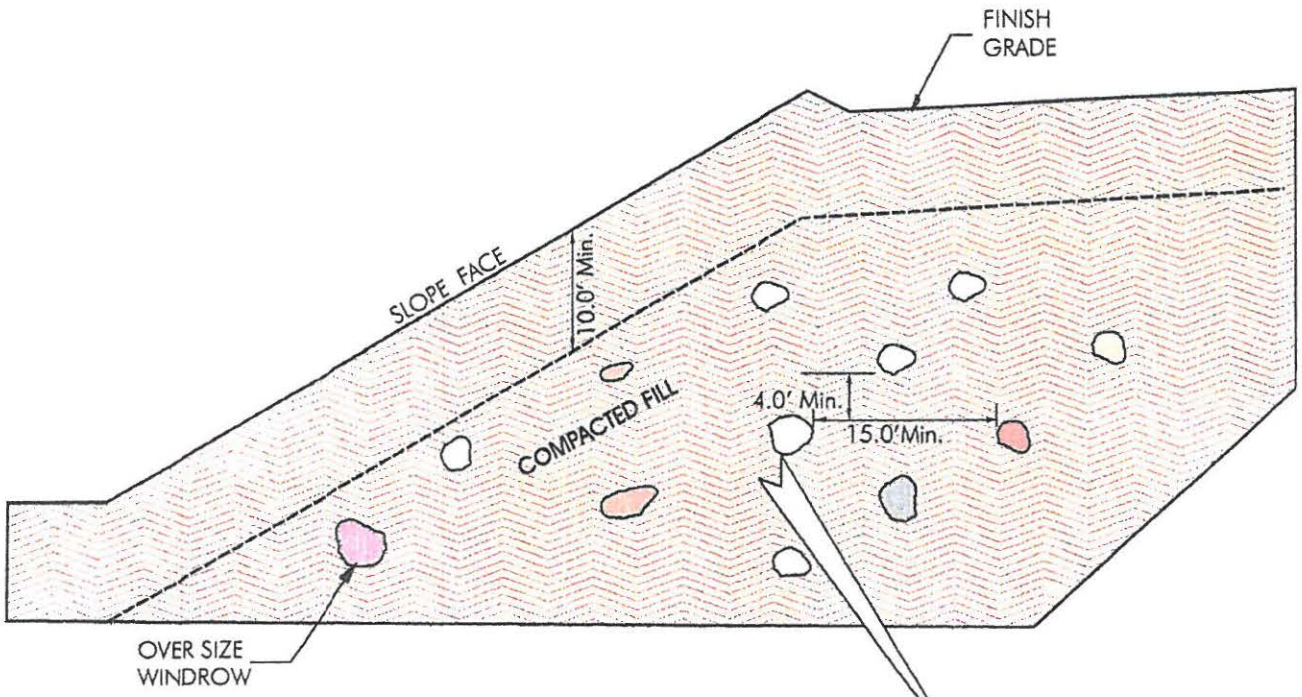


BENCHING SHALL BE DONE WHEN SLOPES ANGLE IS EQUAL TO OR THAN 5:1. MAXIMUM BENCH HEIGHT SHALL BE 4 FEET. MAXIMUM FILL WIDTH SHALL BE 8 FEET.

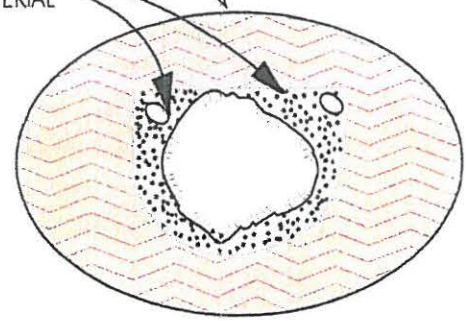
KEYING AND BENCHING

DETAIL A

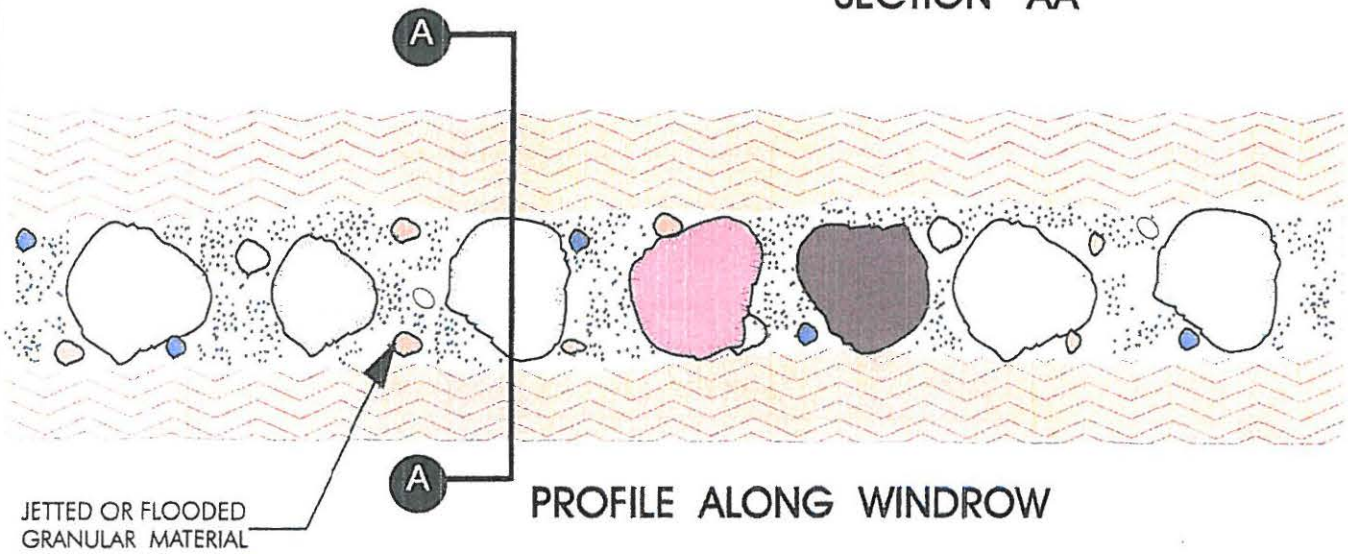
ALLIED EARTH TECHNOLOGY



- OVER SIZE ROCK IS LARGER THAN INCHES IN LARGEST DIMENSION
- EXCAVATE A TRENCH IN THE COMPACTED FILL DEEP ENOUGH TO BURY ALL THE ROCK
- BACKFILL WITH GRANULAR SOIL JETTED OR FLOODED IN PLACE TO FILL ALL THE ROCK VOIDS
- DO NOT BURY ROCK WITHIN 10 FEET OF FINISH GRADED.
- WINDROW OF BURIED ROCK SHALL BE PARALLEL TO THE FINISH SLOPE FILL.



SECTION "AA"

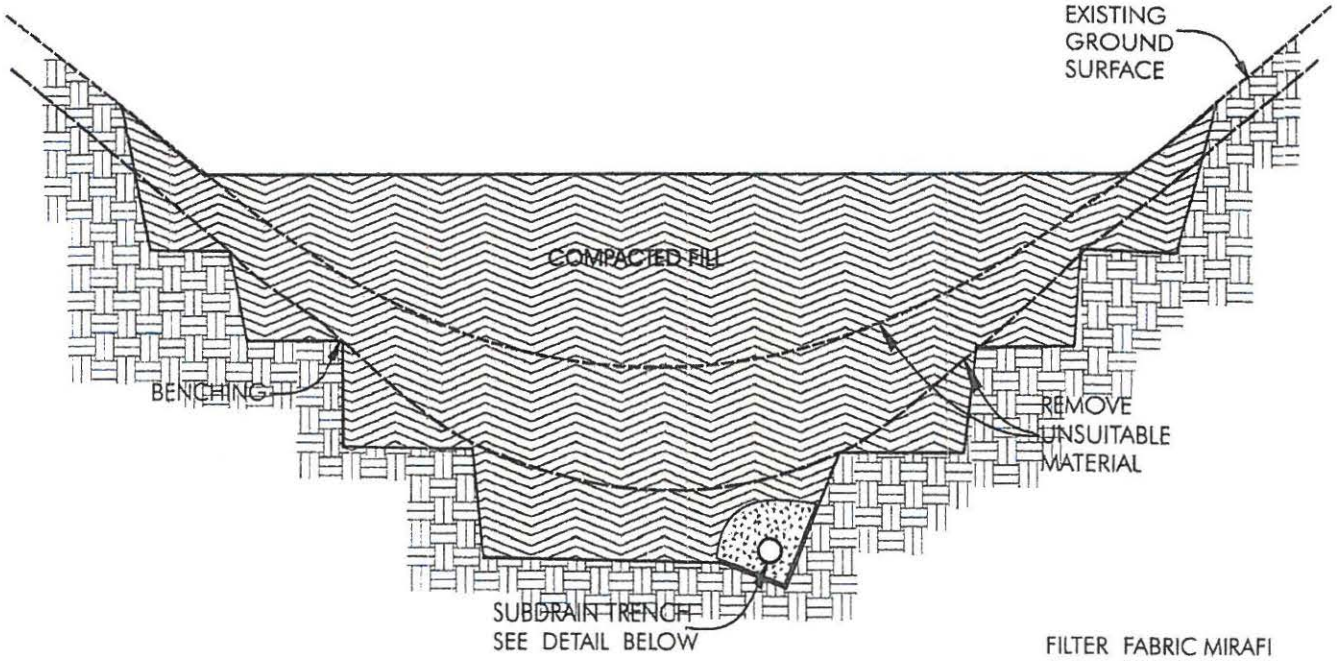


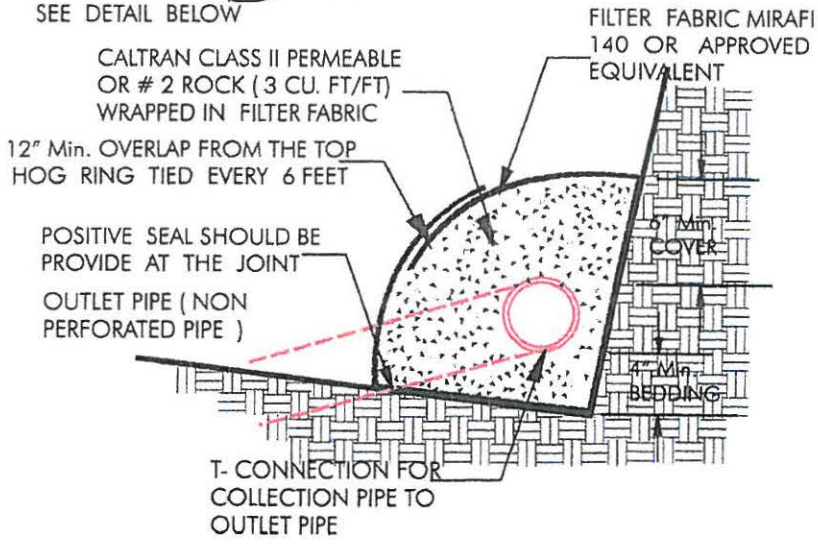
PROFILE ALONG WINDROW

OVER SIZE ROCK DISPOSAL

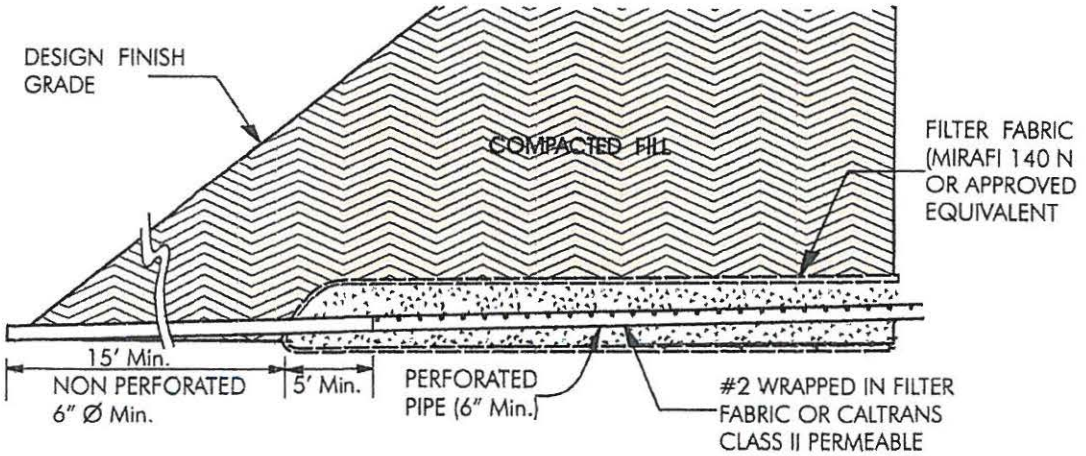
DETAIL B

ALLIED EARTH TECHNOLOGY





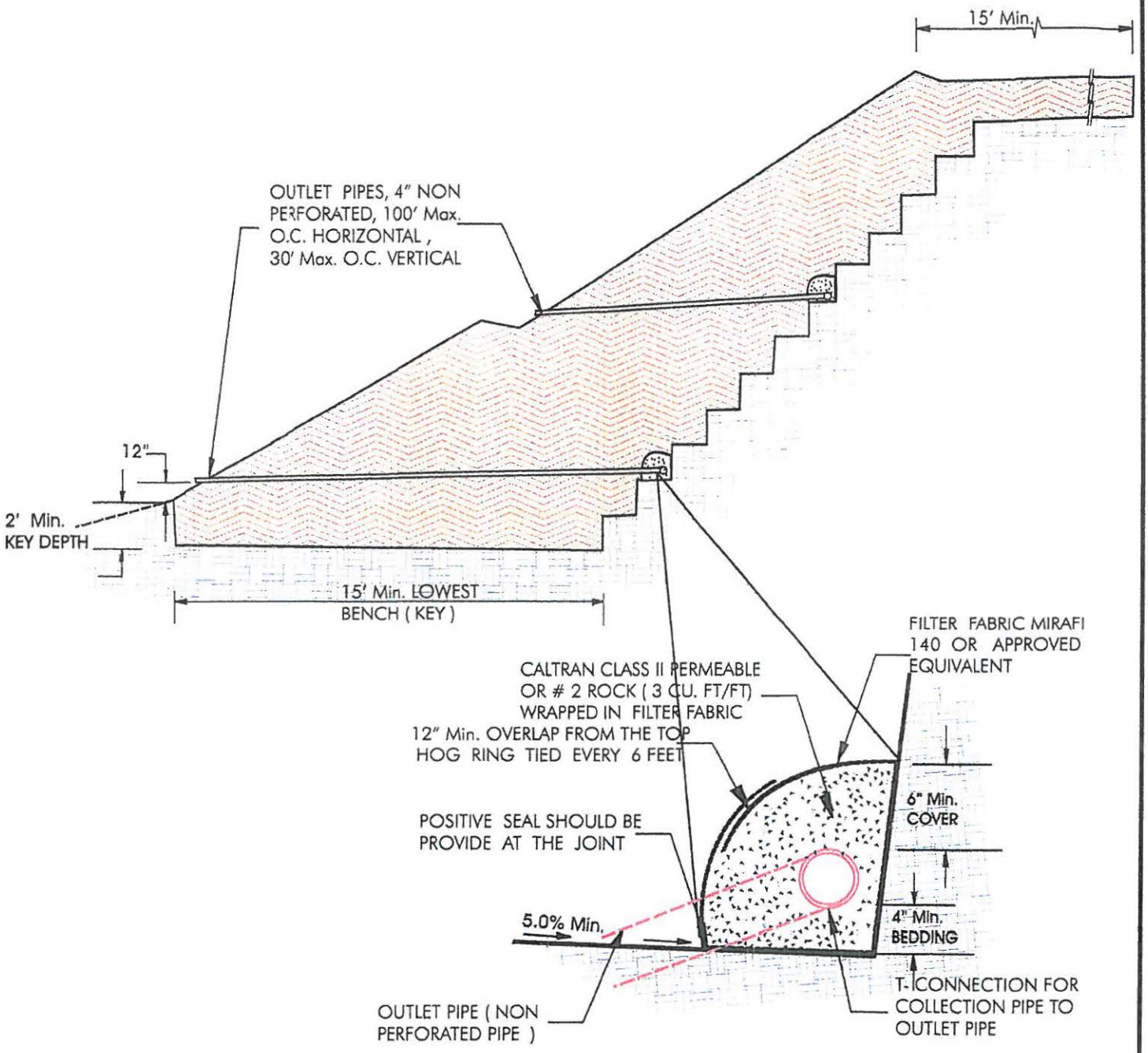
DETAIL OF CANYON SUBDRAIN TERMINAL



CANYON SUBDRAIN DETALS

DETAIL C

ALLIED EARTH TECHNOLOGY



SUBDRAIN INSTALLATION- SUBDRAIN COLLECTOR PIPE SHALL BE INSTALLED WITH PERFORATIONS DOWN OR UNLESS OTHERWISE DESIGNED BY THE GEOTECHNICAL CONSULTAN. OUTLET SHALL BE NON-PERFORATED PIPE. THE S UBDRAIN PIPE SHALL HAVE AT LEAST 8 PERFORATIONS UNIFORMLY SPACED PER FOOT. PERFORATION SHALL BE 1/4" TO 1/2" IF DRILLED HOLES ARE USED. ALL SUBDRAIN PIPES SHALL HAVE A GRADIENT AT LEAST 2% TOWARD THE OUTLET.

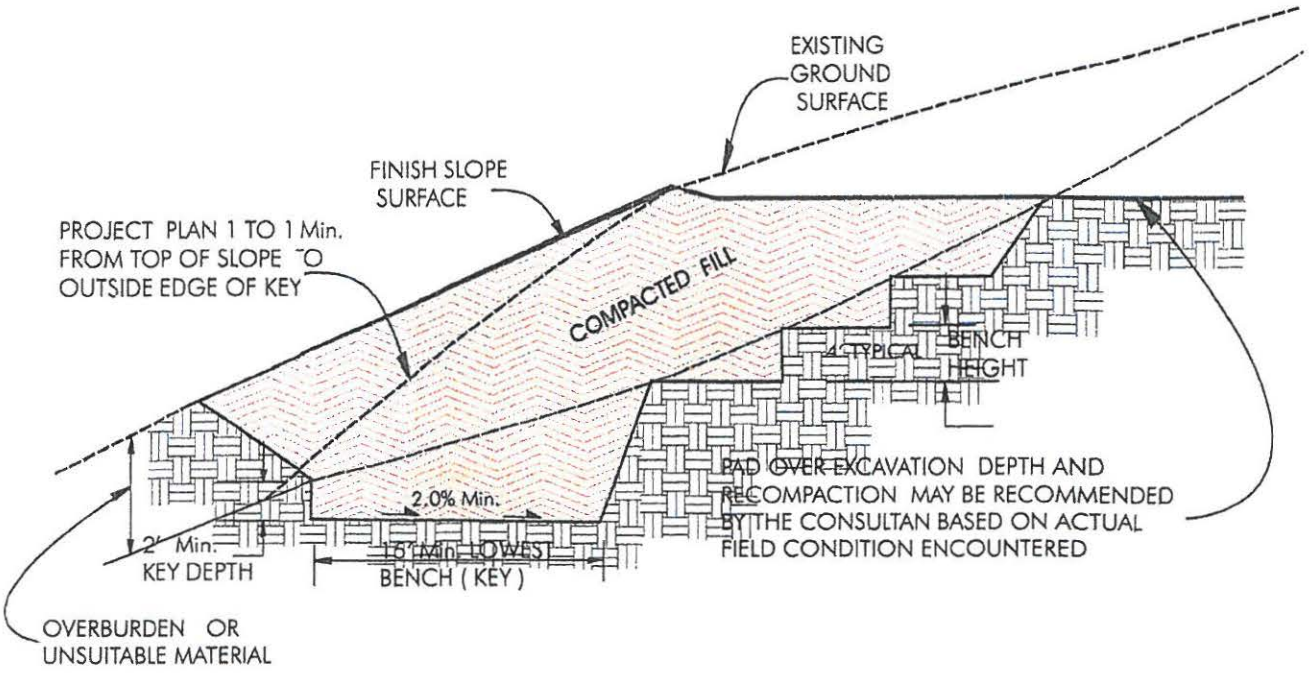
SUBDRAIN PIPES- SUBDRAIN PIPE SHALL BE ASTMD 2751, SDR 23.5 OR ASTMD 1527, SCHEDULE 40, OR ASTMD 3034, SDR 23.5, SCHEDULE 40 POLYVINYL CHORIDE PLASTIC (PVC) PIPE.

ALL OUTLET PIPE SHALL BE PLACED IN A TRENCH NO WIDER THAN TWICE THE SUBDRAIN PIPE, PIE SHALL BE IN SOIL OF SE>30 JETTED OR FLOODED IN PLACED EXCEPT FOR THE OUTSIDE 5 FEET WHICH BE NATIVE SOIL BACKFILL

BUTRESS OR REPLACEMENT SUBDRAIN

DETAIL D

ALLIED EARTH TECHNOLOGY



NOTE: SUBDRAIN DETAILS AND KEY WIDTH RECOMMENDATIONS TO BE PROVIDED BASED ON EXPOSED SURFACE CONDITIONS

HILLSIDE STABILITY FILL

DETAIL E

ALLIED EARTH TECHNOLOGY

Project No. 16-1268J6 NDD 03/04/16
Torrance

APPENDIX II

LABORATORY TEST RESULTS

1. The maximum dry density and optimum moisture content of the fill soils encountered were determined in accordance with A.S.T.M. D1557, Method A. The results of the tests are presented as follows :

	Soil Description	Maximum Dry Density (lbs./cu.ft.)	Optimum Moisture Content (% Dry Wt.)
Boring #1 Sample #1 Depth 3.0'	Tan silty fine sand (SM)	122.0	11.0

2. The Expansion Index of the most clayey soils was determined in accordance with A.S.T.M. D4929-08. The results of the test are presented as follows :

	Soil Description	Expansion Index
Boring #1 Sample #1 Depth 3.0'	Tan silty fine sand (SM)	33*

*Considered to possess LOW expansion potential

3. The sulfate content of the soils were determined in accordance with A.S.T.M. D516. The results are presented below :

	Soil Description	Sulfate Content (ppm)	
Boring #1 Sample #1 Depth 3.0'	Tan silty fine sand (SM)	38	Negligible

APPENDIX III

REFERENCES

- California Building Code, Volumes 1 & 2, International Conference of Building Officials, 2013.
- California Department of Conservation, Division of Mines and Geology (California Geological Survey), 1997, Guidelines for Evaluating and Mitigating Seismic Hazards in California, DMG Special Publication 117, 71p.
- Coffey Engineering – topographic map of Torrance Street propety
- "Foundations and Earth Structures", Naval Facilities Engineering Command, DM 7.02
- "Green Book" Standard Specifications for Public Works Construction, Public Works Standards, .
- Hart, Michael – Geologic Reconnaissance, Otsego Drive Residence, San Diego, CA.
- Kennedy, Michael P. – Geology Map of the San Diego 30'x60' Quadrangle, California, California Department of Conservation, Division of Mines and Geology
- "Soil Mechanics", Naval Facilities Engineering Command, DM 7.01
- "Soil Mechanics in Engineering Practice", Karl Terzaghi, Ralph B. Peck, Gholamreza Mesri.

ALLIED EARTH TECHNOLOGY

7915 SILVERTON AVENUE, SUITE 317
SAN DIEGO, CALIFORNIA 92126
PH. (858) 586-1665 FAX (858) 586-1650
(619) 447-4747

ROBERT CHAN, P.E.

September 7, 1016

Nakhshab Development & Design Inc.
2900 4th Avenue, Suite 100
San Diego, CA. 92103

Subject : Project No. 16-1268J6
Results of Percolation Testing
Proposed Five Residential Building Sites
South Side of Torrance Street, between Curlew Street and Dove Court
San Diego, California

Gentlemen :

In accordance with your request, we have performed percolation tests on subject property, located on the south side of Torrance Street, between Curlew Street and Dove Court, in the City and County of San Diego, State of California.

The purpose of the percolation testing is to determine the permeability of the upper soils for water infiltration purposes in the design of storm water best management practices.

Percolation Testing

In order to accomplish this purpose, 2 percolation test borings were excavated in the bio-infiltration area along the lower, northerly portion of the property. The location of these percolation test borings are shown on Figure No. 1, entitled, "Approximate Location of Percolation Tests".

The test borings were excavated to a depth of 3 feet. These test borings were presoaked for a period of 4 hours. During the testing, a minimum of 12 inches of water was placed in the borings and the rate of the drop in water level was recorded at approximately 30 minute intervals. This procedure was repeated until rates varied generally less than 10 percent.

The stabilized percolation rates are presented on the following page ;

Boring No.	Depth of Boring	Stabilized Percolation Rate (min/in)	Infiltration Rate* (in/hr)
1	3 ft.	15	2.0
2	3 ft.	27	8.5

*Percolation rates were converted to infiltration rates by the "Porchet Method".

Description of Property

Subject property is a rectangular-shaped property of approximately 0.57 acres, situated on the south side of the Torrance Street right-of-way, between Curlew Street and Dove Court. The general topography of the site may be described as sloping relatively steeply in an easterly direction at gradients on the order of 35 to 40 percent.

The site is currently vacant, and covered with a thick growth of grass and weeds. Severaleucalyptus and palm trees were also observed on the site. There were signs of past grading on thesite. Undocumented fill soils were encountered in the upper, east portion of the property, as well as excavations and cut slopes. Maximum thickness of the undocumented fill soils is on the order of 6 to 7 feet; with excavations on the order of 5 to 6 feet. However, due to the thickness of the existing vegetation, accurate quantities of excavation and fill placed on the site cannot be determined at this time. the remnants of a structure in the upper southwest portion of the property.

The properly is located in a developed area of the City of San Diego. The site is bounded on the north by the Torrance Street right-of-way and residences beyond; and on the east, south and west by existing residences

On-Site Soil Conditions

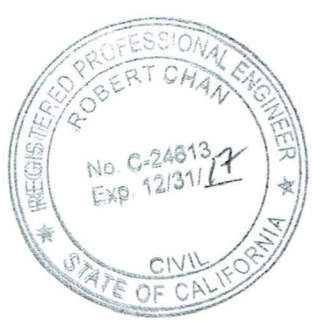
The soil types encountered in the bio-infiltration area consist of light gray/tan silty sands.

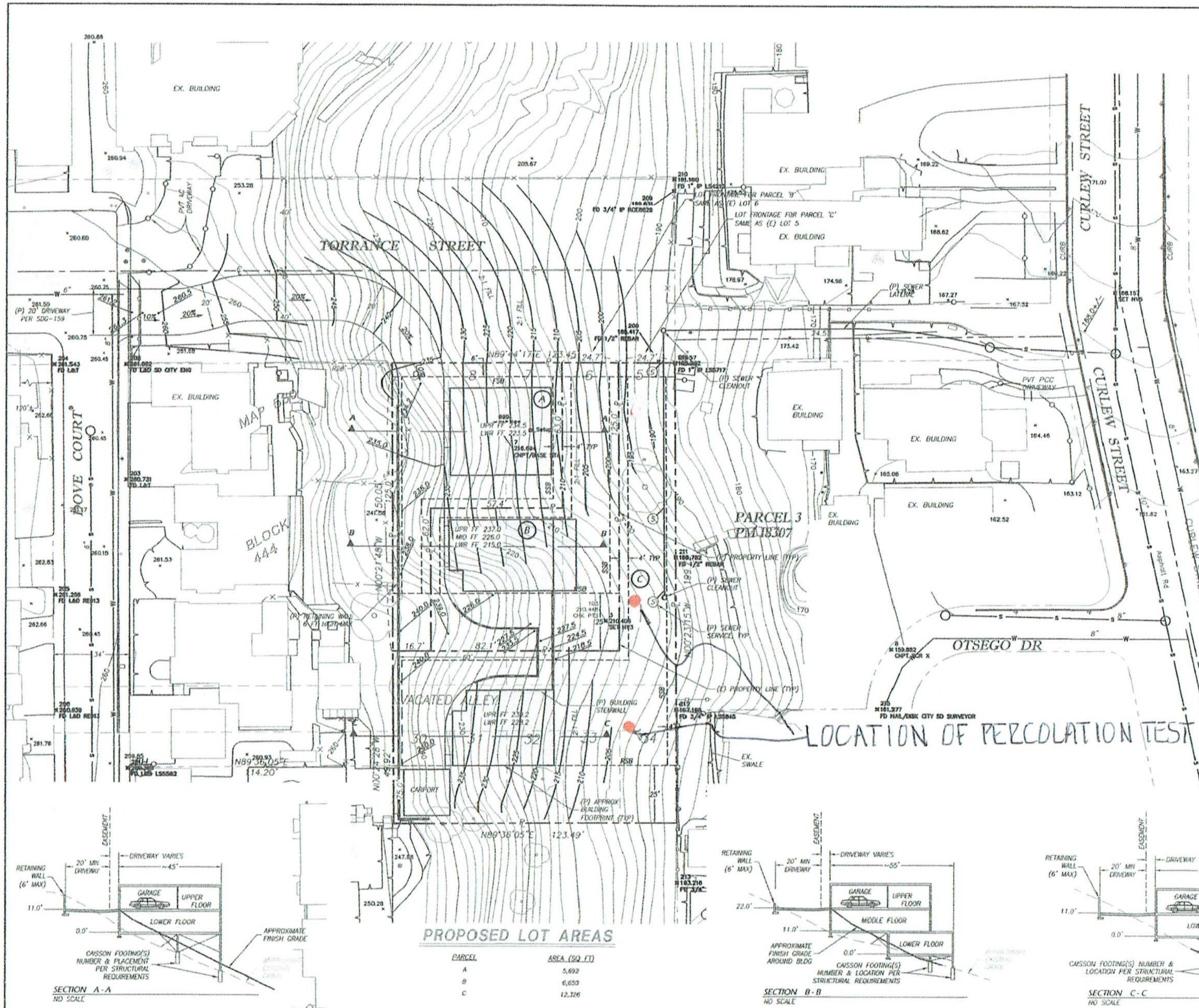
Groundwater

No groundwater was encountered on the property. Depth to groundwater in the general area is estimated to be greater than 35 feet.

Respectfully submitted,
ALLIED EARTH TECHNOLOGY

ROBERT CHAN, P.E.





LEGEND

DESCRIPTION	SYMBOL
EXISTING	
PROPERTY LINE (RECORD)	
RIGHT OF WAY	
STREET CENTERLINE	
CONTOUR	
EDGE OF PAVING	
SPOT ELEVATION	
BUILDING FOOTPRINT	
SEWER MAIN	
WATER MAIN	
FIRE HYDRANT	
CHAIN LINK FENCE	
WOOD FENCE	
CHAIN LINK FENCE	
FREE STANDING WALL	
RETAINING WALL	
TREE; PLANT; PALM	
PROPOSED	
PROPERTY LINE (ADJUSTED)	N45°45'45"W
CONTOUR	90
STREET CENTERLINE	
EDGE OF PAVING	
SPOT ELEVATION	100.00
BUILDING FOOTPRINT	
CHAIN LINK FENCE	
WOOD FENCE	
CHAIN LINK FENCE	
FREE STANDING WALL	
RETAINING WALL	
PARCEL DESIGNATION	X

ABBREVIATIONS

FRONT YARD SETBACK	FSB	FINISH FLOOR	FF
REAR YARD SETBACK	RSB	EXISTING	(E)
SIDE YARD SETBACK	SSB	PROPOSED	(P)
UPPER	UPR	TYPICAL	TYP
LOWER	LWR		

PROPOSED LOT AREAS

PARCEL	AREA (SQ FT)
A	5,692
B	6,653
C	12,326

COFFEY ENGINEERING, INC.

9666 BUSINESSPARK AVENUE, SUITE 210, SAN DIEGO, CA 92131 PH (858)831-0111 FAX (858)831-0179

PRELIMINARY

TORRANCE STREET

TORRANCE STREET
SAN DIEGO, CA 92103

DRAWN BY: GC/DK
CHECKED BY: JC
ORIGINAL 8/11/16
REVISION 1
REVISION 2
REVISION 3
REVISION 4
REVISION 5

CONCEPTUAL GRADING PLAN

SCALE: 1"=20'

C.1

SHT 1 OF 1 SHTS

ALLIED EARTH TECHNOLOGY

7915 SILVERTON AVENUE, SUITE 317
SAN DIEGO, CALIFORNIA 92126
PH. (858) 586-1665 FAX (858) 586-1650
(619) 447-4747

ROBERT CHAN, P.E.

December 12, 2016

Nakhshab Development & Design, Inc.
2900 4th Avenue, Suite 100
San Diego, CA. 92103

Subject : Project No. 16-1268J6
Response to City Comments
Five Proposed Residential Building Sites
South Side of Torrance Street, between Curlew Street and Dove Court
San Diego, California

Gentlemen :

The following are response to City comments dated December 6, 2016 :

4. *The project's geotechnical consultant must submit an addendum geotechnical report that provides the information required in the Storm Water Standards, Part 1, BMP Design Manual, Appendix C, Section C.4 and Work Sheet C.4-1 or Form I-8.*

   See attached.

5. *Provide a representative cross section of the proposed construction and relationship to geologic site conditions. Show the location of the cross section on the geologic/geotechnical map*

   See attached.

6. *The geotechnical consultant must provide recommendations regarding the existing undocumented fill and dumped sea shells. Clarify if the undocumented fill and dumped sea shells are to remain.*

   Existing undocumented fill and dumped sea shells shall be disposed of in accordance with the provisions of Appendix I to the report, entitled "General Grading and Earthwork

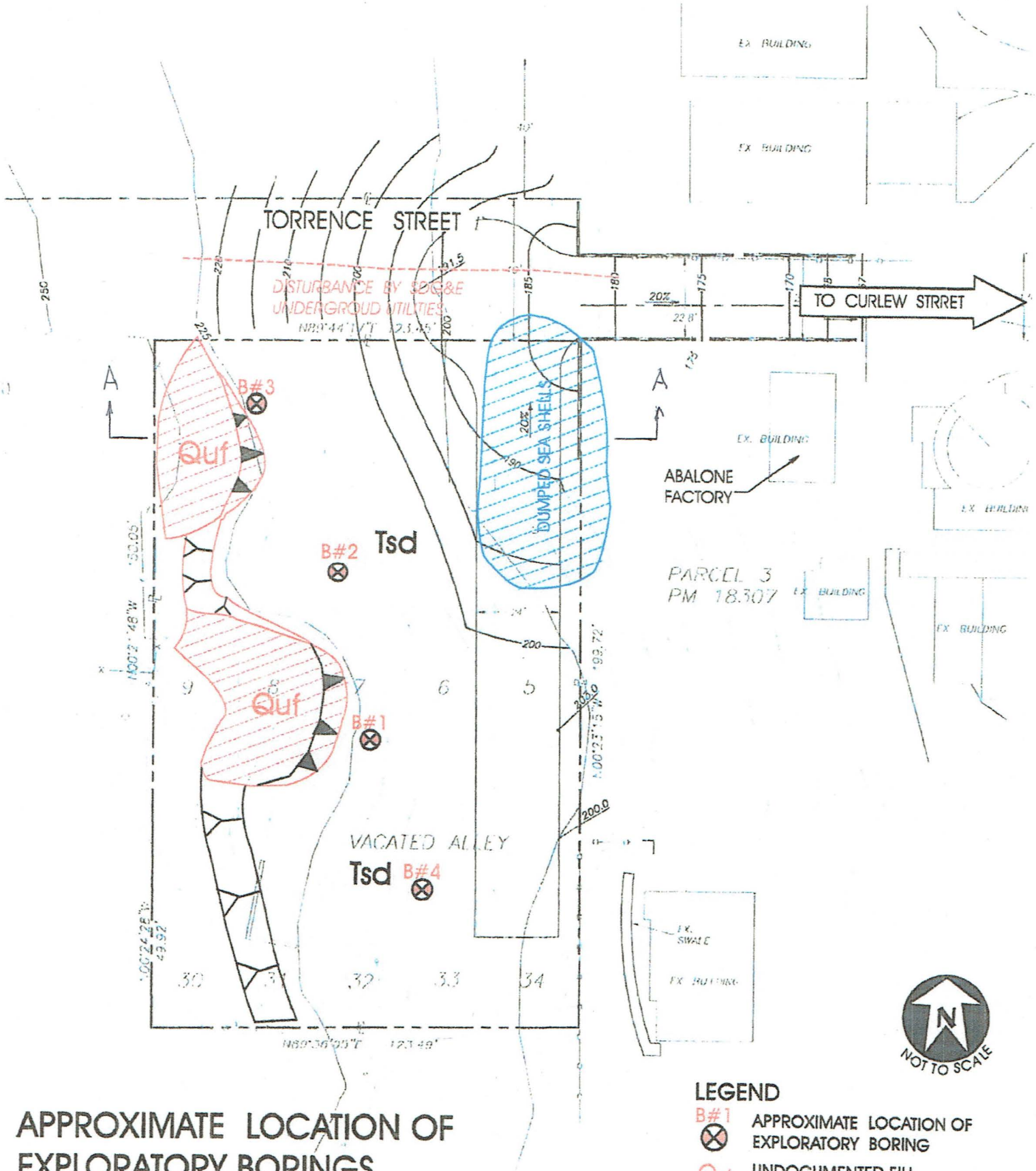
Specifications". Vegetation, dumped sea shells and other deleterious materials shall be hauled away and disposed of off-site. Remaining suitable fill soils shall be properly compacted on site.

7. *An Uncontrolled Embankment Agreement will be required for the areas of the undocumented fill to remain. The geotechnical consultant must demonstrate the uncontrolled embankment will not endanger the public health, safety, and welfare. Coordination with Geology and Engineering review will be required to execute the agreement.*

No areas of the undocumented fill will remain. Unsuitable materials will be hauled away; while suitable soils will be compacted on site. Therefore no Uncontrolled Embankment Agreement will be required.

Respectfully submitted,
ALLIED EARTH TECHNOLOGY

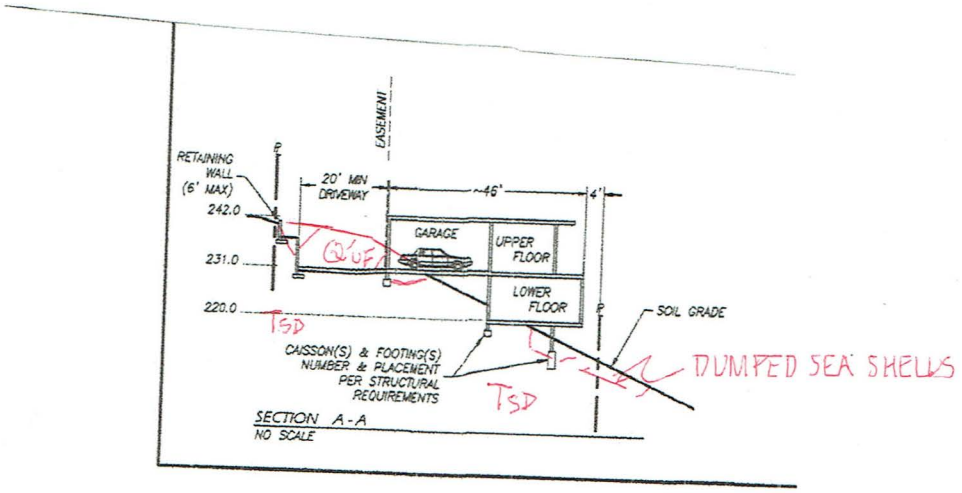
ROBERT CHAN, P.E.



