April 3, 2020

Walter C. Gefrom, PE
City of San Diego Engineering Division
Development Services Department
1222 First Avenue
San Diego, CA 92101

Re: Preliminary Stormwater Design Letter
College View Apartments
Lots 108 & 109
APN: 462-200-400

Attn: Walter C. Gefrom

The purpose of this letter is for conceptual review and approval of the preliminary stormwater design for the College View Project. The criteria used for this analysis is the 2018 City of San Diego Storm Water Standards.

Project Description:

The project proposes redevelopment of 1.24 acres on a site of 2.39 acres of land located at 5420 55th Street, San Diego, California. The project will consist of a 5-story podium residential development over 1-level of garage comprised of 85 dwelling units, amenity space, commercial space, fitness center and leasing office. The site is bordered by 55th Street to the east, residential development to the north and south and an existing canyon to the west.

Storm Water Requirements:

The site is located within Lower San Diego River Watershed Management Area and ultimately discharges to the Pacific Ocean at Alvarado Creek. The project will be designed to meet pollutant control, retention, and hydromodification control requirements via proprietary biofiltration BMPs and underground detention as described in Attachment 1 and shown in Attachment 2.

Pollutant control and retention requirements will be satisfied via proprietary biofiltration units. Retention requirements will be satisfied through the impervious area dispersion, as shown in Attachment 4, work sheet B.5-6. Proprietary BMPs are sized as flow-based. The minimum flow-rate calculation for water quality treatment was determined using Worksheet B.6-1 in Attachment 4 of this report. Hydromodification control requirements will be met through underground detention vaults.

Per the "Infiltration Feasibility Conditions Letter", provided by Geocon (the geotechnical engineer) infiltration is infeasible. Refer to Attachment 3 for letter from geotechnical engineer.

This project is not required to obtain permitting through the Federal Clean Water Act sections 401 and 404. This project does not discharge directly to navigable waters of the United States and disturbance of the canyon will be limited to constructing the storm drain infrastructure.

If you have any questions or require additional information regarding this matter, please do not hesitate to contact me at (858) 554-1500.

Sincerely,

FUSCOE ENGINEERING, INC.

Miles Leandro, PE
RCE 84291

Attachment 1: DMA Descriptions
Attachment 2: DMA & & Hydromodification Control Exhibit
Attachment 3: Geotechnical Investigation
Attachment 4: BMP Manual B-Worksheets
Attachment 5: Hydromodification BMP Sizing Spreadsheets V3.0
Attachment 6: Hydrology Condition Maps

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Attachment 1

DMA Descriptions

ATTACHMENT 1: CONCEPTUAL DMA DESCRIPTIONS

DMA 1 consists of the north grasscrete EVA, hardscape, and landscape areas. Runoff from DMA 1 will be collected via subdrains connected the proposed storm drain system and discharge into a Proprietary Biofiltration (BMP 1 - MWS unit) located on the first floor for water quality treatment only.

DMA 2 consists of the entire building roof area and amenity deck. DMAs 2A-2D consists of portions of the roof will be hard-piped into raised landscape planters to meet retention requirements. All runoff will be collected via the proposed storm drain system and discharge into the a Proprietary Biofiltration (BMP 1 – MWS unit), located on the first floor for water quality treatment only.

DMA 3 consists of the south grasscrete EVA, hardscape and landscape areas. Runoff from DMA will be collected via subdrains connected to the proposed storm drain system and discharge into Proprietary Biofiltration (BMP 1- MWS unit) located on the first floor for water quality treatment only.

DMA 4 consists of landscape and hardscape areas. The hardscape areas will be considered to be de-minimis and the landscape areas will be self-mitigating.

Mitigated flows from DMAs1-4 will be treated for hydromodification control and 100-year storm attenuation via underground detention vaults (height 5') before ultimately discharging into the canyon.

The minimum required water quality treatment flowrate was determined using Worksheet B.6-1 located in Attachment 4 of this letter. The minimum hydromodification treatment required was determined using the BMP Sizing Spreadsheet V3.0 located in Attachment 5 of this letter.

See DMA and Hydromodification Control Exhibit in Attachment 2 for reference.

In existing hydrology conditions, the site is split into two drainage basins. A portion of the existing site drains west into the canyon and the remaining portion discharges east onto 55th street. The portion of runoff that drains to 55th street is collected by a gutter which conveys flow to the end of the 55th street cul-de-sac where it is captured by a large curb inlet. This curb inlet then directly drains to the same canyon and confluences with the other portion of runoff from the site. Due to site constraints, we are proposing to divert all flows into the canyon for proposed hydrology conditions. After hydromodification control is satisfied, the entire site will be discharging west into the canyon. Refer to Attachment 6 for existing and proposed hydrology conditions maps.

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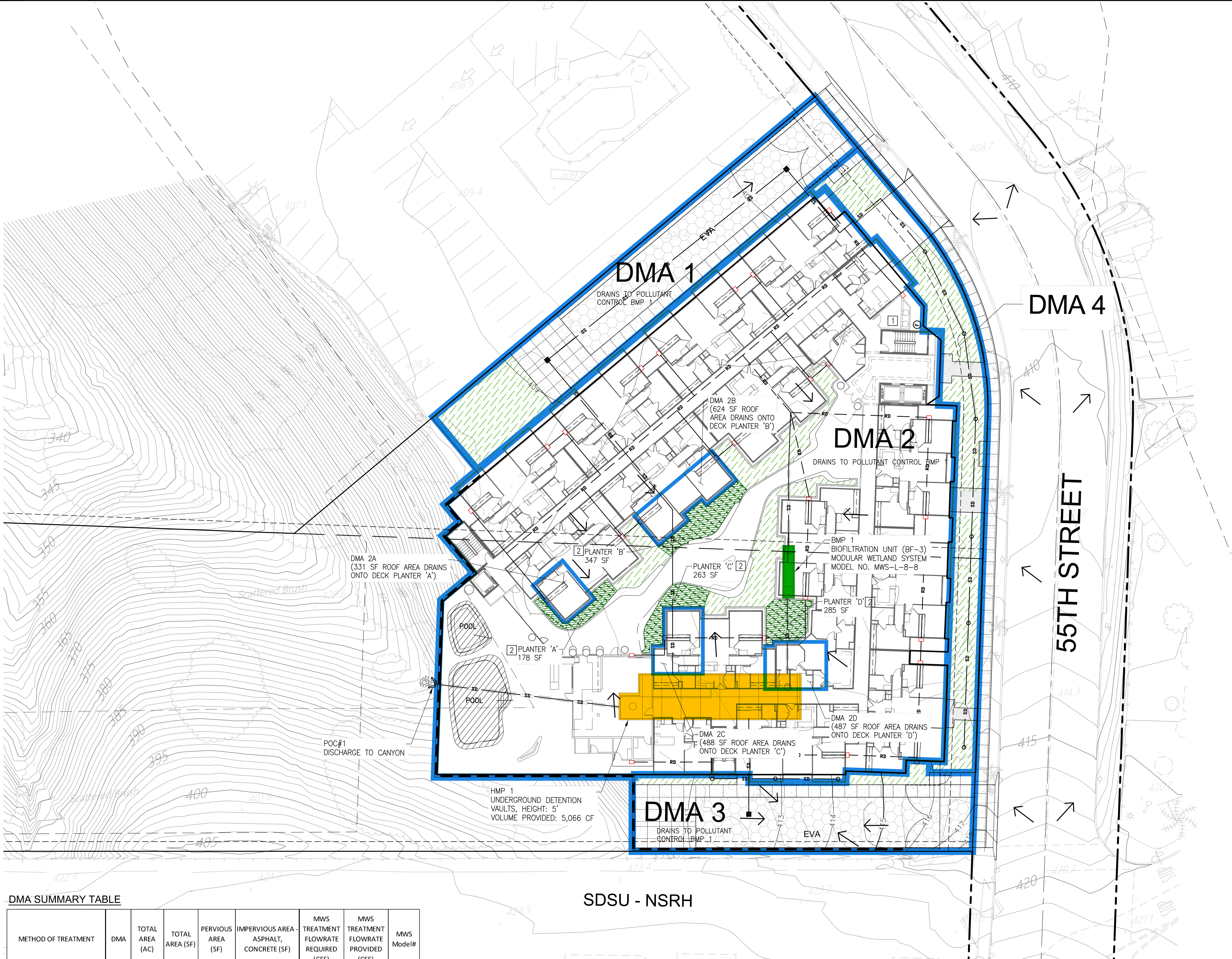
Attachment 2

DMA & Hydromodification Exhibit



LEGEND

- RIGHT-OF-WAY
- STREET CENTERLINE
- DRAINAGE MANAGEMENT AREA (DMA) LIMITS
- LANDSCAPE PLANTERS
- GRASSCRETE
- POOL AREA
- FLOW DIRECTION
- BIOFILTRATION UNIT, BF-3
- BUILDING DRAINAGE SYSTEM (SHOWN DIAGRAMMATICALLY)
- UNDERGROUND DETENTION VAULTS

PERMANENT STORM WATER BMP NOTES

1. POLLUTANT CONTROL BMP (BF-3, BIOFILTRATION). SEE DETAIL THIS SHEET
2. IMPERVIOUS AREA DISPERSION BMP (SD-B) SEE LANDSCAPE PLANTER DETAIL THIS SHEET

PROJECT SITE INFO

UNDERLYING HYDROLOGIC SOIL: D
APPROXIMATE DEPTH TO GROUNDWATER: 50 FT±
EXISTING NATURAL HYDROLOGIC FEATURES (WATERCOURSES, SEEPS, SPRINGS, WETLANDS): NONE
CRITICAL COARSE SEDIMENT YEILD AREAS TO BE PROTECTED: NONE
EXISTING IMPERVIOUS AREA: 39,511 SF
PROPOSED IMPERVIOUS AREA: 39,768 SF

DESIGN CAPTURE VOLUME

SEE WORKSHEET B.5-1 INCLUDED IN ATTACHMENT 1E OF THIS REPORT FOR DESIGN CAPTURE VOLUME CALCULATION.