APPROXIMATE LOCATION OF EXPLORATORY BORINGS

PROJECT NO. 16- 1268 J6

FIGURE NO.2



Tsd SAN DIEGO FORMATION

Qcf UNCOMPACTED FILL

ALLIED EARTH TECHNOLOGY

7915 SILVERTON AVENUE, SUITE 317
SAN DIEGO, CALIFORNIA 92126
PH. (858) 586-1665 FAX (858) 586-1650
(619) 447-4747

ROBERT CHAN, P.E.

September 7, 1016

Nakhshab Development & Design Inc.
2900 4th Avenue, Suite 100
San Diego, CA. 92103

Subject : Project No. 16-1268J6
Results of Percolation Testing
Proposed Five Residential Building Sites
South Side of Torrance Street, between Curlew Street and Dove Court
San Diego, California

Gentlemen :

In accordance with your request, we have performed percolation tests on subject property, located on the south side of Torrance Street, between Curlew Street and Dove Court, in the City and County of San Diego, State of California.

The purpose of the percolation testing is to determine the permeability of the upper soils for water infiltration purposes in the design of storm water best management practices.

Percolation Testing

In order to accomplish this purpose, 2 percolation test borings were excavated in the bio-infiltration area along the lower, northerly portion of the property. The location of these percolation test borings are shown on Figure No. 1, entitled, "Approximate Location of Percolation Tests".

The test borings were excavated to a depth of 3 feet. These test borings were presoaked for a period of 4 hours. During the testing, a minimum of 12 inches of water was placed in the borings and the rate of the drop in water level was recorded at approximately 30 minute intervals. This procedure was repeated until rates varied generally less than 10 percent.

The stabilized percolation rates are presented on the following page ;

Boring No.	Depth of Boring	Stabilized Percolation Rate (min/in)	Infiltration Rate* (in/hr)
1	3 ft.	15	0.54
2	3 ft.	27	0.28

*Percolation rates were converted to infiltration rates by the "Porchet Method".

Description of Property

Subject property is a rectangular-shaped property of approximately 0.57 acres, situated on the south side of the Torrance Street right-of-way, between Curlew Street and Dove Court. The general topography of the site may be described as sloping relatively steeply in an easterly direction at gradients on the order of 35 to 40 percent.

The site is currently vacant, and covered with a thick growth of grass and weeds. Severaleucalyptus and palm trees were also observed on the site. There were signs of past grading on thesite. Undocumented fill soils were encountered in the upper, east portion of the property, as well as excavations and cut slopes. Maximum thickness of the undocumented fill soils is on the order of 6 to 7 feet; with excavations on the order of 5 to 6 feet. However, due to the thickness of the existing vegetation, accurate quantities of excavation and fill placed on the site cannot be determined at this time. the remnants of a structure in the upper southwest portion of the property.

The properly is located in a developed area of the City of San Diego. The site is bounded on the north by the Torrance Street right-of-way and residences beyond; and on the east, south and west by existing residences

On-Site Soil Conditions

The soil types encountered in the bio-infiltration area consist of light gray/tan silty sands.

Groundwater

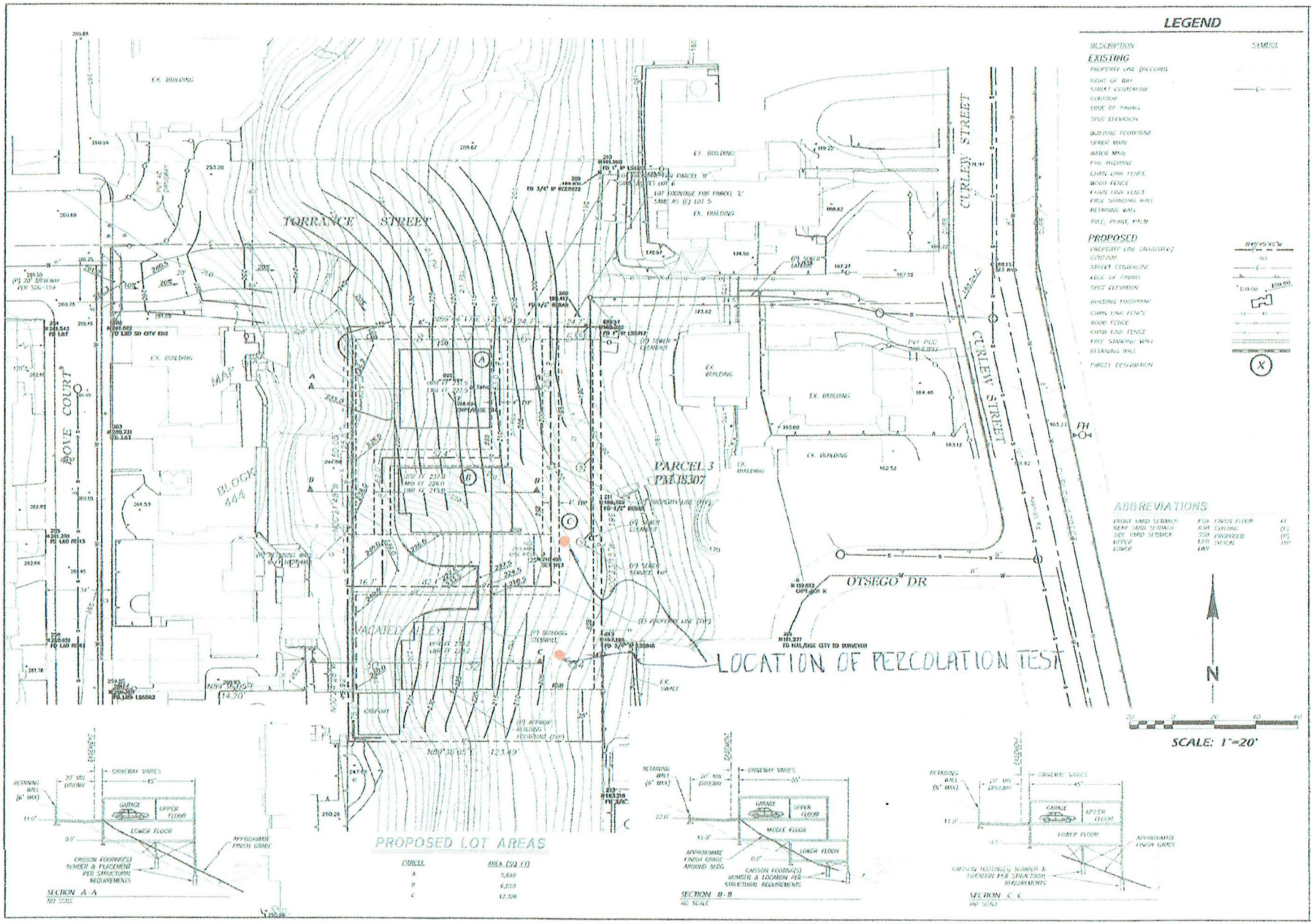
No groundwater was encountered on the property. Depth to groundwater in the general area is estimated to be greater than 35 feet.

Respectfully submitted,
ALLIED EARTH TECHNOLOGY

ROBERT CHAN, P.E.

REGISTERED PROFESSIONAL ENGINEER ROBERT CHAN No. C-24613 Exp. 12/31/17 CIVIL STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER ROBERT CHAN No. G-00198 Exp. 12/31/17 GEOTECHNICAL STATE OF CALIFORNIA


LEGEND
DESCRIPTION
SYMBOL
EXISTING
PROPERTY LINE (RECORD)
RIGHT OF WAY
STREET CENTERLINE
CONTOUR
EDGE OF PAVING
SPOT ELEVATION
BUILDING FOOTPRINT
SEWER MAIN
WATER MAIN
FIRE HYDRANT
CHAIN LINK FENCE
WOOD FENCE
CHAIN LINK FENCE
FREE STANDING WALL
RETAINING WALL
TREE, PLANT, PALM
PROPOSED
PROPERTY LINE (ADJUSTED)
CONTOUR
STREET CENTERLINE
EDGE OF PAVING
SPOT ELEVATION
BUILDING FOOTPRINT
CHAIN LINK FENCE
WOOD FENCE
CHAIN LINK FENCE
FREE STANDING WALL
RETAINING WALL
PARCEL DESIGNATION
ABBREVIATIONS
FINISH FLOOR
EXISTING
PROPOSED
TOP OF CURB
LOWER
TORRANCE STREET
CURLEW STREET
CURLEW STREET
OTSEGO DR
VACATED ALLEY
BOVE COURT
MAP
BLOCK 444
PARCEL 3
PM 18307
LOCATION OF PERCOLATION TEST
N
SCALE: 1"=20'
PROPOSED LOT AREAS
PARCEL
AREA (SQ FT)
A 5,692
B 6,853
C 12,326
SECTION A-A
NO SCALE
SECTION B-B
NO SCALE
SECTION C-C
NO SCALE
COFFEY ENGINEERING, INC.
TORRANCE STREET
TORRANCE STREET
SAN DIEGO, CA 92103
DRAWN BY: GC/DK
CHECKED BY: JC
ORIGINAL 8/14/15
REVISION 1
REVISION 2
REVISION 3
REVISION 4
REVISION 5
CONCEPTUAL GRADING PLAN
SCALE: 1"=20'
C.1
SHT 1 OF 1 SHTS

Percolation Test Data Sheet

Project:	TORRANCE ST.	Project No:	16-126816	Date:	09/02/16
Test Hole No:	1	Tested By:	A. TORRES		
Depth of Test Hole, D_T:	36 IN	USCS Soil Classification:	SM		
Test Hole Dimensions (inches)			Length	Width	
Diameter (if round)=	6 IN	Sides (if rectangular)=			

Sandy Soil Criteria Test*

Trial No.	Start Time	Stop Time	Time Interval, (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Greater than or Equal to 6"? (y/n)
1	9:00	9:30	30	15.00	16.80	1.80	N
2	9:45	10:15	30	15.00	17.00	2.00	N

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Other wise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25".

Trial No.	Start Time	Stop Time	Δt Time Interval (min.)	D_o Initial Depth to Water (in.)	D_f Final Depth to Water (in.)	ΔD Change in Water Level (in.)	Percolation Rate (min./in.)
1	10:30	11:00	30	15.00	17.75	2.75	10.9
2	11:15	11:45	30	15.15	17.6	2.6	11.5
3	12:00	12:30	30	15.00	17.2	2.2	13.6
4	12:45	13:15	30	15.10	17.1	2.0	15.0
5	13:30	14:00	30	15.00	17.0	2.0	15.0
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

COMMENTS:

Percolation Test Data Sheet

Project:	TORRANCE ST.	Project No:	16-126816	Date:	09/02/16
Test Hole No:	2	Tested By:	A. TORRES		
Depth of Test Hole, D_T:	36 IN	USCS Soil Classification:	SM		
Test Hole Dimensions (inches)			Length	Width	
Diameter (if round)=	6 IN.	Sides (if rectangular)=			

Sandy Soil Criteria Test*

Trial No.	Start Time	Stop Time	Time Interval, (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Greater than or Equal to 6"? (y/n)
1	11:15	11:45	30	15.00	16.2	1.2	N
2	12:00	12:30	30	15.00	16.1	1.1	N

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Other wise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25".

Trial No.	Start Time	Stop Time	Δt Time Interval (min.)	D_o Initial Depth to Water (in.)	D_f Final Depth to Water (in.)	ΔD Change in Water Level (in.)	Percolation Rate (min./in.)
1	10:45	11:15	30	15.0	15.9	0.9	33
2	11:30	12:00	30	15.0	16.0	1.0	30
3	12:15	12:45	30	15.0	16.1	1.1	27
4	13:00	13:30	30	15.0	16.1	1.1	27
5							
6							
7							
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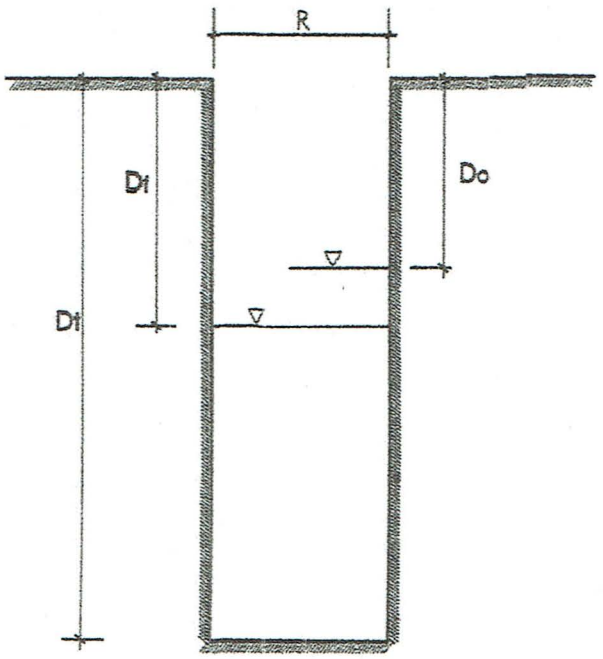
9							
10							
11							
12							
13							
14							
15							

COMMENTS:



ΔT = 30 min. R = 6 in.

Df = 17.1 in.

Do = 15.0 in

Dt = 36 in.

$$It = \frac{\Delta H60r}{\Delta T\,(r + 2Havg)}$$

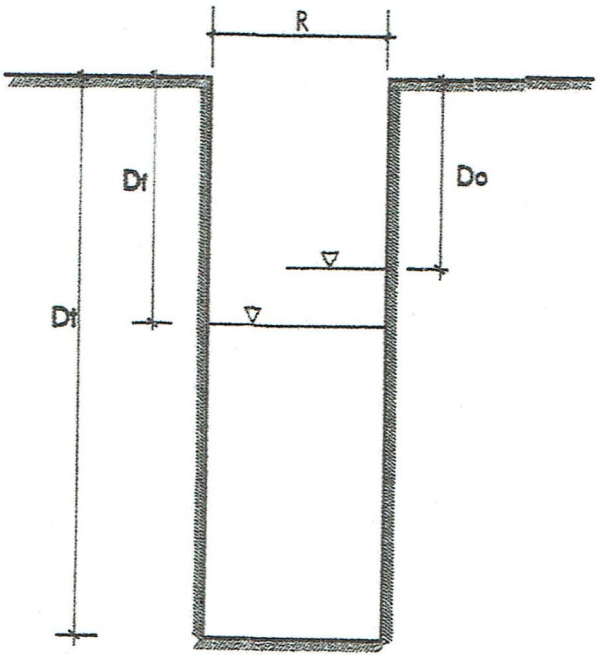
Ho = Dt -- Do = 36.0 - 15.0 = 21.0

Hf = Dt - Df = 36.0 - 17.1 = 18.9

ΔH = Ho - Hf = 21.0 - 18.9 = 2.1

Hav = (21.0 + 18.9)/2 = 19.95

$$It = \frac{(2.1)(60)(6)}{(30)\{6+ 2(19.95)\}} = \frac{756}{1,377} = 0.54 \text{ in/hr.}$$



Δ T	=	30 min.	R	=	6 in.					
Df	=	16.1 in.								
Do	=	15.0 in								
Dt	=	36 in.								
It	=	$\frac{\Delta H60r}{\Delta T\,(r + 2Havg)}$								
H o	=	Dt	--	Do	=	36.0	-	15.0	=	21.0
H f	=	Dt	-	Df	=	36.0	-	16.1	=	19.9
H	=	Ho	-	Hf	=	21.0	-	19.9	=	1.1
Hav	=	(21.0 + 19.9)/2			=					20.45

$$It = \frac{(1.1)(60)(6)}{(30)\{6+2(20.45)\}} = \frac{396}{1{,}407} = 0.28 \text{ in/hr.}$$

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.	✓	
Provide basis: Reliable infiltration rate of 0.54 in/hr was obtained. Based on this rate, full Infiltration is feasible 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: Geologic hazards associated with full infiltration can be mitigated to an Acceptable level 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.	✓	
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		

*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.		
Provide basis: 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.		
Provide basis: 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.		
Provide basis: 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.		
Provide basis: 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.		

*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: 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.		✓
Provide basis: Reliable infiltration rate of 0.28 in/hr. was obtained. Based on this rate, full Infiltration is not feasible. 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: Geologic hazard associated with full infiltration has not been inv estigated as Per Appendix C, Sec. C.1 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.		
Provide basis: Geologic hazard associated with groundwater contamination has not been Investigated as per Appendix C, Sec. C.1 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: Geologic hazard associated with potential water balance issues has not been Investigated as per Appendix C, Sec. C.1 Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
Part 1 Result*	If all answers to rows 1 - 4 are "Yes" a full infiltration design is potentially feasible. The feasibility screening category is Full Infiltration If any answer from row 1-4 is "No", infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design. Proceed to Part 2		

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

Provide basis:

INFILTRATION RATE OF 0.28 IN/HR. WAS OBTAINED.
SAFETY FACTOR OF 2 SHOULD BE USED.
PARTIAL INFILTRATION IS FEASIBLE

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.	✓	

Provide basis:

Partial infiltration can be allowed without increasing risk of geotechnical hazards. Lining of basin side adjacent to building foundation is recommended to minimize Potential migration of water from infiltration basin beneath the building foundation.

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.	✓	
Provide basis: Partial infiltration can be allowed without posing significant risk for groundwater Related concerns. 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.	✓	
Provide basis: Partial infiltration can be allowed with no downstream water rights violated. 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.		

*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

COFFEY ENGINEERING, INC.

Drainage Study

Torrance Street
San Diego, CA 92103

APN 451-292-06

Project Information:

Owner: Jennifer Currie
1283 Johnson Ave
San Diego, CA. 92103
Developer: Nakhshab Development & Design Inc.

May 12, 2017

9666 Businesspark Avenue, Suite 210 San Diego, CA 92131 Phone: (858)831-0111 Fax: (858)831-0179

Table of Contents

1. Existing Conditions 3
2. Proposed Project 3
3. Purpose and Scope of Report 3
4. Method of Calculations 3
5. Results and Conclusions: 4
6. Exemption from CWA Section 401/404 4
7. Declaration of Responsible Charge 5

Appendix A – Referenced Plans & Drainage Maps

- Drainage Map 'A' – Existing Drainage Conditions
- Drainage Map 'B' – Proposed Drainage Conditions

Appendix B – Calculations/Evaluations

- Table: 100 Year Storm Flow Rate Table

Appendix C – Reference Tables & Figures (County of San Diego Hydrology Manual)

- Soil Hydrology Groups
- Table 3-1 – Runoff Coefficients

1. **Existing Conditions**

The 0.566-acre site consists of a vacant lot. The entire site (Basin X), consisting of 24,667 SF of pervious surfaces, sheet flows east to Curlew Street. In addition to the site, approximately 0.113 acres (4,938 SF) of pervious vegetated area contributes run-on to the site from the west hillside. See Drainage Map 'A'.

2. **Proposed Project**

Proposed is the construction of three single family residences, two with adjoining carports and one with a detached garage. Site improvements include retaining walls, concrete walkways, and driveway. Proposed landscaping consists of the implementation of two biofiltration basins for stormwater treatment, as well as hydromod compliance. These impervious surfaces total 14,615 SF.

3. **Purpose and Scope of Report**

This report will evaluate the existing and water run-off flow patterns and flow rate characteristics for the project site. All calculations are for a 100-year expected storm event.

4. **Method of Calculations**

The Rational Method, as defined by *County of San Diego Hydrology Manual (2003)*, will be used to calculate storm water flow rates. Where noted, the following calculations were used to determine flow properties:

<u>Rainfall Characteristics</u>

$Q = C * I * A$, where

Q = Flow rate (ft^3/sec)
C = Runoff coefficient
(Runoff coefficient per County of San Diego Hydrology Manual Table 3-1 reproduced in Appendix C. Soil type D determined from the *Soil Hydrologic Groups* map from the County of San Diego Hydrology Manual reproduced in Appendix C also.)
I = Rainfall intensity (in/hr.)
A = Area (acres)

<u>Rainfall Intensity (per County of San Diego Hydrology Manual Figure 3-1 reproduced in Appendix C)</u>

$I = 7.44 * P_6 * D^{-0.645}$, where

I = Rainfall intensity (in/hr.)
P_6 = Adjusted 6-hour precipitation (inches)
D = Storm duration (min), equal to T_c for time-of-concentration storms

Tc = Ti+Tt+Tp (time-of-concentration), where
Ti=Over land initial time.
Tt=Travel time on natural watersheds.
Tp=Travel time on drainage structures (pipes, brow ditch, gutter etc.)

Overland Time of Flow (per County of San Diego Hydrology Manual Figure 3-3 reproduced in Appendix C)

$Ti= 1.8(1.1-C) D^{0.50} /(s^{0.33})$ (Overland initial time of concentration formula), where

D= Watercourse Distance (feet)(see table 3-2 for the max. overland flow length)
s = Slope (%)
C= Runoff Coefficient
Ti=Initial time of concentration (min.)

5. **Results and Conclusions:**

In the existing conditions, the site (including run-on) discharges a flow of 1.58 cfs east to Curlew Street, where it is collected by a storm water inlet and ultimately discharged to the San Diego Bay. Post-construction conditions replicate the existing flow pattern, and feature a flow rate of 2.55 cfs. This increase of 0.97 cfs can be attributed to an increase in both the impervious area on-site, as well as the size of the tributary area, and will require water attenuation for hydromodification compliance.

In the post-construction condition, two biofiltration basins will discharge storm water runoff to a proposed private storm drain line that will outlet to Curlew Street via a D-25 curb outlet. In order to meet hydromodification compliance, the storm water will be released at a mitigated rate of 0.01 cfs to the D-25 curb outlet (0.002 cfs in IMP A, and 0.006 cfs in IMP B. This will result in a reduction of runoff in the mitigated flow condition, from 1.58 CFS, to 0.870 cfs.

6. **Exemption from CWA Section 401/404:**

The proposed project is exempt from permitting under Federal Clean Water Act section 401 or 404 because it does not directly discharge into navigable waters of the United States. The project will convey storm water runoff to a City of San Diego storm drain inlet.

7. **Declaration of Responsible Charge**

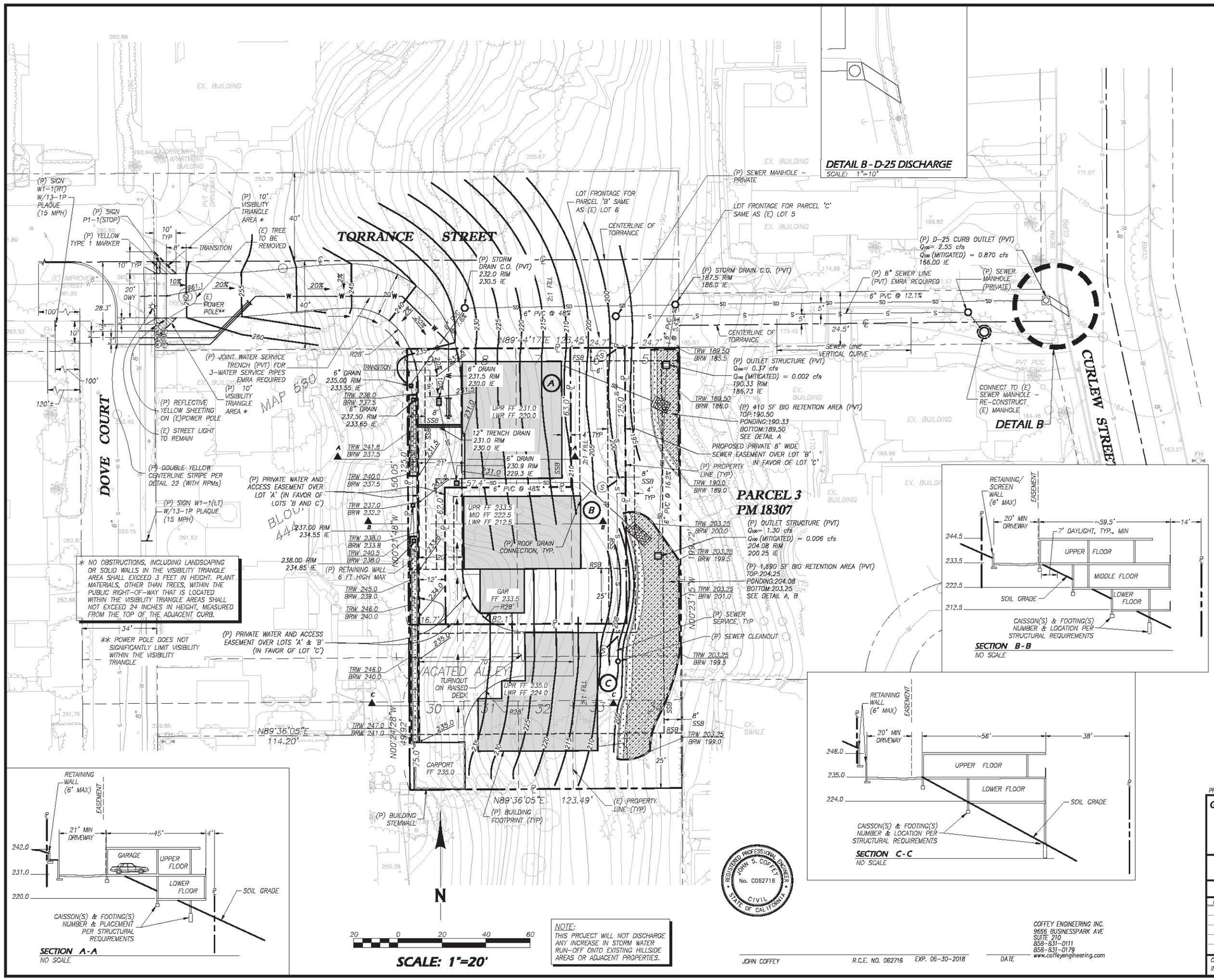
I hereby declare that I am the Civil Engineer of work for this project, that I have exercised responsible charge over the design of the project as defined in section 6703 of the business and professions code, and that the design is consistent with current design.

I understand that the check of project drawings and specifications by the County of San Diego is confined to a review only and does not relieve me, as Engineer of Work, of my responsibilities for project design.

Michael Kinnear
RCE 76785
Exp. 12-31-18

5/12/17
Date

Appendix A –Reference Plans Drainage Maps



LEGEND

DESCRIPTION	SYMBOL
EXISTING	
PROPERTY LINE (RECORD)	
RIGHT OF WAY	
STREET CENTERLINE	
CONTOUR	90
EDGE OF PAVING	
SPOT ELEVATION	+100.00 100.00
BUILDING FOOTPRINT	
SEWER MAIN	S
WATER MAIN	W
FIRE HYDRANT	FH
CHAIN LINK FENCE	
WOOD FENCE	
CHAIN LINK FENCE	
FREE STANDING WALL	
RETAINING WALL	
TREE; PLANT; PALM	
STREET LIGHT	
PROPOSED	
PROPERTY LINE (ADJUSTED)	N45°45'45"W
CONTOUR	90
STREET CENTERLINE	
EDGE OF PAVING	
SPOT ELEVATION	+100.00 100.00
BUILDING FOOTPRINT	
BIO RETENTION AREA (PVT)	
FREE STANDING WALL	
RETAINING WALL	
SEWER LATERAL (PVT)	S
STORM DRAIN LINE (PVT)	SD SD
DRAINAGE SWALE OR DIRECTION OF FLOW	
DRAIN INLET/CATCH BASIN	
TRENCH DRAIN	
RIP RAP ENERGY DISSIPATER	
WATER SERVICE W/BACKFLOW PREVENTION	W RP
RE-CONSTRUCT SEWER MANHOLE	
PARCEL DESIGNATION	X

PROPOSED LOT AREAS

PARCEL	AREA (SQ FT)
A	5,692
B	6,650
C	12,326

DRAINAGE NOTES

1. ALL DRAINAGE TO BE 6" PVC @ 2% UNLESS OTHERWISE NOTED.

COFFEY ENGINEERING, INC.
9666 BUSINESSPARK AVENUE, SUITE 210, SAN DIEGO, CA 92131 PH (858)831-0111 FAX (858)831-0179

PRIVATE CONTRACT

GRADING PLANS FOR:

TORRANCE 3

PARCELS A, B, & C OF PM _____

CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET OF 6 SHEETS

I.O. NO. _____
PROJECT NO. _____

FOR CITY ENGINEER _____ DATE _____

V.T.M. _____

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	CE			
AS-BUILTS				

NAD83 COORDINATES

LAMBERT COORDINATES

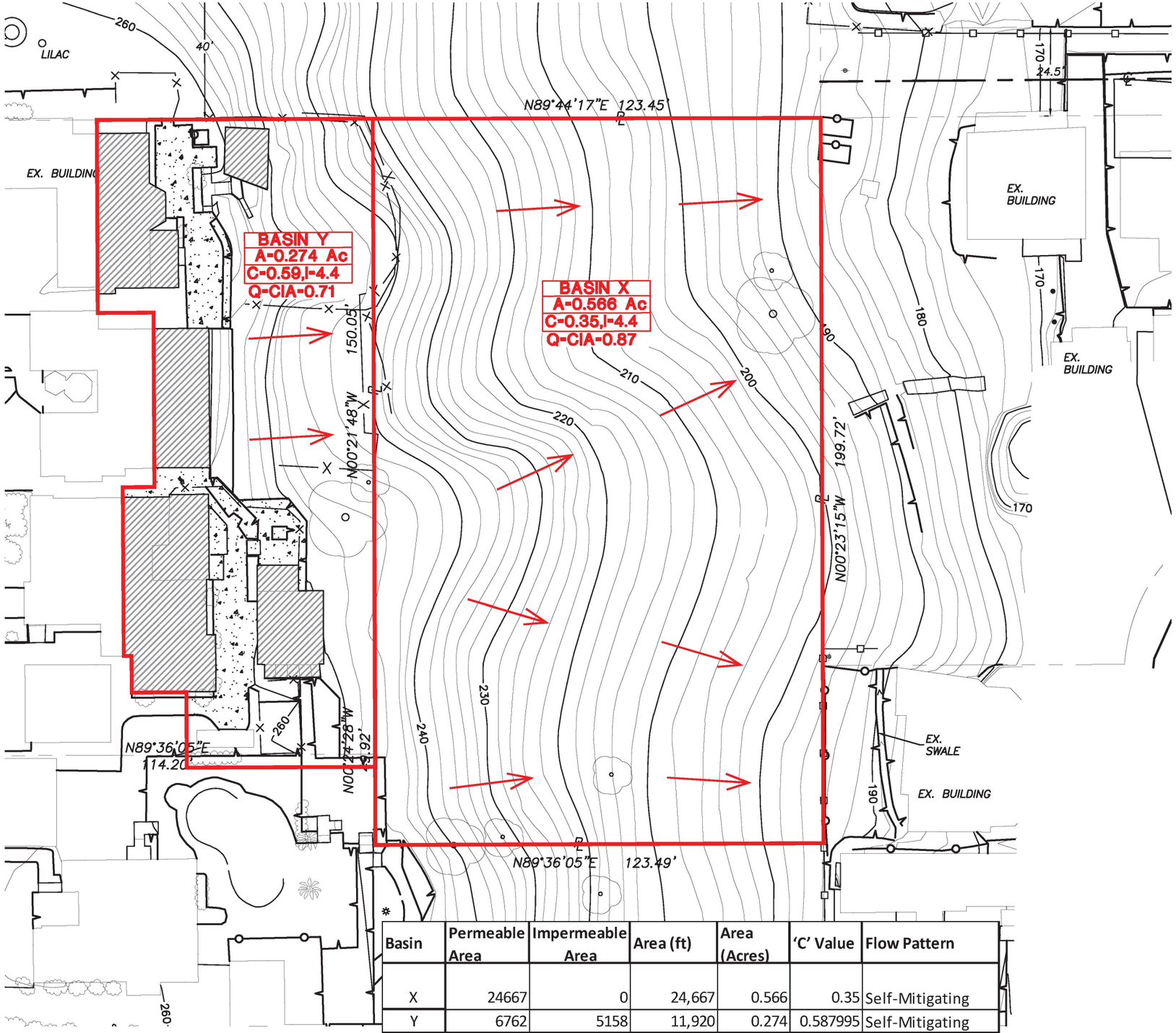
CONTRACTOR _____ DATE STARTED _____

INSPECTOR _____ DATE COMPLETED _____

REGISTERED PROFESSIONAL ENGINEER JOHN S. COFFEY No. C062716 CIVIL STATE OF CALIFORNIA

JOHN COFFEY R.C.E. NO. 062716 EXP. 06-30-2018 DATE

COFFEY ENGINEERING INC.
9666 BUSINESSPARK AVE
SUITE 210
858-831-0111
858-831-0179
www.coffeyengineering.com



LEGEND

DESCRIPTION	SYMBOL
PROPERTY LINE	
EXISTING CONTOUR	90
DIRECTION OF FLOW	
SITE BASIN LIMIT	

N

SCALE: 1"=30'

Basin	Permeable Area	Impermeable Area	Area (ft)	Area (Acres)	'C' Value	Flow Pattern
X	24667	0	24,667	0.566	0.35	Self-Mitigating
Y	6762	5158	11,920	0.274	0.587995	Self-Mitigating
Total	31429	5158	36587	0.840		

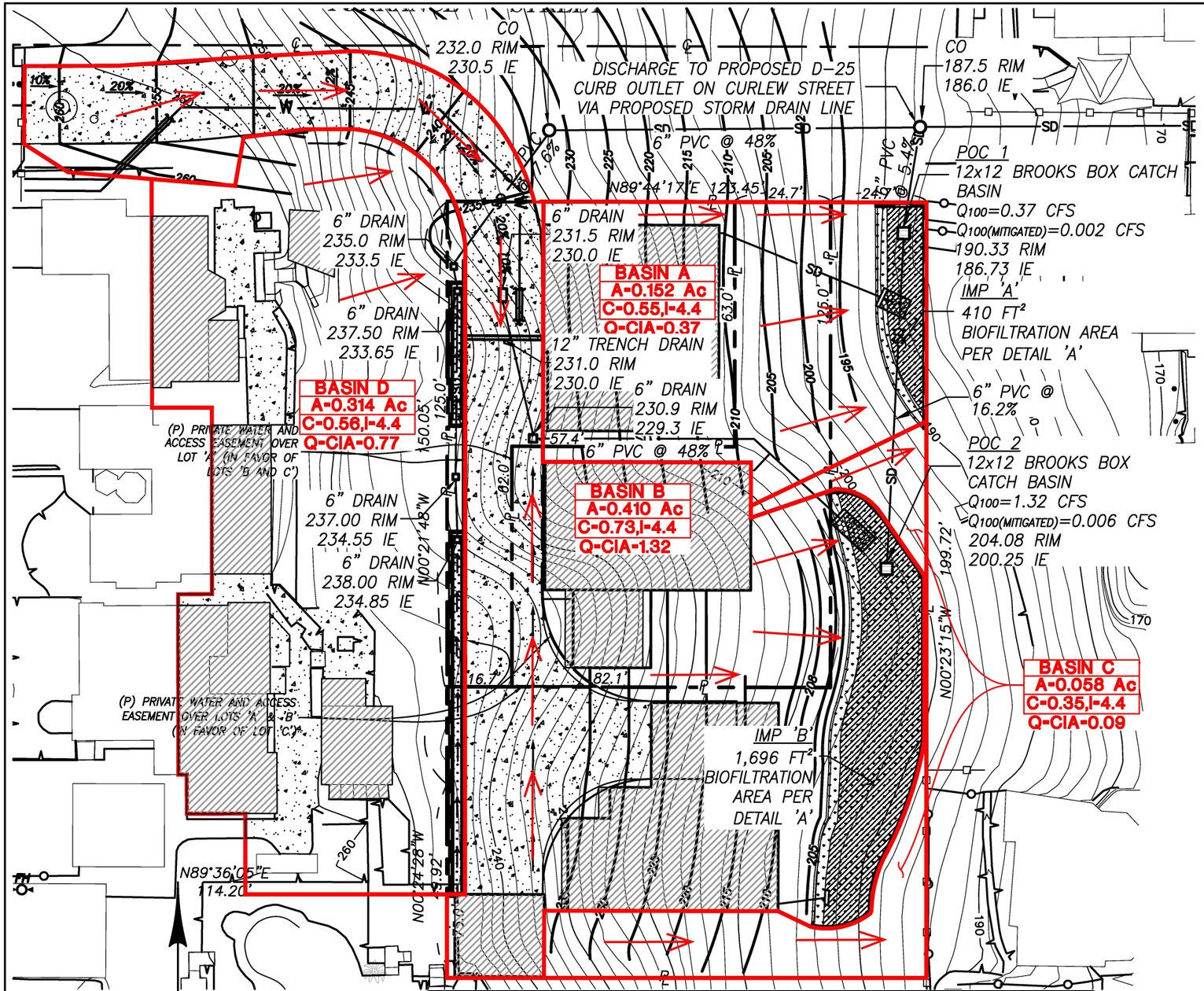
COFFEY ENGINEERING, INC.

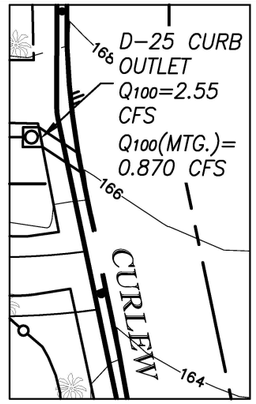
TORRANCE 5

Torrance St , San Diego CA 92103

DRAINAGE MAP 'A'
EXISTING CONDITIONS

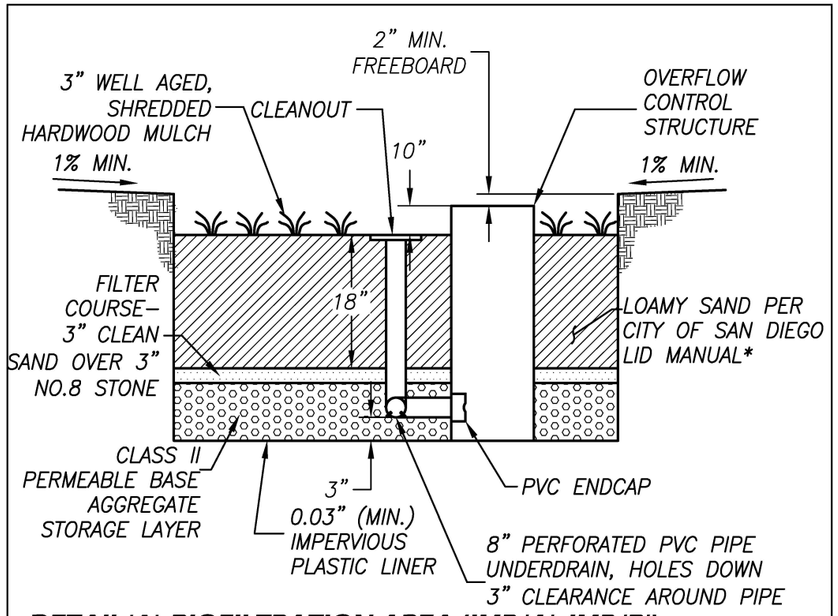
SCALE: 1"=30'





LEGEND

DESCRIPTION	SYMBOL
PROPERTY LINE	
EXISTING CONTOUR	90
PROPOSED CONTOUR	90
DIRECTION OF FLOW	
PVC PIPE	
DMA LIMIT	
IMPERVIOUS AREAS	
PERVIOUS AREAS	
BIOFILTRATION BASIN	



DETAIL 'A'-BIOFILTRATION AREA (IMP 'A', IMP 'B')
TYPICAL SECTION
NOT TO SCALE

Basin	Permeable Area	Impermeable Area	Area (ft)	Area (Acres)	'C' Value	Flow Pattern
A	4230	2398	6,628	0.152	0.55	Biofiltration
B	5628	12217	17,845	0.410	0.73	Biofiltration
C	2540	0	2,540	0.058	0.35	Self-Mitigating
D	8541	5158	13,699	0.314	0.56	Run-on redirected
Total	20939	19773	40,712	0.935		

SITE CHARACTERISTICS

- HYDROLOGIC SOIL GROUP.....D
- APPROXIMATE DEPTH TO GROUND WATER.....>24'
- CRITICAL COARSE SEDIMENT YIELD AREAS.....PRESENT ON SITE

COFFEY ENGINEERING, INC.

TORRANCE 5

Torrance Street, San Diego CA 92103

Appendix B –Calculation/Evaluations

100 Year Storm

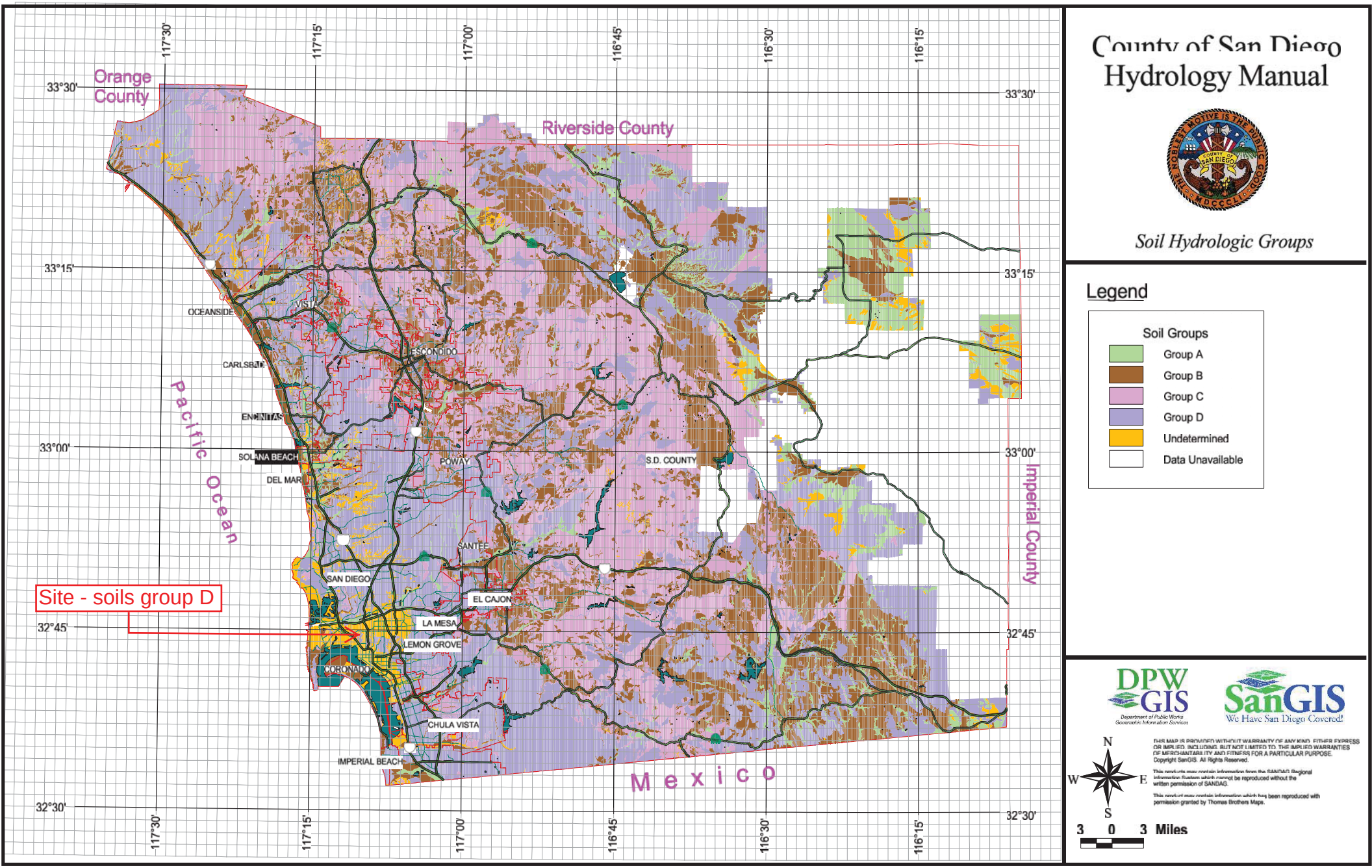
Table B - Pre Construction Flow Conditions							
		Summary					
Flow ID (Basin)	Runoff Coefficient, C	(5 min minimum) Total time-of-concentration, T_c (min)	Rainfall Intensity, I (in/hr)	Basin Area, A (acres)	**Q (cfs)**	Flow ID (Basin)	Flow Description
X	0.35	5.00	4.40	0.566	**0.87**	X	Sheet-flow offsite (Runoff)
Y	0.59	5.00	4.40	0.274	**0.71**	Y	Sheet-flow offsite (Runon)
				Sum =	1.58		

Table B - Post Construction Flow Conditions						Table B - Hydraulics of Proposed Structures	
		Summary					
Flow ID (Basin)	Runoff Coefficient, C	(5 min minimum) Total time-of-concentration, T_c (min)	Rainfall Intensity, I (in/hr)	Basin Area, A (acres)	**Q (cfs)**	Flow ID (Basin)	Flow Description
A	0.55	5.00	4.40	0.152	**0.37**	A	Sheet flow to flow-thru planter
B	0.73	5.00	4.40	0.410	**1.32**	B	Drains to flow-thru planter
C	0.35	5.00	4.40	0.058	**0.09**	C	Self-Mitigating
D	0.56	5.00	4.40	0.314	**0.77**	D	Connect to drain offsite (Runon)
				Sum =	2.55		

	Pre-Construction (CFS)	Post-Construction (Non-Mitigated) (CFS)	Post-Con (Mitigated)** (CFS)
Site Discharge	1.58	2.55	0.870

**** Post-Construction site discharge is calculated by taking the site discharge (including run-on) and subtracting the basins contributing to the biofiltration basin (Basins A & B). Using the orifice discharge equation in Attachment 2, the orifice flow rate is then added to the remaining site flow rate to calculate the total mitigated flow rate discharging to the hillside.**

Appendix C –Reference Tables & Figures (County of San Diego Hydrology Manual)



County of San Diego Hydrology Manual

Soil Hydrologic Groups

Legend

Soil Groups

- Group A
- Group B
- Group C
- Group D
- Undetermined
- Data Unavailable

DPW GIS
Department of Public Works
Geographic Information Services

SanGIS
We Have San Diego Covered!

N
W E
S

3 0 3 Miles

Table 3-1
RUNOFF COEFFICIENTS FOR URBAN AREAS

Land Use		Runoff Coefficient "C"				
			Soil Type			
NRCS Elements	County Elements	% IMPER.	A	B	C	D
Undisturbed Natural Terrain (Natural)	Permanent Open Space	0*	0.20	0.25	0.30	0.35
Low Density Residential (LDR)	Residential, 1.0 DU/A or less	10	0.27	0.32	0.36	0.41
Low Density Residential (LDR)	Residential, 2.0 DU/A or less	20	0.34	0.38	0.42	0.46
Low Density Residential (LDR)	Residential, 2.9 DU/A or less	25	0.38	0.41	0.45	0.49
Medium Density Residential (MDR)	Residential, 4.3 DU/A or less	30	0.41	0.45	0.48	0.52
Medium Density Residential (MDR)	Residential, 7.3 DU/A or less	40	0.48	0.51	0.54	0.57
Medium Density Residential (MDR)	Residential, 10.9 DU/A or less	45	0.52	0.54	0.57	0.60
Medium Density Residential (MDR)	Residential, 14.5 DU/A or less	50	0.55	0.58	0.60	0.63
High Density Residential (HDR)	Residential, 24.0 DU/A or less	65	0.66	0.67	0.69	0.71
High Density Residential (HDR)	Residential, 43.0 DU/A or less	80	0.76	0.77	0.78	0.79
Commercial/Industrial (N. Com)	Neighborhood Commercial	80	0.76	0.77	0.78	0.79
Commercial/Industrial (G. Com)	General Commercial	85	0.80	0.80	0.81	0.82
Commercial/Industrial (O.P. Com)	Office Professional/Commercial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (Limited I.)	Limited Industrial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (General I.)	General Industrial	95	0.87	0.87	0.87	0.87

*The values associated with 0% impervious may be used for direct calculation of the runoff coefficient as described in Section 3.1.2 (representing the pervious runoff coefficient, Cp, for the soil type), or for areas that will remain undisturbed in perpetuity. Justification must be given that the area will remain natural forever (e.g., the area is located in Cleveland National Forest).
DU/A = dwelling units per acre
NRCS = National Resources Conservation Service

The City of San Diego

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

Project Name: Torrance 3

PTS No. 519307

ENGINEER OF WORK:

Michael Kinnear, RCE 76785

Insert Civil Engineer's Name and PE Number Here
Provide Wet Signature and Stamp Above Line

5/12/17

PREPARED FOR:

Jennifer Currie
1283 Johnson Ave
San Diego, CA. 92103

PREPARED BY:

COFFEY ENGINEERING, INC.

Coffey Engineering, Inc.
9666 Businesspark Ave., Suite 210
San Diego, CA 92131
(858) 831-0111

DATE:

5/12/17

Approved by: City of San Diego Date

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- Certification Page
- Submittal Record
- Project Vicinity Map
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- FORM I-3B: Site Information Checklist for PDPs
- FORM I-4: Source Control BMP Checklist for All Development Projects
- FORM I-5: Site Design BMP Checklist for All Development Projects
- FORM I-6: Summary of PDP Structural BMPs
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    - Attachment 1c: Harvest and Use Feasibility Screening (when applicable)
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    - Attachment 2c: Geomorphic Assessment of Receiving Channels
    - Attachment 2d: Flow Control Facility Design
- Attachment 3: Structural BMP Maintenance Plan
    - Attachment 3a: Structural BMP Maintenance Thresholds and Actions
    - Attachment 3b: Draft Maintenance Agreement (when applicable)
- Attachment 4: Copy of Plan Sheets Showing Permanent Storm Water BMPs
- Attachment 5: Project's Drainage Report
- Attachment 6: Project's Geotechnical and Groundwater Investigation Report

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ACRONYMS

APN	Assessor's Parcel Number
ASBS	Area of Special Biological Significance
BMP	Best Management Practice
CEQA	California Environmental Quality Act
CGP	Construction General Permit
DCV	Design Capture Volume
DMA	Drainage Management Areas
ESA	Environmentally Sensitive Area
GLU	Geomorphic Landscape Unit
GW	Ground Water
HMP	Hydromodification Management Plan
HSG	Hydrologic Soil Group
HU	Harvest and Use
INF	Infiltration
LID	Low Impact Development
LUP	Linear Underground/Overhead Projects
MS4	Municipal Separate Storm Sewer System
N/A	Not Applicable
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
PDP	Priority Development Project
PE	Professional Engineer
POC	Pollutant of Concern
SC	Source Control
SD	Site Design
SDRWQCB	San Diego Regional Water Quality Control Board
SIC	Standard Industrial Classification
SWPPP	Stormwater Pollutant Protection Plan
SWQMP	Storm Water Quality Management Plan
TMDL	Total Maximum Daily Load
WMAA	Watershed Management Area Analysis
WPCP	Water Pollution Control Program
WQIP	Water Quality Improvement Plan

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CERTIFICATION PAGE

Project Name: Project Name: Torrance 3
Permit Application Number: PTS No. 519307

I hereby declare that I am the Engineer in Responsible Charge of design of storm water BMPs for this project, and that I have exercised responsible charge over the design of the project as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with the requirements of the Storm Water Standards, which is based on the requirements of SDRWQCB Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100 (MS4 Permit).

I have read and understand that the City Engineer has adopted minimum requirements for managing urban runoff, including storm water, from land development activities, as described in the Storm Water Standards. I certify that this PDP SWQMP has been completed to the best of my ability and accurately reflects the project being proposed and the applicable source control and site design BMPs proposed to minimize the potentially negative impacts of this project's land development activities on water quality. I understand and acknowledge that the plan check review of this PDP SWQMP by the City Engineer is confined to a review and does not relieve me, as the Engineer in Responsible Charge of design of storm water BMPs for this project, of my responsibilities for project design.

RCE 76785, Expiration Date 12/31/18

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

Michael Kinnear

Print Name

Coffey Engineering, Inc.

Company

5/12/2017

Date

Engineer's Stamp

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SUBMITTAL RECORD

Use this Table to keep a record of submittals of this PDP SWQMP. Each time the PDP SWQMP is re-submitted, provide the date and status of the project. In last column indicate changes that have been made or indicate if response to plan check comments is included. When applicable, insert response to plan check comments.

Submittal Number	Date	Project Status	Changes
1	12/19/16	☑ Preliminary Design/Planning/CEQA ☐ Final Design	Initial Submittal
2	1/30/17	☐ Preliminary Design/Planning/CEQA ☐ Final Design	
3	5/15/17	☐ Preliminary Design/Planning/CEQA ☐ Final Design	
4		☐ Preliminary Design/Planning/CEQA ☐ Final Design	

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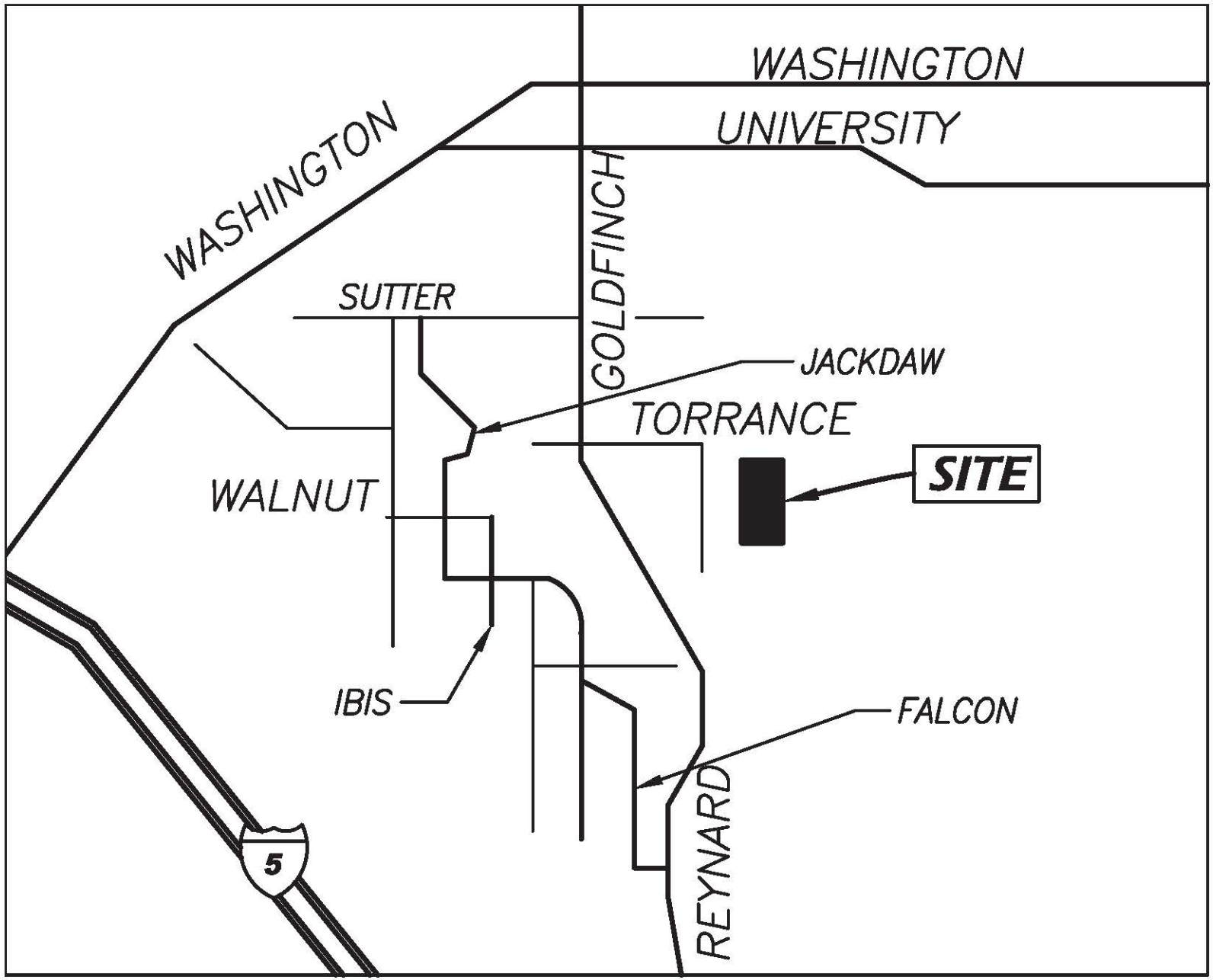
PROJECT VICINITY MAP

Project Name: Torrance 3

Permit Application Number: PTS No. 519307

Insert Project Vicinity Map



VICINITY MAP

THOMAS BROS. MAP 1268–J6

NO SCALE

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STORM WATER REQUIREMENTS APPLICABILITY CHECKLIST

Complete and attach DS-560 Form included in Appendix A.1

City of San Diego
Development Services
1222 First Ave., MS-302
San Diego, CA 92101
(619) 446-5000

THE CITY OF SAN DIEGO

Storm Water Requirements Applicability Checklist

FORM DS-560
FEBRUARY 2016

Project Address: TORRANCE ST (APN: 451-292-06)	Project Number *(for City Use Only):*

SECTION 1. Construction Storm Water BMP Requirements:

All construction sites are required to implement construction BMPs in accordance with the performance standards in the Storm Water Standards Manual. Some sites are additionally required to obtain coverage under the State Construction General Permit (CGP)[1] , which is administered by the State Water Resources Control Board.

For all project complete PART A: If project is required to submit a SWPPP or WPCP, continue to PART B.

PART A: Determine Construction Phase Storm Water Requirements.

1. Is the project subject to California's statewide General NPDES permit for Storm Water Discharges Associated with Construction Activities, also known as the State Construction General Permit (CGP)? (Typically projects with land disturbance greater than or equal to 1 acre.)

   ☐ Yes; SWPPP required, skip questions 2-4 ☑ No; next question

2. Does the project propose construction or demolition activity, including but not limited to, clearing, grading, grubbing, excavation, or any other activity that results in ground disturbance and contact with storm water runoff?

   ☑ Yes; WPCP required, skip 3-4 ☐ No; next question

3. Does the project propose routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility? (Projects such as pipeline/utility replacement)

   X

   ☐ Yes; WPCP required, skip 4 ☐ No; next question

4. Does the project only include the following Permit types listed below?
   - Electrical Permit, Fire Alarm Permit, Fire Sprinkler Permit, Plumbing Permit, Sign Permit, Mechanical Permit, Spa Permit.
   - Individual Right of Way Permits that exclusively include only ONE of the following activities: water service, sewer lateral, or utility service.
   - Right of Way Permits with a project footprint less than 150 linear feet that exclusively include only ONE of the following activities: curb ramp, sidewalk and driveway apron replacement, pot holing, curb and gutter replacement, and retaining wall encroachments.

   ☐ Yes; no document required

   X Check one of the boxes to the right, and continue to PART B:

   ☐ If you checked "Yes" for question 1, **a SWPPP is REQUIRED. Continue to PART B**

   ☒ If you checked "No" for question 1, and checked "Yes" for question 2 or 3, **a WPCP is REQUIRED.** If the project proposes less than 5,000 square feet of ground disturbance AND has less than a 5-foot elevation change over the entire project area, a Minor WPCP may be required instead. **Continue to PART B.**

   ☐ If you checked "No" for all questions 1-3, and checked "Yes" for question 4 PART B **does not apply and no document is required. Continue to Section 2.**

1. More information on the City's construction BMP requirements as well as CGP requirements can be found at: www.sandiego.gov/stormwater/regulations/index.shtml

PART B: Determine Construction Site Priorit

This prioritization must be completed within this form, noted on the plans, and included in the SWPPP or WPCP. The city reserves the right to adjust the priority of projects both before and after construction. Construction projects are assigned an inspection frequency based on if the project has a "high threat to water quality." The City has aligned the local definition of "high threat to water quality" to the risk determination approach of the State Construction General Permit (CGP). The CGP determines risk level based on project specific sediment risk and receiving water risk. Additional inspection is required for projects within the Areas of Special Biological Significance (ASBS) watershed. **NOTE:** The construction priority does **NOT** change construction BMP requirements that apply to projects; rather, it determines the frequency of inspections that will be conducted by city staff.

Complete PART B and continued to Section 2

1. ☐ **ASBS**
   a. Projects located in the ASBS watershed.

2. ☐ **High Priority**
   a. Projects 1 acre or more determined to be Risk Level 2 or Risk Level 3 per the Construction General Permit and not located in the ASBS watershed.
   b. Projects 1 acre or more determined to be LUP Type 2 or LUP Type 3 per the Construction General Permit and not located in the ASBS watershed.

3. ☐ **Medium Priority**
   a. Projects 1 acre or more but not subject to an ASBS or high priority designation.
   b. Projects determined to be Risk Level 1 or LUP Type 1 per the Construction General Permit and not located in the ASBS watershed.

4. ☑ **Low Priority**
   a. Projects requiring a Water Pollution Control Plan but not subject to ASBS, high, or medium priority designation.

SECTION 2. Permanent Storm Water BMP Requirements.

Additional information for determining the requirements is found in the Storm Water Standards Manual.

PART C: Determine if Not Subject to Permanent Storm Water Requirements.

Projects that are considered maintenance, or otherwise not categorized as "new development projects" or "redevelopment projects" according to the Storm Water Standards Manual are not subject to Permanent Storm Water BMPs.

If "yes" is checked for any number in Part C, proceed to Part F and check "Not Subject to Permanent Storm Water BMP Requirements".

If "no" is checked for all of the numbers in Part C continue to Part D.

1.	Does the project only include interior remodels and/or is the project entirely within an existing enclosed structure and does not have the potential to contact storm water?	☐ Yes	☑ No
2.	Does the project only include the construction of overhead or underground utilities without creating new impervious surfaces?	☐ Yes	☑ No
3.	Does the project fall under routine maintenance? Examples include, but are not limited to: roof or exterior structure surface replacement, resurfacing or reconfiguring surface parking lots or existing roadways without expanding the impervious footprint, and routine replacement of damaged pavement (grinding, overlay, and pothole repair).	☐ Yes	☑ No

PART D: PDP Exempt Requirements.

PDP Exempt projects are required to implement site design and source control BMPs.

If "yes" was checked for any questions in Part D, continue to Part F and check the box labeled "PDP Exempt."

If "no" was checked for all questions in Part D, continue to Part E.

1. Does the project ONLY include new or retrofit sidewalks, bicycle lanes, or trails that:
   - Are designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas? Or;
   - Are designed and constructed to be hydraulically disconnected from paved streets and roads? Or;
   - Are designed and constructed with permeable pavements or surfaces in accordance with the Green Streets guidance in the City's Storm Water Standards manual?

   ☐ Yes; PDP exempt requirements apply ☑ No; next question

2. Does the project ONLY include retrofitting or redeveloping existing paved alleys, streets or roads designed and constructed in accordance with the Green Streets guidance in the City's Storm Water Standards Manual?

   ☐ Yes; PDP exempt requirements apply ☑ No; project not exempt. PDP requirements apply

PART E: Determine if Project is a Priority Development Project (PDP).
Projects that match one of the definitions below are subject to additional requirements including preparation of a Storm Water Quality Management Plan (SWQMP).

If "yes" is checked for any number in PART E, continue to PART F.

If "no" is checked for every number in PART E, continue to PART F and check the box labeled "Standard Development Project".

1.	**New Development that creates 10,000 square feet or more of impervious surfaces collectively over the project site.** This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.	☑ Yes ☐ No
2.	**Redevelopment project that creates and/or replaces 5,000 square feet or more of impervious surfaces on an existing site of 10,000 square feet or more of impervious surfaces**. This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.	☐ Yes ☑ No
3.	**New development or redevelopment of a restaurant.** Facilities that sell prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC 5812), and where the land development creates and/or replace 5,000 square feet or more of impervious surface.	☐ Yes ☑ No
4.	**New development or redevelopment on a hillside.** The project creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site) and where the development will grade on any natural slope that is twenty-five percent or greater.	☑ Yes ☐ No
5.	**New development or redevelopment of a parking lot that creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site).**	☐ Yes ☑ No
6.	**New development or redevelopment of streets, roads, highways, freeways, and driveways.** The project creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site).	☑ Yes ☐ No

7. **New development or redevelopment discharging directly to an Environmentally Sensitive Area.** The project creates and/or replaces 2,500 square feet of impervious surface (collectively over project site), and discharges directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands). ☐ Yes ☑ No

8. **New development or redevelopment projects of a retail gasoline outlet (RGO) that create and/or replaces 5,000 square feet of impervious surface.** The development project meets the following criteria: (a) 5,000 square feet or more or (b) has a projected Average Daily Traffic (ADT) of 100 or more vehicles per day. ☐ Yes ☑ No

9. **New development or redevelopment projects of an automotive repair shops that creates and/or replaces 5,000 square feet or more of impervious surfaces.** Development projects categorized in any one of Standard Industrial Classification (SIC) codes 5013, 5014, 5541, 7532-7534, or 7536-7539. ☐ Yes ☑ No

10. **Other Pollutant Generating Project.** The project is not covered in the categories above, results in the disturbance of one or more acres of land and is expected to generate pollutants post construction, such as fertilizers and pesticides. This does not include projects creating less than 5,000 sf of impervious surface and where added landscaping does not require regular use of pesticides and fertilizers, such as slope stabilization using native plants. Calculation of the square footage of impervious surface need not include linear pathways that are for infrequent vehicle use, such as emergency maintenance access or bicycle pedestrian use, if they are built with pervious surfaces of if they sheet flow to surrounding pervious surfaces. ☐ Yes ☑ No

PART F: Select the appropriate category based on the outcomes of PART C through PART E.

1. The project is **NOT SUBJECT TO STORM WATER REQUIREMENTS**. ☐
2. The project is a **STANDARD DEVELOPMENT PROJECT**. Site design and source control BMP requirements apply. See the Storm Water Standards Manual for guidance. ☐
3. The project is **PDP EXEMPT**. Site design and source control BMP requirements apply. See the Storm Water Standards Manual for guidance. ☐
4. The project is a **PRIORITY DEVELOPMENT PROJECT**. Site design, source control, and structural pollutant control BMP requirements apply. See the Storm Water Standards Manual for guidance on determining if project requires a hydromodification plan management ☑

Name of Owner or Agent *(Please Print)*: JOHN S. COFFEY

Title: CIVIL ENGINEER

Signature:

Date: 10/20/16

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Applicability of Permanent, Post-Construction Storm Water BMP Requirements	Form I-1

Project Identification

Project Name: Torrance 3

Permit Application Number: PTS No. 519307 | Date: 12/19/16

Determination of Requirements

The purpose of this form is to identify permanent, post-construction requirements that apply to the project. This form serves as a short summary of applicable requirements, in some cases referencing separate forms that will serve as the backup for the determination of requirements.

Answer each step below, starting with Step 1 and progressing through each step until reaching "Stop". Refer to Part 1 of Storm Water Standards sections and/or separate forms referenced in each step below.

Step	Answer	Progression
Step 1: Is the project a "development project"? See Section 1.3 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	☑ Yes	Go to Step 2.
	☐ No	Stop. Permanent BMP requirements do not apply. No SWQMP will be required. Provide discussion below.

Discussion / justification if the project is not a "development project" (e.g., the project includes only interior remodels within an existing building):

N/A

Step 2: Is the project a Standard Project, Priority Development Project (PDP), or exception to PDP definitions? To answer this item, see Section 1.4 of the BMP Design Manual (Part 1 of Storm Water Standards) in its entirety for guidance, AND complete Storm Water Requirements Applicability Checklist.	☐ Standard Project	Stop. Standard Project requirements apply.
	☑ PDP	PDP requirements apply, including PDP SWQMP. Go to Step 3.
	☐ PDP Exempt	Stop. Standard Project requirements apply. Provide discussion and list any additional requirements below.

Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:

Form I-1 Page 2		
Step	Answer	Progression
Step 3. Is the project subject to earlier PDP requirements due to a prior lawful approval? See Section 1.10 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	☐ Yes	Consult the City Engineer to determine requirements. Provide discussion and identify requirements below. Go to Step 4.
	☑ No	BMP Design Manual PDP requirements apply. Go to Step 4.
Discussion / justification of prior lawful approval, and identify requirements (not required if prior lawful approval does not apply):		
Step 4. Do hydromodification control requirements apply? See Section 1.6 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	☑ Yes	PDP structural BMPs required for pollutant control (Chapter 5) and hydromodification control (Chapter 6). Go to Step 5.
	☐ No	Stop. PDP structural BMPs required for pollutant control (Chapter 5) only. Provide brief discussion of exemption to hydromodification control below.
Discussion / justification if hydromodification control requirements do not apply:		
Step 5. Does protection of critical coarse sediment yield areas apply? See Section 6.2 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	☑ Yes	Management measures required for protection of critical coarse sediment yield areas (Chapter 6.2). Stop.
	☐ No	Management measures not required for protection of critical coarse sediment yield areas. Provide brief discussion below. Stop.
Discussion / justification if protection of critical coarse sediment yield areas does not apply:		

Site Information Checklist For PDPs	Form I-3B
Project Summary Information	
Project Name	Torrance 3
Project Address	Torrance Street, San Diego CA 92103
Assessor's Parcel Number(s) (APN(s))	451-292-06-00
Permit Application Number	PTS No. 519307
Project Watershed	Select One: ☐ San Dieguito River ☐ Penasquitos ☐ Mission Bay ☐ San Diego River ☑ San Diego Bay ☐ Tijuana River
Hydrologic subarea name with Numeric Identifier up to two decimal places (9XX.XX)	Lindbergh HSA Watershed (908.21). (San Diego Region 9, Pueblo San Diego Hydrologic Unit 8)
Project Area (total area of Assessor's Parcel(s) associated with the project or total area of the right-of-way)	0.62 Acres (27,013 Square Feet)
Area to be disturbed by the project (Project Footprint)	0.62 Acres (27,013 Square Feet)
Project Proposed Impervious Area (subset of Project Footprint)	0.34 Acres (14,615 Square Feet)
Project Proposed Pervious Area (subset of Project Footprint)	0.29 Acres (12,398 Square Feet)
Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Project Area.	
The proposed increase or decrease in impervious area in the proposed condition as compared to the pre-project condition.	NA %

Form I-3B Page 2 of 11
Description of Existing Site Condition and Drainage Patterns
Current Status of the Site (select all that apply): ☐ Existing development ☐ Previously graded but not built out ☐ Agricultural or other non-impervious use ☑ Vacant, undeveloped/natural Description / Additional Information:
Existing Land Cover Includes (select all that apply): ☑ Vegetative Cover ☐ Non-Vegetated Pervious Areas ☐ Impervious Areas Description / Additional Information:
Underlying Soil belongs to Hydrologic Soil Group (select all that apply): ☐ NRCS Type A ☐ NRCS Type B ☐ NRCS Type C ☑ NRCS Type D
Approximate Depth to Groundwater (GW): ☐ GW Depth < 5 feet ☐ 5 feet < GW Depth < 10 feet ☐ 10 feet < GW Depth < 20 feet ☑ GW Depth > 20 feet
Existing Natural Hydrologic Features (select all that apply): ☐ Watercourses ☐ Seeps ☐ Springs ☐ Wetlands ☑ None Description / Additional Information:

Description of Existing Site Topography and Drainage:

How is storm water runoff conveyed from the site? At a minimum, this description should answer:

1. Whether existing drainage conveyance is natural or urban;
2. If runoff from offsite is conveyed through the site? If yes, quantification of all offsite drainage areas, design flows, and locations where offsite flows enter the project site and summarize how such flows are conveyed through the site;
3. Provide details regarding existing project site drainage conveyance network, including storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, and natural and constructed channels;
4. Identify all discharge locations from the existing project along with a summary of the conveyance system size and capacity for each of the discharge locations. Provide summary of the pre-project drainage areas and design flows to each of the existing runoff discharge locations.

Description / Additional Information:

1. The existing drainage is natural.

2. The western hillside run-on (Basin Y, approximately 0.274 acres) contributes 0.71 CFS to the site in the existing condition. In post-construction conditions, run-on from Basin D will be collected against the wall by a series of drains, where it will flow under the driveway and ultimately discharge to the proposed D-25 curb outlet at Curlew Street.

3. There are no existing man-made storm drain facilities within the site. Site runoff sheet flows to the east hillside where it reaches Curlew Street.

4. Site runoff is treated and released at a low-flow threshold to Curlew Street via an 8" PVC pipe and D-25 curb outlet.

Existing conditions feature a flow rate of 1.58 CFS sheet flowing to the east hillside. Proposed conditions concentrate 1.69 CFS (0.37 CFS in Basin A and 1.32 CFS in Basin B) of storm water runoff to two biofiltration basins, where runoff is released to Curlew Street through the D-25 curb outlet at the mitigated flow rate of 0.78 CFS (this includes 0.77 CFS of run-on from Basin D and 0.007 CFS from the low-flow threshold orifice). The remaining 0.09 cfs is from self-mitigating areas that will continue existing patterns and sheet flow east off-site (Basin C). The total mitigated discharge to Curlew Street is 0.870 CFS.

Description of Proposed Site Development and Drainage Patterns

Project Description / Proposed Land Use and/or Activities:

Proposed is the construction of three single family residences, two with adjoining carports and one with a detached garage. They total 7,352 SF of impervious areas.

Site improvements include retaining walls, concrete walkways, and driveway. Proposed landscaping consists of the implementation of two biofiltration basins for stormwater treatment, as well as hydromod compliance.

List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features):

Proposed impervious features consist of three single family residences, concrete walkways, carports, and driveway. These impervious areas total 14,615 SF.

List/describe proposed pervious features of the project (e.g., landscape areas):

The pervious features of the site consist of landscaping adjacent to the single family residences and walkways.

Does the project include grading and changes to site topography?

☑ Yes

☐ No

Description / Additional Information:

Grading will be required to create pads for each of the single family residences, driveway, and 2:1 fill slopes (both on and off the site). Retaining walls will be required to lower the grade for the pad and raise the grade for the biofiltration basins along the eastern edge of the site.

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

☑ Yes

☐ No

If yes, provide details regarding the proposed project site drainage conveyance network, including storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural and constructed channels, and the method for conveying offsite flows through or around the proposed project site. Identify all discharge locations from the proposed project site along with a summary of the conveyance system size and capacity for each of the discharge locations. Provide a summary of pre and post-project drainage areas and design flows to each of the runoff discharge locations. Reference the drainage study for detailed calculations.

Description / Additional Information:

The project does propose changes to the site drainage.

Proposed impervious areas off-site (concrete driveway north of the site) will direct flow to a trench drain, which will be connected to a system of landscape drains collecting runoff from the remaining hardscape and southerly two residences and discharged to a 1,696 SF biofiltration system. This storm water will be treated and released at the low flow threshold to the overflow structure of a 410 SF biofiltration area. This biofiltration basin will be responsible for the northerly single-family residence and hillside.

When storm water is treated in this basin, the site's runoff will tie into a proposed 8" PVC pipe, where it will discharge to Curlew Street via a D-25 curb outlet.

Identify whether any of the following features, activities, and/or pollutant source areas will be present (select all that apply):

- ☑ On-site storm drain inlets
- ☐ Interior floor drains and elevator shaft sump pumps
- ☐ Interior parking garages
- ☐ Need for future indoor & structural pest control
- ☑ Landscape/Outdoor Pesticide Use
- ☐ Pools, spas, ponds, decorative fountains, and other water features
- ☐ Food service
- ☑ Refuse areas
- ☐ Industrial processes
- ☐ Outdoor storage of equipment or materials
- ☐ Vehicle and Equipment Cleaning
- ☐ Vehicle/Equipment Repair and Maintenance
- ☐ Fuel Dispensing Areas
- ☐ Loading Docks
- ☐ Fire Sprinkler Test Water
- ☐ Miscellaneous Drain or Wash Water
- ☑ Plazas, sidewalks, and parking lots
- ☐ Large Trash Generating Facilities
- ☐ Animal Facilities
- ☐ Plant Nurseries and Garden Centers
- ☐ Automotive-related Uses

Description / Additional Information:

Form I-3B Page 7 of 11
Identification and Narrative of Receiving Water
Narrative describing flow path from discharge location(s), through urban storm conveyance system, to receiving creeks, rivers, and lagoons and ultimate discharge location to Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable) The site runoff will be treated using two biofiltration areas, and discharged at the low flow threshold to Curlew Street via a D-25 curb outlet. It will be collected by a City of San Diego storm water inlet, where it will ultimately outlet to the San Diego Bay approximately 7,500 feet southwest of the site.
Provide a summary of all beneficial uses of receiving waters downstream of the project discharge locations. Powerhouse Canyon - MUN, REC1, REC2, WARM, WILD
Identify all ASBS (areas of special biological significance) receiving waters downstream of the project discharge locations. None.
Provide distance from project outfall location to impaired or sensitive receiving waters. Runoff from the project ultimately discharges to the San Diego Bay approximately 7,500 ft southwest of the site.
Summarize information regarding the proximity of the permanent, post-construction storm water BMPs to the City's Multi-Habitat Planning Area and environmentally sensitive lands The entire site lies approximately 7,500 feet northeast of the City's Environmentally Sensitive Lands area, and outside of the MHPA area.

Form I-3B Page 8 of 11

Identification of Receiving Water Pollutants of Concern

List any 303(d) impaired water bodies within the path of storm water from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable), identify the pollutant(s)/stressor(s) causing impairment, and identify any TMDLs and/or Highest Priority Pollutants from the WQIP for the impaired water bodies:

303(d) Impaired Water Body	Pollutant(s)/Stressor(s)	TMDLs/ WQIP Highest Priority Pollutant
San Diego Bay Shoreline, Downtown Anchorage	Benthic Community Effects	
San Diego Bay Shoreline, Downtown Anchorage	Sediment Toxicity	
San Diego Bay Shoreline, G Street Pier	Total Coliform	
San Diego Bay Shoreline, Vicinity of B St and Broadway Piers	Benthic Community Effects	
San Diego Bay Shoreline, Vicinity of B St and Broadway Piers	Sediment Toxicity	
San Diego Bay Shoreline, Vicinity of B St and Broadway Piers	Total Coliform	
San Diego Bay Shoreline, at Harbor Island (East Basin)	Copper	
San Diego Bay Shoreline, at Marriott Marina	Copper	

Identification of Project Site Pollutants*

*Identification of project site pollutants is only required if flow-thru treatment BMPs are implemented onsite in lieu of retention or biofiltration BMPs (note the project must also participate in an alternative compliance program unless prior lawful approval to meet earlier PDP requirements is demonstrated)

Identify pollutants anticipated from the project site based on all proposed use(s) of the site (see BMP Design Manual (Part 1 of Storm Water Standards) Appendix B.6):

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

Hydromodification Management Requirements

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

☑ Yes, hydromodification management flow control structural BMPs required.