DMA SUMMARY TABLE

METHOD OF TREATMENT	DMA	TOTAL AREA (AC)	TOTAL AREA (SF)	PERVIOUS AREA (SF)	IMPERVIOUS AREA - ASPHALT, CONCRETE (SF)	MWS TREATMENT FLOWRATE REQUIRED (CFS)	MWS TREATMENT FLOWRATE PROVIDED (CFS)	MWS Model#
BMP 1 (MWS Unit)	1	0.13	5,841	4,217	1,624	0.236	0.268	L-4-21
	2	0.86	37,394	3,694	33,700			
Drains to Planter 'A" (Ultimately drains to BMP 1)	2A	0.01	331	0	331			
Drains to Planter 'B' (Ultimately drains to BMP 1)	2B	0.01	624	0	624			
Drains to Planter 'C' (Ultimately drains to BMP 1)	2C	0.01	488	0	488			
Drains to Planter 'C' (Ultimately drains to BMP 1)	2D	0.01	487	0	487			
BMP 1 (MWS Unit)	3	0.10	4,440	2,834	1,606			
Self-Treating	4	0.10	4,224	3,316	908	-	-	-

HMP SUMMARY TABLE

METHOD OF TREATMENT	DMA	TOTAL AREA (AC)	TOTAL AREA (SF)	PERVIOUS AREA (SF)	IMPERVIOUS AREA - ASPHALT, CONCRETE (SF)	HMP Volume Required (CFS)	HMP Volume Provided (CFS)
HMP 1	1	0.13	5,841	4,217	1,624	4,941	5,066
	2	0.90	39,324	3,694	35,630		
	3	0.10	4,440	2,834	1,606		
	4	0.10	4,224	3,316	908		

NO.	DATE	REVISION

COLLEGE VIEW APARTMENTS

ATTACHMENT 2: DMA & HYDROMODIFICATION CONTROL EXHIBIT

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JOB NO. 893-006
DRAWN BY: L.S.
SHEET 1 of 1

Attachment 3

Geotechnical Investigation

Project No. G2432-52-01
August 23, 2019

Pierce Education Properties, L.P.
8880 Rio San Diego Drive, Suite 750
San Diego, California 92108

Attention: Mr. Neal L. Singer

Subject: STORM WATER MANAGEMENT INVESTIGATION
COLLEGE VIEW
5420-22 55TH STREET
SAN DIEGO, CALIFORNIA

Dear Mr. Singer:

In accordance with your request and authorization of our Proposal No. LG-19288 dated August 1, 2019, we herein submit the results of our storm water management investigation for the subject project. We performed our investigation to evaluate the underlying soil and geologic conditions and potential geologic hazards, and to assist in the design of the proposed building and associated improvements.

The accompanying report presents the results of our study and conclusions and recommendations pertaining to storm water aspects of the proposed project. Should you have questions regarding this report, or if we may be of further service, please contact the undersigned at your convenience.

Very truly yours,

GEOCON INCORPORATED

Ken W. Haase	Shawn Foy Weedon	Matthew R. Love
Senior Staff Geologist	GE 2714	RCE 84154

REGISTERED PROFESSIONAL ENGINEER SHAWN WEEDON No. 2714 GEOTECHNICAL STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER MATTHEW R. LOVE C84154 CIVIL STATE OF CALIFORNIA

KWH:SFW:MRL:kcd

(e-mail) Addressee

STORM WATER MANAGEMENT INVESTIGATION

The property is located at 5420-22 55th Street in the College area of the City of San Diego, California (see Vicinity Map, Figure 1). The existing property consists of 2- to 4-story apartment complex with accommodating pool area, utilities and landscaping. Surface parking is available on the west side of the buildings. The Existing Site Plans shows the existing conditions. A canyon slope descends to the west and drains to the northwest with a maximum slope height of about 50 feet.

Existing Site Plan

We understand storm water management devices will be used in accordance with the *Storm Water Standards* (SWS) currently used by the City of San Diego. If not properly constructed, there is a potential for distress to improvements and properties located hydrologically down gradient or adjacent to these devices. Factors such as the amount of water to be detained, its residence time, and soil permeability have an important effect on seepage transmission and the potential adverse impacts that may occur if the storm water management features are not properly designed and constructed. We have not performed a hydrogeological study at the site. If infiltration of storm water runoff occurs, downstream properties may be subjected to seeps, springs, slope instability, raised groundwater, movement of foundations and slabs, or other undesirable impacts as a result of water infiltration.

INFILTRATION CONDITIONS

Hydrologic Soil Group

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

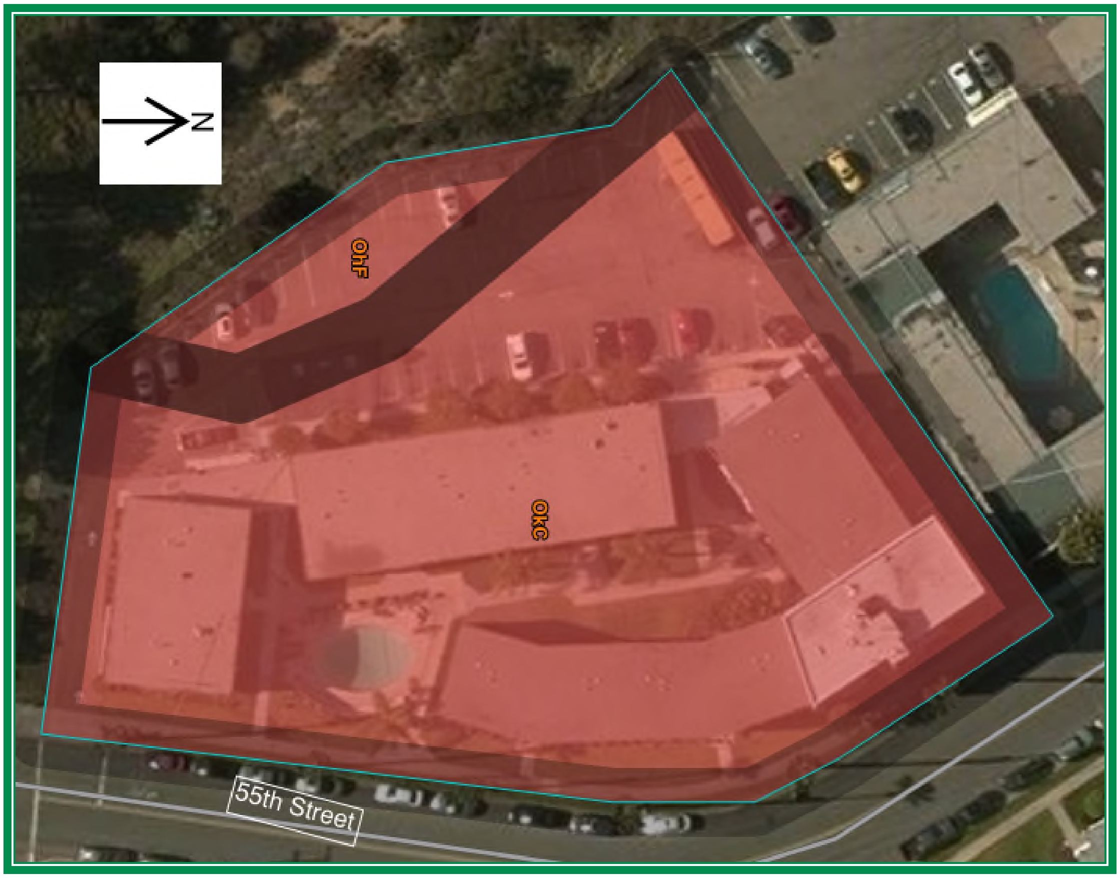
TABLE 1
HYDROLOGIC SOIL GROUP DEFINITIONS

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

The property is underlain by undocumented fill, Very Old Paralic Deposits and Stadium Conglomerate. and should be classified as Soil Group D. Table 2 presents the information from the USDA website for the subject property. The USDA Hydrologic Map presents the approximate location of the units from the USDA website.

TABLE 2
USDA WEB SOIL SURVEY – HYDROLOGIC SOIL GROUP

Map Unit Name	Map Unit Symbol	Approximate Percentage of Property	Hydrologic Soil Group	k_{SAT} of Most Limiting Layer (inches/hour)
Olivenhain cobbly loam, 30 to 50 percent slopes	OhF	10	D	0.00 – 0.06
Olivenhain-Urban land complex, 2 to 9 percent slopes	OkC	90	D	0.00 – 0.06



USDA Hydrologic Map

In-Situ Testing

We performed 5 Aardvark Permeameter tests at the property at locations determined by the project Civil Engineer, as shown on the Geologic Map, Figure 2. The results of the tests provide parameters regarding the saturated hydraulic conductivity and infiltration characteristics of on-site soil and geologic units. Table 3 presents the results of the estimated field saturated hydraulic conductivity and estimated infiltration rates obtained from the Aardvark Permeameter tests. The field sheets are also attached herein. Based on the *City of San Diego Storm Water Standards*, the infiltration rate should be considered equal to the saturated hydraulic conductivity rate. We applied a feasibility factor of safety of 2.0 to our estimated infiltration rates to provide input on Worksheet C.4-1. Soil infiltration rates from in-situ tests can vary significantly from one location to another due to the heterogeneous characteristics inherent to most soil. The Geologic Map, Figure 2 presents the locations of the permeability tests.

TABLE 3
FIELD PERMEAMETER INFILTRATION TEST RESULTS

Test Location	Test Depth (feet)	Geologic Unit	Field-Saturated Infiltration Rate, k_{sat} (inch/hour)	C.4-1 Worksheet Infiltration Rate[1], k_{sat} (inch/hour)
P-1	4 ½	Qvop/Tst	0.002	0.001
P-2	8 ½	Qvop/Tst	0.004	0.002
P-3	5	Qvop/Tst	0.002	0.001
P-4	2	Qvop/Tst	0.128	0.064
P-5	2	Qvop/Tst	0.003	0.002
		Average:	0.028	0.014

Using a Factor of Safety of 2.

Infiltration categories include full infiltration, partial infiltration and no infiltration. Table 4 presents the commonly accepted definitions of the potential infiltration categories based on the infiltration rates.

TABLE 4
INFILTRATION CATEGORIES

Infiltration Category	Field Infiltration Rate, I (inches/hour)	Factored Infiltration Rate[1], I (inches/hour)
Full Infiltration	$I > 1.0$	$I > 0.5$
Partial Infiltration	$0.10 < I \leq 1.0$	$0.05 < I \leq 0.5$
No Infiltration (Infeasible)	$I < 0.10$	$I < 0.05$

Using a Factor of Safety of 2.

GEOLOGIC HAZARDS AND CONSIDERATIONS

Groundwater Elevations

We did not encounter static groundwater during our field investigation to the maximum depth explored of 46½ feet. We expect static groundwater exists at depths greater than 80 feet below existing grades.

New or Existing Utilities

Existing utilities are located onsite and utilities will be constructed within the site boundaries. Full or partial infiltration should not be allowed in the areas of the utilities to help prevent potential damage/distress to improvements. Mitigation measures to prevent water from infiltrating the utilities consist of setbacks, installing cutoff walls around the utilities and installing subdrains and/or installing liners. The horizontal and vertical setbacks for infiltration devices should be a minimum of 10 feet and a 1:1 plane of 1 foot below the closest edge of the deepest adjacent utility, respectively.

Existing and Planned Structures

Existing residential and roadway structures exist adjacent to the site. Water should not be allowed to infiltrate in areas where it could affect the neighboring properties and existing adjacent structures, improvements and roadway. Mitigation for existing structures consists of not allowing water infiltration within a lateral distance of at least 10 feet from the new or existing foundations and properly lines.

Slope Hazards

The site is relatively flat to sloping with an approximately 50-foot high descending slope on the western limit of the site. Water migration and the resulting seepage forces negatively affect the stability of slopes and causes erosion. The *City of San Diego Storm Water Standards* recommends a minimum setback of 50 feet or 1.5 times the slope height (75 feet for a 50-foot high slope) from the top of existing slopes. A setback would be needed for the project from an infiltration standpoint for slopes.

Hydrocollapse

Hydrocollapse is the tendency of unsaturated soil structure to collapse upon saturation resulting in the overall settlement of the effected soil and overlying foundations or improvements supported thereon. Potentially compressible surficial soil underlying the proposed improvements is typically removed and recompacted during remedial site grading. However, if compressible soil is left in-place, a potential for settlement due to hydrocollapse of the soil exists. Due to the very dense nature of the underlying units, the potential for hydrocollapse is not present within the Very Old Paralic Deposits/Stadium Conglomerate.

CONCLUSIONS AND RECOMMENDATIONS

Storm Water Evaluation Narrative

The area where infiltration could potentially be feasible is limited based on the locations of site slopes and existing underground utilities and buildings. The associated setbacks from these features and improvements are detailed herein. We performed infiltration tests within the formational materials within potentially feasible areas for infiltration per the recommendations herein and as determined by the project Civil Engineer at the locations shown on Figure 2.

Storm Water Infiltration Conclusion

Infiltration would not be possible in the areas of existing or proposed underground utilities, buildings, and descending slopes, as discussed herein. Additionally, the infiltration test results from the area where infiltration could be possible indicate permeability rates less than 0.5 inches per hour and 0.05 inches per hour (with a FOS of 2) for full or partial infiltration, respectively. Therefore, full or partial infiltration within the Very Old Paralic Deposits/Stadium Conglomerate is considered infeasible at the site.

We opine the property is considered infeasible to full and partial infiltration. The planned storm water devices should be properly lined to prevent water migration into the underlying soil and to prevent distress to utilities and buildings. If storm water devices/basins are planned in the allowable infiltration area (area outside of the setback zones), liners can be removed from the bottom to allow incidental infiltration, if possible. However, the devices will need to be lined if located adjacent to proposed utilities and structures.

Storm Water Infiltration Recommendations

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

Storm Water Standard Worksheets

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

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

TABLE 5
SUITABILITY ASSESSMENT RELATED CONSIDERATIONS FOR INFILTRATION FACILITY SAFETY FACTORS

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

Based on our geotechnical investigation and the previous table, Table 6 presents the estimated factor values for the evaluation of the factor of safety. This table only presents the suitability assessment safety factor (Part A) of the worksheet. The project civil engineer should evaluate the safety factor for design (Part B) and use the combined safety factor for the design infiltration rate.

TABLE 6
FACTOR OF SAFETY WORKSHEET DESIGN VALUES – PART A1

Suitability Assessment Factor Category	**Assigned Weight (w)**	**Factor Value (v)**	**Product (p = w x v)**
Assessment Methods	0.25	2	0.50
Predominant Soil Texture	0.25	2	0.50
Site Soil Variability	0.25	2	0.50
Depth to Groundwater/ Impervious Layer	0.25	1	0.25
Suitability Assessment Safety Factor, S_A = □p			1.75

The project civil engineer should complete Worksheet D.5-1 or Form I-9 using the data on this table. Additional information is required to evaluate the design factor of safety.

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I- 8A[10]
Part 1 - Full Infiltration Feasibility Screening Criteria		
DMA(s) Being Analyzed:		**Project Phase:**
College View – 5420-22 55th Street, San Diego, California		Design
Criteria 1: Infiltration Rate Screening		
1A	Is the mapped hydrologic soil group according to the NRCS Web Soil Survey or UC Davis Soil Web Mapper Type A or B and corroborated by available site soil data[11]? ☐Yes; the DMA may feasibly support full infiltration. Answer “Yes” to Criteria 1 Result or continue to Step 1B if the applicant elects to perform infiltration testing. ☐No; the mapped soil types are A or B but is not corroborated by available site soil data (continue to Step 1B). ☐No; the mapped soil types are C, D, or “urban/unclassified” and is corroborated by available site soil data. Answer “No” to Criteria 1 Result. ☒No; the mapped soil types are C, D, or “urban/unclassified” but is not corroborated by available site soil data (continue to Step 1B).	
1B	Is the reliable infiltration rate calculated using planning phase methods from Table D.3-1? ☒Yes; Continue to Step 1C. ☐No; Skip to Step 1D.	
1C	Is the reliable infiltration rate calculated using planning phase methods from Table D.3-1 greater than 0.5 inches per hour? ☐Yes; the DMA may feasibly support full infiltration. Answer “Yes” to Criteria 1 Result. ☒No; full infiltration is not required. Answer “No” to Criteria 1 Result.	
1D	**Infiltration Testing Method.** Is the selected infiltration testing method suitable during the design phase (see Appendix D.3)? Note: Alternative testing standards may be allowed with appropriate rationales and documentation. ☒Yes; continue to Step 1E. ☐No; select an appropriate infiltration testing method.	

Note that it is not required to investigate each and every criterion in the worksheet, a single “no” answer in Part 1, Part 2, Part 3, or Part 4 determines a full, partial, or no infiltration condition.

[10] This form must be completed each time there is a change to the site layout that would affect the infiltration feasibility condition. Previously completed forms shall be retained to document the evolution of the site storm water design.

[11] Available data include site-specific sampling or observation of soil types or texture classes, such as obtained from borings or test pits necessary to support other design elements.

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions	Worksheet C.4-1: Form I- 8A[10]
1E	**Number of Percolation/Infiltration Tests.** Does the infiltration testing method performed satisfy the minimum number of tests specified in Table D.3-2? ☒ Yes; continue to Step 1F. ☐ No; conduct appropriate number of tests.
IF	**Factor of Safety.** Is the suitable Factor of Safety selected for full infiltration design? See guidance in D.5; Tables D.5-1 and D.5-2; and Worksheet D.5-1 (Form I-9). ☒ Yes; continue to Step 1G. ☐ No; select appropriate factor of safety.
1G	**Full Infiltration Feasibility.** Is the average measured infiltration rate divided by the Factor of Safety greater than 0.5 inches per hour? ☐ Yes; answer "Yes" to Criteria 1 Result. ☒ No; answer "No" to Criteria 1 Result.
Criteria 1 Result	Is the estimated reliable infiltration rate greater than 0.5 inches per hour within the DMA where runoff can reasonably be routed to a BMP? ☐ Yes; the DMA may feasibly support full infiltration. Continue to Criteria 2. ☒ No; full infiltration is not required. Skip to Part 1 Result.

Summarize infiltration testing methods, testing locations, replicates, and results and summarize estimates of reliable infiltration rates according to procedures outlined in D.5. Documentation should be included in project geotechnical report.

We performed 5 Aardvark Permeameter tests at the site within existing Very Old Paralic Deposits/Stadium Conglomerate. The following presents the results of our field infiltration tests:

P-1 at 5 feet; Material: Very Old Paralic Deposits; 0.002 inches/hour (0.001 inches/hour with FOS=2)

P-2 at 5 feet; Material: Very Old Paralic Deposits; 0.004 inches/hour (0.002 inches/hour with FOS=2)

P-3 at 5 feet; Material: Very Old Paralic Deposits; 0.002 inches/hour (0.001 inches/hour with FOS=2)

P-4 at 5 feet; Material: Very Old Paralic Deposits; 0.128 inches/hour (0.064 inches/hour with FOS=2)

P-5 at 5 feet; Material: Very Old Paralic Deposits; 0.003 inches/hour (0.002 inches/hour with FOS=2)

The test results indicate the approximate infiltration rates range from 0.002 to 0.128 inches per hour (0.001 to 0.064 inches per hour with an applied factor of safety of 2) and an average of 0.028 inches per hour (0.014 inches per hour with a factor of safety of 2).

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions			Worksheet C.4-1: Form I- 8A[10]
Criteria 2: Geologic/Geotechnical Screening			
2A	If all questions in Step 2A are answered "Yes," continue to Step 2B. For any "No" answer in Step 2A answer "No" to Criteria 2, and submit an "Infiltration Feasibility Condition Letter" that meets the requirements in Appendix C.1.1. The geologic/geotechnical analyses listed in Appendix C.2.1 do not apply to the DMA because one of the following setbacks cannot be avoided and therefore result in the DMA being in a no infiltration condition. The setbacks must be the closest horizontal radial distance from the surface edge (at the overflow elevation) of the BMP.		
2A–1	Can the proposed full infiltration BMP(s) avoid areas with existing fill materials greater than 5 feet thick below the infiltrating surface?	☐ Yes	☐ No
2A-2	Can the proposed full infiltration BMP(s) avoid placement within 10 feet of existing underground utilities, structures, or retaining walls?	☐ Yes	☐ No
2A-3	Can the proposed full infiltration BMP(s) avoid placement within 50 feet of a natural slope (>25%) or within a distance of 1.5H from fill slopes where H is the height of the fill slope?	☐ Yes	☐ No
2B	When full infiltration is determined to be feasible, a geotechnical investigation report must be prepared that considers the relevant factors identified in Appendix C.2.1. If all questions in Step 2B are answered "Yes," then answer "Yes" to Criteria 2 Result. If there are "No" answers continue to Step 2C.		
2B–1	**Hydroconsolidation.** Analyze hydroconsolidation potential per approved ASTM standard due to a proposed full infiltration BMP. Can full infiltration BMPs be proposed within the DMA without increasing hydroconsolidation risks?	☐ Yes	☐ No
2B-2	**Expansive Soils.** Identify expansive soils (soils with an expansion index greater than 20) and the extent of such soils due to proposed full infiltration BMPs. Can full infiltration BMPs be proposed within the DMA without increasing expansive soil risks?	☐ Yes	☐ No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I- 8A[10]	
2B-3	**Liquefaction**. If applicable, identify mapped liquefaction areas. Evaluate liquefaction hazards in accordance with Section 6.4.2 of the City of San Diego's Guidelines for Geotechnical Reports (2011 or most recent edition). Liquefaction hazard assessment shall take into account any increase in groundwater elevation or groundwater mounding that could occur as a result of proposed infiltration or percolation facilities. Can full infiltration BMPs be proposed within the DMA without increasing liquefaction risks?	☐ Yes	☐ No
2B-4	**Slope Stability**. If applicable, perform a slope stability analysis in accordance with the ASCE and Southern California Earthquake Center (2002) Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Landslide Hazards in California to determine minimum slope setbacks for full infiltration BMPs. See the City of San Diego's Guidelines for Geotechnical Reports (2011) to determine which type of slope stability analysis is required. Can full infiltration BMPs be proposed within the DMA without increasing slope stability risks?	☐ Yes	☐ No
2B-5	**Other Geotechnical Hazards.** Identify site-specific geotechnical hazards not already mentioned (refer to Appendix C.2.1). Can full infiltration BMPs be proposed within the DMA without increasing risk of geologic or geotechnical hazards not already mentioned?	☐ Yes	☐ No
2B-6	**Setbacks.** Establish setbacks from underground utilities, structures, and/or retaining walls. Reference applicable ASTM or other recognized standard in the geotechnical report. Can full infiltration BMPs be proposed within the DMA using established setbacks from underground utilities, structures, and/or retaining walls?	☐ Yes	☐ No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions			Worksheet C.4-1: Form I- 8A[10]
2C	**Mitigation Measures.** Propose mitigation measures for each geologic/geotechnical hazard identified in Step 2B. Provide a discussion of geologic/geotechnical hazards that would prevent full infiltration BMPs that cannot be reasonably mitigated in the geotechnical report. See Appendix C.2.1.8 for a list of typically reasonable and typically unreasonable mitigation measures. Can mitigation measures be proposed to allow for full infiltration BMPs? If the question in Step 2 is answered "Yes," then answer "Yes" to Criteria 2 Result. If the question in Step 2C is answered "No," then answer "No" to Criteria 2 Result.	☐ Yes	☐ No
Criteria 2 Result	Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geologic or geotechnical hazards that cannot be reasonably mitigated to an acceptable level?	☐ Yes	☐ No
Summarize findings and basis; provide references to related reports or exhibits.			