☐ No, the project will discharge runoff directly to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.

☐ No, the project will discharge runoff directly to conveyance channels whose bed and bank are concrete-lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.

☐ No, the project will discharge runoff directly to an area identified as appropriate for an exemption by the WMAA for the watershed in which the project resides.

Description / Additional Information (to be provided if a 'No' answer has been selected above):

Critical Coarse Sediment Yield Areas*

*This Section only required if hydromodification management requirements apply

Based on Section 6.2 and Appendix H does CCSYA exist on the project footprint or in the upstream area draining through the project footprint?

☑ Yes

☐ No

Discussion / Additional Information:

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.

There are two Point of Compliances, labeled 'POC 1' and 'POC 2' on the HMP Exhibit. These points are the discharge points of the outflow pipes from the onsite biofiltration areas.

Has a geomorphic assessment been performed for the receiving channel(s)?

☑ No, the low flow threshold is 0.1Q2 (default low flow threshold)
☐ Yes, the result is the low flow threshold is 0.1Q2
☐ Yes, the result is the low flow threshold is 0.3Q2
☐ Yes, the result is the low flow threshold is 0.5Q2

If a geomorphic assessment has been performed, provide title, date, and preparer:

Discussion / Additional Information: (optional)

Form I-3B Page 11 of 11

Other Site Requirements and Constraints

When applicable, list other site requirements or constraints that will influence storm water management design, such as zoning requirements including setbacks and open space, or local codes governing minimum street width, sidewalk construction, allowable pavement types, and drainage requirements.

Available surface area is the main limiting factor for the location and size of storm water management features.

Optional Additional Information or Continuation of Previous Sections As Needed

This space provided for additional information or continuation of information from previous sections as needed.

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Source Control BMP Checklist for All Development Projects	Form I-4

Source Control BMPs

All development projects must implement source control BMPs SC-1 through SC-6 where applicable and feasible. See Chapter 4 and Appendix E of the BMP Design Manual (Part 1 of the Storm Water Standards) for information to implement source control BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the source control BMP as described in Chapter 4 and/or Appendix E of the BMP Design Manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification may be provided.

Source Control Requirement	Applied?		
SC-1 Prevention of Illicit Discharges into the MS4	☑ Yes	☐ No	☐ N/A
Discussion / justification if SC-1 not implemented:			
SC-2 Storm Drain Stenciling or Signage	☑ Yes	☐ No	☐ N/A
Discussion / justification if SC-2 not implemented:			
SC-3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	☑ N/A
Discussion / justification if SC-3 not implemented: There are no proposed outdoor storage areas.			
SC-4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	☑ N/A
Discussion / justification if SC-4 not implemented: There are no proposed outdoor work areas.			
SC-5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☑ Yes	☐ No	☐ N/A
Discussion / justification if SC-5 not implemented:			

Form I-4 Page 2 of 2			
Source Control Requirement	Applied?		
SC-6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below)			
On-site storm drain inlets	☑ Yes	☐ No	☐ N/A
Interior floor drains and elevator shaft sump pumps	☐ Yes	☐ No	☑ N/A
Interior parking garages	☐ Yes	☐ No	☑ N/A
Need for future indoor & structural pest control	☐ Yes	☐ No	☑ N/A
Landscape/Outdoor Pesticide Use	☑ Yes	☐ No	☐ N/A
Pools, spas, ponds, decorative fountains, and other water features	☐ Yes	☐ No	☑ N/A
Food service	☐ Yes	☐ No	☑ N/A
Refuse areas	☑ Yes	☐ No	☐ N/A
Industrial processes	☐ Yes	☐ No	☑ N/A
Outdoor storage of equipment or materials	☐ Yes	☐ No	☑ N/A
Vehicle/Equipment Repair and Maintenance	☐ Yes	☐ No	☑ N/A
Fuel Dispensing Areas	☐ Yes	☐ No	☑ N/A
Loading Docks	☐ Yes	☐ No	☑ N/A
Fire Sprinkler Test Water	☑ Yes	☐ No	☐ N/A
Miscellaneous Drain or Wash Water	☑ Yes	☐ No	☐ N/A
Plazas, sidewalks, and parking lots	☑ Yes	☐ No	☐ N/A
SC-6A: Large Trash Generating Facilities	☐ Yes	☐ No	☑ N/A
SC-6B: Animal Facilities	☐ Yes	☐ No	☑ N/A
SC-6C: Plant Nurseries and Garden Centers	☐ Yes	☐ No	☑ N/A
SC-6D: Automotive-related Uses	☐ Yes	☐ No	☑ N/A

Discussion / justification if SC-6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for all "No" answers shown above.

Project is single-family residence, not applicable if not selected.

Site Design BMP Checklist for All Development Projects	Form I-5

Site Design BMPs

All development projects must implement site design BMPs SD-1 through SD-8 where applicable and feasible. See Chapter 4 and Appendix E of the BMP Design Manual (Part 1 of Storm Water Standards) for information to implement site design BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the site design BMP as described in Chapter 4 and/or Appendix E of the BMP Design Manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification may be provided.

A site map with implemented site design BMPs must be included at the end of this checklist.

Site Design Requirement	Applied?		
SD-1 Maintain Natural Drainage Pathways and Hydrologic Features	☑ Yes	☐ No	☐ N/A
Discussion / justification if SD-1 not implemented:			
Overall drainage patterns will be mainintained (i.e. there will not be any diversions of storm water) however due to grading activities the natural drainage pathways will be affected. A small portion of the site will maintain its sheet flow drainage pattern, the remainder will be collected by a hardened conveyance system and discharged to Curlew Street.			
1-1 Are existing natural drainage pathways and hydrologic features mapped on the site map?	☑ Yes	☐ No	
1-2 Are trees implemented? If yes, are they shown on the site map?	☐ Yes	☑ No	
1-3 Implemented trees meet the design criteria in SD-1 Fact Sheet (e.g. soil volume, maximum credit, etc.)?	☐ Yes	☑ No	
1-4 Is tree credit volume calculated using Appendix B.2.2.1 and SD-1 Fact Sheet in Appendix E?	☐ Yes	☑ No	
SD-2 Have natural areas, soils and vegetation been conserved?	☐ Yes	☑ No	☐ N/A
Discussion / justification if SD-2 not implemented:			
Size of the lot combined with planned use did not present many opportunities to preserve natural areas. Very little existing onsite vegetation to preserve.			

Site Design Requirement	Applied?		
SD-3 Minimize Impervious Area	☑ Yes	☐ No	☐ N/A
Discussion / justification if SD-3 not implemented: Landscape areas to be implemented into site as much as possible.			
SD-4 Minimize Soil Compaction	☑ Yes	☐ No	☐ N/A
Discussion / justification if SD-4 not implemented: Soil compaction to be minimized in planned landscape areas.			
SD-5 Impervious Area Dispersion	☐ Yes	☑ No	☐ N/A
Discussion / justification if SD-5 not implemented: Walkways and sidewalks within site are pitched to landscape areas. Drains installed in hardscape were kept to a minimum. However, limited flat areas due to steep slopes don't allow for adequate design to meet the criteria in SD-5.			
5-1 Is the pervious area receiving runon from impervious area identified on the site map?	☑ Yes	☐ No	
5-2 Does the pervious area satisfy the design criteria in SD-5 Fact Sheet in Appendix E (e.g. maximum slope, minimum length, etc.)	☐ Yes	☑ No	
5-3 Is impervious area dispersion credit volume calculated using Appendix B.2.1.1 and SD-5 Fact Sheet in Appendix E?	☐ Yes	☑ No	

Form I-5 Page 3 of 4			
Site Design Requirement	Applied?		
SD-6 Runoff Collection	☐ Yes	☑ No	☐ N/A
Discussion / justification if SD-6 not implemented: Green roof not implemented.			
6a-1 Are green roofs implemented in accordance with design criteria in SD-6A Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☑ No	
6a-2 Is green roof credit volume calculated using Appendix B.2.1.2 and SD-6A Fact Sheet in Appendix E?	☐ Yes	☑ No	
6b-1 Are permeable pavements implemented in accordance with design criteria in SD-6B Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☑ No	
6b-2 Is permeable pavement credit volume calculated using Appendix B.2.1.3 and SD-6B Fact Sheet in Appendix E?	☐ Yes	☑ No	
SD-7 Landscaping with Native or Drought Tolerant Species	☑ Yes	☐ No	☐ N/A
Discussion / justification if SD-7 not implemented:			
SD-8 Harvesting and Using Precipitation	☐ Yes	☑ No	☐ N/A
Discussion / justification if SD-8 not implemented: Storm water will be infiltrated on-site within the biofiltration areas and discharged to the street, however water collected will not be harvested for future use.			
8-1 Are rain barrels implemented in accordance with design criteria in SD-8 Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☑ No	
8-2 Is rain barrel credit volume calculated using Appendix B.2.2.2 and SD-8 Fact Sheet in Appendix E?	☐ Yes	☑ No	

Form I-5 Page 4 of 4
Insert Site Map with all site design BMPs identified:

Summary of PDP Structural BMPs	Form I-6

PDP Structural BMPs

All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the BMP Design Manual, Part 1 of Storm Water Standards). Selection of PDP structural BMPs for storm water pollutant control must be based on the selection process described in Chapter 5. PDPs subject to hydromodification management requirements must also implement structural BMPs for flow control for hydromodification management (see Chapter 6 of the BMP Design Manual). Both storm water pollutant control and flow control for hydromodification management can be achieved within the same structural BMP(s).

PDP structural BMPs must be verified by the City at the completion of construction. This includes requiring the project owner or project owner's representative to certify construction of the structural BMPs (complete Form DS-563). PDP structural BMPs must be maintained into perpetuity (see Chapter 7 of the BMP Design Manual).

Use this form to provide narrative description of the general strategy for structural BMP implementation at the project site in the box below. Then complete the PDP structural BMP summary information sheet (page 3 of this form) for each structural BMP within the project (copy the BMP summary information page as many times as needed to provide summary information for each individual structural BMP).

Describe the general strategy for structural BMP implementation at the site. This information must describe how the steps for selecting and designing storm water pollutant control BMPs presented in Section 5.1 of the BMP Design Manual were followed, and the results (type of BMPs selected). For projects requiring hydromodification flow control BMPs, indicate whether pollutant control and flow control BMPs are integrated or separate.

-The project has no demand for harvest and reuse.
-The onsite soil conditions are not conducive to full infiltration.
-Completion of the "Categorization of Infiltration Feasibility Condition" worksheet results in No Infiltration BMPs.
- Biofiltration with Impervious Liner is selected for the project.

To address the primary and secondary pollutants of concern, structural BMP treatment control options were evaluated for required pollutant removal efficiency. A biofiltration facility was selected which meets the required removal efficiency for all anticipated pollutants from the project.

Runoff from the flat graded area which will contain the house and majority of the landscaping & hardscape will be collected by area drains and will be directed to one of two biofiltration areas located at the eastern border of the site. An 18" soil binder layer incorporated into the base layers of the biofiltration basin will allow runoff to filter through the engineered soil layer before discharging from the biofiltration area through an 8” PVC drain discharging from the site (see plan sheet C.1 – Grading & Drainage Plan reproduced in Appendix A). A 12”x12" inlet will also be incorporated into the biofiltration area for overflow control.
The hydromodification component (underground storage area) was sized utilizing the design guidelines of Section G.2 based on the pre-development condition. The Water Quality component (biofiltration) was sized utilizing the design guidelines of Section B

(Continue on page 2 as necessary.)

Form I-6 Page 2 of X
(Page reserved for continuation of description of general strategy for structural BMP implementation at the site)
(Continued from page 1)

Form I-6 Page 3 of X (Copy as many as needed)	
Structural BMP Summary Information	
Structural BMP ID No. IMP A	
Construction Plan Sheet No.	
Type of structural BMP: ○ Retention by harvest and use (HU-1) ○ Retention by infiltration basin (INF-1) ○ Retention by bioretention (INF-2) ○ Retention by permeable pavement (INF-3) ○ Partial retention by biofiltration with partial retention (PR-1) ◉ Biofiltration (BF-1) ○ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide (BMP type/description in discussion section below) ○ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ○ Flow-thru treatment control with alternative compliance (provide BMP type/description in ○ Detention pond or vault for hydromodification management ○ Other (describe in discussion section below)	
Purpose: ○ Pollutant control only ○ Hydromodification control only ◉ Combined pollutant control and hydromodification control ○ Pre-treatment/forebay for another structural BMP ○ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification form DS-563	The engineer of work shall certify construction. At the time this report is written the EOW is Michael Kinnear, RCE 76785.
Who will be the final owner of this BMP?	The property owner(s) in perpetuity.
Who will maintain this BMP into perpetuity?	The property owner(s).
What is the funding mechanism for maintenance?	Funding provided by private property owner(s).

Form I-6 Page 3 of X (Copy as many as needed)	
Structural BMP Summary Information	
Structural BMP ID No. IMP B	
Construction Plan Sheet No.	
Type of structural BMP: ○ Retention by harvest and use (HU-1) ○ Retention by infiltration basin (INF-1) ○ Retention by bioretention (INF-2) ○ Retention by permeable pavement (INF-3) ○ Partial retention by biofiltration with partial retention (PR-1) ◉ Biofiltration (BF-1) ○ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide (BMP type/description in discussion section below) ○ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ○ Flow-thru treatment control with alternative compliance (provide BMP type/description in ○ Detention pond or vault for hydromodification management ○ Other (describe in discussion section below)	
Purpose: ○ Pollutant control only ○ Hydromodification control only ○ Combined pollutant control and hydromodification control ◉ Pre-treatment/forebay for another structural BMP ○ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification form DS-563	The engineer of work shall certify construction. At the time this report is written the EOW is Michael Kinnear, RCE 76785.
Who will be the final owner of this BMP?	The property owner(s) in perpetuity.
Who will maintain this BMP into perpetuity?	The property owner(s).
What is the funding mechanism for maintenance?	Funding provided by private property owner(s).

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

Date Prepared:	Project No.:
Project Applicant:	Phone:
Project Address: Torrance St, San Diego, CA 92103	
Project Engineer:	Phone:

The purpose of this form is to verify that the site improvements for the project, identified above, have been constructed in conformance with the approved Storm Water Quality Management Plan (SWQMP) documents and drawings.

This form must be completed by the engineer and submitted prior to final inspection of the construction permit. Completion and submittal of this form is required for all new development and redevelopment projects in order to comply with the City's Storm Water ordinances and NDPES Permit Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100. Final inspection for occupancy and/or release of grading or public improvement bonds may be delayed if this form is not submitted and approved by the City of San Diego.

CERTIFICATION:

As the professional in responsible charge for the design of the above project, I certify that I have inspected all constructed Low Impact Development (LID) site design, source control and structural BMP's required per the approved SWQMP and Construction Permit No. _____; and that said BMP's have been constructed in compliance with the approved plans and all applicable specifications, permits, ordinances and Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100 of the San Diego Regional Water Quality Control Board.

I understand that this BMP certification statement does not constitute an operation and maintenance verification.

Signature: _____

Date of Signature: _____

Printed Name: _____

Title: _____

Phone No. _____

Engineer's Stamp

DS-563 (01-16)

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ATTACHMENT 1
BACKUP FOR PDP POLLUTANT CONTROL BMPS

This is the cover sheet for Attachment 1.

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Indicate which Items are Included:

Attachment Sequence	Contents	Checklist
Attachment 1a	DMA Exhibit (Required) See DMA Exhibit Checklist.	☑ Included B.2-1, B-5.1
Attachment 1b	Tabular Summary of DMAs Showing DMA ID matching DMA Exhibit, DMA Area, and DMA Type (Required)* *Provide table in this Attachment OR on DMA Exhibit in Attachment 1a	☑ Included on DMA Exhibit in Attachment 1a ☐ Included as Attachment 1b, separate from DMA Exhibit
Attachment 1c	Form I-7, Harvest and Use Feasibility Screening Checklist (Required unless the entire project will use infiltration BMPs) Refer to Appendix B.3-1 of the BMP Design Manual to complete Form I-7.	☑ Included ☐ Not included because the entire project will use infiltration BMPs
Attachment 1d	Form I-8, Categorization of Infiltration Feasibility Condition (Required unless the project will use harvest and use BMPs) Refer to Appendices C and D of the BMP Design Manual to complete Form I-8.	☑ Included ☐ Not included because the entire project will use harvest and use BMPs
Attachment 1e	Pollutant Control BMP Design Worksheets / Calculations (Required) Refer to Appendices B and E of the BMP Design Manual for structural pollutant control BMP design guidelines and site design credit calculations	☑ Included

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

The DMA Exhibit must identify:

- ☑ Underlying hydrologic soil group
- ☑ Approximate depth to groundwater
- ☑ Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
- ☑ Critical coarse sediment yield areas to be protected
- ☑ Existing topography and impervious areas
- ☑ Existing and proposed site drainage network and connections to drainage offsite
- ☑ Proposed grading
- ☑ Proposed impervious features
- ☑ Proposed design features and surface treatments used to minimize imperviousness
- ☑ Drainage management area (DMA) boundaries, DMA ID numbers, and DMA areas (square footage or acreage), and DMA type (i.e., drains to BMP, self-retaining, or self-mitigating)
- ☑ Potential pollutant source areas and corresponding required source controls (see Chapter 4, Appendix E.1, and Form I-3B)
- ☑ Structural BMPs (identify location, type of BMP, and size/detail)

IMP A

Harvest and Use Feasibility Checklist	Form I-7

1. Is there a demand for harvested water (check all that apply) at the project site that is reliably present during the wet season?

☑ Toilet and urinal flushing
☑ Landscape irrigation
☐ Other:_____

2. If there is a demand; estimate the anticipated average wet season demand over a period of 36 hours. Guidance for planning level demand calculations for toilet/urinal flushing and landscape irrigation is provided in Section B.3.2.
[Provide a summary of calculations here]

4 residents/residence x 9.3 gallons/resident/day / 7.48 gallons/cubic foot x 36 hours / 24hours/day = 7.45 cubic feet/residence

1 Residence x 7.45 cubic feet/residence = 7.45 cubic feet

3. Calculate the DCV using worksheet B-2.1.
DCV = 139.78 (cubic feet)

3a. Is the 36 hour demand greater than or equal to the DCV?	3b. Is the 36 hour demand greater than 0.25DCV but less than the full DCV?	3c. Is the 36 hour demand less than 0.25DCV?
☐ Yes / ☑ No ⇨ ⇩	☐ Yes / ☑ No ⇨ ⇩	☑ Yes ⇩
Harvest and use appears to be feasible. Conduct more detailed evaluation and sizing calculations to confirm that DCV can be used at an adequate rate to meet drawdown criteria.	Harvest and use may be feasible. Conduct more detailed evaluation and sizing calculations to determine feasibility. Harvest and use may only be able to be used for a portion of the site, or (optionally) the storage may need to be upsized to meet long term capture targets while draining in longer than 36 hours.	Harvest and use is considered to be infeasible.

Is harvest and use feasible based on further evaluation?

☐ Yes, refer to Appendix E to select and size harvest and use BMPs.
☑ No, select alternate BMPs.

IMP B

Harvest and Use Feasibility Checklist	Form I-7

1. Is there a demand for harvested water (check all that apply) at the project site that is reliably present during the wet season?

☑ Toilet and urinal flushing
☑ Landscape irrigation
☐ Other:_____

2. If there is a demand; estimate the anticipated average wet season demand over a period of 36 hours. Guidance for planning level demand calculations for toilet/urinal flushing and landscape irrigation is provided in Section B.3.2.
[Provide a summary of calculations here]

4 residents/residence x 9.3 gallons/resident/day / 7.48 gallons/cubic foot x 36 hours / 24hours/day = 7.45 cubic feet/residence

2 Residences x 7.45 cubic feet/residence = 14.90 cubic feet

3. Calculate the DCV using worksheet B-2.1.
DCV = 532.36 (cubic feet)

3a. Is the 36 hour demand greater than or equal to the DCV?	3b. Is the 36 hour demand greater than 0.25DCV but less than the full DCV?	3c. Is the 36 hour demand less than 0.25DCV?
☐ Yes / ☑ No ⇨ ⇩	☐ Yes / ☑ No ⇨ ⇩	☑ Yes ⇩
Harvest and use appears to be feasible. Conduct more detailed evaluation and sizing calculations to confirm that DCV can be used at an adequate rate to meet drawdown criteria.	Harvest and use may be feasible. Conduct more detailed evaluation and sizing calculations to determine feasibility. Harvest and use may only be able to be used for a portion of the site, or (optionally) the storage may need to be upsized to meet long term capture targets while draining in longer than 36 hours.	Harvest and use is considered to be infeasible.

Is harvest and use feasible based on further evaluation?

☐ Yes, refer to Appendix E to select and size harvest and use BMPs.
☑ No, select alternate BMPs.

Categorization of Infiltration Feasibility Condition		**Form I-8**	
Part 1 - Full Infiltration Feasibility Screening Criteria Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?			
Criteria	Screening Question	Yes	No
1	Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		✓
Provide basis: Review of NRCS soil maps indicates poorly draining HSG type D soils on the site. 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: Hydrologic soil group D. Low infiltration. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			

Form I-8 Page 2 of 4			
Criteria	Screening Question	Yes	No
3	Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		✓
Provide basis: Hydrologic soil group D. Low infiltration. 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: Hydrologic soil group D. Low infiltration. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
Part 1 Result*	If all answers to rows 1 - 4 are "Yes" a full infiltration design is potentially feasible. The feasibility screening category is Full Infiltration If any answer from row 1-4 is "No", infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design. Proceed to Part 2		

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

Form I-8 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.		✓
Provide basis: Hydrologic soil group D. Low 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.		✓
Provide basis: Hydrologic soil group D. Low 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.			

Form I-8 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.		✓
Provide basis: Hydrologic soil group D. Low 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.			
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.		✓
Provide basis: Hydrologic soil group D. Low 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.			
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 the City Engineer to substantiate findings

IMP A

Worksheet B.2-1 DCV

Design Capture Volume		Worksheet B.2-1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	.49	inches
2	Area tributary to BMP (s)	A=	0.152	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.517	unitless
4	Trees Credit Volume	TCV=	0	cubic-feet
5	Rain barrels Credit Volume	RCV=	0	cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=	139.78	cubic-feet

IMP B

Worksheet B.2-1 DCV

Design Capture Volume		Worksheet B.2-1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	.49	inches
2	Area tributary to BMP (s)	A=	0.410	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.71	unitless
4	Trees Credit Volume	TCV=	0	cubic-feet
5	Rain barrels Credit Volume	RCV=	0	cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=	517.78	cubic-feet

Weighted Runoff Factor (B.1.1)

DMA	Permeable Area	Impermeable Area	Total (SF)	Total (AC)	C-Value
Pre					
X	24667	0	24,667.00	0.57	0.30
Y	6762	5158	11,920.00	0.27	0.56
Total	31,429.00	5,158.00	36,587.00	0.84	

Runoff Coefficient 'C'	Permeable	Impermeable
	0.30	0.90

DMA	Permeable Area	Impermeable Area	Total (SF)	Total (AC)	C-Value
Post					
A	4230	2398	6,628.00	0.15	0.52
B	5628	12217	17,845.00	0.41	0.71
C	2540	0	2,540.00	0.06	0.30
D	8541	5158	13,699.00	0.31	0.53
Total	20,939.00	19,773.00	40,712.00	0.93	

Area Weighted Runoff Factor Calculations

Basin X) [(24667*0.30)+(0*0.90)]/24667 = **0.30**
Basin Y) [(6762*0.30)+(5158*0.90)]/11920 = **0.56**
Basin A) [(4230*0.30)+(2398*0.90)]/6628 = **0.52**
Basin B) [(5628*0.30)+(12217*0.90)]/17845 = **0.71**
Basin C) [(2540*0.30)+(0*0.90)]/2540 = **0.30**
Basin D) [(8541*0.30)+(5158*0.90)]/13699 = **0.53**

B.1.1 Runoff Factor

Estimate the area weighted runoff factor for the tributary area to the BMP using runoff factor (from Table B.1-1) and area of each surface type in the tributary area and the following equation.

Equation B.1-2: Estimating Runoff Factor for Area

$$C = \frac{\sum C_x A_x}{\sum A_x}$$

where:

C_x = Runoff factor for area X

A_x = Tributary area X (acres)

These runoff factors apply to areas receiving direct rainfall only. For conditions in which runoff is routed onto a surface from an adjacent surface, see Section B.2 for determining composite runoff factors for these areas.

Table B.1-1: Runoff factors for surfaces draining to BMPs – Pollutant Control BMPs

Surface	Runoff Factor
Roofs[1]	0.90
Concrete or Asphalt[1]	0.90
Unit Pavers (grouted)[1]	0.90
Decomposed Granite	0.30
Cobbles or Crushed Aggregate	0.30
Amended, Mulched Soils or Landscape[2]	0.10
Compacted Soil (e.g., unpaved parking)	0.30
Natural (A Soil)	0.10
Natural (B Soil)	0.14
Natural (C Soil)	0.23
Natural (D Soil)	0.30

[1]Surface is considered impervious and could benefit from use of Site Design BMPs and adjustment of the runoff factor per Section B.2.1.

[2]Surface shall be designed in accordance with SD-4 (Amended soils) fact sheet in Appendix E

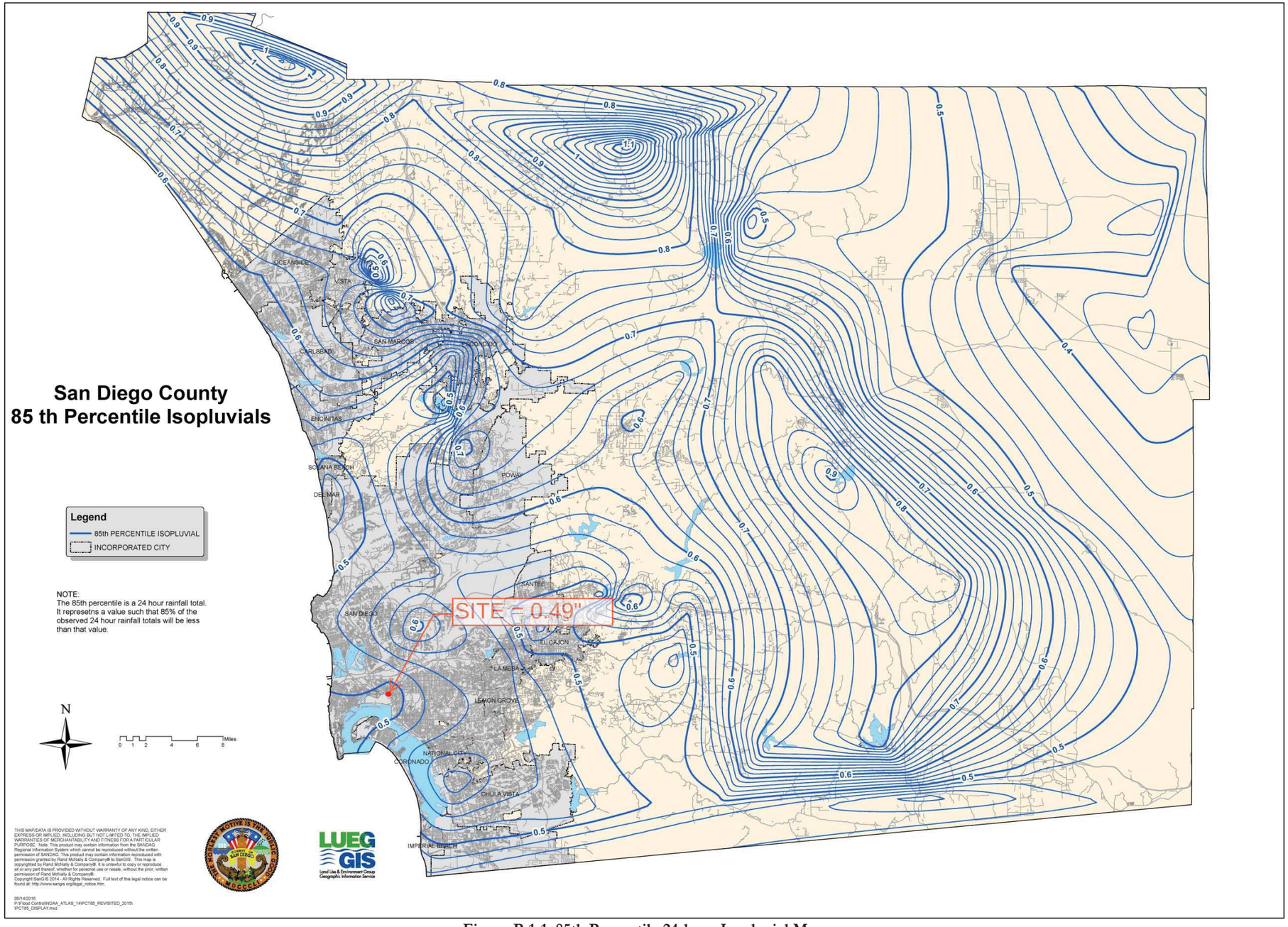

Figure B.1-1: 85th Percentile 24-hour Isopluvial Map

IMP A

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

Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1 (Page 1 of 2)	
1	Remaining DCV after implementing retention BMPs	139.78	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36	hours
4	Depth of runoff that can be infiltrated [Line 2 x Line 3]	0	inches
5	Aggregate pore space	0.40	in/in
6	Required depth of gravel below the underdrain [Line 4/ Line 5]	0	inches
7	Assumed surface area of the biofiltration BMP	410	sq-ft
8	Media retained pore storage	0.1	in/in
9	Volume retained by BMP [[Line 4 + (Line 12 x Line 8)]/12] x Line 7	61.5	cubic-feet
10	DCV that requires biofiltration [Line 1 – Line 9]	78.28	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	10	inches
12	Media Thickness [18 inches minimum], also add mulch layer thickness to this line for sizing calculations	18	inches
13	Aggregate Storage above underdrain invert (12 inches typical) – use 0 inches for sizing if the aggregate is not over the entire bottom surface area	18	inches
14	Freely drained pore storage	0.2	in/in
15	Media filtration rate to be used for sizing (5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate which will be less than 5 in/hr.)	5	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6	hours
17	Depth filtered during storm [Line 15 x Line 16]	30	inches
18	Depth of Detention Storage [Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5)]	20.80	inches
19	Total Depth Treated [Line 17 + Line 18]	50.80	inches

Note: Line 7 is used to estimate the amount of volume retained by the BMP. Update assumed surface area in Line 7 until its equivalent to the required biofiltration footprint (either Line 21 or Line 23)

IMP A **Worksheet B.5-1: Simple Sizing Method for Biofiltration BMPs (continued)**

Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1 (Page 2 of 2)	
Option 1 – Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]	117.42	cubic-feet
21	Required Footprint [Line 20/ Line 19] x 12	27.74	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]	58.71	cubic-feet
23	Required Footprint [Line 22/ Line 18] x 12	33.87	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	6,628	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.517	
26	BMP Footprint Sizing Factor (Default 0.03 or an alternative minimum footprint sizing factor from Worksheet B.5-2, Line 11)	0.03	
27	Minimum BMP Footprint [Line 24 x Line 25 x Line 26]	102.80	sq-ft
28	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 27)	102.80	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]	.440	unitless
30	Minimum required fraction of DCV retained for partial infiltration condition	0.375	unitless
31	Is the retained DCV ≥ 0.375? If the answer is no increase the footprint sizing factor in Line 26 until the answer is yes for this criterion.	☑ Yes	☐ No

Note:

1. Line 7 is used to estimate the amount of volume retained by the BMP. Update assumed surface area in Line 7 until its equivalent to the required biofiltration footprint (either Line 21 or Line 23)
2. The DCV fraction of 0.375 is based on a 40% average annual percent capture and a 36-hour drawdown time.
3. The increase in footprint for volume reduction can be optimized using the approach presented in Appendix B.5.2. The optimized footprint cannot be smaller than the alternative minimum footprint sizing factor from Worksheet B.5-2.
4. If the proposed biofiltration BMP footprint is smaller than the alternative minimum footprint sizing factor from Worksheet B.5-2, but satisfies Option 1 or Option 2 sizing, it is considered a compact biofiltration BMP and may be allowed at the discretion of the City Engineer, if it meets the requirements in Appendix F.

IMP B

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

Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1 (Page 1 of 2)	
1	Remaining DCV after implementing retention BMPs	517.78	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36	hours
4	Depth of runoff that can be infiltrated [Line 2 x Line 3]	0	inches
5	Aggregate pore space	0.40	in/in
6	Required depth of gravel below the underdrain [Line 4/ Line 5]	0	inches
7	Assumed surface area of the biofiltration BMP	1696	sq-ft
8	Media retained pore storage	0.1	in/in
9	Volume retained by BMP [[Line 4 + (Line 12 x Line 8)]/12] x Line 7	254.4	cubic-feet
10	DCV that requires biofiltration [Line 1 – Line 9]	263.38	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	10	inches
12	Media Thickness [18 inches minimum], also add mulch layer thickness to this line for sizing calculations	18	inches
13	Aggregate Storage above underdrain invert (12 inches typical) – use 0 inches for sizing if the aggregate is not over the entire bottom surface area	18	inches
14	Freely drained pore storage	0.2	in/in
15	Media filtration rate to be used for sizing (5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate which will be less than 5 in/hr.)	5	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6	hours
17	Depth filtered during storm [Line 15 x Line 16]	30	inches
18	Depth of Detention Storage [Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5)]	20.80	inches
19	Total Depth Treated [Line 17 + Line 18]	50.80	inches

Note: Line 7 is used to estimate the amount of volume retained by the BMP. Update assumed surface area in Line 7 until its equivalent to the required biofiltration footprint (either Line 21 or Line 23)

IMP B **Worksheet B.5-1: Simple Sizing Method for Biofiltration BMPs (continued)**

Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1 (Page 2 of 2)	
Option 1 – Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]	395.07	cubic-feet
21	Required Footprint [Line 20/ Line 19] x 12	93.32	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]	197.53	cubic-feet
23	Required Footprint [Line 22/ Line 18] x 12	113.96	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	17,845	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.71	
26	BMP Footprint Sizing Factor (Default 0.03 or an alternative minimum footprint sizing factor from Worksheet B.5-2, Line 11)	0.03	
27	Minimum BMP Footprint [Line 24 x Line 25 x Line 26]	380.10	sq-ft
28	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 27)	380.10	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]	N/A	unitless
30	Minimum required fraction of DCV retained for partial infiltration condition	0.375	unitless
31	Is the retained DCV ≥ 0.375? If the answer is no increase the footprint sizing factor in Line 26 until the answer is yes for this criterion.	☐ Yes	☐ No

Note:

1. Line 7 is used to estimate the amount of volume retained by the BMP. Update assumed surface area in Line 7 until its equivalent to the required biofiltration footprint (either Line 21 or Line 23)
2. The DCV fraction of 0.375 is based on a 40% average annual percent capture and a 36-hour drawdown time.
3. The increase in footprint for volume reduction can be optimized using the approach presented in Appendix B.5.2. The optimized footprint cannot be smaller than the alternative minimum footprint sizing factor from Worksheet B.5-2.
4. If the proposed biofiltration BMP footprint is smaller than the alternative minimum footprint sizing factor from Worksheet B.5-2, but satisfies Option 1 or Option 2 sizing, it is considered a compact biofiltration BMP and may be allowed at the discretion of the City Engineer, if it meets the requirements in Appendix F.

ATTACHMENT 2
BACKUP FOR PDP HYDROMODIFICATION CONTROL MEASURES

This is the cover sheet for Attachment 2.