Part 1 Result – Full Infiltration Geotechnical Screening [12]	Result
If answers to both Criteria 1 and Criteria 2 are "Yes", a full infiltration design is potentially feasible based on Geotechnical conditions only. If either answer to Criteria 1 or Criteria 2 is "No", a full infiltration design is not required.	☐ Full infiltration Condition ☒ Complete Part 2

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

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions	Worksheet C.4-1: Form I- 8A[10]
Part 2 – Partial vs. No Infiltration Feasibility Screening Criteria	
DMA(s) Being Analyzed:	**Project Phase:**
College View – 5420-22 55th Street, San Diego, California	Design

Criteria 3: Infiltration Rate Screening

3A	**NRCS Type C, D, or "urban/unclassified":** Is the mapped hydrologic soil group according to the NRCS Web Soil Survey or UC Davis Soil Web Mapper is Type C, D, or "urban/unclassified" and corroborated by available site soil data? ☐ Yes; the site is mapped as C soils and a reliable infiltration rate of 0.15 in/hr. is used to size partial infiltration BMPS. Answer "Yes" to Criteria 3 Result. ☐ Yes; the site is mapped as D soils or "urban/unclassified" and a reliable infiltration rate of 0.05 in/hr. is used to size partial infiltration BMPS. Answer "Yes" to Criteria 3 Result. ☒ No; infiltration testing is conducted (refer to Table D.3–1), continue to Step 3B.
3B	**Infiltration Testing Result:** Is the reliable infiltration rate (i.e. average measured infiltration rate/2) greater than 0.05 in/hr. and less than or equal to 0.5 in/hr? ☐ Yes; the site may support partial infiltration. Answer "Yes" to Criteria 3 Result. ☒ No; the reliable infiltration rate (i.e. average measured rate/2) is less than 0.05 in/hr., partial infiltration is not required. Answer "No" to Criteria 3 Result.
Criteria 3 Result	Is the estimated reliable infiltration rate (i.e., average measured infiltration rate/2) greater than or equal to 0.05 inches/hour and less than or equal to 0.5 inches/hour at any location within each DMA where runoff can reasonably be routed to a BMP? ☐ Yes; Continue to Criteria 4. ☒ No: Skip to Part 2 Result.

Summarize infiltration testing and/or mapping results (i.e. soil maps and series description used for infiltration rate).

We performed 5 Aardvark Permeameter tests at the site within existing Very Old Paralic Deposits/Stadium Conglomerate. The following presents the results of our field infiltration tests:

P-1 at 5 feet; Material: Very Old Paralic Deposits; 0.002 inches/hour (0.001 inches/hour with FOS=2)

P-2 at 5 feet; Material: Very Old Paralic Deposits; 0.004 inches/hour (0.002 inches/hour with FOS=2)

P-3 at 5 feet; Material: Very Old Paralic Deposits; 0.002 inches/hour (0.001 inches/hour with FOS=2)

P-4 at 5 feet; Material: Very Old Paralic Deposits; 0.128 inches/hour (0.064 inches/hour with FOS=2)

P-5 at 5 feet; Material: Very Old Paralic Deposits; 0.003 inches/hour (0.002 inches/hour with FOS=2)

The test results indicate the approximate infiltration rates range from 0.002 to 0.128 inches per hour (0.001 to 0.064 inches per hour with an applied factor of safety of 2) and an average of 0.028 inches per hour (0.014 inches per hour with a factor of safety of 2).

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]	
Criteria 4: Geologic/Geotechnical Screening			
4A	If all questions in Step 4A are answered "Yes," continue to Step 4B. For any "No" answer in Step 4A answer "No" to Criteria 4 Result, and submit an "Infiltration Feasibility Condition Letter" that meets the requirements in Appendix C.1.1. The geologic/geotechnical analyses listed in Appendix C.2.1 do not apply to the DMA because one of the following setbacks cannot be avoided and therefore result in the DMA being in a no infiltration condition. The setbacks must be the closest horizontal radial distance from the surface edge (at the overflow elevation) of the BMP.		
4A–1	Can the proposed partial infiltration BMP(s) avoid areas with existing fill materials greater than 5 feet thick?	☐ Yes	☐ No
4A-2	Can the proposed partial infiltration BMP(s) avoid placement within 10 feet of existing underground utilities, structures, or retaining walls?	☐ Yes	☐ No
4A-3	Can the proposed partial infiltration BMP(s) avoid placement within 50 feet of a natural slope (>25%) or within a distance of 1.5H from fill slopes where H is the height of the fill slope?	☐ Yes	☐ No
4B	When full infiltration is determined to be feasible, a geotechnical investigation report must be prepared that considers the relevant factors identified in Appendix C.2.1 If all questions in Step 4B are answered "Yes," then answer "Yes" to Criteria 4 Result. If there are any "No" answers continue to Step 4C.		
4B–1	**Hydroconsolidation.** Analyze hydroconsolidation potential per approved ASTM standard due to a proposed full infiltration BMP. Can partial infiltration BMPs be proposed within the DMA without increasing hydroconsolidation risks?	☐ Yes	☐ No
4B-2	**Expansive Soils.** Identify expansive soils (soils with an expansion index greater than 20) and the extent of such soils due to proposed full infiltration BMPs. Can partial infiltration BMPs be proposed within the DMA without increasing expansive soil risks?	☐ Yes	☐ No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I- 8A[10]	
4B-3	**Liquefaction**. If applicable, identify mapped liquefaction areas. Evaluate liquefaction hazards in accordance with Section 6.4.2 of the City of San Diego's Guidelines for Geotechnical Reports (2011). Liquefaction hazard assessment shall take into account any increase in groundwater elevation or groundwater mounding that could occur as a result of proposed infiltration or percolation facilities. Can partial infiltration BMPs be proposed within the DMA without increasing liquefaction risks?	☐ Yes	☐ No
4B-4	**Slope Stability**. If applicable, perform a slope stability analysis in accordance with the ASCE and Southern California Earthquake Center (2002) Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Landslide Hazards in California to determine minimum slope setbacks for full infiltration BMPs. See the City of San Diego's Guidelines for Geotechnical Reports (2011) to determine which type of slope stability analysis is required. Can partial infiltration BMPs be proposed within the DMA without increasing slope stability risks?	☐ Yes	☐ No
4B-5	**Other Geotechnical Hazards.** Identify site-specific geotechnical hazards not already mentioned (refer to Appendix C.2.1). Can partial infiltration BMPs be proposed within the DMA without increasing risk of geologic or geotechnical hazards not already mentioned?	☐ Yes	☐ No
4B-6	**Setbacks.** Establish setbacks from underground utilities, structures, and/or retaining walls. Reference applicable ASTM or other recognized standard in the geotechnical report. Can partial infiltration BMPs be proposed within the DMA using recommended setbacks from underground utilities, structures, and/or retaining walls?	☐ Yes	☐ No
4C	**Mitigation Measures.** Propose mitigation measures for each geologic/geotechnical hazard identified in Step 4B. Provide a discussion on geologic/geotechnical hazards that would prevent partial infiltration BMPs that cannot be reasonably mitigated in the geotechnical report. See Appendix C.2.1.8 for a list of typically reasonable and typically unreasonable mitigation measures. Can mitigation measures be proposed to allow for partial infiltration BMPs? If the question in Step 4C is answered "Yes," then answer "Yes" to Criteria 4 Result. If the question in Step 4C is answered "No," then answer "No" to Criteria 4 Result.	☐ Yes	☐ No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I- 8A[10]	
Criteria 4 Result	Can infiltration of greater than or equal to 0.05 inches/hour and less than or equal to 0.5 inches/hour be allowed without increasing the risk of geologic or geotechnical hazards that cannot be reasonably mitigated to an acceptable level?	☐ Yes	☐ No
Summarize findings and basis; provide references to related reports or exhibits.			

Part 2 – Partial Infiltration Geotechnical Screening Result[13]	Result
If answers to both Criteria 3 and Criteria 4 are "Yes", a partial infiltration design is potentially feasible based on geotechnical conditions only. If answers to either Criteria 3 or Criteria 4 is "No", then infiltration of any volume is considered to be infeasible within the site.	☐ Partial Infiltration Condition ☒ No Infiltration Condition

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

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N

NO SCALE

VICINITY MAP

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6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974