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

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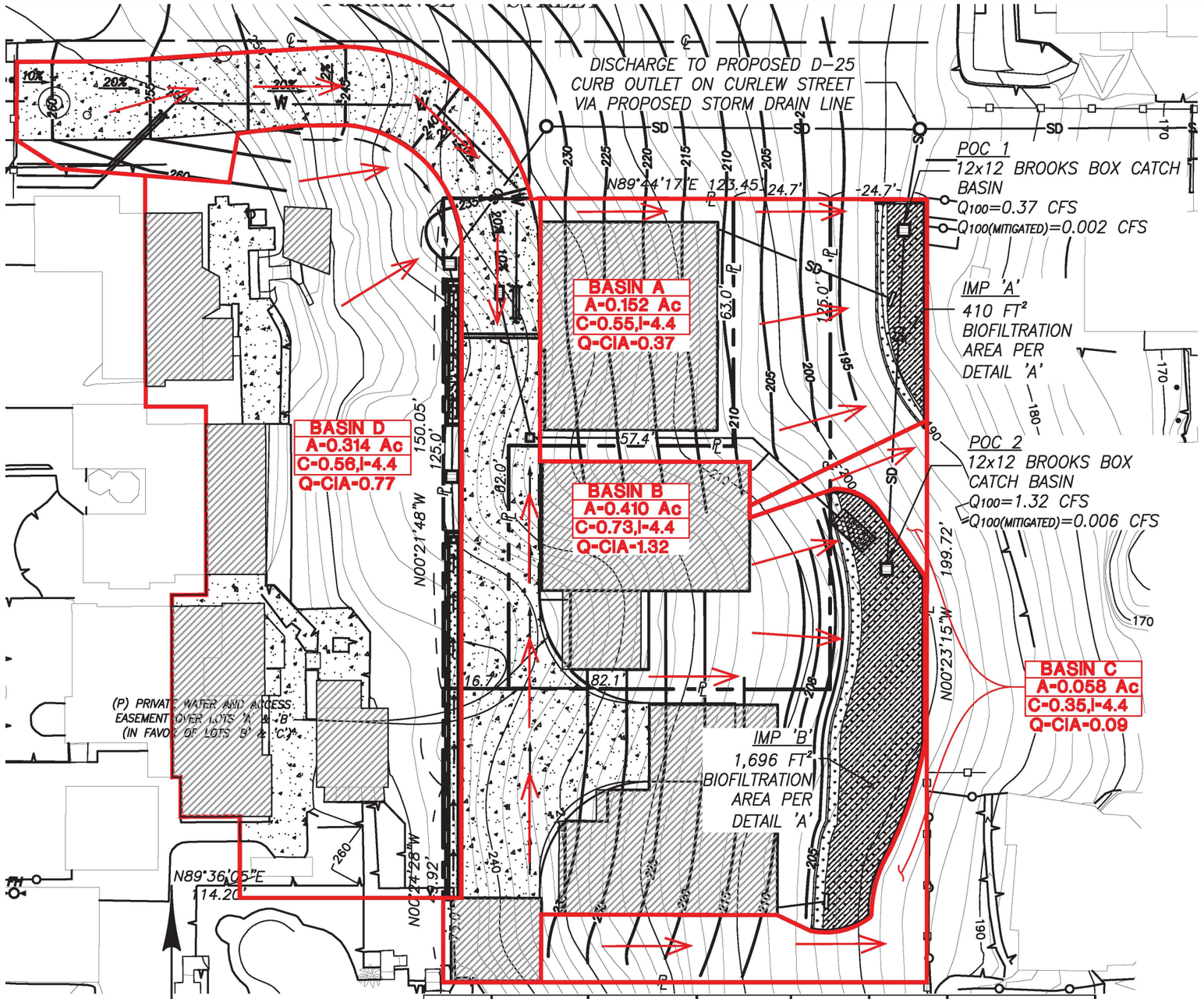
Indicate which Items are Included:

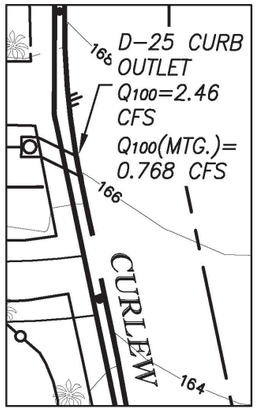
Attachment Sequence	Contents	Checklist
Attachment 2a	Hydromodification Management Exhibit (Required)	☑ Included See Hydromodification Management Exhibit Checklist.
Attachment 2b	Management of Critical Coarse Sediment Yield Areas (WMAA Exhibit is required, additional analyses are optional) See Section 6.2 of the BMP Design Manual.	☑ Exhibit showing project drainage boundaries marked on WMAA Critical Coarse Sediment Yield Area Map (Required) Optional analyses for Critical Coarse Sediment Yield Area Determination ☐ 6.2.1 Verification of Geomorphic Landscape Units Onsite ☐ 6.2.2 Downstream Systems Sensitivity to Coarse Sediment ☐ 6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite
Attachment 2c	Geomorphic Assessment of Receiving Channels (Optional) See Section 6.3.4 of the BMP Design Manual.	○ Not Performed ○ Included ○ Submitted as separate stand-alone document
Attachment 2d	Flow Control Facility Design and Structural BMP Drawdown Calculations (Required) Overflow Design Summary for each structural BMP See Chapter 6 and Appendix G of the BMP Design Manual	○ Included ◉ Submitted as separate stand-alone document
Attachment 2e	Vector Control Plan (Required when structural BMPs will not drain in 96 hours)	○ Included ◉ Not required because BMPs will drain in less than 96 hours

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

The Hydromodification Management Exhibit must identify:

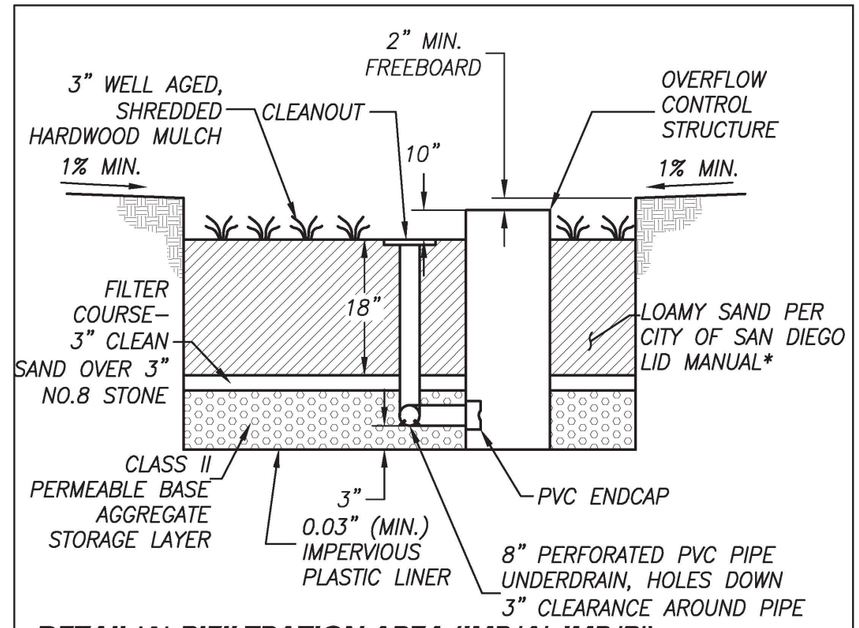
- ☑ Underlying hydrologic soil group
- ☑ Approximate depth to groundwater
- ☑ Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
- ☑ Critical coarse sediment yield areas to be protected
- ☑ Existing topography
- ☑ Existing and proposed site drainage network and connections to drainage offsite
- ☑ Proposed grading
- ☑ Proposed impervious features
- ☑ Proposed design features and surface treatments used to minimize imperviousness
- ☑ Point(s) of Compliance (POC) for Hydromodification Management
- ☑ Existing and proposed drainage boundary and drainage area to each POC (when necessary, create separate exhibits for pre-development and post-project conditions)
- ☑ Structural BMPs for hydromodification management (identify location, type of BMP, and size/detail)





LEGEND

DESCRIPTION	SYMBOL
PROPERTY LINE	
EXISTING CONTOUR	90
PROPOSED CONTOUR	90
DIRECTION OF FLOW	
PVC PIPE	
DMA LIMIT	
IMPERVIOUS AREAS	
PERVIOUS AREAS	
BIOFILTRATION BASIN	



DETAIL 'A'-BIFILTRATION AREA (IMP 'A', IMP 'B')
TYPICAL SECTION
NOT TO SCALE

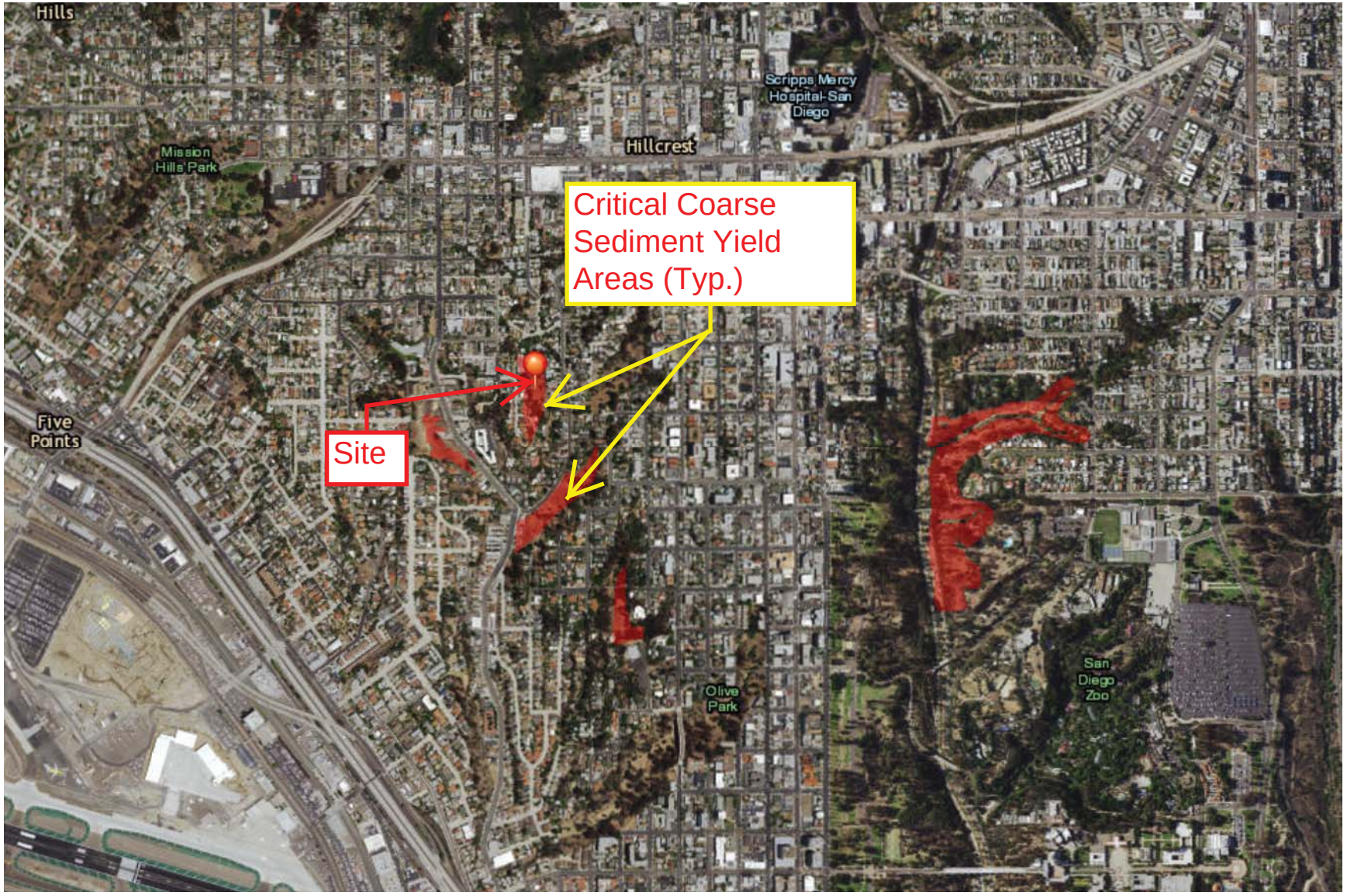
Basin	Permeable Area	Impermeable Area	Area (ft)	Area (Acres)	'C' Value	Flow Pattern
A	4230	2398	6,628	0.152	0.55	Biofiltration
B	5628	12217	17,845	0.410	0.73	Biofiltration
C	2540	0	2,540	0.058	0.35	Self-Mitigating
D	8541	5158	13,699	0.314	0.56	Run-on redirected
Total	20939	19773	40,712	0.935		

SITE CHARACTERISTICS

- HYDROLOGIC SOIL GROUP.....D
- APPROXIMATE DEPTH TO GROUND WATER.....>24'
- CRITICAL COARSE SEDIMENT YIELD AREAS.....PRESENT ON SITE

COFFEY ENGINEERING, INC.

TORRANCE 5
Torrance Street, San Diego CA 92103



CRITICAL COURSE SEDIMENT YIELD AREAS - TORRANCE 3

Integrated Management Practices Sizing Calculations

IMP A

Low Flow Threshold	Soil Group	Slope	Rain Guage
0.1Q2	D - High Runoff (Clay Soils)	Steep	Lindbergh

	Surface Area (ft^2)	Surface Area (AC)	Surface Type	Runoff Factor
Impervious Area	2,398.00	0.06	Concrete (1.0)	1
Pervious Area	4,230.00	0.10	Landscape (0.1)	0.1
Pervious Pavers	0.00	0.00	Solid Unit Pavers o	0.2

IMP Type	Area Factor	V1 Factor	V2 Factor	Surface Area Required (ft^2)	V1 Required (ft^3)	V2 Required (ft^3)	Surface Area Provided (ft^2)	V1 Provided (ft^3)	V2 Provided (ft^3)
Infiltration Devices	N/A	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00
Bioretention	N/A	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00
Biofiltration with Partial Ret.	0.115	0.0958	0.069	350.66	292.11	210.39	0.00	0.00	0.00
Biofiltration with Imp. Liner	0.13	0.1083	0.078	396.40	330.23	237.84	410.44	342.03	246.26
Cistern	N/A	0.16	N/A	0.00	487.87	0.00	0.00	0.00	0.00

IMP B

Low Flow Threshold	Soil Group	Slope	Rain Guage
0.1Q2	D - High Runoff (Clay Soils)	Steep	Lindbergh

	Surface Area (ft^2)	Surface Area (AC)	Surface Type	Runoff Factor
Impervious Area	12,217.00	0.28	Concrete (1.0)	1
Pervious Area	5,628.00	0.13	Landscape (0.1)	0.1
Pervious Pavers	0.00	0.00	Solid Unit Pavers o	0.2

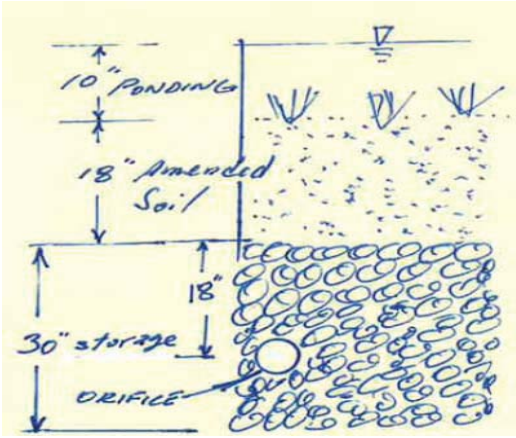
IMP Type	Area Factor	V1 Factor	V2 Factor	Surface Area Required (ft^2)	V1 Required (ft^3)	V2 Required (ft^3)	Surface Area Provided (ft^2)	V1 Provided (ft^3)	V2 Provided (ft^3)
Infiltration Devices	N/A	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00
Bioretention	N/A	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00
Biofiltration with Partial Ret.	0.115	0.0958	0.069	1,467.75	1,222.70	880.65	0.00	0.00	0.00
Biofiltration with Imp. Liner	0.13	0.1083	0.078	1,659.20	1,382.24	995.52	1,696.45	1,413.71	1,017.87
Cistern	N/A	0.16	N/A	0.00	2,042.09	0.00	0.00	0.00	0.00

(1) $Q=C_d \times A \times (2gH)^{0.5}$ Orifice Discharge Equation

(2) $A= [0.1Q_2 \times A_{DMA}]/C_d \times (2gH)^{0.5}$ Orifice Area Equation (for 0.1Q2 as lower limit threshold)

Cd =	g =	H =
0.6	32.2	1.5
dimensionless	ft/s2	ft

Q_2s provided (see 2012 Methodology, Page 1-30, Sec. 1.6, Table 1-6)



	Rain Gage	Soil Type	Cover	Slope	Q2 Sizing Factor	DMA Area (ac)	Lower Limit of Q2	**Orifice Area (in2)**
DMA A	Lindbergh	D	Scrub	Steep	0.143	0.152	0.1	**0.05**

Table 1-6. Unit Runoff Ratios

Rain Gauge	Soil	Cover	Slope	Q_2 (cfs/acre)	Q_{10} (cfs/ac)
Lindbergh	D	Scrub	Steep	0.143	0.319

0.05 Tot. Orifice Area	**0.26** Orifice Dia

	Rain Gage	Soil Type	Cover	Slope	Q2 Sizing Factor	DMA Area (ac)	Lower Limit of Q2	**Orifice Area (in2)**
DMA B	Lindbergh	D	Scrub	Steep	0.143	0.41	0.1	**0.14**

Table 1-6. Unit Runoff Ratios

Rain Gauge	Soil	Cover	Slope	Q_2 (cfs/acre)	Q_{10} (cfs/ac)
Lindbergh	D	Scrub	Steep	0.143	0.319

0.14 Tot. Orifice Area	**0.43** Orifice Dia

ATTACHMENT 3
STRUCTURAL BMP MAINTENANCE INFORMATION

This is the cover sheet for Attachment 3.

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Indicate which Items are Included:

Attachment Sequence	Contents	Checklist
Attachment 3a	Structural BMP Maintenance Thresholds and Actions (Required)	☑ Included See Structural BMP Maintenance Information Checklist.
Attachment 3b	Maintenance Agreement (Form DS-3247) (when applicable)	◉ Included ○ Not Applicable

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Use this checklist to ensure the required information has been included in the Structural BMP Maintenance Information Attachment:

Preliminary Design / Planning / CEQA level submittal:

- Attachment 3a must identify:
  - ☐ Typical maintenance indicators and actions for proposed structural BMP(s) based on Section 7.7 of the BMP Design Manual
- Attachment 3b is not required for preliminary design / planning / CEQA level submittal.

Final Design level submittal:

Attachment 3a must identify:

- ☑ Specific maintenance indicators and actions for proposed structural BMP(s). This shall be based on Section 7.7 of the BMP Design Manual and enhanced to reflect actual proposed components of the structural BMP(s)
- ☑ How to access the structural BMP(s) to inspect and perform maintenance
- ☑ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
- ☐ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
- ☐ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
- ☑ When applicable, frequency of bioretention soil media replacement.
- ☑ Recommended equipment to perform maintenance
- ☐ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management

Attachment 3b: For private entity operation and maintenance, Attachment 3b must include a Storm Water Management and Discharge Control Maintenance Agreement (Form DS-3247). The following information must be included in the exhibits attached to the maintenance agreement:

- ☑ Vicinity map
- ☐ Site design BMPs for which DCV reduction is claimed for meeting the pollutant control obligations.
- ☑ BMP and HMP location and dimensions
- ☑ BMP and HMP specifications/cross section/model
- ☑ Maintenance recommendations and frequency
- ☑ LID features such as (permeable paver and LS location, dim, SF).

THE CITY OF SAN DIEGO RECORDING REQUESTED BY: **THE CITY OF SAN DIEGO** AND WHEN RECORDED MAIL TO: Jennifer Currie 1283 Johnson Ave San Diego, 92103	(THIS SPACE IS FOR THE RECORDER'S USE ONLY)

STORM WATER MANAGEMENT AND DISCHARGE CONTROL MAINTENANCE AGREEMENT

APPROVAL NUMBER:	ASSESSOR'S PARCEL NUMBER:	PROJECT NUMBER: 519307

This agreement is made by and between the City of San Diego, a municipal corporation [City] and Jennifer Currie

the owner or duly authorized representative of the owner [Property Owner] of property located at: Torrance Street, San Diego, CA 92103

(PROPERTY ADDRESS)

and more particularly described as: LOTS 5, 6, 7, 8, 9, 30, 31, 32, 33 AND 34 IN BLOCK 444, OF THE SUBDIVISIO SUBDIVISION OF THE EAST HALF AND THE SOUTH QUARTER OF THE WEST HALF OF PUEBLO LOT 1122

(LEGAL DESCRIPTION OF PROPERTY)

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

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

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

Continued on Page 2

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 Exhibits(s):

_____
(Owner Signature)

_____
(Print Name and Title)

_____
(Company/Organization Name)

_____
(Date)

THE CITY OF SAN DIEGO

APPROVED:

_____
(City Control engineer Signature

_____
(Print Name)

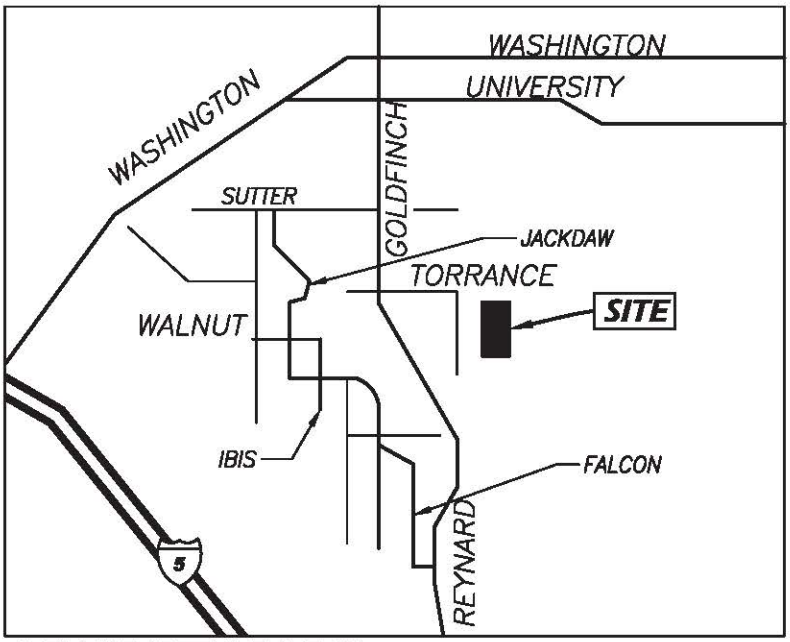
_____
(Date)

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

EXHIBIT 'A'

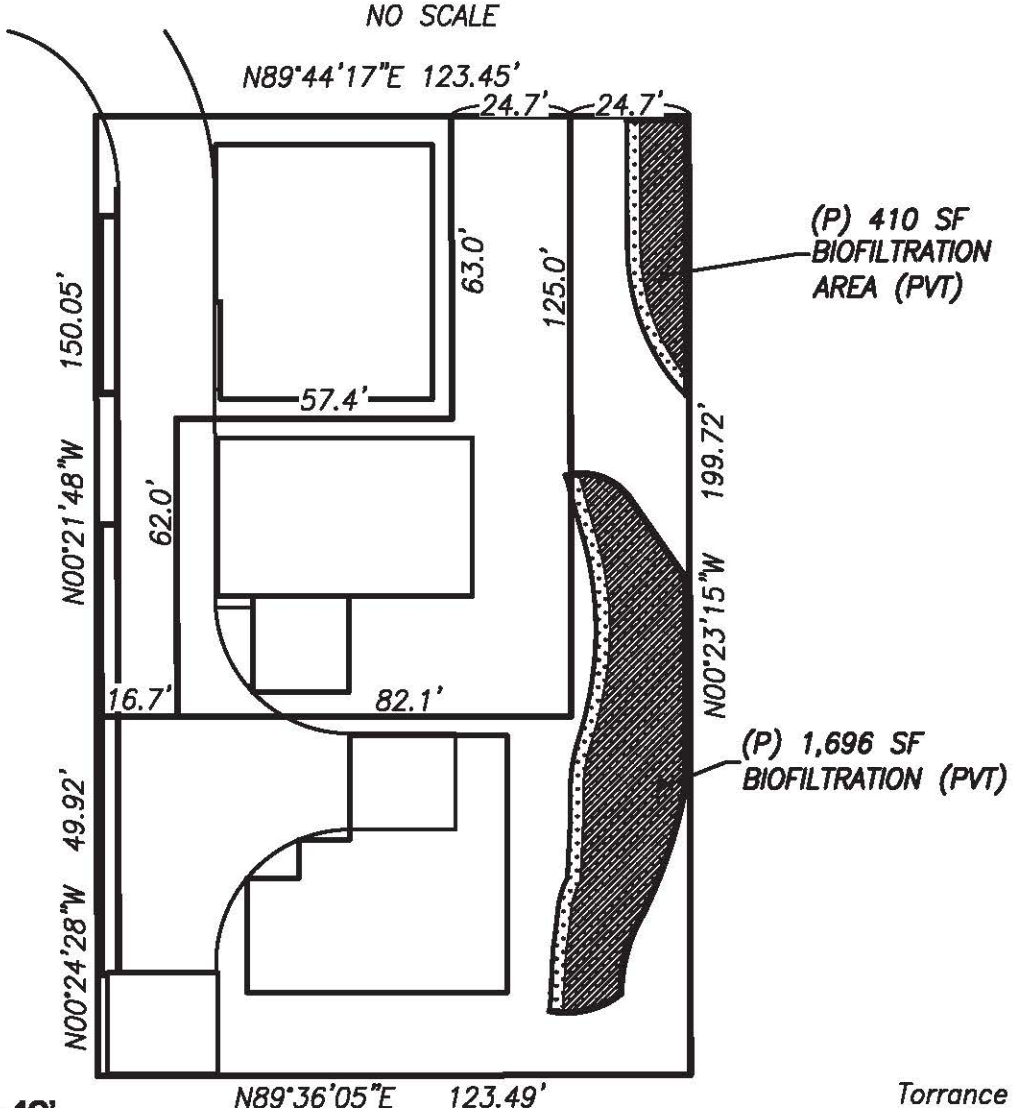
TREATMENT CONTROL BMP:

BIOFILTRATION AREA



VICINITY MAP

THOMAS BROS. MAP 1268–J6
NO SCALE

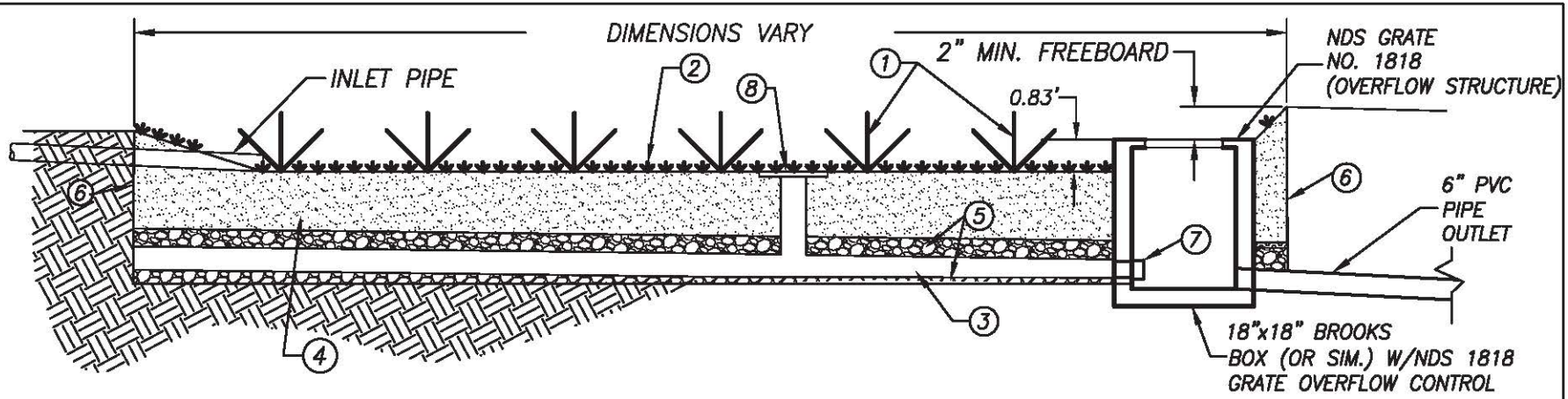


N

SCALE 1"=40'

Torrance 5
San Diego, CA. 92103
APN 451–292–06

EXHIBIT 'B'



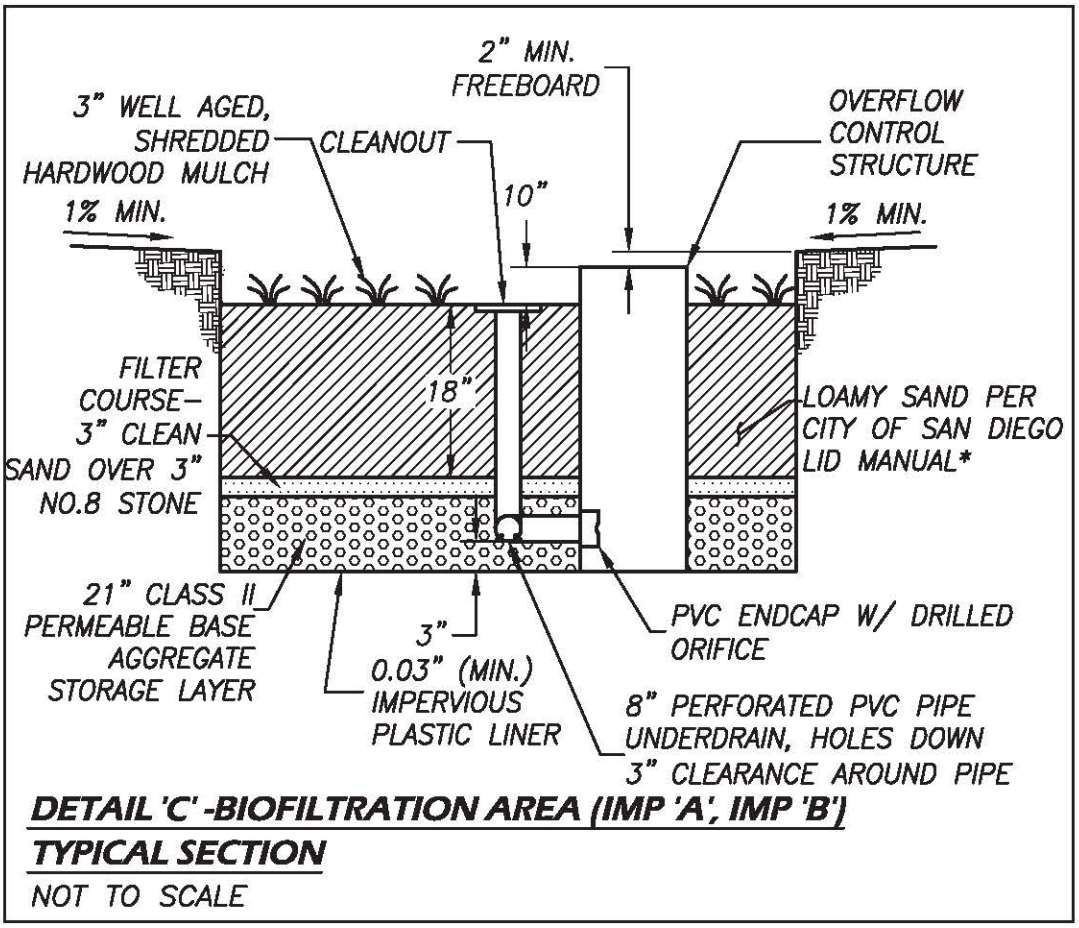
1. VEGETATION PER LANDSCAPE PLAN
2. GROUND COVER: 3" OF FINELY SHREDDED HARDWOOD MULCH
3. 8" PERFORATED UNDERDRAIN–LEVEL (WITH 3" AGGREGATE STORAGE LAYER BELOW)
4. 18" SOIL MEDIA–LOAMY SAND W/ MINIMUM 5"/HR PERCOLATION*
5. 18" AGGREGATE STORAGE LAYER– CLASS II PERMEABLE BASE (W/ 3" MIN BELOW PIPE)
6. 0.03" (MIN.) IMPERVIOUS PLASTIC LINER
7. 8" PVC END CAP WITH DRILLED REDUCED SIZE OUTFLOW ORIFICE
8. CLEANOUT

* SOIL MEDIA CONSISTS OF 85% WASHED COURSE SAND, 10% FINES (RANGE: 8–12%; 8% = 2 IN/HR INFILTRATION RATE, 12% = 1 IN/HR INFILTRATION RATE), AND 5% ORGANIC MATTER.
FOR ADDITIONAL STANDARDS SEE SAN DIEGO LOW IMPACT DEVELOPMENT DESIGN MANUAL SECTION 1.2.4.2
SOIL MEDIA MUST MAINTAIN A MINIMUM INFILTRATION RATE OF 5 IN/HR

DETAIL 'A' - BIOFILTRATION AREA (IMP 'A') TYPICAL SECTION

NOT TO SCALE

EXHIBIT 'C'



DETAIL 'C' -BIOFILTRATION AREA (IMP 'A', IMP 'B')

TYPICAL SECTION

NOT TO SCALE

* SOIL MEDIA CONSISTS OF 85% WASHED COURSE SAND, 10% FINES (RANGE: 8–12%; 8% = 2 IN/HR INFILTRATION RATE, 12% = 1 IN/HR INFILTRATION RATE), AND 5% ORGANIC MATTER. FOR ADDITIONAL STANDARDS SEE SAN DIEGO LOW IMPACT DEVELOPMENT DESIGN MANUAL SECTION 1.2.4.2 SOIL MEDIA MUST MAINTAIN A MINIMUM INFILTRATION RATE OF 5 IN/HR

Exhibit D
Maintenance Plan
Torrance 3
Treatment BMP Maintenance Plan for Vegetated BMPs

Typical Maintenance Indicator(s) for Vegetated BMPs	Maintenance Activities
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials, without damage to the vegetation.
Poor vegetation establishment	Re-seed, re-plant, or re-establish vegetation per original plans.
Overgrown vegetation	Mow or trim as appropriate, but not less than the design height of the vegetation per original plans when applicable (e.g. a vegetated swale may require a minimum vegetation height).
Erosion due to concentrated irrigation flow	Repair/re-seed/re-plant eroded areas and adjust the irrigation system.
Erosion due to concentrated storm water runoff flow	Repair/re-seed/re-plant eroded areas, and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, the City Engineer shall be contacted prior to any additional repairs or reconstruction.
Standing water in vegetated swales	Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, loosening or replacing top soil to allow for better infiltration, or minor re-grading for proper drainage. If the issue is not corrected by restoring the BMP to the original plan and grade, the City Engineer shall be contacted prior to any additional repairs or reconstruction.
Standing water in bioretention, biofiltration with partial retention, or biofiltration areas, or flow-through planter boxes for longer than 96 hours following a storm event*	Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, clearing underdrains (where applicable), or repairing/replacing clogged or compacted soils.
Obstructed inlet or outlet structure	Clear obstructions.
Damage to structural components such as weirs, inlet or outlet structures	Repair or replace as applicable.
*These BMPs typically include a surface ponding layer as part of their function which may take 96 hours to drain following a storm event.	

- **Access of Structural BMPs for Inspection and Maintenance**

    - The biofiltration basins consisting of vegetated area are 410 ft^2 and 1,696 ft^2. A concrete inlet will be installed within this basins with its rim elevated 0.83' above the surface.
    - The inlet should be visible from the surface and can be accessed through the grate.
    - The biofiltration basins are accessible from the driveway through narrow landscaped areas in between the proposed buildings.

- **Maintenance Thresholds**

    - Any grasses within the biofiltration area shall be cut when in excess of 4" tall.
    - Debris & sediment shall be cleared from the basin when 2" have accumulated.
    - Any amount sediment or debris accumulation observed within the overflow inlet shall be removed when seen.
    - During routine landscape maintenance activities, if bare areas or erosion are observed they shall be re-seeded.
    - If standing water is observed for longer than 24-hours the soil media shall be inspected for clogging and cleaned.

- **Biofiltration Soil Media Replacement**

    - Soil media within the biofiltration area shall be replaced when the filtration rate drops below 5"/hour if regular maintenance cannot restore this rate.

- **Recommended Maintenance Equipment**

    - Equipment needed for maintenance will typically include those needed for routine landscape maintenance:

        - Hand Shovels
        - Wheel barrows
        - Lawn mower
        - Hedge clippers
        - Other

- **Special Training**

    - Maintenance and inspection activities required are typical for routine landscape maintenance. No special training required.

ATTACHMENT 4
COPY OF PLAN SHEETS SHOWING PERMANENT STORM WATER BMPS

This is the cover sheet for Attachment 4.

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

The plans must identify:

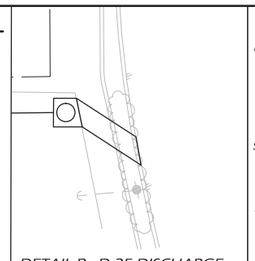
- ☑ Structural BMP(s) with ID numbers matching Form I-6 Summary of PDP Structural BMPs
- ☑ The grading and drainage design shown on the plans must be consistent with the delineation of DMAs shown on the DMA exhibit
- ☑ Details and specifications for construction of structural BMP(s)
- ☑ Signage indicating the location and boundary of structural BMP(s) as required by the City Engineer
- ☑ How to access the structural BMP(s) to inspect and perform maintenance
- ☑ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
- ☐ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
- ☑ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
- ☑ Recommended equipment to perform maintenance
- ☑ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management
- ☑ Include landscaping plan sheets showing vegetation requirements for vegetated structural BMP(s)
- ☑ All BMPs must be fully dimensioned on the plans
- ☐ When proprietary BMPs are used, site specific cross section with outflow, inflow and model number shall be provided. Broucher photocopies are not allowed.

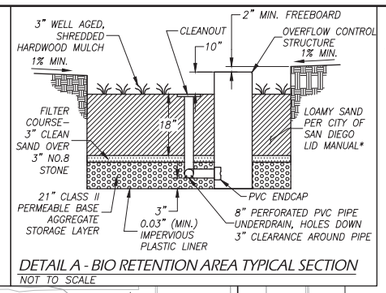
WATER AND SEWER NOTES

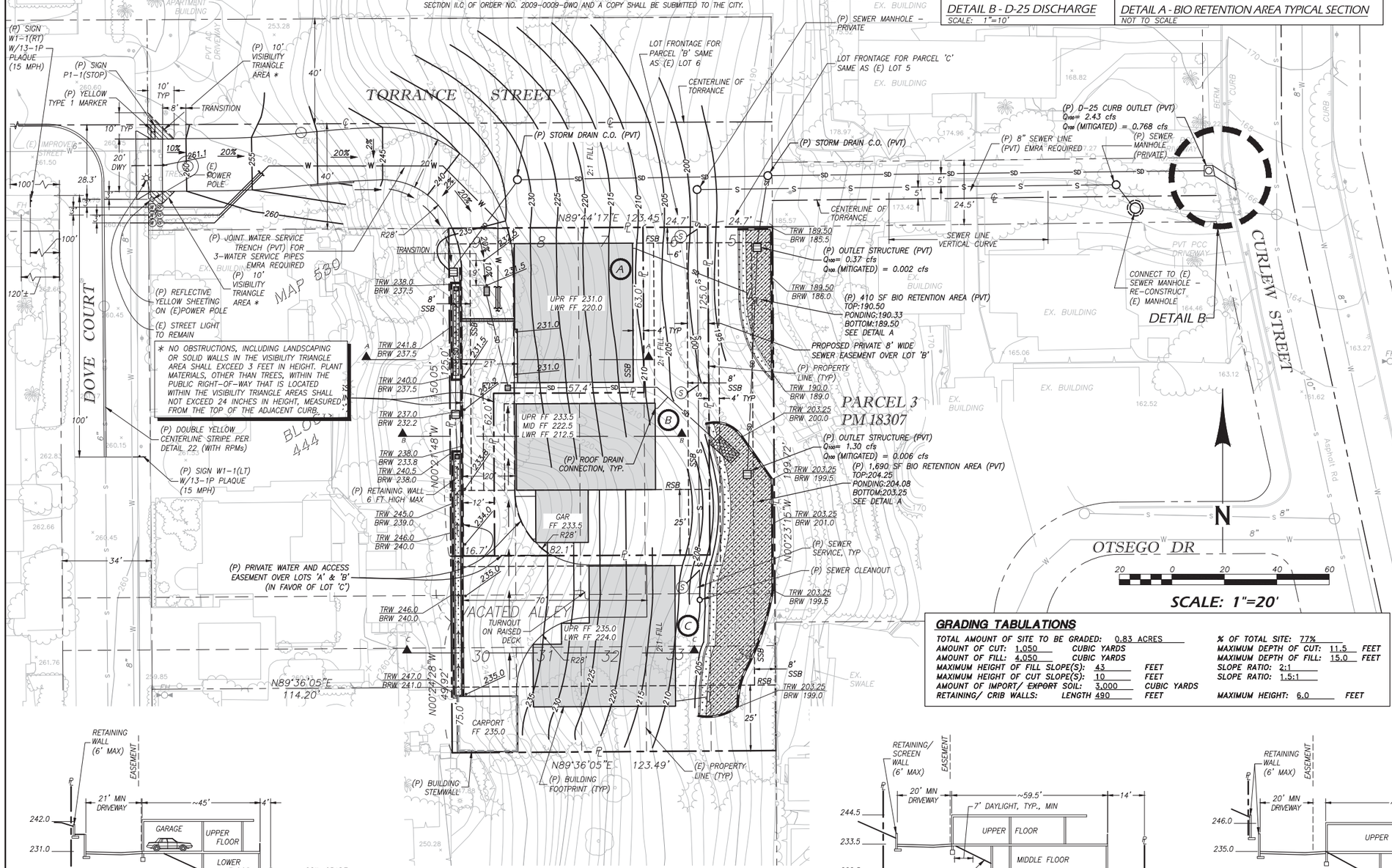
1. ALL PROPOSED WATER AND SEWER FACILITIES WITHIN THE PUBLIC RIGHT-OF-WAY OR PUBLIC EASEMENT (PUBLIC AND PRIVATE) MUST BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE CRITERIA ESTABLISHED WITHIN THE CITY OF SAN DIEGO'S CURRENT WATER AND SEWER FACILITY DESIGN GUIDELINES, REGULATIONS, STANDARDS, AND PRACTICES PERTAINING THERETO.
2. ALL WATER SERVICES TO THE SITE (EXCEPTING SINGLE FAMILY DOMESTIC SERVICE LINES, AND SINGLE FAMILY DOMESTIC/FIRE COMBINED SERVICE LINES WHERE THE RESIDENTIAL FIRE SPRINKLER SYSTEM UTILIZES PASSIVE PURGE DESIGN) MUST PASS THROUGH A PRIVATE ABOVE GROUND BACK FLOW PREVENTION DEVICE (BFPD). BFPDs ARE TO BE LOCATED ON PRIVATE PROPERTY (EXCEPT WHERE SHOWN WITHIN TORRANCE STREET R.O.W. HEREON), IN LINE WITH THE SERVICE, AND IMMEDIATELY ADJACENT TO THE RIGHT-OF-WAY. THE PUBLIC UTILITIES DEPARTMENT WILL NOT PERMIT THE REQUIRED BFPDs TO BE LOCATED BELOW GRADE OR WITHIN THE STRUCTURE.