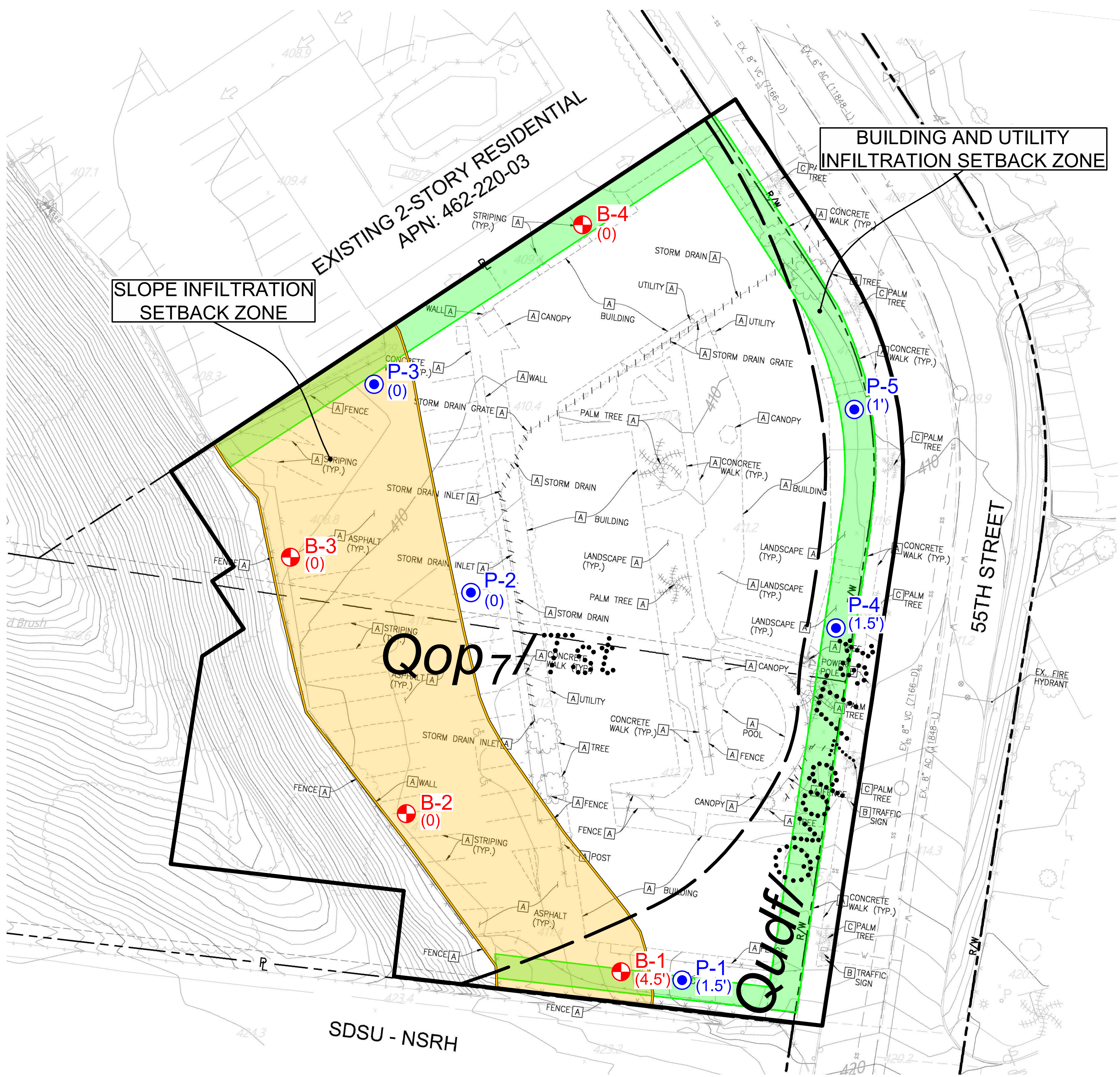
PHONE 858 558-6900 - FAX 858 558-6159

COLLEGE VIEW
5420-22 55TH STREET
SAN DIEGO, CALIFORNIA

RM / AML		DSK/GTYPD	DATE 08 - 23 - 2019	PROJECT NO. G2432 - 52 - 01	FIG. 1

Plotted:08/23/2019 1:44PM | By:RUBEN AGUILAR | File Location:Y:\PROJECTS\G2432-52-01 (College View)\DETAILS\G2432-52-01 Vic Map.dwg

COLLEGE VIEW
5420-22 55TH STREET
SAN DIEGO, CALIFORNIA



SCALE 1"=40'(on 11x17)

0' 20' 40' 60' 80'

GEOCON LEGEND

- Qudf ........UNDOCUMENTED FILL
- Qvop7 ....VERY OLD PARALIC DEPOSITS (Dotted Where Buried)
- Tst ....STADIUM CONGLOMERATE (Dotted Where Buried)
- ....APPROX. LOCATION OF GEOLOGIC CONTACT
- B-4 ....APPROX. LOCATION OF BORING
- P-5 ....APPROX. LOCATION OF AARDVARK PERMEAMETER TEST
- (4') ....APPROX. DEPTH TO FORMATION (Feet)

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GEOLOGIC MAP

PROJECT NO. G2432 - 52 - 01
FIGURE 2
DATE 08 - 23 - 2019

BORING P 1

ELEV. (MSL.) **415'** DATE COMPLETED **08-08-2019**

EQUIPMENT **CME 75** BY: **K. HAASE**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					5" **ASPHALT**			
				SM	**UNDOCUMENTED FILL (Qudf)** Medium dense, moist, brown, Silty, fine to corse SAND; abundant gravel and cobble			
2				SM	**VERY OLD PARALIC DEPOSITS/STADIUM CONGLOMERATE-Undivided ($Qvop_7$/Tst)** Very dense, damp to moist, brown, Silty, fine- to coarse-grained, Sandy CONGLOMERATE			
4								
					BORING TERMINATED AT 5 FEET Groundwater not encountered			

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

G2432-52-01.GPJ

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

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

GEOCON

PROJECT NO. G2432-52-01

BORING P 2

ELEV. (MSL.) 412' DATE COMPLETED 08-08-2019

EQUIPMENT CME 75 BY: K. HAASE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					4" **ASPHALT**			
				SC	**VERY OLD PARALIC DEPOSITS/STADIUM CONGLOMERATE-Undivided (Qvop$_7$/Tst)** Dense to very dense, moist, brown, Clayey, fine- to coarse-grained, Sandy CONGLOMERATE			
2								
4								
6								
8					BORING TERMINATED AT 8 FEET Groundwater not encountered			

Figure A-6,
Log of Boring P 2, Page 1 of 1

G2432-52-01.GPJ

SAMPLE SYMBOLS

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

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

GEOCON

PROJECT NO. G2432-52-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	BORING P 3 ELEV. (MSL.) 409' DATE COMPLETED 08-08-2019 EQUIPMENT CME 75 BY: K. HAASE	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0					5" **ASPHALT**			
				SC	**VERY OLD PARALIC DEPOSITS/STADIUM CONGLOMERATE-Undivided (Qvop$_7$/Tst)** Dense to very dense, moist, dark brown, Clayey, fine- to coarse-grained, Sandy CONGLOMERATE			
2								
4								
					BORING TERMINATED AT 5 FEET Groundwater not encountered			

Figure A-7,
Log of Boring P 3, Page 1 of 1

G2432-52-01.GPJ

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

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

GEOCON

PROJECT NO. G2432-52-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	BORING P 4 ELEV. (MSL.) 411' DATE COMPLETED 08-09-2019 EQUIPMENT HAND AUGER BY: K. HAASE	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SC	**UNDOCUMENTED FILL (Qudf)** Loose, moist, dark brown, Clayey, fine to coarse SAND; some gravel			
2				SC	**VERY OLD PARALIC DEPOSITS/STADIUM CONGLOMERATE-Undivided ($Qvop_7$/Tst)** Very dense, damp to moist, brown, Clayey, fine- to coarse-grained Sandy CONGLOMERATE			
					BORING TERMINATED AT 2.5 FEET Groundwater not encountered			

Figure A-8,
Log of Boring P 4, Page 1 of 1

G2432-52-01.GPJ

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

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

GEOCON

PROJECT NO. G2432-52-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	BORING P 5 ELEV. (MSL.) 409' DATE COMPLETED 08-09-2019 EQUIPMENT HAND AUGER BY: K. HAASE	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SC	**UNDOCUMENTED FILL (Qudf)** Loose, moist, brown, Clayey, fine to medium SAND; some gravel			
				SC	**VERY OLD PARALIC DEPOSITS/STADIUM CONGLOMERATE-Undivided ($Qvop_7$/Tst)** Very dense, damp to moist, brown, Clayey, fine- to coarse-grained Sandy CONGLOMERATE			
2					BORING TERMINATED AT 2 FEET Groundwater not encountered			

Figure A-9,
Log of Boring P 5, Page 1 of 1

G2432-52-01.GPJ

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

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

GEOCON

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Aardvark Permeameter Data Analysis

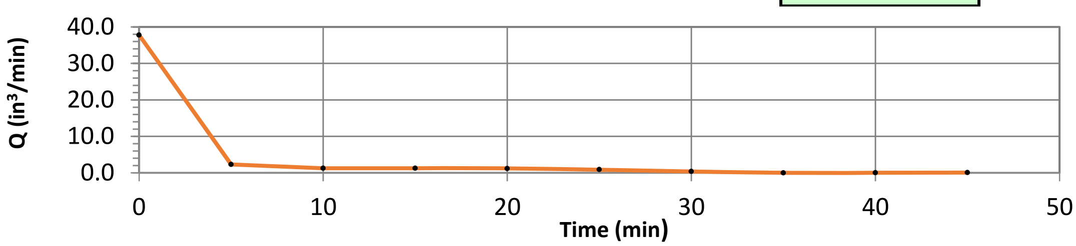
Project Name: College View
Project Number: G2432-52-01
Test Number: P-1
Date: 8/8/2019
By: JML

Borehole Diameter, d (in.):	8.00
Borehole Depth, **H** (in):	55.00
Distance Between Reservoir & Top of Borehole (in.):	30.50
Estimated Depth to Water Table, **S** (feet):	50.00
Height APM Raised from Bottom (in.):	5.00
Pressure Reducer Used:	No

Ref. EL (feet, MSL):	415.0
Bottom EL (feet, MSL):	410.4

Distance Between Resevoir and APM Float, **D** (in.):	73.25
Head Height Calculated, **h** (in.):	8.74
Head Height Measured, **h** (in.):	8.00
Distance Between Constant Head and Water Table, **L** (in.):	553.00

Reading	Time Elapsed (min)	Water Weight Consummed (lbs)	Water Volume Consummed (in^3)	Q (in^3/min)
1	0.00	0.000	0.00	0.00
2	5.00	6.820	188.86	37.772
3	5.00	0.415	11.49	2.298
4	5.00	0.230	6.37	1.274
5	5.00	0.225	6.23	1.246
6	5.00	0.210	5.82	1.163
7	5.00	0.165	4.57	0.914
8	5.00	0.070	1.94	0.388
9	5.00	0.000	0.00	0.000
10	5.00	0.005	0.14	0.028
11	5.00	0.010	0.28	0.055
			Steady Flow Rate, Q (in^3/min):	0.042



Soil Matric Flux Potential, Φ_m

Φ_m= 0.00041 in^2/min

Field-Saturated Hydraulic Conductivity (Infiltration Rate)

K_{sat} = 4.16E-05 in/min 0.002 in/hr

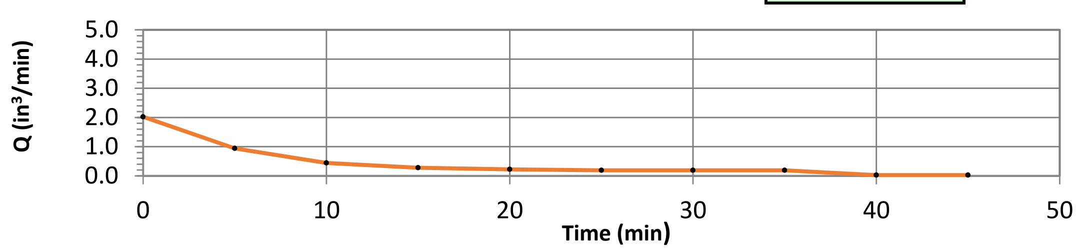
GEOCON

Aardvark Permeameter Data Analysis

Project Name:	College View	Date:	8/8/2019	
Project Number:	G2432-52-01	By:	JML	
Test Number:	P-2		Ref. EL (feet, MSL):	412.0
			Bottom EL (feet, MSL):	403.5

Borehole Diameter, d (in.):	8.00
Borehole Depth, **H** (in):	102.00
Distance Between Reservoir & Top of Borehole (in.):	29.50
Estimated Depth to Water Table, **S** (feet):	50.00
Height APM Raised from Bottom (in.):	5.00
Pressure Reducer Used:	No
Distance Between Resevoir and APM Float, **D** (in.):	119.25
Head Height Calculated, **h** (in.):	8.90
Head Height Measured, **h** (in.):	11.00
Distance Between Constant Head and Water Table, **L** (in.):	509.00

Reading	Time Elapsed (min)	Water Weight Consummed (lbs)	Water Volume Consummed (in^3)	Q (in^3/min)
1	0.00	0.000	0.00	0.00
2	5.00	0.365	10.11	2.022
3	5.00	0.170	4.71	0.942
4	5.00	0.080	2.22	0.443
5	5.00	0.050	1.38	0.277
6	5.00	0.040	1.11	0.222
7	5.00	0.035	0.97	0.194
8	5.00	0.035	0.97	0.194
9	5.00	0.035	0.97	0.194
10	5.00	0.005	0.14	0.028
11	5.00	0.005	0.14	0.028
			Steady Flow Rate, Q (in^3/min):	0.083



Soil Matric Flux Potential, Φ_m

Φ_m= 0.0006 in^2/min

Field-Saturated Hydraulic Conductivity (Infiltration Rate)

K_{sat} = 6.39E-05 in/min | 0.004 in/hr

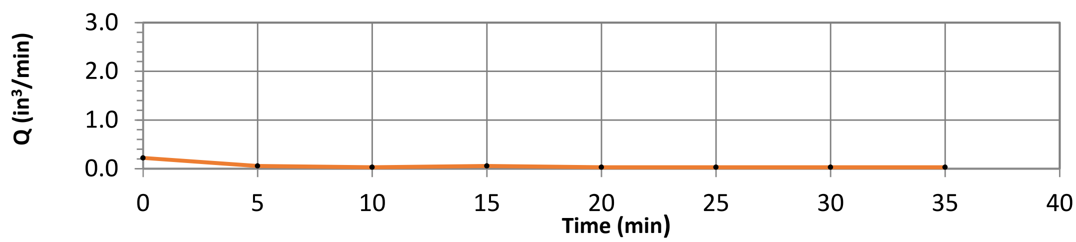
GEOCON

Aardvark Permeameter Data Analysis

Project Name:	College View	Date:	8/9/2019
Project Number:	G2432-52-01	By:	JML
Test Number:	P-3	Ref. EL (feet, MSL):	409.0
		Bottom EL (feet, MSL):	404.3

Borehole Diameter, d (in.):	8.00
Borehole Depth, **H** (in):	57.00
Distance Between Reservoir & Top of Borehole (in.):	28.50
Estimated Depth to Water Table, **S** (feet):	50.00
Height APM Raised from Bottom (in.):	5.00
Pressure Reducer Used:	No
Distance Between Resevoir and APM Float, **D** (in.):	73.25
Head Height Calculated, **h** (in.):	8.74
Head Height Measured, **h** (in.):	9.00
Distance Between Constant Head and Water Table, **L** (in.):	552.00

Reading	Time Elapsed (min)	Water Weight Consummed (lbs)	Water Volume Consummed (in^3)	Q (in^3/min)
1	0.00	0.000	0.00	0.00
2	5.00	8.775	243.00	48.600
3	5.00	0.040	1.11	0.222
4	5.00	0.010	0.28	0.055
5	5.00	0.005	0.14	0.028
6	5.00	0.010	0.28	0.055
7	5.00	0.005	0.14	0.028
8	5.00	0.005	0.14	0.028
9	5.00	0.005	0.14	0.028
10	5.00	0.005	0.14	0.028
			Steady Flow Rate, Q (in^3/min):	0.028



Soil Matric Flux Potential, Φ_m

Φ_m= 0.0002 in^2/min

Field-Saturated Hydraulic Conductivity (Infiltration Rate)

K_{sat} = 2.53E-05 in/min | 0.002 in/hr

GEOCON

Aardvark Permeameter Data Analysis

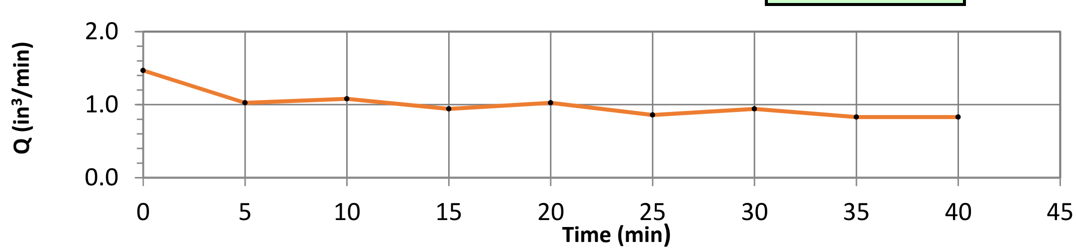
Project Name: College View
Project Number: G2432-52-01
Test Number: P-4

Date: 8/9/2019
By: JML
Ref. EL (feet, MSL): 411.0
Bottom EL (feet, MSL): 408.7

Borehole Diameter, d (in.):	5.00
Borehole Depth, **H** (in):	28.00
Distance Between Reservoir & Top of Borehole (in.):	26.00
Estimated Depth to Water Table, **S** (feet):	50.00
Height APM Raised from Bottom (in.):	1.00
Pressure Reducer Used:	No

Distance Between Resevoir and APM Float, **D** (in.):	45.75
Head Height Calculated, **h** (in.):	4.65
Head Height Measured, **h** (in.):	3.50
Distance Between Constant Head and Water Table, **L** (in.):	575.50

Reading	Time Elapsed (min)	Water Weight Consummed (lbs)	Water Volume Consummed (in^3)	Q (in^3/min)
1	0.00	0.000	0.00	0.00
2	5.00	0.265	7.34	1.468
3	5.00	0.185	5.12	1.025
4	5.00	0.195	5.40	1.080
5	5.00	0.170	4.71	0.942
6	5.00	0.185	5.12	1.025
7	5.00	0.155	4.29	0.858
8	5.00	0.170	4.71	0.942
9	5.00	0.150	4.15	0.831
10	5.00	0.150	4.15	0.831
			Steady Flow Rate, Q (in^3/min):	0.868



Soil Matric Flux Potential, Φ_m

Φ_m= 0.0209 in^2/min

Field-Saturated Hydraulic Conductivity (Infiltration Rate)

K_{sat} = 2.13E-03 in/min   0.128 in/hr

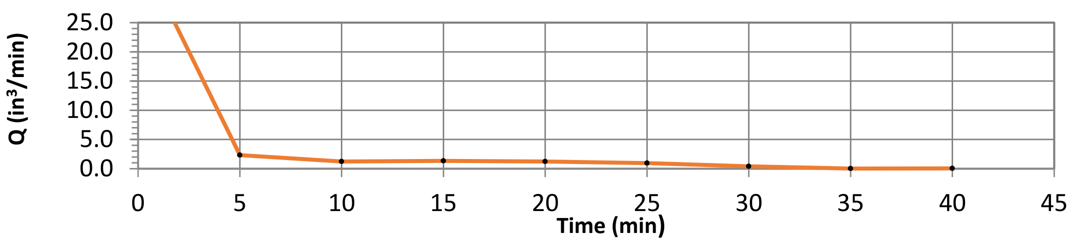
GEOCON

Aardvark Permeameter Data Analysis

Project Name:	College View	Date:	8/9/2019
Project Number:	G2432-52-01	By:	JML
Test Number:	P-5	Ref. EL (feet, MSL):	409.0
		Bottom EL (feet, MSL):	406.9

Borehole Diameter, d (in.):	8.00
Borehole Depth, **H** (in):	25.00
Distance Between Reservoir & Top of Borehole (in.):	28.00
Estimated Depth to Water Table, **S** (feet):	50.00
Height APM Raised from Bottom (in.):	2.00
Pressure Reducer Used:	No
Distance Between Resevoir and APM Float, **D** (in.):	43.75
Head Height Calculated, **h** (in.):	5.65
Head Height Measured, **h** (in.):	5.50
Distance Between Constant Head and Water Table, **L** (in.):	580.50

Reading	Time Elapsed (min)	Water Weight Consummed (lbs)	Water Volume Consummed (in^3)	Q (in^3/min)
1	0.00	0.000	0.00	0.00
2	5.00	6.810	188.58	37.717
3	5.00	0.420	11.63	2.326
4	5.00	0.220	6.09	1.218
5	5.00	0.240	6.65	1.329
6	5.00	0.220	6.09	1.218
7	5.00	0.175	4.85	0.969
8	5.00	0.075	2.08	0.415
9	5.00	0.005	0.14	0.028
10	5.00	0.010	0.28	0.055
			Steady Flow Rate, Q (in^3/min):	0.042



Soil Matric Flux Potential, Φ_m

Φ_m= 0.0005 in^2/min

Field-Saturated Hydraulic Conductivity (Infiltration Rate)

K_{sat} = 5.46E-05 in/min | 0.003 in/hr

Attachment 4

City of San Diego: B- Worksheets

The City of SAN DIEGO		Project Name		COLLEGE VIEW
		BMP ID		BMP 1
Design Capture Volume		**Worksheet B.2-1**		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.57	inches
2	Area tributary to BMP (s)	A=	1.13	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.73	unitless
4	Trees Credit Volume Note: In the SWQMP list the number of trees, size of each tree, amount of soil volume installed for each tree, contributing area to each tree and the inlet opening dimension for each tree.	TCV=	0	cubic-feet
5	Rain barrels Credit Volume Note: In the SWQMP list the number of rain barrels, size of each rain barrel and the use of the captured storm water runoff.	RCV=	0	cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=	1707	cubic-feet

The City of SAN DIEGO		Project Name	COLLEGE VIEW
		BMP ID	BMP 1
Flow-thru Design Flows		**Worksheet B.6-1**	

1	DCV	DCV	1,707	cubic-feet
2	DCV retained	$DCV_{retained}$	0	cubic-feet
3	DCV biofiltered	$DCV_{biofiltered}$	0	cubic-feet
4	DCV requiring flow-thru (Line 1 – Line 2 – 0.67*Line 3)	$DCV_{flow-thru}$	0	cubic-feet
5	Adjustment factor (Line 4 / Line 1)	AF=	1	unitless
6	Design rainfall intensity	i=	0.20	in/hr.
7	Area tributary to BMP (s)	A=	1.13	acres
8	Area-weighted runoff factor (estimate using Appendix B.2)	C=	0.73	unitless
9	Calculate Flow Rate = AF x (C x i x A)	Q=	0.165	cfs

TREATMENT FLOW = 0.247 CFS

The City of SAN DIEGO	Project Name	COLLEGE VIEW	
	BMP ID	BMP 1	
Sizing Method for Volume Retention Criteria		**Worksheet B.5-2**	

1	Area draining to the BMP	49605	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)	0.73	
3	85^{th} percentile 24-hour rainfall depth	0.57	inches
4	Design capture volume [Line 1 x Line 2 x (Line 3/12)]	1720	cu. ft.
Volume Retention Requirement			
5	Measured infiltration rate in the DMA Note: When mapped hydrologic soil groups are used enter 0.10 for NRCS Type D soils and for NRCS Type C soils enter 0.30 When in no infiltration condition and the actual measured infiltration rate is unknown enter 0.0 if there are geotechnical and/or groundwater hazards identified in Appendix C or enter 0.05	0	in/hr.
6	Factor of safety	2	
7	Reliable infiltration rate, for biofiltration BMP sizing [Line 5 / Line 6]	0	in/hr.
8	Average annual volume reduction target (Figure B.5-2) When Line 7 > 0.01 in/hr. = Minimum (40, 166.9 x Line 7 +6.62) When Line 7 ≤ 0.01 in/hr. = 3.5%	3.5	%
9	Fraction of DCV to be retained (Figure B.5-3) When Line 8 > 8% = 0.0000013 x Line 8^3 - 0.000057 x Line 8^2 + 0.0086 x Line 8 - 0.014 When Line 8 ≤ 8% = 0.023	0.023	
10	Target volume retention [Line 9 x Line 4]	40	cu. ft.