STORMWATER NOTES

1. PRIOR TO THE ISSUANCE OF ANY CONSTRUCTION PERMIT, THE OWNER/PERMITTEE SHALL ENTER INTO A MAINTENANCE AGREEMENT FOR THE ONGOING PERMANENT BMP MAINTENANCE, SATISFACTORY TO THE CITY ENGINEER.
2. PRIOR TO THE ISSUANCE OF ANY CONSTRUCTION PERMIT, THE OWNER/PERMITTEE SHALL INCORPORATE ANY CONSTRUCTION BEST MANAGEMENT PRACTICES NECESSARY TO COMPLY WITH CHAPTER 14, ARTICLE 2, DIVISION 1 (GRADING REGULATIONS) OF THE SAN DIEGO MUNICIPAL CODE.
3. PRIOR TO THE ISSUANCE OF ANY CONSTRUCTION PERMIT, THE APPLICANT SHALL SUBMIT A TECHNICAL REPORT THAT WILL BE SUBJECT TO FINAL REVIEW AND APPROVAL BY THE CITY ENGINEER, BASED ON THE STORM WATER STANDARDS IN EFFECT AT THE TIME OF CONSTRUCTION PERMIT ISSUANCE.
4. DEVELOPMENT OF THIS PROJECT SHALL COMPLY WITH ALL STORM WATER CONSTRUCTION REQUIREMENTS OF THE STATE CONSTRUCTION GENERAL PERMIT, ORDER NO. 2009-0009DWQ, OR SUBSEQUENT ORDER, AND THE MUNICIPAL STORM WATER PERMIT, ORDER NO R9-2013-0001, OR SUBSEQUENT ORDER. IN ACCORDANCE WITH ORDER NO. 2009-0009DWQ, OR SUBSEQUENT ORDER, A RISK LEVEL DETERMINATION SHALL BE CALCULATED FOR THE SITE AND A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) SHALL BE IMPLEMENTED CONCURRENTLY WITH THE COMMENCEMENT OF GRADING ACTIVITIES.
5. PRIOR TO THE ISSUANCE OF A GRADING OR A CONSTRUCTION PERMIT, A COPY OF THE NOTICE OF INTENT (NOI) WITH A VALID WASTE DISCHARGE ID NUMBER (WDID#) SHALL BE SUBMITTED TO THE CITY OF SAN DIEGO AS A PROOF OF ENROLLMENT UNDER THE CONSTRUCTION GENERAL PERMIT. WHEN OWNERSHIP OF THE ENTIRE SITE OR PORTIONS OF THE SITE CHANGES PRIOR TO TO FILING OF THE NOTICE OF TERMINATION (NOT), A REVISED NOI SHALL BE SUBMITTED ELECTRONICALLY TO THE STATE WATER RESOURCES BOARD IN ACCORDANCE WITH THE PROVISIONS AS SET FORTH IN SECTION II.C OF ORDER NO. 2009-0009-DWQ AND A COPY SHALL BE SUBMITTED TO THE CITY.







GRADING TABULATIONS

TOTAL AMOUNT OF SITE TO BE GRADED:	0.83 ACRES		% OF TOTAL SITE:	77%	
AMOUNT OF CUT:	1,050	CUBIC YARDS	MAXIMUM DEPTH OF CUT:	11.5	FEET
AMOUNT OF FILL:	4,050	CUBIC YARDS	MAXIMUM DEPTH OF FILL:	15.0	FEET
MAXIMUM HEIGHT OF FILL SLOPE(S):	43	FEET	SLOPE RATIO:	2:1	
MAXIMUM HEIGHT OF CUT SLOPE(S):	10	FEET	SLOPE RATIO:	1.5:1	
AMOUNT OF IMPORT/ ~~EXPORT~~ SOIL:	3,000	CUBIC YARDS			
RETAINING/ CRIB WALLS: LENGTH	490	FEET	MAXIMUM HEIGHT:	6.0	FEET

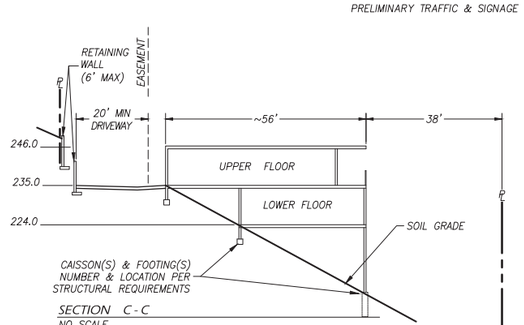
NOTE:
THIS PROJECT WILL NOT DISCHARGE ANY INCREASE IN STORM WATER RUN-OFF ONTO EXISTING HILLSIDE AREAS OR ADJACENT PROPERTIES.

PROPOSED LOT AREAS

PARCEL	AREA (SQ FT)
A	5,692
B	6,650
C	12,326

SECTION A-A
NO SCALE

SECTION B-B
NO SCALE



SECTION C-C
NO SCALE

LEGEND

DESCRIPTION	SYMBOL
EXISTING	
PROPERTY LINE (RECORD)	
RIGHT OF WAY	
STREET CENTERLINE	
CONTOUR	90
EDGE OF PAVING	
SPOT ELEVATION	+100.00
BUILDING FOOTPRINT	
SEWER MAIN	S
WATER MAIN	W
FIRE HYDRANT	FH
CHAIN LINK FENCE	
WOOD FENCE	
CHAIN LINK FENCE	
FREE STANDING WALL	
RETAINING WALL	
TREE; PLANT; PALM	
STREET LIGHT	
PROPOSED	
PROPERTY LINE (ADJUSTED)	N45°45'45"W
CONTOUR	90
STREET CENTERLINE	
EDGE OF PAVING	
SPOT ELEVATION	+100.00
BUILDING FOOTPRINT	
BIO RETENTION AREA (PVT)	
FREE STANDING WALL	
RETAINING WALL	
SEWER LATERAL (PVT)	S
STORM DRAIN LINE (PVT)	SD
DRAINAGE SWALE OR DIRECTION OF FLOW	
DRAIN INLET/CATCH BASIN	
TRENCH DRAIN	
RIP RAP ENERGY DISSIPATER	
WATER SERVICE W/BACKFLOW PREVENTION	W RP
RE-CONSTRUCT SEWER MANHOLE	
PARCEL DESIGNATION	X

ABBREVIATIONS

FRONT YARD SETBACK	FSB	EXISTING	(E)
REAR YARD SETBACK	RSB	PROPOSED	(P)
SIDE YARD SETBACK	SSB	CLEAN OUT	C.O.
UPPER	UPR	PRIVATE	PVT
LOWER	LWR	TYPICAL	TYP
FINISH FLOOR	FF		

SOURCE OF TOPOGRAPHY

FIELD TOPO BY:
COFFEY ENGINEERING, INC.
(BY AERIAL METHODS - DATED 2/24/16)
JOHN S. COFFEY, PLS 8733, EXP 6/30/2018

BENCHMARK

NWBP AT OTSEGO DRIVE AND CURLEW STREET
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SHEET INDEX

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COFFEY ENGINEERING, INC.
9666 BUSINESSPARK AVENUE, SUITE 210, SAN DIEGO, CA 92131 PH (858)831-0111 FAX (858)831-0179

PRELIMINARY - FOR REVIEW

REGISTERED PROFESSIONAL ENGINEER JOHN S. COFFEY No. C062716 CIVIL STATE OF CALIFORNIA

TORRANCE STREET

TORRANCE STREET
SAN DIEGO, CA 92103

DRAWN BY:	GC/DK
CHECKED BY:	JC
ORIGINAL	5/11/17
REVISION 1	
REVISION 2	
REVISION 3	
REVISION 4	
REVISION 5	

PRELIMINARY GRADING AND DRAINAGE PLAN

SCALE: 1"=20'

C.1

SHT 1 OF 2 SHTS

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ATTACHMENT 5
DRAINAGE REPORT

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

COFFEY ENGINEERING, INC.

Drainage Study

Torrance Street
San Diego, CA 92103

APN 451-292-06

Project Information:

Owner: Jennifer Currie
1283 Johnson Ave
San Diego, CA. 92103
Developer: Nakhshab Development & Design Inc.

May 12, 2017

9666 Businesspark Avenue, Suite 210 San Diego, CA 92131 Phone: (858)831-0111 Fax: (858)831-0179

Table of Contents

1. Existing Conditions 3
2. Proposed Project 3
3. Purpose and Scope of Report 3
4. Method of Calculations 3
5. Results and Conclusions: 4
6. Exemption from CWA Section 401/404 4
7. Declaration of Responsible Charge 5

Appendix A – Referenced Plans & Drainage Maps

- Drainage Map 'A' – Existing Drainage Conditions
- Drainage Map 'B' – Proposed Drainage Conditions

Appendix B – Calculations/Evaluations

- Table: 100 Year Storm Flow Rate Table

Appendix C – Reference Tables & Figures (County of San Diego Hydrology Manual)

- Soil Hydrology Groups
- Table 3-1 – Runoff Coefficients

1. **Existing Conditions**

The 0.566-acre site consists of a vacant lot. The entire site (Basin X), consisting of 24,667 SF of pervious surfaces, sheet flows east to Curlew Street. In addition to the site, approximately 0.113 acres (4,938 SF) of pervious vegetated area contributes run-on to the site from the west hillside. See Drainage Map 'A'.

2. **Proposed Project**

Proposed is the construction of three single family residences, two with adjoining carports and one with a detached garage. Site improvements include retaining walls, concrete walkways, and driveway. Proposed landscaping consists of the implementation of two biofiltration basins for stormwater treatment, as well as hydromod compliance. These impervious surfaces total 14,615 SF.

3. **Purpose and Scope of Report**

This report will evaluate the existing and water run-off flow patterns and flow rate characteristics for the project site. All calculations are for a 100-year expected storm event.

4. **Method of Calculations**

The Rational Method, as defined by *County of San Diego Hydrology Manual (2003)*, will be used to calculate storm water flow rates. Where noted, the following calculations were used to determine flow properties:

<u>Rainfall Characteristics</u>

$Q = C * I * A$, where

Q = Flow rate (ft^3/sec)
C = Runoff coefficient
(Runoff coefficient per County of San Diego Hydrology Manual Table 3-1 reproduced in Appendix C. Soil type D determined from the *Soil Hydrologic Groups* map from the County of San Diego Hydrology Manual reproduced in Appendix C also.)
I = Rainfall intensity (in/hr.)
A = Area (acres)

<u>Rainfall Intensity (per County of San Diego Hydrology Manual Figure 3-1 reproduced in Appendix C)</u>

$I = 7.44 * P_6 * D^{-0.645}$, where

I = Rainfall intensity (in/hr.)
P_6 = Adjusted 6-hour precipitation (inches)
D = Storm duration (min), equal to T_c for time-of-concentration storms

Tc = Ti+Tt+Tp (time-of-concentration), where
Ti=Over land initial time.
Tt=Travel time on natural watersheds.
Tp=Travel time on drainage structures (pipes, brow ditch, gutter etc.)

Overland Time of Flow (per County of San Diego Hydrology Manual Figure 3-3 reproduced in Appendix C)

$Ti= 1.8(1.1-C) D^{0.50} /(s^{0.33})$ (Overland initial time of concentration formula), where

D= Watercourse Distance (feet)(see table 3-2 for the max. overland flow length)
s = Slope (%)
C= Runoff Coefficient
Ti=Initial time of concentration (min.)

5. **Results and Conclusions:**

In the existing conditions, the site (including run-on) discharges a flow of 1.58 cfs east to Curlew Street, where it is collected by a storm water inlet and ultimately discharged to the San Diego Bay. Post-construction conditions replicate the existing flow pattern, and feature a flow rate of 2.55 cfs. This increase of 0.97 cfs can be attributed to an increase in both the impervious area on-site, as well as the size of the tributary area, and will require water attenuation for hydromodification compliance.

In the post-construction condition, two biofiltration basins will discharge storm water runoff to a proposed private storm drain line that will outlet to Curlew Street via a D-25 curb outlet. In order to meet hydromodification compliance, the storm water will be released at a mitigated rate of 0.01 cfs to the D-25 curb outlet (0.002 cfs in IMP A, and 0.006 cfs in IMP B. This will result in a reduction of runoff in the mitigated flow condition, from 1.58 CFS, to 0.870 cfs.

6. **Exemption from CWA Section 401/404:**

The proposed project is exempt from permitting under Federal Clean Water Act section 401 or 404 because it does not directly discharge into navigable waters of the United States. The project will convey storm water runoff to a City of San Diego storm drain inlet.

7. **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 the project as defined in section 6703 of the business and professions code, and that the design is consistent with current design.

I understand that the check of project drawings and specifications by the County of San Diego is confined to a review only and does not relieve me, as Engineer of Work, of my responsibilities for project design.

Michael Kinnear
RCE 76785
Exp. 12-31-18

5/12/17
Date

Appendix A –Reference Plans Drainage Maps

WATER AND SEWER NOTES

1. ALL PROPOSED WATER AND SEWER FACILITIES WITHIN THE PUBLIC RIGHT-OF-WAY OR PUBLIC EASEMENT (PUBLIC AND PRIVATE) MUST BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE CRITERIA ESTABLISHED WITHIN THE CITY OF SAN DIEGO'S CURRENT WATER AND SEWER FACILITY DESIGN GUIDELINES, REGULATIONS, STANDARDS, AND PRACTICES PERTAINING THERETO.
2. ALL WATER SERVICES TO THE SITE (EXCEPTING SINGLE FAMILY DOMESTIC SERVICE LINES, AND SINGLE FAMILY DOMESTIC/FIRE COMBINED SERVICE LINES WHERE THE RESIDENTIAL FIRE SPRINKLER SYSTEM UTILIZES PASSIVE PURGE DESIGN) MUST PASS THROUGH A PRIVATE ABOVE GROUND BACK FLOW PREVENTION DEVICE (BFPD). BFPDs ARE TO BE LOCATED ON PRIVATE PROPERTY (EXCEPT WHERE SHOWN WITHIN TORRANCE STREET R.O.W. HEREON), IN LINE WITH THE SERVICE, AND IMMEDIATELY ADJACENT TO THE RIGHT-OF-WAY. THE PUBLIC UTILITIES DEPARTMENT WILL NOT PERMIT THE REQUIRED BFPDs TO BE LOCATED BELOW GRADE OR WITHIN THE STRUCTURE.

STORMWATER NOTES

1. PRIOR TO THE ISSUANCE OF ANY CONSTRUCTION PERMIT, THE OWNER/PERMITTEE SHALL ENTER INTO A MAINTENANCE AGREEMENT FOR THE ONGOING PERMANENT BMP MAINTENANCE, SATISFACTORY TO THE CITY ENGINEER.
2. PRIOR TO THE ISSUANCE OF ANY CONSTRUCTION PERMIT, THE OWNER/PERMITTEE SHALL INCORPORATE ANY CONSTRUCTION BEST MANAGEMENT PRACTICES NECESSARY TO COMPLY WITH CHAPTER 14, ARTICLE 2, DIVISION 1 (GRADING REGULATIONS) OF THE SAN DIEGO MUNICIPAL CODE.
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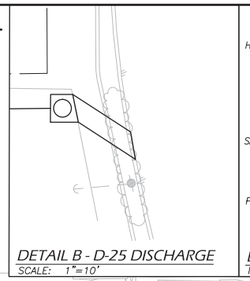

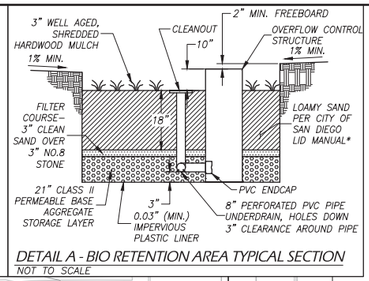

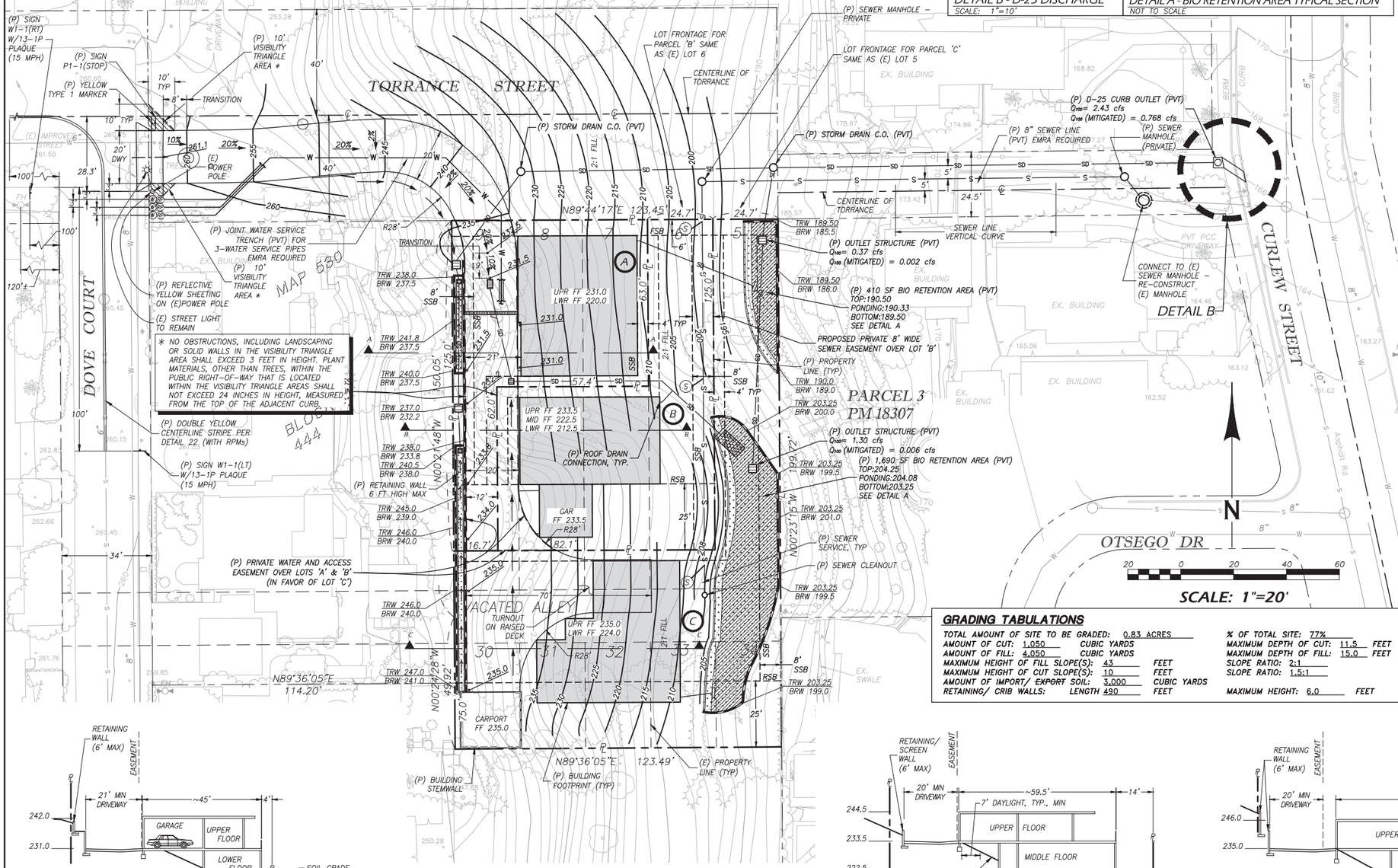

* NO OBSTRUCTIONS, INCLUDING LANDSCAPING OR SOLID WALLS IN THE VISIBILITY TRIANGLE AREA SHALL EXCEED 3 FEET IN HEIGHT. PLANT MATERIALS, OTHER THAN TREES, WITHIN THE PUBLIC RIGHT-OF-WAY THAT IS LOCATED WITHIN THE VISIBILITY TRIANGLE AREAS SHALL NOT EXCEED 24 INCHES IN HEIGHT, MEASURED FROM THE TOP OF THE ADJACENT CURB.

GRADING TABULATIONS

TOTAL AMOUNT OF SITE TO BE GRADED:	0.83 ACRES	% OF TOTAL SITE:	77%
AMOUNT OF CUT:	1,050 CUBIC YARDS	MAXIMUM DEPTH OF CUT:	11.5 FEET
AMOUNT OF FILL:	4,050 CUBIC YARDS	MAXIMUM DEPTH OF FILL:	15.0 FEET
MAXIMUM HEIGHT OF FILL SLOPE(S):	43 FEET	SLOPE RATIO:	2:1
MAXIMUM HEIGHT OF CUT SLOPE(S):	10 FEET	SLOPE RATIO:	1.5:1
AMOUNT OF IMPORT/ ~~EXPORT~~ SOIL:	3,000 CUBIC YARDS		
RETAINING/ CRIB WALLS: LENGTH	490 FEET	MAXIMUM HEIGHT:	6.0 FEET

PROPOSED LOT AREAS

PARCEL	AREA (SQ FT)
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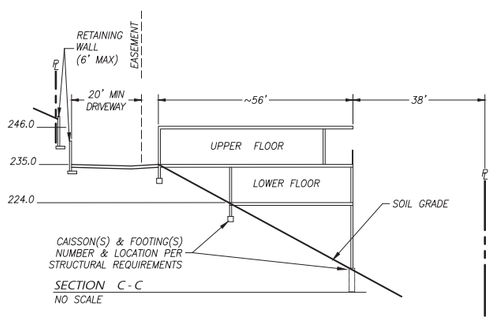
C	12,326

SECTION A-A
NO SCALE

SECTION B-B
NO SCALE



SECTION C-C
NO SCALE

LEGEND

DESCRIPTION	SYMBOL
EXISTING	
PROPERTY LINE (RECORD)	
RIGHT OF WAY	
STREET CENTERLINE	℄
CONTOUR	90
EDGE OF PAVING	
SPOT ELEVATION	+100.00 100.00
BUILDING FOOTPRINT	
SEWER MAIN	S
WATER MAIN	W
FIRE HYDRANT	FH
CHAIN LINK FENCE	
WOOD FENCE	
CHAIN LINK FENCE	X
FREE STANDING WALL	
RETAINING WALL	
TREE; PLANT; PALM	
STREET LIGHT	
PROPOSED	
PROPERTY LINE (ADJUSTED)	N45°45'45"W
CONTOUR	90
STREET CENTERLINE	℄
EDGE OF PAVING	
SPOT ELEVATION	+100.00 100.00
BUILDING FOOTPRINT	
BIO RETENTION AREA (PVT)	
FREE STANDING WALL	
RETAINING WALL	
SEWER LATERAL (PVT)	S
STORM DRAIN LINE (PVT)	SD SD
DRAINAGE SWALE OR DIRECTION OF FLOW	
DRAIN INLET/CATCH BASIN	
TRENCH DRAIN	
RIP RAP ENERGY DISSIPATER	
WATER SERVICE W/BACKFLOW PREVENTION	W RP
RE-CONSTRUCT SEWER MANHOLE	
PARCEL DESIGNATION	X

ABBREVIATIONS

FRONT YARD SETBACK	FSB	EXISTING	(E)
REAR YARD SETBACK	RSB	PROPOSED	(P)
SIDE YARD SETBACK	SSB	CLEAN OUT	C.O.
UPPER	UPR	PRIVATE	PVT
LOWER	LWR	TYPICAL	TYP
FINISH FLOOR	FF		

SOURCE OF TOPOGRAPHY

FIELD TOPO BY:
COFFEY ENGINEERING, INC.
(BY AERIAL METHODS - DATED 2/24/16)
JOHN S. COFFEY, PLS 8733, EXP 6/30/2018

BENCHMARK

NWBP AT OTSEGO DRIVE AND CURLEW STREET
ELEV.=159.882, NGVD 29, CITY OF SAN DIEGO VERT CONTROL BOOK

NOTE:
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SHEET INDEX

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COFFEY ENGINEERING, INC.
9866 BUSINESSPARK AVENUE, SUITE 210, SAN DIEGO, CA 92131 PH (858)831-0111 FAX (858)831-0179

PRELIMINARY - FOR REVIEW

REGISTERED PROFESSIONAL ENGINEER JOHN S. COFFEY No. C062716 CIVIL STATE OF CALIFORNIA

TORRANCE STREET

TORRANCE STREET
SAN DIEGO, CA 92103

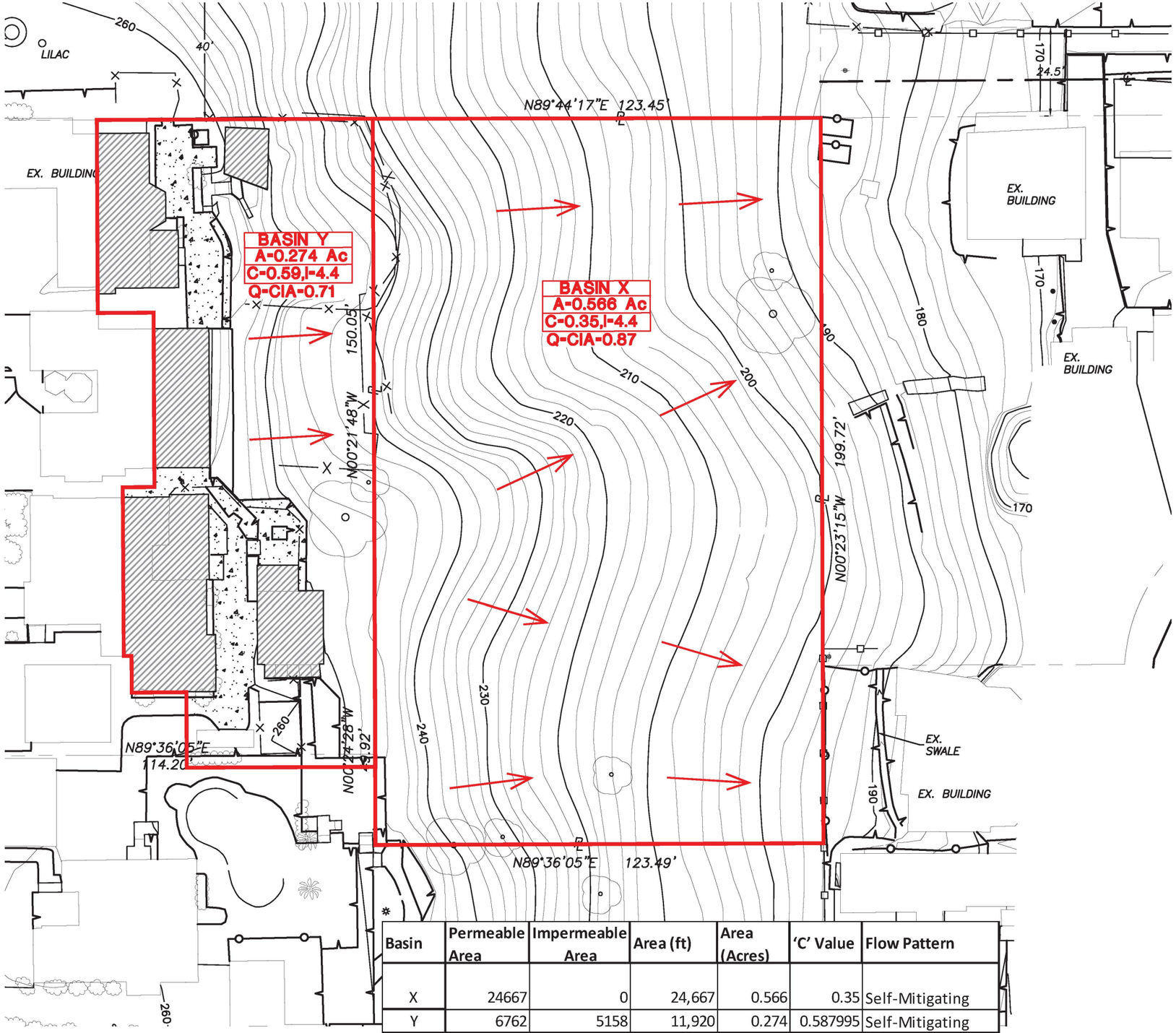
DRAWN BY:	GC/DK
CHECKED BY:	JC
ORIGINAL	5/11/17
REVISION 1	
REVISION 2	
REVISION 3	
REVISION 4	
REVISION 5	

PRELIMINARY GRADING AND DRAINAGE PLAN

SCALE: 1"=20'

C.1

SHT 1 OF 2 SHTS



LEGEND

DESCRIPTION	SYMBOL
PROPERTY LINE	
EXISTING CONTOUR	90
DIRECTION OF FLOW	
SITE BASIN LIMIT	

N

SCALE: 1"=30'

Basin	Permeable Area	Impermeable Area	Area (ft)	Area (Acres)	'C' Value	Flow Pattern
X	24667	0	24,667	0.566	0.35	Self-Mitigating
Y	6762	5158	11,920	0.274	0.587995	Self-Mitigating
Total	31429	5158	36587	0.840		

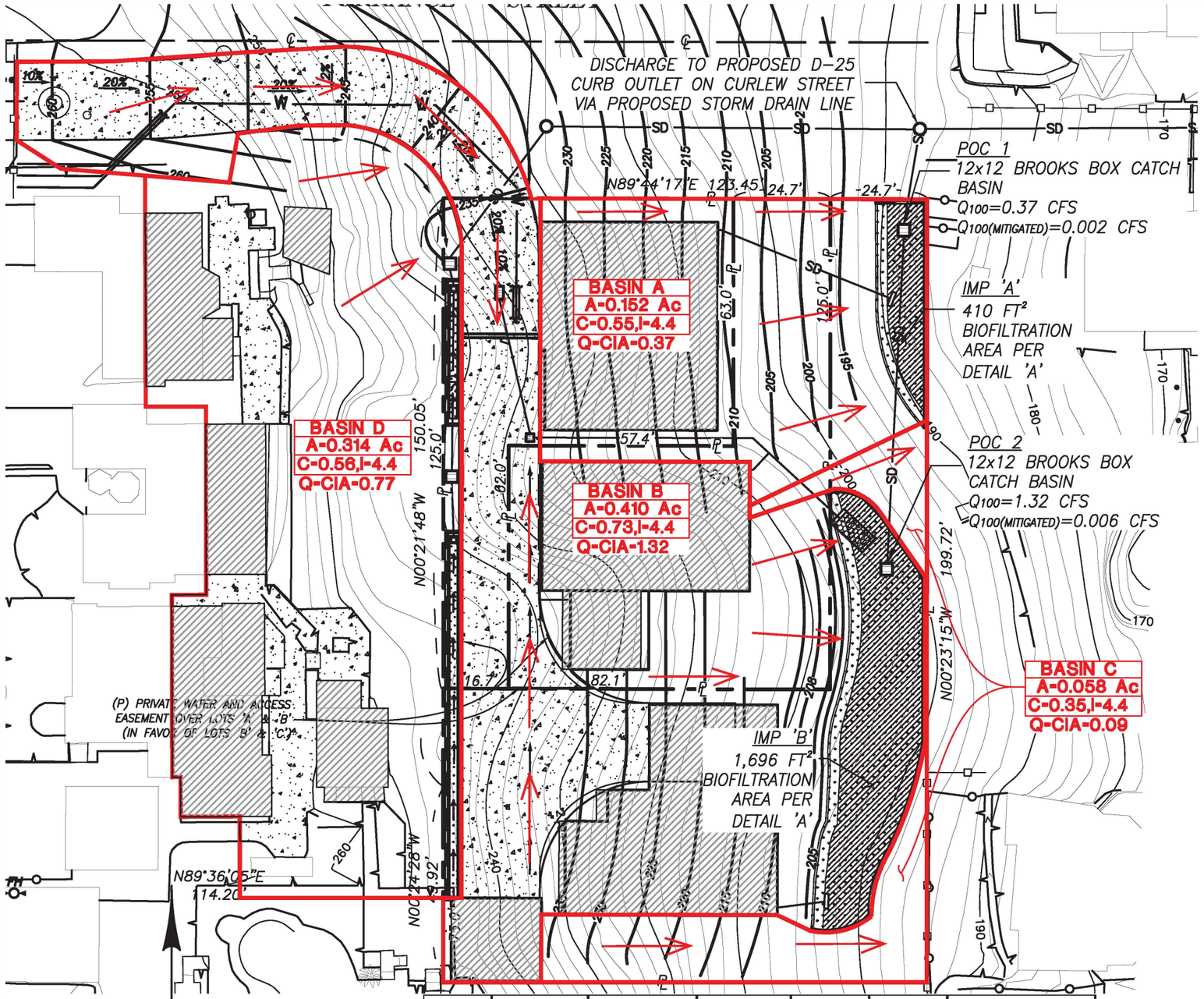
COFFEY ENGINEERING, INC.

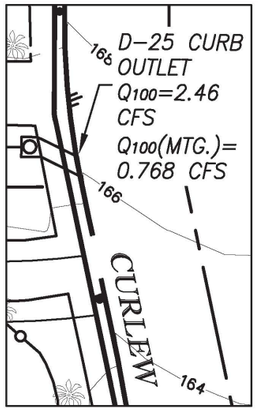
TORRANCE 5

Torrance St , San Diego CA 92103

DRAINAGE MAP 'A'
EXISTING CONDITIONS

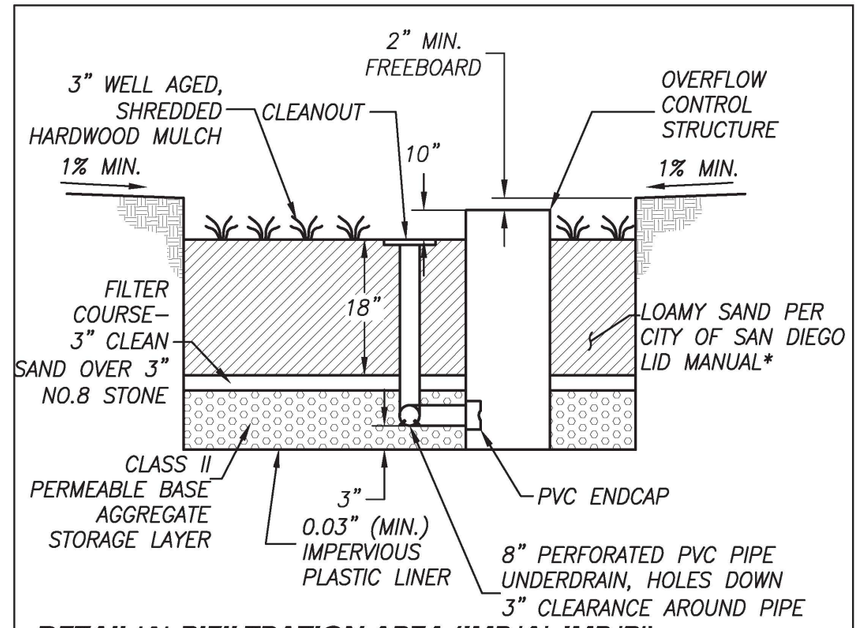
SCALE: 1"=30'





LEGEND

DESCRIPTION	SYMBOL
PROPERTY LINE	
EXISTING CONTOUR	90
PROPOSED CONTOUR	90
DIRECTION OF FLOW	
PVC PIPE	
DMA LIMIT	
IMPERVIOUS AREAS	
PERVIOUS AREAS	
BIOFILTRATION BASIN	



DETAIL 'A'-BIFILTRATION AREA (IMP 'A', IMP 'B')
TYPICAL SECTION
NOT TO SCALE

Basin	Permeable Area	Impermeable Area	Area (ft)	Area (Acres)	'C' Value	Flow Pattern
A	4230	2398	6,628	0.152	0.55	Biofiltration
B	5628	12217	17,845	0.410	0.73	Biofiltration
C	2540	0	2,540	0.058	0.35	Self-Mitigating
D	8541	5158	13,699	0.314	0.56	Run-on redirected
Total	20939	19773	40,712	0.935		

SITE CHARACTERISTICS

- HYDROLOGIC SOIL GROUP.....D
- APPROXIMATE DEPTH TO GROUND WATER.....>24'
- CRITICAL COARSE SEDIMENT YIELD AREAS.....PRESENT ON SITE

COFFEY ENGINEERING, INC.