The City of SAN DIEGO

Project Name	COLLEGE VIEW
BMP ID	BMP 1

Volume Retention for No Infiltration Condition — Worksheet B.5-6

1	Area draining to the biofiltration BMP	49605	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)	0.73	
3	Effective impervious area draining to the BMP [Line 1 x Line 2]	36212	sq. ft.
4	Required area for Evapotranspiration [Line 3 x 0.03]	1086	sq. ft.
5	Biofiltration BMP Footprint	84	sq. ft.

Landscape Area (must be identified on DS-3247)

	Identification	1	2	3	4	5
6	Landscape area that meet the requirements in SD-B and SD-F Fact Sheet (sq. ft.)	178	347	263	285	
7	Impervious area draining to the landscape area (sq. ft.)	331	624	488	487	
8	Impervious to Pervious Area ratio [Line 7/Line 6]	1.86	1.80	1.86	1.71	0.00
9	Effective Credit Area If (Line 8 >1.5, Line 6, Line 7/1.5]	178	347	263	285	0

10	Sum of Landscape area [sum of Line 9 Id's 1 to 5]	1073	sq. ft.
11	Provided footprint for evapotranspiration [Line 5 + Line 10]	1157	sq. ft.

Volume Retention Performance Standard

12	Is Line 11 ≥ Line 4?	Volume Retention Performance Standard is Met	
13	Fraction of the performance standard met through the BMP footprint and/or landscaping [Line 11/Line 4]	1.07	
14	Target Volume Retention [Line 10 from Worksheet B.5.2]	40	cu. ft.
15	Volume retention required from other site design BMPs [(1-Line 13) x Line 14]	-2.769285934	cu. ft.

Site Design BMP

	Identification	Site Design Type	Credit	
16	1			cu. ft.
	2			cu. ft.
	3			cu. ft.
	4			cu. ft.
	5			cu. ft.
	Sum of volume retention benefits from other site design BMPs (e.g. trees; rain barrels etc.). [sum of Line 16 Credits for Id's 1 to 5] Provide documentation of how the site design credit is calculated in the PDP SWQMP.		0	cu. ft.
17	Is Line 16 ≥ Line 15?	Volume Retention Performance Standard is Met		

Attachment 5

BMP Sizing Spreadsheet V3.0

BMP Sizing Spreadsheet V3.0

Project Name:	College View
Project Applicant:	Pierce Education Properties
Jurisdiction:	City of San Diego
Parcel (APN):	462-200-400
Hydrologic Unit:	San Diego
Rain Gauge:	Oceanside
Total Project Area (sf):	53,829
Channel Susceptibility:	HIGH

BMP Sizing Spreadsheet V3.0			
Project Name:	College View	Hydrologic Unit:	San Diego
Project Applicant:	Pierce Education Properties	Rain Gauge:	Oceanside
Jurisdiction:	City of San Diego	Total Project Area:	53,829
Parcel (APN):	462-200-400	Low Flow Threshold:	0.1Q2
BMP Name:	DMA 1 -4	BMP Type:	Cistern
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	NA

Areas Draining to BMP						HMP Sizing Factors	Minimum BMP Size
DMA Name	Area (sf)	Pre Project Soil Type	Pre-Project Slope	Post Project Surface Type	Area Weighted Runoff Factor (Table G.2-1)[1]	Volume	Volume (CF)
DMA 1 - Impervious	1,624	D	Steep	Concrete	1.0	0.12	195
DMA 1 -Pervious	4,217	D	Steep	Landscape	0.1	0.12	51
						0	0
DMA 2 - Impervious	35,630	D	Steep	Concrete	1.0	0.12	4276
DMA 2 -Pervious	3,694	D	Steep	Landscape	0.1	0.12	44
						0	0
DMA 3 - Impervious	1,606	D	Steep	Concrete	1.0	0.12	193
DMA 3 -Pervious	2,834	D	Steep	Landscape	0.1	0.12	34
						0	0
DMA 4 - Impervious	908	D	Steep	Concrete	1.0	0.12	109
DMA 4 -Pervious	3,316	D	Steep	Landscape	0.1	0.12	40
						0	0
						0	0
						0	0
						0	0
BMP Tributary Area	53,829					Minimum BMP Size	4941
						Proposed BMP Size*	5066

* Assumes standard configuration

Standard Cistern Depth (Overflow Elevation)	3.5	ft
Provided Cistern Depth (Overflow Elevation)	3.5	ft
Minimum Required Cistern Footprint	1412	CF

Notes:

1. Runoff factors which are used for hydromodification management flow control (Table G.2-1) are different from the runoff factors used for pollutant control BMP sizing (Table B.1-1). Table references are taken from the San Diego Region Model BMP Design Manu

Describe the BMP's in sufficient detail in your PDP SWQMP to demonstrate the area, volume, and other criteria can be met within the constraints of the site.

BMP's must be adapted and applied to the conditions specific to the development project such as unstable slopes or the lack of available head.
Designated Staff have final review and approval authority over the project design.

This BMP Sizing Spreadsheet has been updated in conformance with the San Diego Region Model BMP Design Manual, April 2018. For questions or concerns please contact the jurisdiction in which your project is located.

BMP Sizing Spreadsheet V3.0			
Project Name:	College View	Hydrologic Unit:	San Diego
Project Applicant:	Pierce Education Properties	Rain Gauge:	Oceanside
Jurisdiction:	City of San Diego	Total Project Area:	53,829
Parcel (APN):	462-200-400	Low Flow Threshold:	0.1Q2
BMP Name	DMA 1 -4	BMP Type:	Cistern

DMA Name	Rain Gauge	Pre-developed Condition		Unit Runoff Ratio	DMA Area (ac)	Orifice Flow - $\%Q_2$	Orifice Area
		Soil Type	Slope	(cfs/ac)		(cfs)	(in^2)
DMA 1 - Impervious	Oceanside	D	Steep	0.576	0.037	0.002	**0.03**
DMA 1 -Pervious	Oceanside	D	Steep	0.576	0.097	0.006	**0.08**
DMA 2 - Impervious	Oceanside	D	Steep	0.576	0.818	0.047	**0.70**
DMA 2 -Pervious	Oceanside	D	Steep	0.576	0.085	0.005	**0.07**
DMA 3 - Impervious	Oceanside	D	Steep	0.576	0.037	0.002	**0.03**
DMA 3 -Pervious	Oceanside	D	Steep	0.576	0.065	0.004	**0.06**
DMA 4 - Impervious	Oceanside	D	Steep	0.576	0.021	0.001	**0.02**
DMA 4 -Pervious	Oceanside	D	Steep	0.576	0.076	0.004	**0.06**

3.50	**0.071**	**1.05**	**1.16**
Max Orifice Head (feet)	**Max Tot. Allowable Orifice Flow (cfs)**	**Max Tot. Allowable Orifice Area (in^2)**	**Max Orifice Diameter (in)**

Provide Hand Calc.	**0.053**	**0.79**	**1.000**
Average outflow during surface drawdown (cfs)	Max Orifice Outflow (cfs)	Actual Orifice Area (in^2)	Selected Orifice Diameter (in)

Drawdown (Hrs)	Provide Hand Calculation

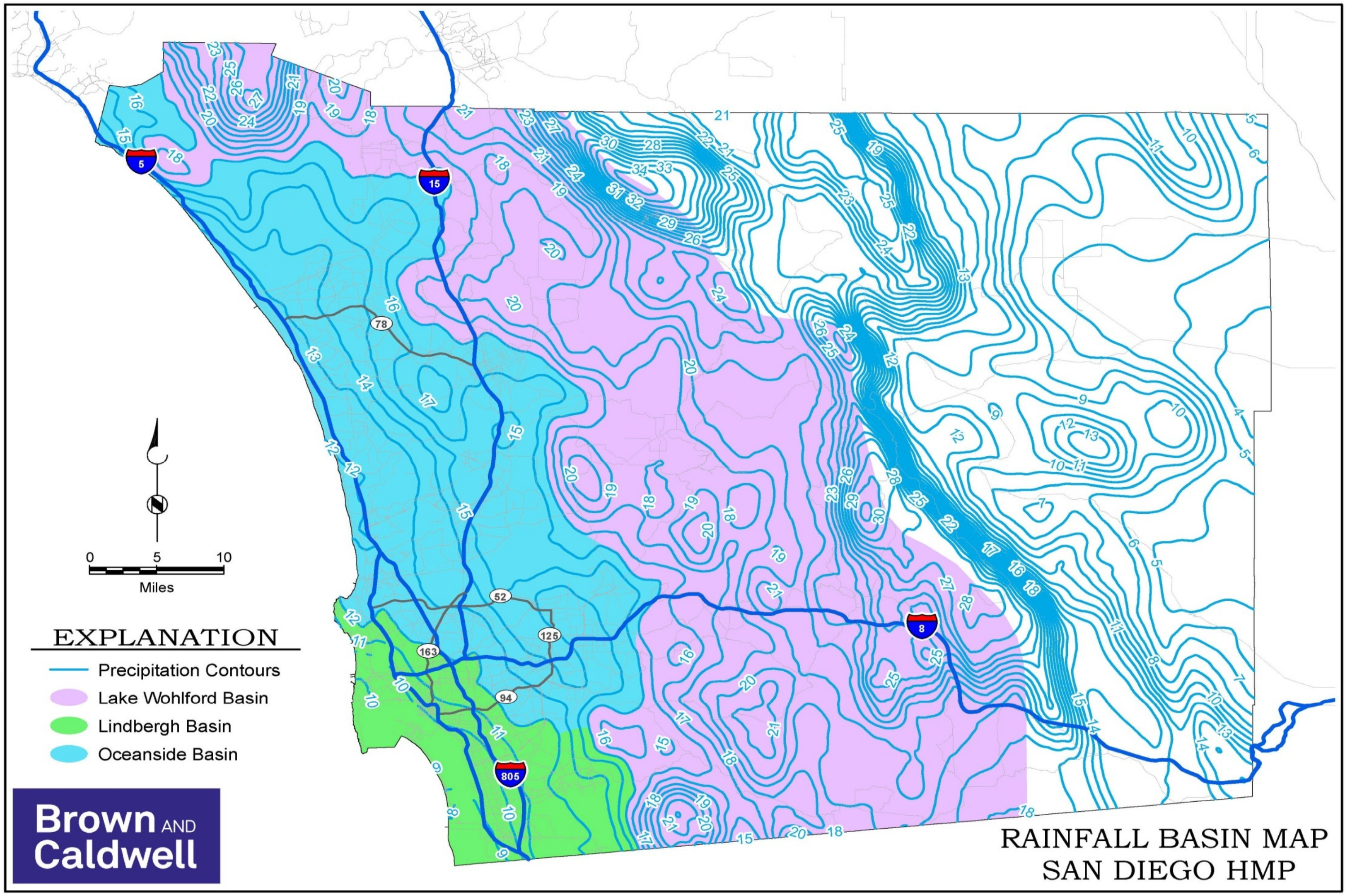


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Table G.2-3: Sizing Factors for Hydromodification Flow Control Infiltration BMPs Designed Using Sizing Factor Method				
Lower Flow Threshold	**Soil Group**	**Slope**	**Rain Gauge**	**A**
0.1Q2	A	Flat	Lindbergh	0.055
0.1Q2	A	Moderate	Lindbergh	0.055
0.1Q2	A	Steep	Lindbergh	0.055
0.1Q2	B	Flat	Lindbergh	0.045
0.1Q2	B	Moderate	Lindbergh	0.045
0.1Q2	B	Steep	Lindbergh	0.045
0.1Q2	C	Flat	Lindbergh	0.035
0.1Q2	C	Moderate	Lindbergh	0.035
0.1Q2	C	Steep	Lindbergh	0.035
0.1Q2	D	Flat	Lindbergh	0.03
0.1Q2	D	Moderate	Lindbergh	0.03
0.1Q2	D	Steep	Lindbergh	0.03
0.1Q2	A	Flat	Oceanside	0.06
0.1Q2	A	Moderate	Oceanside	0.06
0.1Q2	A	Steep	Oceanside	0.06
0.1Q2	B	Flat	Oceanside	0.05
0.1Q2	B	Moderate	Oceanside	0.05
0.1Q2	B	Steep	Oceanside	0.05
0.1Q2	C	Flat	Oceanside	0.05
0.1Q2	C	Moderate	Oceanside	0.05
0.1Q2	C	Steep	Oceanside	0.045
0.1Q2	D	Flat	Oceanside	0.035
0.1Q2	D	Moderate	Oceanside	0.035
0.1Q2	D	Steep	Oceanside	0.035
0.1Q2	A	Flat	Lake Wohlford	0.085
0.1Q2	A	Moderate	Lake Wohlford	0.085
0.1Q2	A	Steep	Lake Wohlford	0.085
0.1Q2	B	Flat	Lake Wohlford	0.07