TORRANCE 5
Torrance Street, San Diego CA 92103

Appendix B –Calculation/Evaluations

100 Year Storm

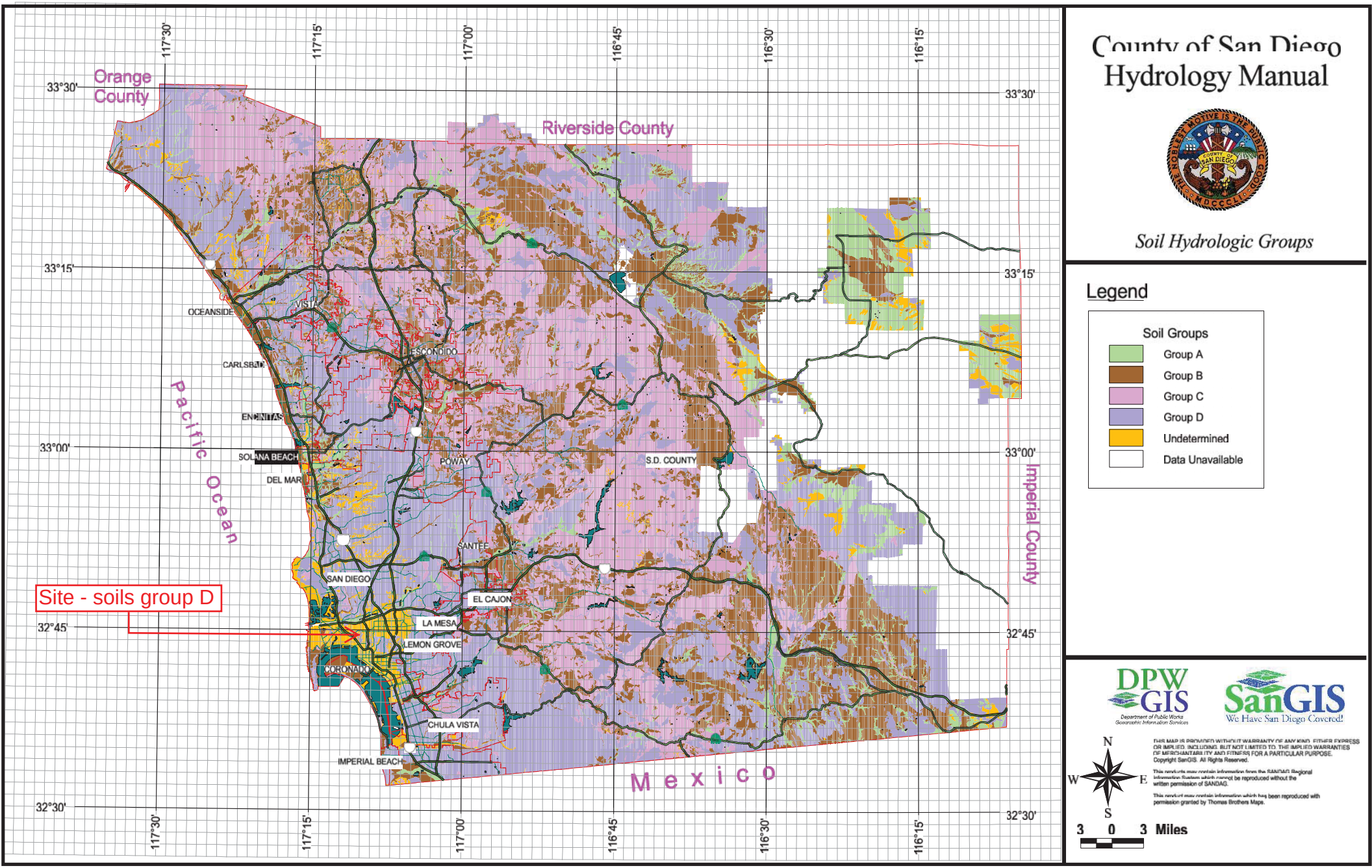
Table B - Pre Construction Flow Conditions							
		Summary					
Flow ID (Basin)	Runoff Coefficient, C	(5 min minimum) Total time-of-concentration, T_c (min)	Rainfall Intensity, I (in/hr)	Basin Area, A (acres)	**Q (cfs)**	Flow ID (Basin)	Flow Description
X	0.35	5.00	4.40	0.566	**0.87**	X	Sheet-flow offsite (Runoff)
Y	0.59	5.00	4.40	0.274	**0.71**	Y	Sheet-flow offsite (Runon)
				Sum =	1.58		

Table B - Post Construction Flow Conditions						Table B - Hydraulics of Proposed Structures	
		Summary					
Flow ID (Basin)	Runoff Coefficient, C	(5 min minimum) Total time-of-concentration, T_c (min)	Rainfall Intensity, I (in/hr)	Basin Area, A (acres)	**Q (cfs)**	Flow ID (Basin)	Flow Description
A	0.55	5.00	4.40	0.152	**0.37**	A	Sheet flow to flow-thru planter
B	0.73	5.00	4.40	0.410	**1.32**	B	Drains to flow-thru planter
C	0.35	5.00	4.40	0.058	**0.09**	C	Self-Mitigating
D	0.56	5.00	4.40	0.314	**0.77**	D	Connect to drain offsite (Runon)
				Sum =	2.55		

	Pre-Construction (CFS)	Post-Construction (Non-Mitigated) (CFS)	Post-Con (Mitigated)** (CFS)
Site Discharge	1.58	2.55	0.870

**** Post-Construction site discharge is calculated by taking the site discharge (including run-on) and subtracting the basins contributing to the biofiltration basin (Basins A & B). Using the orifice discharge equation in Attachment 2, the orifice flow rate is then added to the remaining site flow rate to calculate the total mitigated flow rate discharging to the hillside.**

Appendix C –Reference Tables & Figures (County of San Diego Hydrology Manual)



County of San Diego Hydrology Manual

Soil Hydrologic Groups

Legend

Soil Groups

- Group A
- Group B
- Group C
- Group D
- Undetermined
- Data Unavailable

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Department of Public Works
Geographic Information Services

SanGIS
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Table 3-1
RUNOFF COEFFICIENTS FOR URBAN AREAS

Land Use		Runoff Coefficient "C"				
			Soil Type			
NRCS Elements	County Elements	% IMPER.	A	B	C	D
Undisturbed Natural Terrain (Natural)	Permanent Open Space	0*	0.20	0.25	0.30	0.35
Low Density Residential (LDR)	Residential, 1.0 DU/A or less	10	0.27	0.32	0.36	0.41
Low Density Residential (LDR)	Residential, 2.0 DU/A or less	20	0.34	0.38	0.42	0.46
Low Density Residential (LDR)	Residential, 2.9 DU/A or less	25	0.38	0.41	0.45	0.49
Medium Density Residential (MDR)	Residential, 4.3 DU/A or less	30	0.41	0.45	0.48	0.52
Medium Density Residential (MDR)	Residential, 7.3 DU/A or less	40	0.48	0.51	0.54	0.57
Medium Density Residential (MDR)	Residential, 10.9 DU/A or less	45	0.52	0.54	0.57	0.60
Medium Density Residential (MDR)	Residential, 14.5 DU/A or less	50	0.55	0.58	0.60	0.63
High Density Residential (HDR)	Residential, 24.0 DU/A or less	65	0.66	0.67	0.69	0.71
High Density Residential (HDR)	Residential, 43.0 DU/A or less	80	0.76	0.77	0.78	0.79
Commercial/Industrial (N. Com)	Neighborhood Commercial	80	0.76	0.77	0.78	0.79
Commercial/Industrial (G. Com)	General Commercial	85	0.80	0.80	0.81	0.82
Commercial/Industrial (O.P. Com)	Office Professional/Commercial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (Limited I.)	Limited Industrial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (General I.)	General Industrial	95	0.87	0.87	0.87	0.87

*The values associated with 0% impervious may be used for direct calculation of the runoff coefficient as described in Section 3.1.2 (representing the pervious runoff coefficient, Cp, for the soil type), or for areas that will remain undisturbed in perpetuity. Justification must be given that the area will remain natural forever (e.g., the area is located in Cleveland National Forest).
DU/A = dwelling units per acre
NRCS = National Resources Conservation Service

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ATTACHMENT 6
GEOTECHNICAL AND GROUNDWATER INVESTIGATION REPORT

Attach project's geotechnical and groundwater investigation report. Refer to Appendix C.4 to determine the reporting requirements.

ALLIED EARTH TECHNOLOGY

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ROBERT CHAN, P.E.

GEOTECHNICAL INVESTIGATION

FIVE PROPOSED SINGLE-FAMILY RESIDENTIAL BUILDING SITES

SOUTH SIDE OF TORRANCE STREET,

BETWEEJ CURLEWE STREET AND DOVE COURT

SAN DIEGO, CALIFORNIA

NAKHSHAB DEVELOPMENT & DESIGN INC.

PROJECT NO. 16-1268J6

MARCH 4, 2016

ALLIED EARTH TECHNOLOGY

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ROBERT CHAN, P.E.

March 4, 2016

Nakhshab Development & Design, Inc.
2900 4th Avenue, Suite 100
San Diego, CA. 92103

Subject : Project No. 16-1268J6
Geotechnical Investigation
Five Proposed Residential Building Sites
South Side of Torrance Street, between Curlew Street and Dove Court
San Diego, California

Gentlemen :

In accordance with your request, we have completed the geotechnical investigation for the five proposed residential building sites on subject property, more specifically referred to as being a portion of Block No. 444 of Seaman's point, according to Map thereof No. 530, , in the City and County of San Diego, State of California.

We are pleased to submit the accompanying geotechnical investigation report to present our findings, conclusions and recommendations relative to the proposed development of the site.

The geotechnical investigation was conducted under the supervision of the undersigned. The scope of our investigation included field exploration, laboratory testing and soil engineering analysis.

No major adverse geotechnical conditions were encountered which would prohibit the currently proposed development of the site.

This opportunity to be of service is sincerely appreciated. Should you have any questions, please do not hesitate to contact our office.

Respectfully submitted,
ALLIED EARTH TECHNOLOGY

ROBERT CHAN, P.E.

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Figure No. 1 - Site Location Map
Figure No. 2 – Approximate Location of Exploratory Borings
Figure Nos. 3 to 6, inclusive – Boring Log Sheet

Appendix I – General Grading and Earthwork Specifications
Appendix II – Laboratory Test Results
Appendix III - References

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ROBERT CHAN, P.E.

March 4, 2016

GEOTECHNICAL INVESTIGATION

INTRODUCTION

This report presents the findings and conclusions of a geotechnical investigation conducted at the site of five proposed residential buildings on subject property, located on the south side of Torrance Street, between Curlew Street and Dove Court, in the City and County of San Diego, State of California.

Subject property is more specifically referred to as being a portion of Block No. 444 of Seaman's Point, according to Map thereof No. 530 (APN 451-292-06-00)

The location of the property is shown on Figure No. 1, entitled, "Site Location Map".

DESCRIPTION OF PROJECT

It is our understanding that five single-family residences are to be constructed on the Property. The proposed structures will be two stories in height; of wood-frame/stucco and slab-on-grade construction.

SCOPE OF WORK

The objectives of the investigation were to inspect and determine the subsurface soil conditions and certain physical engineering properties of the soils beneath the site, and to evaluate any potential adverse geotechnical conditions that could affect the

proposed project, in order that engineering recommendations could be presented relative to the safe and economical development of the site; and checking and design of foundation for the proposed residential structures.

In order to accomplish these objectives, four exploratory borings were excavated and inspected, and representative samples of the subsurface soils were collected for laboratory testing and analysis.

The data derived from the field observations and laboratory test results were reviewed and analyzed, and a summary of our preliminary findings, opinions and recommendations is presented in this report.

FIELD INVESTIGATION

The field exploratory phase of our investigation was performed on February 9, 2016, and involved a reconnaissance of the site, and the excavation of four exploratory borings with a portable motorized continuous flight auger.

The exploratory borings were excavated at various locations on the site where the most useful information relative to subsurface soil conditions may be obtained. The exploratory borings were excavated to depths varying from 6 to 7 feet below existing ground surface. The locations of the exploratory borings is shown on Figure No. 2, entitled, "Approximate Location of Exploratory Borings".

The drilling operation was performed under the direction of our field personnel, and a

continuous log of the soil types encountered in the borings was recorded at the time of excavation, and is shown on Figure Nos. 3 to 6, inclusive, each entitled, "Boring Log Sheet".

The soils were visually and texturally classified by the field identification procedures set forth on the Unified Soil Classification Chart. Representative samples were obtained and the in-situ densities of the soils encountered were determined.

LABORATORY TESTS

The samples collected during our field investigation were subjected to various tests in the laboratory to evaluate their engineering characteristics. The tests were performed in accordance with current A.S.T.M. testing standards or other regulatory agency testing procedures. A summary of the tests that were performed and the final test results are presented in Appendix II hereto.

The tests that were performed included determinations of the maximum dry densities and optimum moisture contents; the sulfate contents and Expansion Indices of the soils encountered.

SITE DESCRIPTION

Subject property is a rectangular-shaped property of approximately 0.57 acres, situated on the south side of the Torrance Street right-of-way, between Curlew Street and Dove Court. The general topography of the site may be described as sloping relatively steeply in an easterly direction at gradients on the order of 35 to 40 percent.

The site is currently vacant, and covered with a thick growth of grass and weeds. Several eucalyptus and palm trees were also observed on the site. There were signs of past grading on the site. Undocumented fill soils were encountered in the upper, east portion of the property, as well

as excavations and cut slopes. Maximum thickness of the undocumented fill soils is on the order of 6 to 7 feet; with excavations on the order of 5 to 6 feet. However, due to the thickness of the existing vegetation, accurate quantities of excavation and fill placed on the site cannot be determined at this time. the remnants of a structure in the upper southwest portion of the property. Approximate location of the existing cut and fill areas are delineated on Figure No. 2

The properly is located in a developed area of the City of San Diego. The site is bounded on the north by the Torrance Street right-of-way and residences beyond; and on the east, south and west by existing residences.

PROPOSED SITE DEVELOPMENT

Site development will consist of the construction of five single-family residences. The proposed structures will be two stories in height; of wood-frame/stucco and slab-on-grade construction. The residences will generally follow the contour of the land, with minimum grading proposed.

GENERAL GEOLOGY AND SUBSURFACE SOIL CONDITIONS

Regional Geology

The subject property is located within the southern coastal strip region of the Peninsular Range Geomorphic Province of California. This geomorphic province is characterized by mountainous terrain to the east composed mostly of Mesozoic igneous and metamorphic rocks and relatively low-lying coastal terraces to the west underlain by late Cretaceous, Tertiary and Quaternary sedimentary rocks. The southeast portion of the City of San Diego, including the site, occurs within the westerly region and is underlain by sedimentary rocks.

Site Geology and Subsurface Soil Conditions

A review of geologic maps as well as observations made during our subsurface exploration indicated that the general area is underlain by Pliocene San Diego Formation. On subject property, as encountered in the exploratory borings, the San Diego Formation was encountered in the form of medium dense to dense light gray/tan silty sands, overlain by approximately 24 to 30 inches of slopewash or colluvium, in the form of loose and porous, brown silty sands

Tectonic Setting

No evidence of faulting was noted during our surface reconnaissance or in our exploratory borings. A review of available geologic literature did not reveal any major faulting in the area. It should be noted that much of southern California, including the City of San Diego area, is characterized by a series of Quaternary-age fault zones which typically 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.

A review of available geologic maps indicate that the subject property is approximately 2.1 km (1.3 miles) from the Rose Canyon Fault zone, and 63.0 km (39.4 miles) from the Elsinore-Julian Fault zone.

GROUNDWATER

No groundwater was encountered in the exploratory borngs to the maximum

depth of exploration at 7 feet. Based on our knowledge of groundwater level in this area of the City of San Diego, the depth to groundwater is on the order of 35 to 40 feet below existing ground level. No groundwater related problems, either during or after construction, are anticipated. However, it should be recognized that minor seepage problems may occur after development of a site even where none were present before development. These are usually minor phenomena and are often the results of an alteration of the permeability characteristics of the soils; an alteration in drainage patterns due to grading; and an increase in the use of irrigation water. Based on the permeability characteristics of the soils and anticipated usage of the development, it is our opinion that any seepage problems which 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 develop.

GEOLOGIC HAZARDS

Ground shaking – The most likely geologic hazard to affect the site is ground shaking as a result of movement along one of the active fault zones mentioned above.

For seismic design purposes, soil parameters in accordance with the 2013 edition of the California Building Code were determined, and presented hereinafter.

Surface Rupture - Surface rupture is the result of movement of an active fault reaching the surface. No faults were observed during our investigation of the site. Based on our observations, experience and review of the referenced geotechnical and geologic literature, it is our opinion that

there is little probability of surface rupture due to faulting beneath the site. However, lurching and ground cracking are a possibility as a result of a significant seismic event on a regional active fault.

Liquefaction Potential - In consideration of the dense sedimentary rocks underlying the site, and the lack of a high groundwater level, it is our opinion that soil liquefaction does not present a significant geotechnical hazard to the proposed site development.

Landslides – Subject property is situated on relatively steep terrain, and underlain by competent formational rocks. Available geologic maps did not reveal the presence of any ancient landslides on subject or adjacent properties. The potential for landslides on subject and adjacent properties is considered minimal.

FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

General

1. Based on the results of the investigation, it is our opinion that the currently proposed site development is feasible from a geotechnical engineering standpoint, provided that the recommendations presented in this report are incorporated into the design plan(s) and are properly implemented during the construction phase.

2. It is noted that some of the recommendations may have to be modified and supplemental recommendations may have to be presented, depending on the actual subsurface conditions encountered during construction.

3. Site grading and earthwork constructions will not impact the adjacent properties provided our recommendations are incorporated into the final designs and

implemented during the construction phase. Additional field recommendations, however, may also be necessary and should be given by the project geotechnical consultant for the protection of adjacent properties and should be anticipated.

4. Prior to commencement of construction, a preconstruction conference should be held at the site with the owner, grading contractor, civil engineer and geotechnical engineer in attendance. Special soil handling and/or grading improvement plan requirements can be discussed at that time

Expansion Index of On-Site Soils

5. The soils encountered on the site possess low expansion potential (Expansion Index = 33). Recommendations presented hereinafter reflects this on-site soil condition

Sulfate Content of On-Site Soils

6. The soils encountered on the site are subject to negligible sulfate exposure (sulfate content of 38 ppm).

Grading

7. It is recommended that all earthwork be accomplished in accordance with the Grading Ordinance of the City of San Diego, current edition of the California Building Code, Appendix I attached hereto, entitled, "General Grading and Earthwork Specifications", and recommendations as presented in this Section.

8. Where the recommendations of this Section of the report conflict with those of

Appendix I, this Section of the report takes precedence.

9. Grading operations should begin with the clearing and grubbing of the site, and hauling away of the debris to an approved dump site.

10. Only minor grading will be required for the development of the site, primarily creating level pads for the garages along the front, east side of the property. It is anticipated that cuts on the order of 10 feet in height will be made during the excavation. It is recommended that cuts into the formational soils be accomplished at near vertical for a height of 5 feet. Above a height of 5 feet, especially in the loose colluvial soils, the excavation should be flattened to a slope ratio of ½ : 1 (horizontal : vertical).

11. The excavated soils should be properly exported to a City-approved dump site.

12. Backfill soils behind the basement retaining walls will be necessary. On-site non-expansive soils may be used as backfill.

13. All fill soils should be compacted to at least 90 percent of maximum dry density at near optimum moisture content, in accordance with A.S.T.M. D1557.

Foundation and Slab Design

14. It is recommended that a safe allowable soil bearing value of 2,000 pounds per square foot be used for the design and checking of continuous footings that are 12 inches in minimum horizontal dimension, and isolated pier footings that are 15 inches in minimum horizontal dimension; and are embedded 12 inches (for single

story) or 18 inches (for two stories) below the lowest adjacent ground surface.

15. The above safe allowable soil bearing value may be increased by one-third when considering wind and/or seismic forces.

16. The settlements of foundation, when designed and loaded as outlined above, are expected to be less than 1 ½ inch total and 1 inch differential over a span of 40 eet.

17. It is recommended that all continuous footings be reinforced with a minimum of 4 #5 rebars; two rebars located near the top, and the other two rebars near the bottom of the footings. All isolated pier footings should be reinforced with a minimum of 2 #5 rebars in both directions, placed near the bottom of the footings.

18. The concrete slab-on-grade should be 4 ½ inches in thickness, and be reinforced with #3 rebars @ 18 inches on center in both directions, placed at mid-height of concrete slab. The slab reinforcement should extend into the perimeter footings at least 6 inches.

Under-Slab Vapor Retarders

19. The concrete slab should be underlain by 4 inches of clean sand, a 10-mil plastic membrane moisture barrier, and another one inch of clean sand cover. The seams of the plastic membrane should be sealed and should extend at least 12 inches down the placed in accordance with the recommendation and consideration of ACI 302, "Guide for

Concrete Floor and Slab Construction" and ASTM 1643, "Standard Practice for Installation of Water Vapor Retarder Used in Contact with Earth or Granular Fill Under Concrete Slabs". The above foundation and slab reinforcement requirements are based on soil characteristics, and should be superseded by the requirements of the project architect.

20 It is recommended that our firm inspect the foundation trench excavations for the proposed residential structures to ensure proper embedment into competent natural or compacted fill soils.

Retaining Wall Design

21. It is recommended that retaining walls be designed to withstand the pressure exerted by equivalent fluid weights given below :

Backfill Surface (horizontal : vertical)	Equivalent Fluid Pressure (pcf)
Level	35
2 : 1	50
1 ½ : 1	58

The above values assume that the retaining walls are unrestrained from movement, and have a granular backfill. For retaining walls restrained from movement at the top, such as basement retaining walls, an uniform horizontal pressure of 7H (where H is the height of the retaining wall in feet) should be applied in addition to the active pressures recommended above.

22. All retaining walls should be supplied with a backfill drainage system adequate to prevent the buildup of hydrostatic pressure. The subdrain should consist of one-inch gravel and a perforated pipe near the bottom of the retaining wall. The width of this subdrain should be at least 12 inches, and extend at least 2/3 height of the retaining wall. The subdrain should be enclosed in a geotextile fabric such as Mirafi 140N or equal. Prefabricated subdrains such as Miradrain 2000 series or "J" Drains 400 series may also be used.

Seismic Earth Pressure

23. Seismic earth pressures can be taken as an inverted triangular distribution with a maximum pressure at the top equal to 12H pound per square foot (with H being the height of retained earth in feet). This pressure is in addition to the static design wall load. The allowable passive pressure and bearing capacity can be increased by 1/3 in determining the stability of the wall. A factor-of-safety of 1.2 can be used in determining the stability of the retaining wall under seismic conditions.

Lateral Loading

24. To resist lateral loads, it is recommended that the pressure exerted by an equivalent fluid weight of 300 pcf be used for footings or shear keys poured neat against competent natural or compacted fill soils. The upper 12 inches of material in areas not protected by floor slabs or pavements should not be included in the design for passive resistance. This value assumes that the horizontal distance of the soil mass extends at least 10 feet or three times the height of the surface generating the passive pressure, whichever is greater.

25. A coefficient of sliding friction of 0.35 may be used for cast-in-place concrete on competent natural or compacted fill soils. Footings can be designed to resist lateral loads by using a combination of sliding friction and passive resistance. The coefficient of friction should be applied to dead load forces only.

Seismic Coefficients

26. The seismic design factors were determined in accordance with the 2013 California Building Code, and presented below :

Site Coordinates :		Latitude	=	32.7377
		Longitude	=	- 117.1708
Site Class :			=	D
Site Coefficient Fa			=	1.00
Site Coefficient Fv			=	1.50
Spectral Response Acceleration				
At Short Periods		Ss	=	1.581
Spectral Response Acceleration				
At 1-second Period		S1	=	0.617
Sms	= FaSs		=	1.581
Sm1	= FvS1		=	0.926
Sds	= 2/3*Sms		=	1.955
Sd1	= 2/3*Sm1		=	0.618

Concrete Flatwork

27. In consideration of the on-site soil conditions, it is recommended that concrete flatwork be a minimum of 3 ½ inches in thickness, and be reinforced with 6x6-W1.4xW1.4 (6x6-10/10) welded wire mesh, placed at mid-height of concrete slab. One inch expansion joints should be provided at 15-foot intervals, with ¼ inch weakened plane contraction joints at 5-foot intervals.

Surface Drainage and Maintenance

28. Adequate drainage control and proper maintenance of all drainage facilities are imperative to minimize infiltration of surface water into the underlying soil mass in order to reduce settlement potential and to minimize erosion. The building pad should have drainage swales which direct storm and excess irrigation water away from the structures and into the street gutters or other drainage facilities. No surface runoff should be allowed to pond adjacent to the foundation of structures.

Grading and Foundation Plans Review

29. It is recommended that our firm review the final grading and foundation plans for the proposed site development to verify their compliance with our recommendations.

LIMITATION AND UNIFORMITY OF CONDITIONS

1. The preliminary findings and recommendations contained in this report pertain only to the site investigated and are based on the assumption that the soil conditions beneath the entire site do not deviate substantially from those disclosed in the exploratory trenches. If any variations or undesirable conditions are encountered during grading, or if the scope of the project differs from that planned at the present time, our firm should be notified in order that supplemental recommendations can be presented, if necessary.

2. This report is issued with the understanding that it is the responsibility of the Owner, or his representative, to ensure that the information and recommendations presented herein are brought to the attention of the Project Architect and Engineer

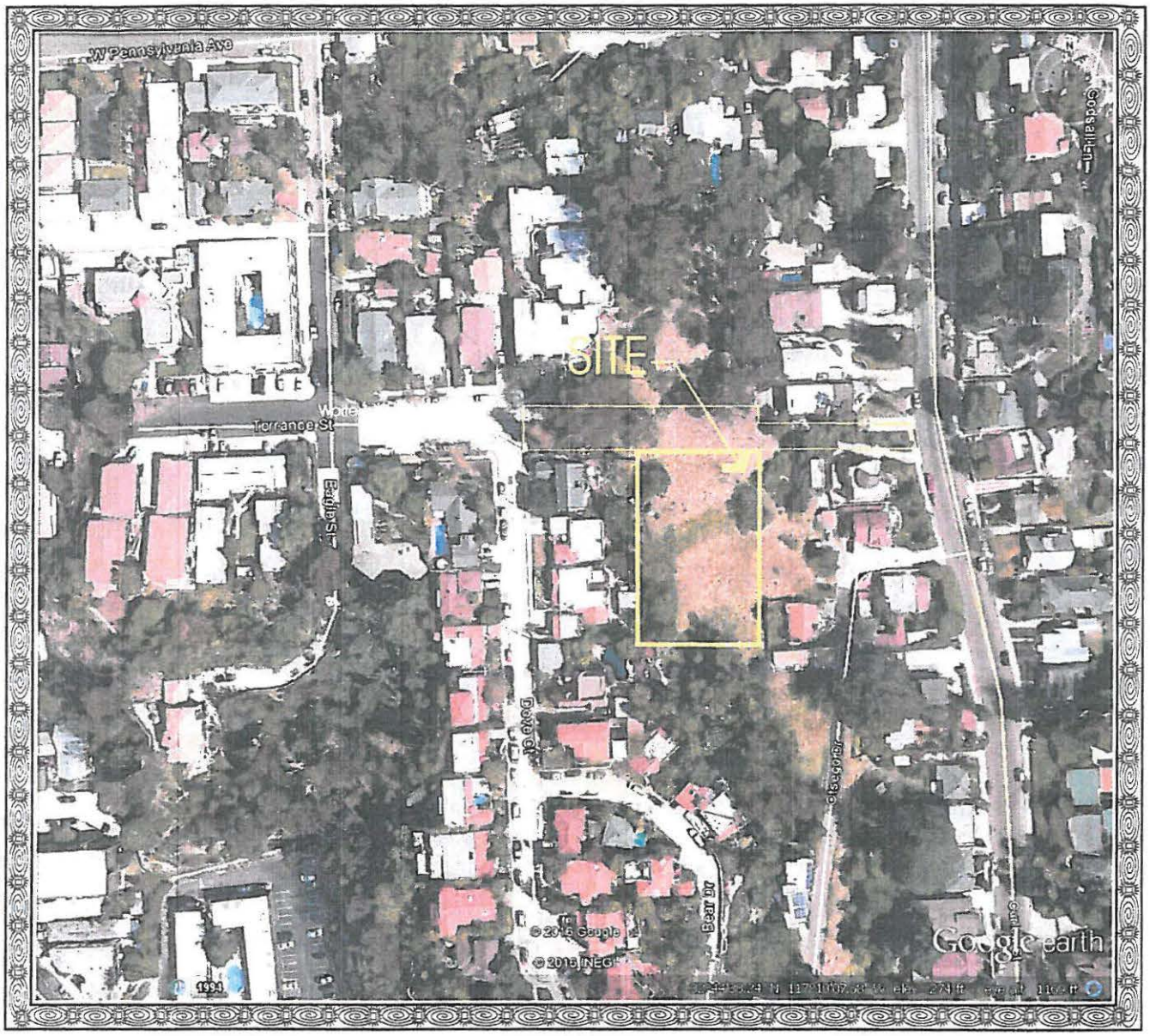
and are incorporated into the plans and specifications for the project. Furthermore, the Owner, or his representative, will also be responsible for taking the necessary measures to ensure that the Contractor and subcontractors properly carry out the recommendations in the field.

3. Professional opinions and recommendations presented in this report are based partly on our evaluation and analysis of the technical information gather during the study, partly on the currently available information regarding the proposed project, and partly on our previous experience with similar soil conditions and projects of similar scope. Our study has been performed in accordance with the minimum standards of car exercised by other professional geotechnical consultants currently practicing in the same locality. We do not, however, guarantee the performance of the proposed project in any respect, and no warranties of any kind, expressed or implied, are made or intended in connection with the study performed by our firm.

4. The findings and recommendations contained in this report are valid as of the present date. However, changes in the conditions of the property could occur with the passage of time, whether they be due to natural processes or due to man-made actions on the subject and/or adjacent properties. In addition, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this

report may be invalidated, wholly or partially, by changes outside of our control. Therefore, this report is subject to review by our firm and should not be relied upon after a period of two years.

Figure Nos. 1 to 6, inclusive, and Appendices I to III are parts of this report.

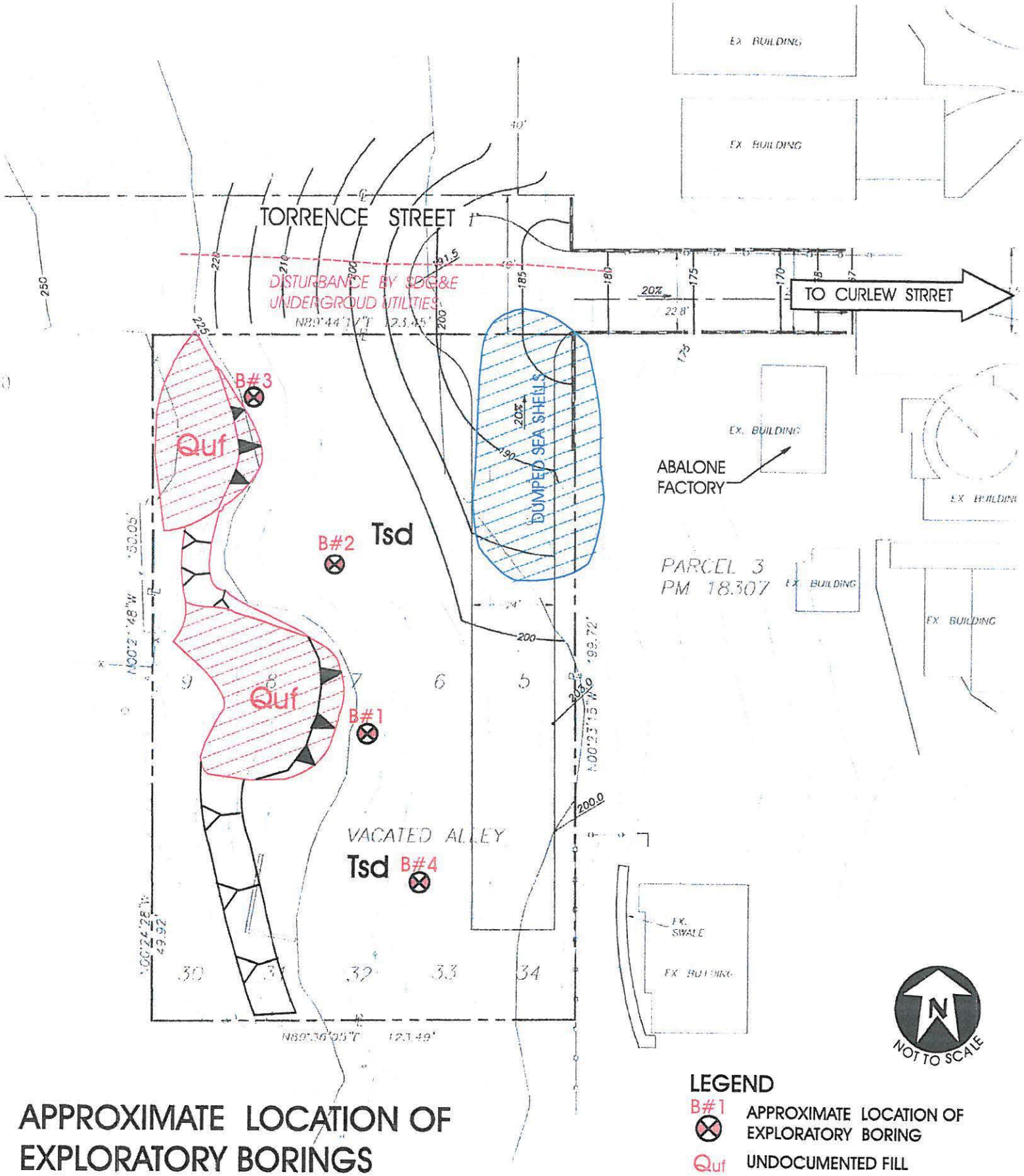


SITE LOCATON MAP

NOT TO SCALE

PROJECT NO. 16-1268 J6

FIGURE NO.1



APPROXIMATE LOCATION OF EXPLORATORY BORINGS

LEGEND

- B#1 ⊗ APPROXIMATE LOCATION OF EXPLORATORY BORING
- Quf UNDOCUMENTED FILL
- Tsd SAN DIEGO FORMATION

PROJECT NO. 16- 1268 J6

FIGURE NO.2

BORING LOG SHEET

BORING NO. 1
Elev. 220' msl

FT.		DESCRIPTION		SOIL TYPE
0		Brown, damp, loose (Colluvium)		SILTY FINE SANDS (SM)
1				
2			5*	
3	(1)	Tan/light gray, moist, medium (San Diego Formation)		SILTY FINE SANDS (SM))
4			12*	
5			18*	
6			16*	
7			22*	

BOTTOM OF BORING (No Refusal)

LEGEND

◯ - Indicates representative sample
* - Indicates blowcount/10 cm/Triggs penetrometer

	Granular		Cohesive
0	Very loose	0	Very soft
5	Loose	2	Soft
11	Medium dense	5	Medium stiff
31	Dense	9	Stiff
51	Very dense	16	Very stiff
		31	Hard

Project No. 16-1268J6

Figure No. 3

BORING LOG SHEET

BORING NO. 2
Elev. 214' msl

FT.		DESCRIPTION		SOIL TYPE
0		Brown, damp, loose (Colluvium)		SILTY FINE SANDS (SM)
1				
2	(1)			
3				
4		Tan/light gray, moist, medium (San Diego Formation)	21*	SILTY FINE SANDS (SM))
5			18*	
6			26*	

BOTTOM OF BORING (No Refusal)

BORING LOG SHEET

BORING NO. 3
Elev. 217' msl

FT.	DESCRIPTION		SOIL TYPE
0	Brown, damp, loose (Colluvium)		SILTY FINE SANDS (SM)
1			
2			
3			
4	Tan/light gray, moist, medium (San Diego Formation)	19*	SILTY FINE SANDS (SM))
5		18*	
6		27*	

BOTTOM OF BORING (No Refusal)

Project No. 16-1268J6

Figure No. 5

ALLIED EARTH TECHNOLOGY

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ROBERT CHAN, P.E.

APPENDIX I

GENERAL GRADING AND EARTHWORK SPECIFICATIONS

1.0 General

1.1 All earthwork shall be accomplished in accordance with the Grading Ordinance of the City of San Diego; Chapter 18 and 18A, and Appendix J of the 2010 edition of the California Building Code; Appendix I hereinafter, and recommendations as presented in the Geotechnical Report.

1.2 These recommended grading and earthwork specifications are intended to be a part of and to supplement the Geotechnical Report(s). In the event of a conflict, the recommendations of the Geotechnical Report(s) will supercede these specifications. Observations during the course of earthwork operations may result in addition, new or revised recommendations that could supercede these specifications and/or the recommendations in the Geotechnical Report(s).

1.3 The Owner or his authorized representative shall procure the services of a qualified Geotechnical Consulting Firm, hereinafter to be referred to as the "Geotechnical Consultant" (often the same entity that produced the Geotechnical Report(s).

1.4 The Geotechnical Consultant shall be given a schedule of work by the Earthwork contractor for the subject project, so as to be able to perform required observations; testing and mapping of work in progress in a timely manner.

1.5 The work herein includes all activities from clearing and grubbing through fine grading. Included are trenching, excavating, backfilling compacting and grading. All work shall be as shown on the approved project drawings.

1.6 The Geotechnical Consultant or a qualified representative shall be present on the site as required, to observe, map and document the subsurface exposures so as to verify the geotechnical design suppositions. In the event that observed conditions are found to be significantly different from the interpreted conditions during the design phase, the Geotechnical

Consultant shall notify the Owner, recommend appropriate changes in the design to suit the observed conditions and notify the agenc(ies) having jurisdiction, where required. Subsurface areas to be geotechnically observed, mapped, record elevations or tested included cleared natural ground for receiving fill or structures, "remedial removal" areas, key bottoms and benches.

1.7 The guidelines contained herein and any standard details attached herewith represent this firm's recommendations for the grading and all associated operations on the subject project. These guidelines shall be considered to be a part of these Specifications.

1.8 If interpretation of these guidelines or standard details result in a dispute(s), the Geotechnical Consultant shall conclude the appropriate interpretation.

1.9 The Geotechnical Consultant shall observe the processing of subgrade and fill materials and perform the necessary compaction testing. The test results shall be provided to the Owner and the Contractor and if so required, to the agenc(ies) having jurisdiction.

1.10 The Geotechnical Consultant shall not provide "supervision" or any "direction" of work in progress to the Earthwork Contractor, or to any of the Contractor's employees or to any of the Contractor's agent.

1.11 The Earthwork Contractor : The Earthwork Contractor (contractor) shall be qualified, experienced and knowledgeable in earthwork logistics; preparation and processing of ground to receive fill, moisture conditioning and processing of fill, and compacting fill. The Contractor shall review and accept the plans, geotechnical report(s), and these Specifications prior to commencement of grading. The Contractor shall be solely responsible for performing the grading in accordance with the plans and specifications.

The Contractor shall prepare and submit to the Owner and the Geotechnical Consultant a work plan that indicates the sequence of earthwork grading, the number of "spreads" of work and the estimated quantities of daily earthwork contemplated for the site prior to commencement of grading. The Contractor shall inform the Owner and the Geotechnical Consultant of change in work schedules and updates to the work plan at least 24 hours in advance of such changes so that appropriate observations and tests can be planned and accomplished. The

Contractor shall not assume that the Geotechnical Consultant is aware of all grading operations.

The Contractor shall have the sole responsibility to provide adequate equipment and methods to accomplish the earthwork in accordance with the applicable grading codes and agency ordinances, these Specifications and the recommendations in the approved geotechnical report (s) and grading plan(s). If, in the opinion of the Geotechnical Consultant, unsatisfactory conditions, such as unsuitable soils, improper moisture conditions, inadequate compaction, insufficient buttress key size, adverse weather, etc. are resulting in a quality of work less than required in these specifications, the Geotechnical Consultant shall reject the work and may recommend to the Owner that construction be stopped until the conditions are rectified.

2.0 Preparation of Areas to be Filled

2.1 Clearing and grubbing : vegetation, such as brush, grass, roots, and other deleterious materials shall be sufficiently removed and properly disposed of in a method acceptable to the Owner, governing agencies, and the Geotechnical Consultant.

The Geotechnical Consultant shall evaluate the extent of these removals depending on specific site conditions. Earth fill material shall not contain more than 1 percent of organic materials (by volume). No fill lifts shall contain more than 5 percent of organic matter. Nesting of the organic materials shall not be allowed.

If potentially hazardous materials are encountered, the Contractor shall stop work in the affected area, and a hazardous material specialist shall be informed immediately for proper evaluation and handling of these materials prior to continuing to work in that area.

As presently defined by the State of California, most refined petroleum products (gasoline, diesel fuel, motor oil, grease, coolant, etc.) have chemical constituents that are considered to be hazardous waste. As such, the indiscriminate dumping or spillage of these fluids onto the ground may constitute a misdemeanor, punishable by fine and/or imprisonment and shall not be allowed.

Materials used for fill, either imported or on-site, shall not contain hazardous materials as defined by the California Code of Regulations, Title 22, Division 4, Chapter 30, Article 9 and 10; 40 CRF; and any other

applicable local, state or federal laws. The Consultant shall not be responsible for the identification or analysis of the potential presence of hazardous materials. However, if observations, odors or soil discoloration cause Consultant to suspect the presence of hazardous materials, the Consultant may request from the Owner the termination of grading operations within the affected area. Prior to resuming grading operations, the Owner shall provide a written report to the Consultant indicating that the suspected materials are not hazardous as defined by applicable laws and regulations.

2.2 Any asphaltic pavement material removed during clearing operations should be properly disposed of at an approved off-site facility. Concrete fragments which are free of reinforcing steel may be placed in fills, provided that they are placed in accordance with Section 3.1 of this document.

2.3 During grading, soil or groundwater conditions other than those identified in the Geotechnical Report may be encountered by the Contractor. The Consultant shall be notified immediately to evaluate the significance of the unanticipated conditions.

2.4 Processing : Existing ground that has been declared satisfactory for support of fill by the Geotechnical Consultant shall be scarified to a minimum depth of 6 inches. Existing ground that is not satisfactory shall be over-excavated as specified in the following section. Scarification shall continue until soils are broken down and free of large clay humps or clods and the working surface is reasonable uniform, flat, and free of uneven features that would inhibit uniform compaction.

2.5 Over-excavation : In addition to removals and over-excavations recommended in the approved geotechnical report(s) and the grading plan, Soft, loose, dry, saturated, spongy, organic-rich highly fractured or otherwise unsuitable ground shall be over-excavated to competent ground as evaluated by the Geotechnical Consultant during grading.

2.6 Benching : Where fills are to be placed on ground with slopes steeper than 5 : 1 (horizontal : vertical), the ground shall be stepped or benched. Please see the Standard Details for a graphic illustration. The lowest bench or key shall be a minimum of 15 feet wide and at least 2 feet deep into competent material as evaluated by the Geotechnical Consultant. Other benches shall be excavated a minimum height of 4 feet into competent material or as otherwise recommended by the Geotechnical Consultant. Fill placed on ground sloping flatter than 5 :1 (horizontal :

vertical) shall also be benched or otherwise over-excavated to provide a flat subgrade for the fill.

2.7 Evaluation/Acceptance of Fill Areas : All areas to receive fill, including removal and processed areas, key bottoms, and benches, shall be observed, mapped, elevations recorded, and/or tested prior to being accepted by the Geotechnical Consultant as suitable to receive fill. The Contractor shall obtain a written acceptance from the Geotechnical Consultant prior to fill placement. A licensed surveyor shall provide the survey control for determining elevations of processed areas, keys and benches.

3.0 Fill Material

3.1 General : Materials to be used as fill shall be essentially free of organic matter and other deleterious substances evaluated and accepted by the Geotechnical Consultant prior to placement. Soils of poor quality, such as those with unacceptable gradation, high expansion potential or low strength shall be placed in areas acceptable to the Geotechnical Consultant or mixed with other soils to achieve satisfactory fill materials.

3.2 Oversized Material : Oversize material defined as rock, or other irreducible material with a maximum dimension greater than 8 inches shall not be buried or placed in fill unless location, materials and placement methods are specifically accepted by the Geotechnical Consultant. Placement operations shall be such that nesting of oversized material does not occur and such that oversize material is completely surrounded by compacted or densified fill. Oversize material shall not be placed within 10 vertical feet of finish grade or within 2 feet of future utilities or underground construction.

3.3 Import : If importing of fill materials is required for grading, proposed import material shall meet the requirements of Section 3.1. The potential import source shall be given to the Geotechnical Consultant as least 48 hours (2 working days) before importing begins so that its suitability can be determined and appropriate tests performed.

4.0 Fill Placement and Compaction

4.1 Fill Layer : Approved fill material shall be placed in areas prepared to receive fill (per Section 3.0) in near vertical layers generally not exceeding

8 inches in thickness when compacted. The Geotechnical Consultant may accept thicker layers if testing indicates that the grading procedure can adequately compact the thicker layers. Each layer shall be spread evenly and mixed thoroughly to attain relative uniformity of material and moisture throughout.

4.2 Fill Moisture Conditioning : Fill soils shall be watered, dried back, blended, and/or mixed, as necessary to attain a relatively uniform moisture content at or slightly over optimum. Maximum density and optimum moisture content tests shall be performed in accordance with the American Society of Testing and Materials (ASTM Test Method D1557).

4.3 Compaction of Fill : After each layer has been moisture-conditioned, mixed and evenly spread, it shall be uniformly compacted to not less than 90 percent of maximum dry density (ASTM D1557). Compaction equipment shall be adequately sized and be either specifically designed for soil compaction or of proven reliability to efficiently achieve the specified level of compaction with uniformity.

4.4 Compaction of Fill Slopes : In addition to normal compaction procedures specified above, compaction of slopes shall be accomplished by backrolling of slopes with sheepsfoot rollers at increment of 3 to 4 feet in fill elevation, or by other methods producing satisfactory results acceptable to the Geotechnical Consultant. Upon completion of grading, relative compaction of the fill, out to the slope face, shall be at least 90 percent of maximum dry density per ASTM Test Method D1557.

4.5 Compaction Testing : Field tests for moisture content and relative compaction of the fill soils shall be performed by the Geotechnical Consultant. Location and frequency of tests shall be at the Consultant's discretion based on field conditions encountered. Compaction test locations will not necessarily be selected on a random basis. Test locations shall be selected to verify adequacy of compaction levels in areas that are judged to be prone to inadequate compaction (such as close to slope faces and at the fill/bedrock benches).

4.6 Frequency of Compaction Testing : Tests shall be taken at intervals not exceeding 2 feet in vertical rise and/or 1,000 cubic yards of compacted fill soils embankment. In addition as a guideline, at least one test shall be taken on slope faces for each 5,000 square feet of slope face and/or each 10 feet of vertical height of slope. The Contractor shall assure that fill construction is such that the testing schedule can be accomplished by the

Geotechnical Consultant. The Contractor shall stop or slow down the earthwork construction if these minimum standards are not met.

4.7 Compaction Test Locations : The Geotechnical Consultant shall document the approximate elevation and horizontal coordinates of each test location. The Contractor shall coordinate with the project surveyor to assure that sufficient grade stakes are established so that the Geotechnical Consultant can determine the test locations with sufficient accuracy. At a minimum, two grade stakes within a horizontal distance of 100 feet and vertically less than 5 feet apart from potential test locations shall be provided.

5.0 Subdrain Installation

Subdrain systems shall be installed in accordance with the approved geotechnical report(s), the grading plan, and the Standard Details. The Geotechnical Consultant may recommend additional subdrains and/or changes in subdrain extent, location, grade, or material depending on conditions encountered during grading. All subdrains shall be surveyed by a land surveyor/civil engineer for line and grade after installation and prior to burial. Sufficient time should be allowed by the Contractor for these surveys.

6.0 Excavation

Excavations, as well as over-excavation for remedial purposes, shall be evaluated by the Geotechnical Consultant during grading. Remedial removal depths shown on geotechnical plans are estimates only. The actual extent of removal shall be determined by the Geotechincal Consultant based on the field evaluation of exposed conditions during grading. Where fill-overcut slopes are to be graded, the cut portion of the slopes shall be made, evaluated, and accepted by the Geotechnical Consultant prior to placement of materials for construction of the fill portion of the slope, unless otherwise recommended by the Geotechnical Consultant.

7.0 Trench Backfill

7.1 The Contractor shall follow all OSHA and Cal/OSHA requirements for safety of trench excavations.

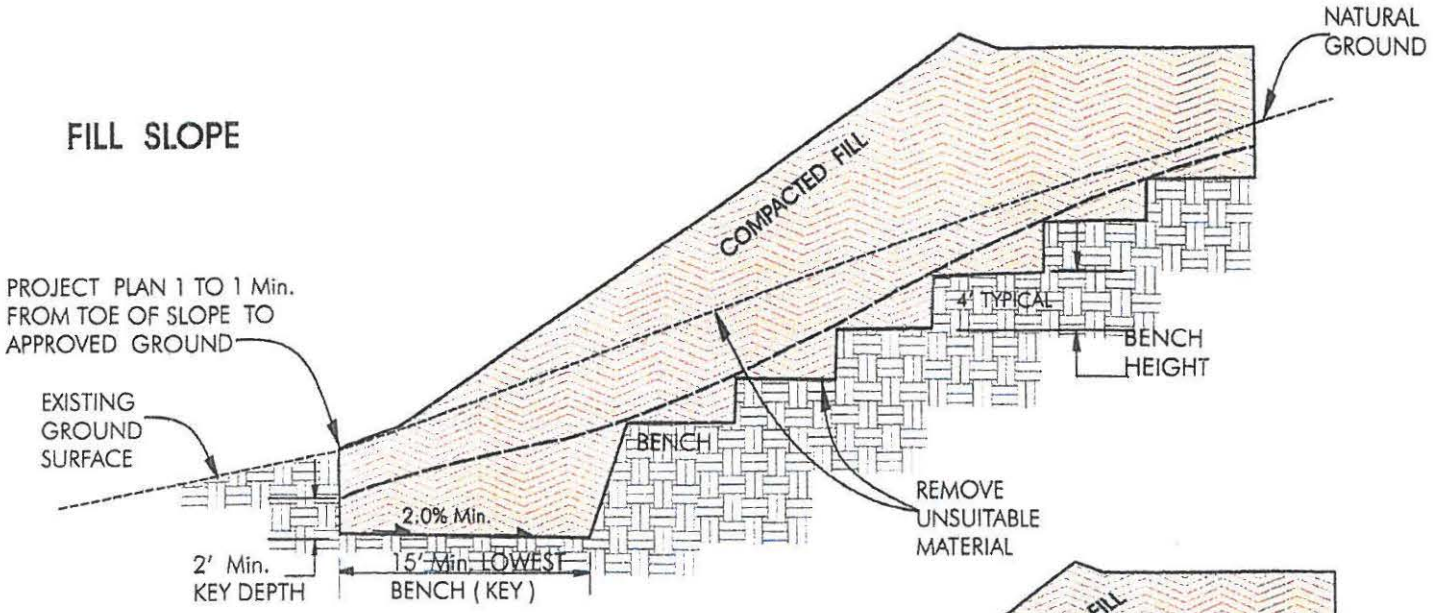
7.2 All bedding and backfill of utility trenches shall be done in accordance with the applicable provisions of Standard Specifications of Public Works Construction. Bedding material shall have a Sand Equivalent greater than 30 (SE>30). The bedding shall be placed and compacted to a minimum of 90 percent of maximum dry density from 1 foot above the top of the conduit to the surface.

7.3 The jetting of the bedding around the conduits shall be observed by the Geotechnical Consultant.

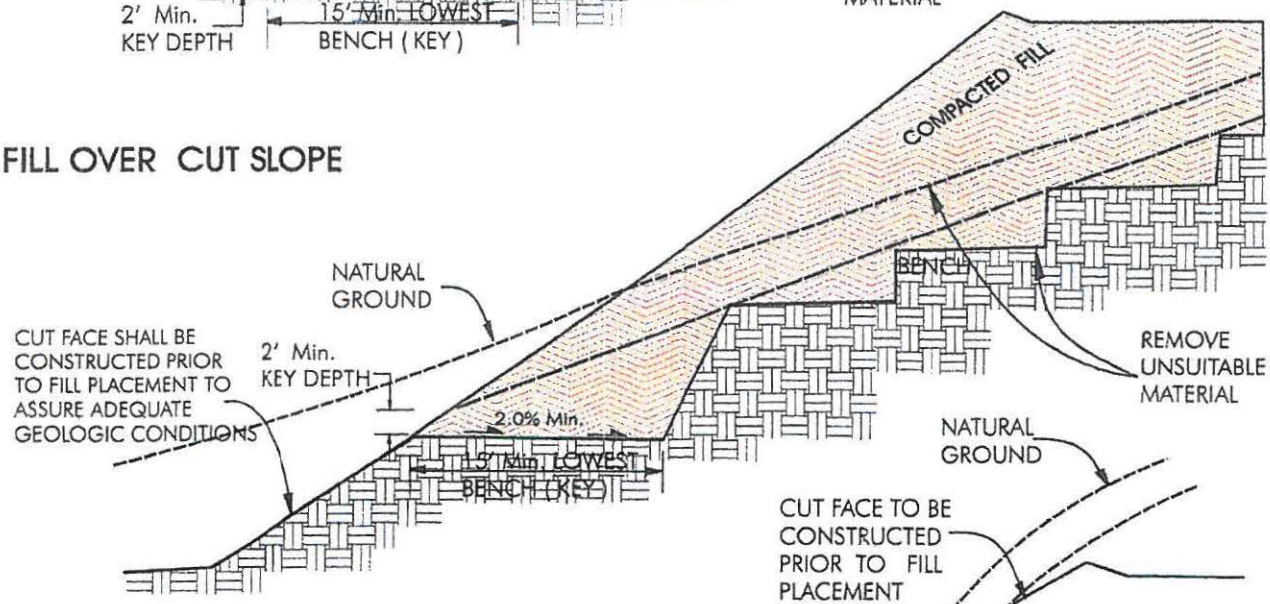
7.4 The Geotechnical Consultant shall test the trench backfill for relative compaction. At least one test should be made for every 300 feet of trench and 2 feet of fill.

7.5 Lift thickness of trench backfill shall not exceed those allowed in the Standard Specifications of Public Works Construction unless the Contractor can demonstrate to the Geotechnical Consultant that the fill lift can be compacted to the minimum relative compaction by his alternative equipment and method.

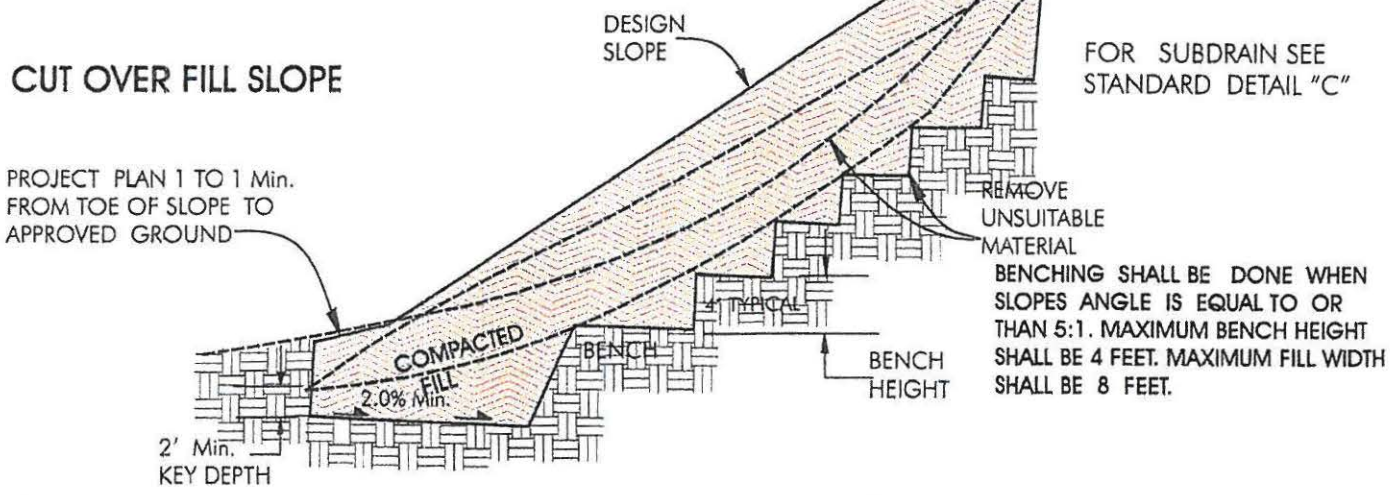
FILL SLOPE



FILL OVER CUT SLOPE



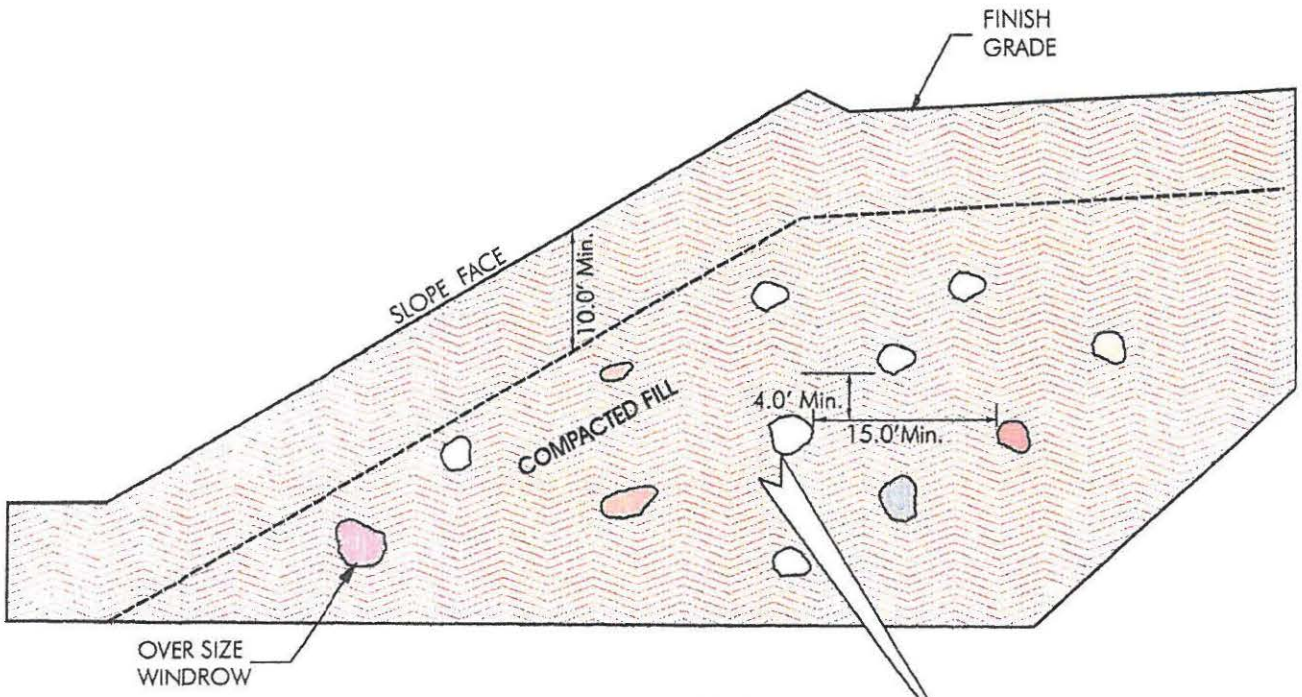
CUT OVER FILL SLOPE



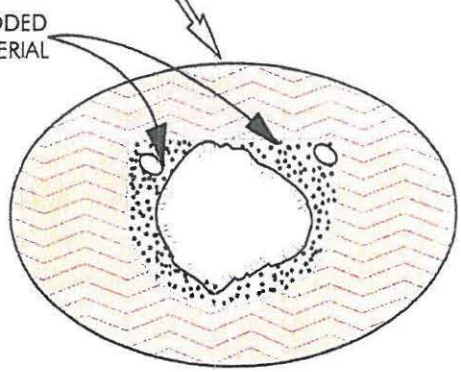
KEYING AND BENCHING

DETAIL A

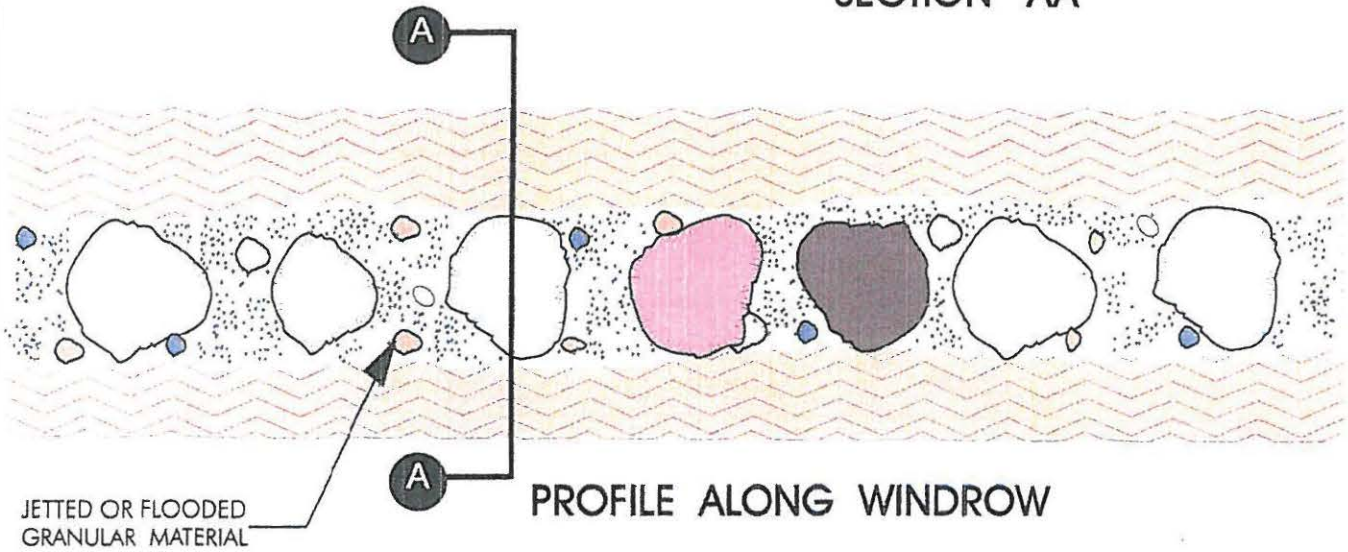
ALLIED EARTH TECHNOLOGY



- OVER SIZE ROCK IS LARGER THAN INCHES IN LARGEST DIMENSION
- EXCAVATE A TRENCH IN THE COMPACTED FILL DEEP ENOUGH TO BURY ALL THE ROCK
- BACKFILL WITH GRANULAR SOIL JETTED OR FLOODED IN PLACE TO FILL ALL THE ROCK VOIDS
- DO NOT BURY ROCK WITHIN 10 FEET OF FINISH GRADED.
- WINDROW OF BURIED ROCK SHALL BE PARALLEL TO THE FINISH SLOPE FILL.



SECTION "AA"

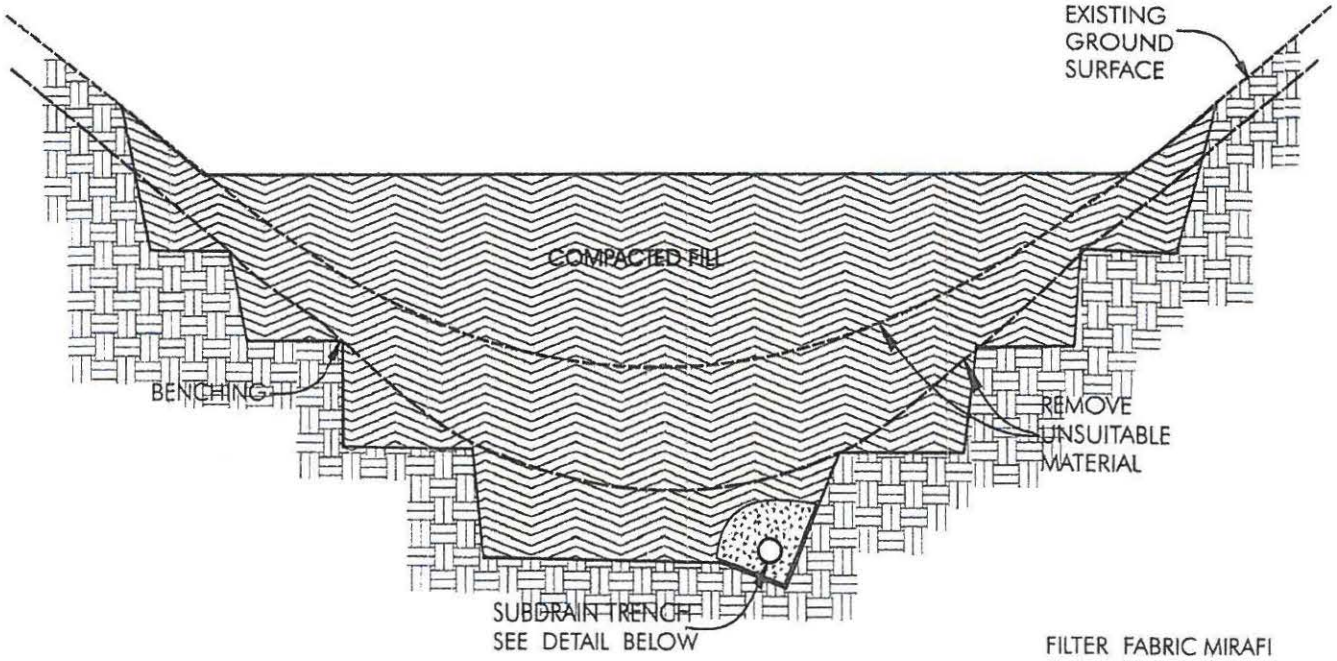


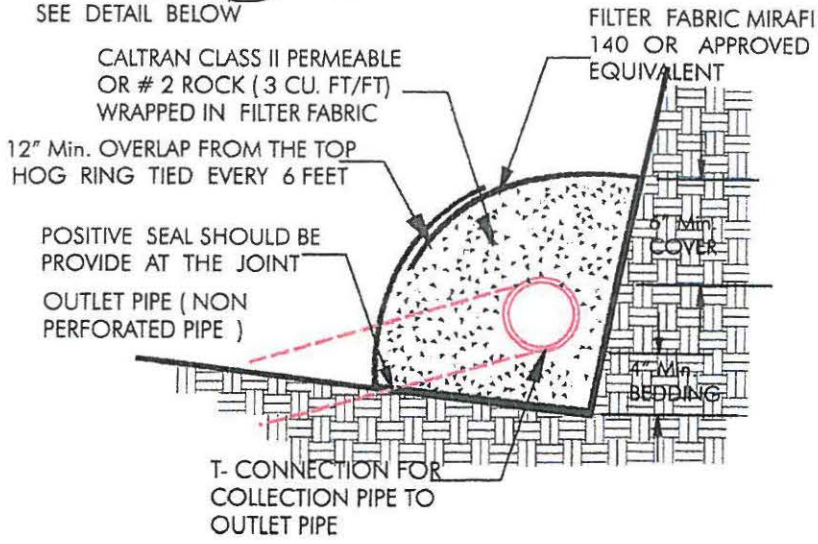
PROFILE ALONG WINDROW

OVER SIZE ROCK DISPOSAL

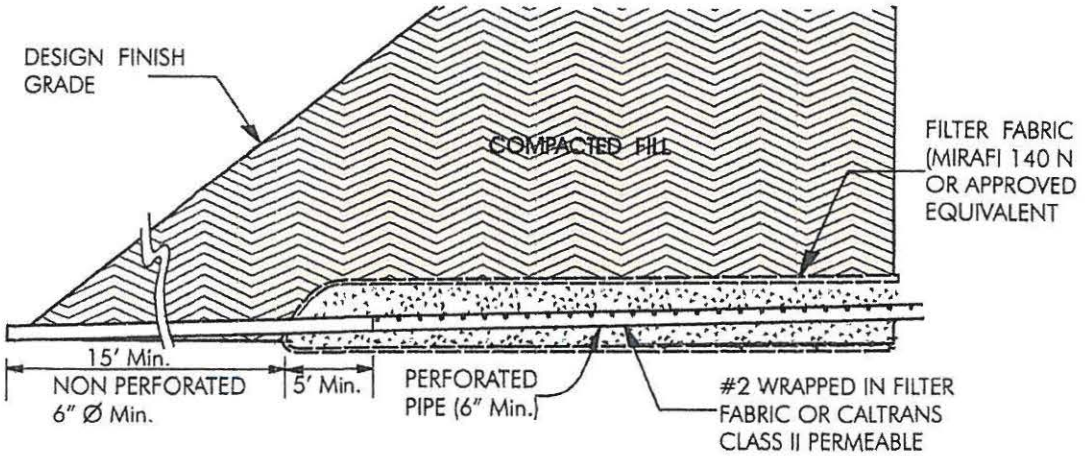
DETAIL B

ALLIED EARTH TECHNOLOGY





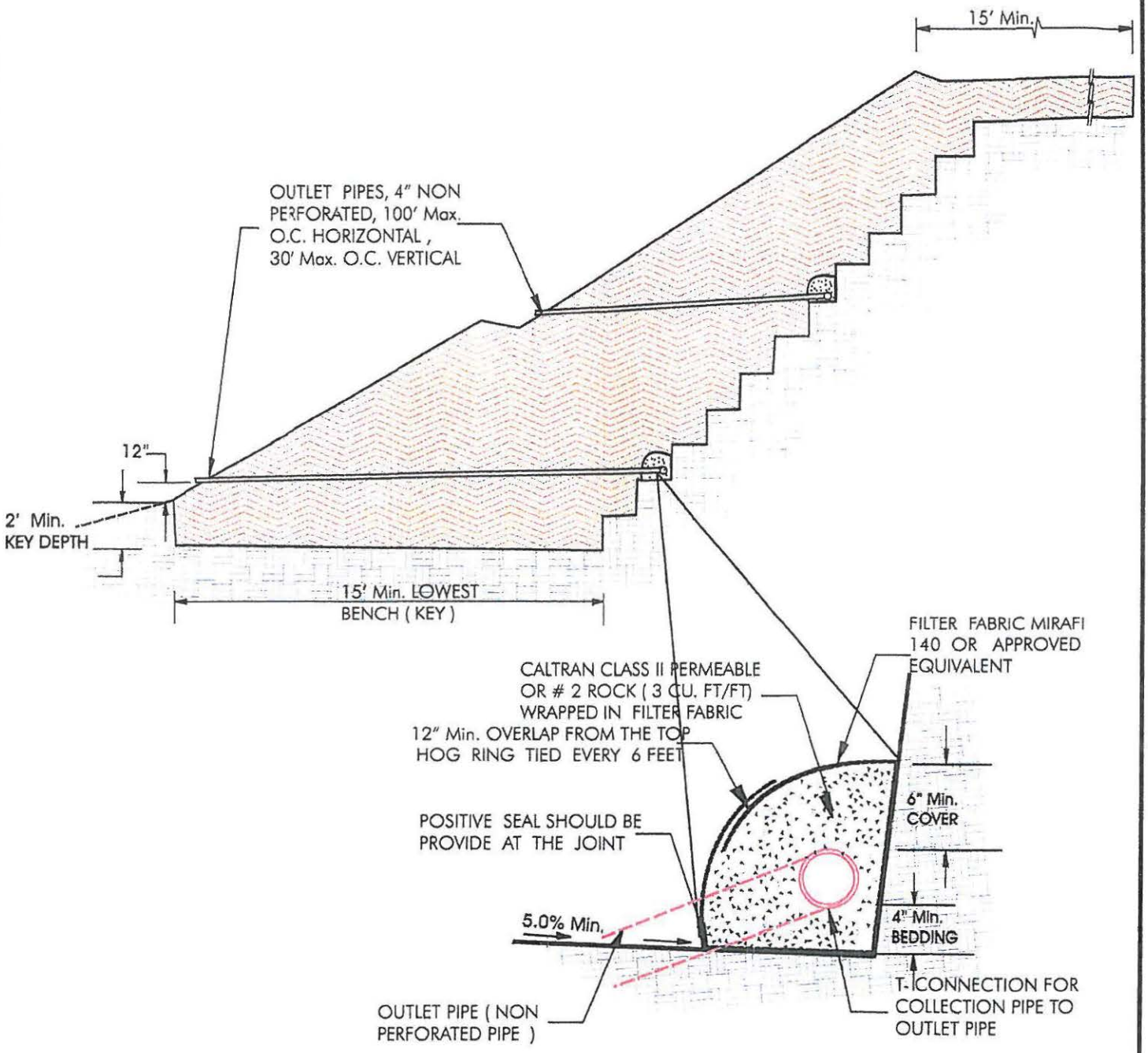
DETAIL OF CANYON SUBDRAIN TERMINAL



CANYON SUBDRAIN DETALS

DETAIL C

ALLIED EARTH TECHNOLOGY



SUBDRAIN INSTALLATION- SUBDRAIN COLLECTOR PIPE SHALL BE INSTALLED WITH PERFORATIONS DOWN OR UNLESS OTHERWISE DESIGNED BY THE GEOTECHNICAL CONSULTAN. OUTLET SHALL BE NON-PERFORATED PIPE. THE S UBDRAIN PIPE SHALL HAVE AT LEAST 8 PERFORATIONS UNIFORMLY SPACED PER FOOT. PERFORATION SHALL BE 1/4" TO 1/2" IF DRILLED HOLES ARE USED. ALL SUBDRAIN PIPES SHALL HAVE A GRADIENT AT LEAST 2% TOWARD THE OUTLET.

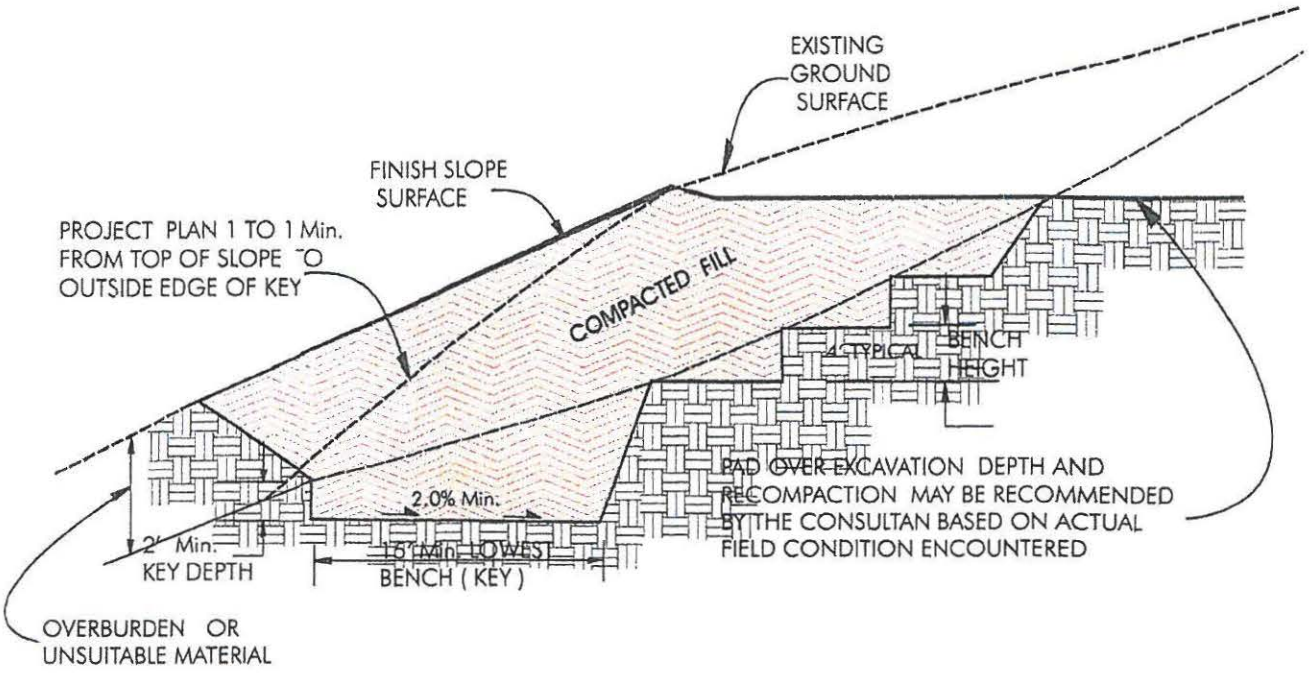
SUBDRAIN PIPES- SUBDRAIN PIPE SHALL BE ASTMD 2751, SDR 23.5 OR ASTMD 1527, SCHEDULE 40, OR ASTMD 3034, SDR 23.5, SCHEDULE 40 POLYVINYL CHORIDE PLASTIC (PVC) PIPE.

ALL OUTLET PIPE SHALL BE PLACED IN A TRENCH NO WIDER THAN TWICE THE SUBDRAIN PIPE, PIE SHALL BE IN SOIL OF SE>30 JETTED OR FLOODED IN PLACED EXCEPT FOR THE OUTSIDE 5 FEET WHICH BE NATIVE SOIL BACKFILL

BUTRESS OR REPLACEMENT SUBDRAIN

DETAIL D

ALLIED EARTH TECHNOLOGY



NOTE: SUBDRAIN DETAILS AND KEY WIDTH RECOMMENDATIONS TO BE PROVIDED BASED ON EXPOSED SURFACE CONDITIONS

HILLSIDE STABILITY FILL

DETAIL E

ALLIED EARTH TECHNOLOGY

Project No. 16-1268J6 NDD 03/04/16
Torrance

APPENDIX II

LABORATORY TEST RESULTS

1. The maximum dry density and optimum moisture content of the fill soils encountered were determined in accordance with A.S.T.M. D1557, Method A. The results of the tests are presented as follows :

	Soil Description	Maximum Dry Density (lbs./cu.ft.)	Optimum Moisture Content (% Dry Wt.)
Boring #1 Sample #1 Depth 3.0'	Tan silty fine sand (SM)	122.0	11.0

2. The Expansion Index of the most clayey soils was determined in accordance with A.S.T.M. D4929-08. The results of the test are presented as follows :

	Soil Description	Expansion Index
Boring #1 Sample #1 Depth 3.0'	Tan silty fine sand (SM)	33*

*Considered to possess LOW expansion potential

3. The sulfate content of the soils were determined in accordance with A.S.T.M. D516. The results are presented below :

	Soil Description	Sulfate Content (ppm)	
Boring #1 Sample #1 Depth 3.0'	Tan silty fine sand (SM)	38	Negligible

APPENDIX III

REFERENCES

- California Building Code, Volumes 1 & 2, International Conference of Building Officials, 2013.
- California Department of Conservation, Division of Mines and Geology (California Geological Survey), 1997, Guidelines for Evaluating and Mitigating Seismic Hazards in California, DMG Special Publication 117, 71p.
- Coffey Engineering – topographic map of Torrance Street propety
- "Foundations and Earth Structures", Naval Facilities Engineering Command, DM 7.02
- "Green Book" Standard Specifications for Public Works Construction, Public Works Standards, .
- Hart, Michael – Geologic Reconnaissance, Otsego Drive Residence, San Diego, CA.
- Kennedy, Michael P. – Geology Map of the San Diego 30'x60' Quadrangle, California, California Department of Conservation, Division of Mines and Geology
- "Soil Mechanics", Naval Facilities Engineering Command, DM 7.01
- "Soil Mechanics in Engineering Practice", Karl Terzaghi, Ralph B. Peck, Gholamreza Mesri.

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