0.1Q2	B	Moderate	Lake Wohlford	0.07
0.1Q2	B	Steep	Lake Wohlford	0.07
0.1Q2	C	Flat	Lake Wohlford	0.055
0.1Q2	C	Moderate	Lake Wohlford	0.055
0.1Q2	C	Steep	Lake Wohlford	0.055
0.1Q2	D	Flat	Lake Wohlford	0.04
0.1Q2	D	Moderate	Lake Wohlford	0.04
0.1Q2	D	Steep	Lake Wohlford	0.04

Table G.2-4: Sizing Factors for Hydromodification Flow Control Biofiltration with Partial Retention Designed Using Sizing Factor Method

Lower Flow Threshold	Soil Group	Slope	below low orifice inv	Rain Gauge	A
$0.1Q_2$	A	Flat	18	Lindbergh	0.08
$0.1Q_2$	A	Moderate	18	Lindbergh	0.08
$0.1Q_2$	A	Steep	18	Lindbergh	0.08
$0.1Q_2$	B	Flat	18	Lindbergh	0.065
$0.1Q_2$	B	Moderate	18	Lindbergh	0.065
$0.1Q_2$	B	Steep	18	Lindbergh	0.06
$0.1Q_2$	C	Flat	6	Lindbergh	0.05
$0.1Q_2$	C	Moderate	6	Lindbergh	0.05
$0.1Q_2$	C	Steep	6	Lindbergh	0.05
$0.1Q_2$	D	Flat	3	Lindbergh	0.05
$0.1Q_2$	D	Moderate	3	Lindbergh	0.05
$0.1Q_2$	D	Steep	3	Lindbergh	0.05
$0.1Q_2$	A	Flat	18	Oceanside	0.08
$0.1Q_2$	A	Moderate	18	Oceanside	0.075
$0.1Q_2$	A	Steep	18	Oceanside	0.075
$0.1Q_2$	B	Flat	18	Oceanside	0.07
$0.1Q_2$	B	Moderate	18	Oceanside	0.07
$0.1Q_2$	B	Steep	18	Oceanside	0.07
$0.1Q_2$	C	Flat	6	Oceanside	0.07
$0.1Q_2$	C	Moderate	6	Oceanside	0.07

$0.1Q_2$	C	Steep	6	Oceanside	0.07
$0.1Q_2$	D	Flat	3	Oceanside	0.07
$0.1Q_2$	D	Moderate	3	Oceanside	0.07
$0.1Q_2$	D	Steep	3	Oceanside	0.07
$0.1Q_2$	A	Flat	18	Lake Wohlford	0.11
$0.1Q_2$	A	Moderate	18	Lake Wohlford	0.11
$0.1Q_2$	A	Steep	18	Lake Wohlford	0.105
$0.1Q_2$	B	Flat	18	Lake Wohlford	0.09
$0.1Q_2$	B	Moderate	18	Lake Wohlford	0.085
$0.1Q_2$	B	Steep	18	Lake Wohlford	0.085
$0.1Q_2$	C	Flat	6	Lake Wohlford	0.065
$0.1Q_2$	C	Moderate	6	Lake Wohlford	0.065
$0.1Q_2$	C	Steep	6	Lake Wohlford	0.065
$0.1Q_2$	D	Flat	3	Lake Wohlford	0.06
$0.1Q_2$	D	Moderate	3	Lake Wohlford	0.06
$0.1Q_2$	D	Steep	3	Lake Wohlford	0.06

Table G.2-5: Sizing Factors for Hydromodification Flow Control Biofiltration BMPs Designed Using Sizing Factor Method

Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A
0.1Q2	A	Flat	Lindbergh	0.32
0.1Q2	A	Moderate	Lindbergh	0.3
0.1Q2	A	Steep	Lindbergh	0.285
0.1Q2	B	Flat	Lindbergh	0.105
0.1Q2	B	Moderate	Lindbergh	0.1
0.1Q2	B	Steep	Lindbergh	0.095
0.1Q2	C	Flat	Lindbergh	0.055
0.1Q2	C	Moderate	Lindbergh	0.05
0.1Q2	C	Steep	Lindbergh	0.05
0.1Q2	D	Flat	Lindbergh	0.05
0.1Q2	D	Moderate	Lindbergh	0.05
0.1Q2	D	Steep	Lindbergh	0.05
0.1Q2	A	Flat	Oceanside	0.15
0.1Q2	A	Moderate	Oceanside	0.14
0.1Q2	A	Steep	Oceanside	0.135

0.1Q2	B	Flat	Oceanside	0.085
0.1Q2	B	Moderate	Oceanside	0.085
0.1Q2	B	Steep	Oceanside	0.085
0.1Q2	C	Flat	Oceanside	0.075
0.1Q2	C	Moderate	Oceanside	0.075
0.1Q2	C	Steep	Oceanside	0.075
0.1Q2	D	Flat	Oceanside	0.07
0.1Q2	D	Moderate	Oceanside	0.07
0.1Q2	D	Steep	Oceanside	0.07
0.1Q2	A	Flat	Lake Wohlford	0.285
0.1Q2	A	Moderate	Lake Wohlford	0.275
0.1Q2	A	Steep	Lake Wohlford	0.27
0.1Q2	B	Flat	Lake Wohlford	0.15
0.1Q2	B	Moderate	Lake Wohlford	0.145
0.1Q2	B	Steep	Lake Wohlford	0.145
0.1Q2	C	Flat	Lake Wohlford	0.07
0.1Q2	C	Moderate	Lake Wohlford	0.07
0.1Q2	C	Steep	Lake Wohlford	0.07
0.1Q2	D	Flat	Lake Wohlford	0.06
0.1Q2	D	Moderate	Lake Wohlford	0.06
0.1Q2	D	Steep	Lake Wohlford	0.06

Table G.2-6: Sizing Factors for Hydromodification Flow Control Cistern Facilities Designed Using Sizing Factor Method

Lower Flow Threshold	Soil Group	Slope	Rain Gauge	V
0.1Q2	A	Flat	Lindbergh	0.54
0.1Q2	A	Moderate	Lindbergh	0.51
0.1Q2	A	Steep	Lindbergh	0.49
0.1Q2	B	Flat	Lindbergh	0.19
0.1Q2	B	Moderate	Lindbergh	0.18
0.1Q2	B	Steep	Lindbergh	0.18
0.1Q2	C	Flat	Lindbergh	0.11
0.1Q2	C	Moderate	Lindbergh	0.11
0.1Q2	C	Steep	Lindbergh	0.11
0.1Q2	D	Flat	Lindbergh	0.09

0.1Q2	D	Moderate	Lindbergh	0.09
0.1Q2	D	Steep	Lindbergh	0.09
0.1Q2	A	Flat	Oceanside	0.26
0.1Q2	A	Moderate	Oceanside	0.25
0.1Q2	A	Steep	Oceanside	0.25
0.1Q2	B	Flat	Oceanside	0.16
0.1Q2	B	Moderate	Oceanside	0.16
0.1Q2	B	Steep	Oceanside	0.16
0.1Q2	C	Flat	Oceanside	0.14
0.1Q2	C	Moderate	Oceanside	0.14
0.1Q2	C	Steep	Oceanside	0.14
0.1Q2	D	Flat	Oceanside	0.12
0.1Q2	D	Moderate	Oceanside	0.12
0.1Q2	D	Steep	Oceanside	0.12
0.1Q2	A	Flat	Lake Wohlford	0.53
0.1Q2	A	Moderate	Lake Wohlford	0.49
0.1Q2	A	Steep	Lake Wohlford	0.49
0.1Q2	B	Flat	Lake Wohlford	0.28
0.1Q2	B	Moderate	Lake Wohlford	0.28
0.1Q2	B	Steep	Lake Wohlford	0.28
0.1Q2	C	Flat	Lake Wohlford	0.14
0.1Q2	C	Moderate	Lake Wohlford	0.14
0.1Q2	C	Steep	Lake Wohlford	0.14
0.1Q2	D	Flat	Lake Wohlford	0.12
0.1Q2	D	Moderate	Lake Wohlford	0.12
0.1Q2	D	Steep	Lake Wohlford	0.12

Attachment 6

Hydrology Conditions Maps

EXISTING HYDROLOGY SUMMARY

BASIN NAME	AREA (AC)	% IMPERVIOUS	RUNOFF COEFF	TIME OF CONCENTRATION (MIN)	INTENSITY (IN/HR)			PEAK RUNOFF, Q (CFS)		
					2-YEAR	10-YEAR	100-YEAR	2-YEAR	10-YEAR	100-YEAR
BASIN 1	0.54	73%	0.70	5	2.4	3.4	4.4	0.90	1.29	1.66
BASIN 2	0.70	73%	0.70	5	2.4	3.4	4.4	1.18	1.67	2.16
TOTAL	1.24							2.08	2.96	3.82

NOTE:

HYDROLOGY CALCULATIONS PERFORMED PER CITY OF SAN DIEGO DRAINAGE DESIGN MANUAL (2017) APPENDIX A, RATIONAL METHOD (Q=CIA). TIME OF CONCENTRATION WAS CONSERVATIVELY ASSUMED TO BE 5 MINUTES DUE TO SHORT DRAINAGE FLOW LENGTHS.

NO.	DATE	REVISION

COLLEGE VIEW APARTMENTS

EXISTING HYDROLOGY

FUSCOE ENGINEERING
6390 Greenwich Dr., Suite 170
San Diego, California 92122
tel 858.554.1500 ◦ fax 858.597.0335
www.fuscoe.com

JOB NO. 893-006

DRAWN BY: L.S.

SHEET 1 of 1

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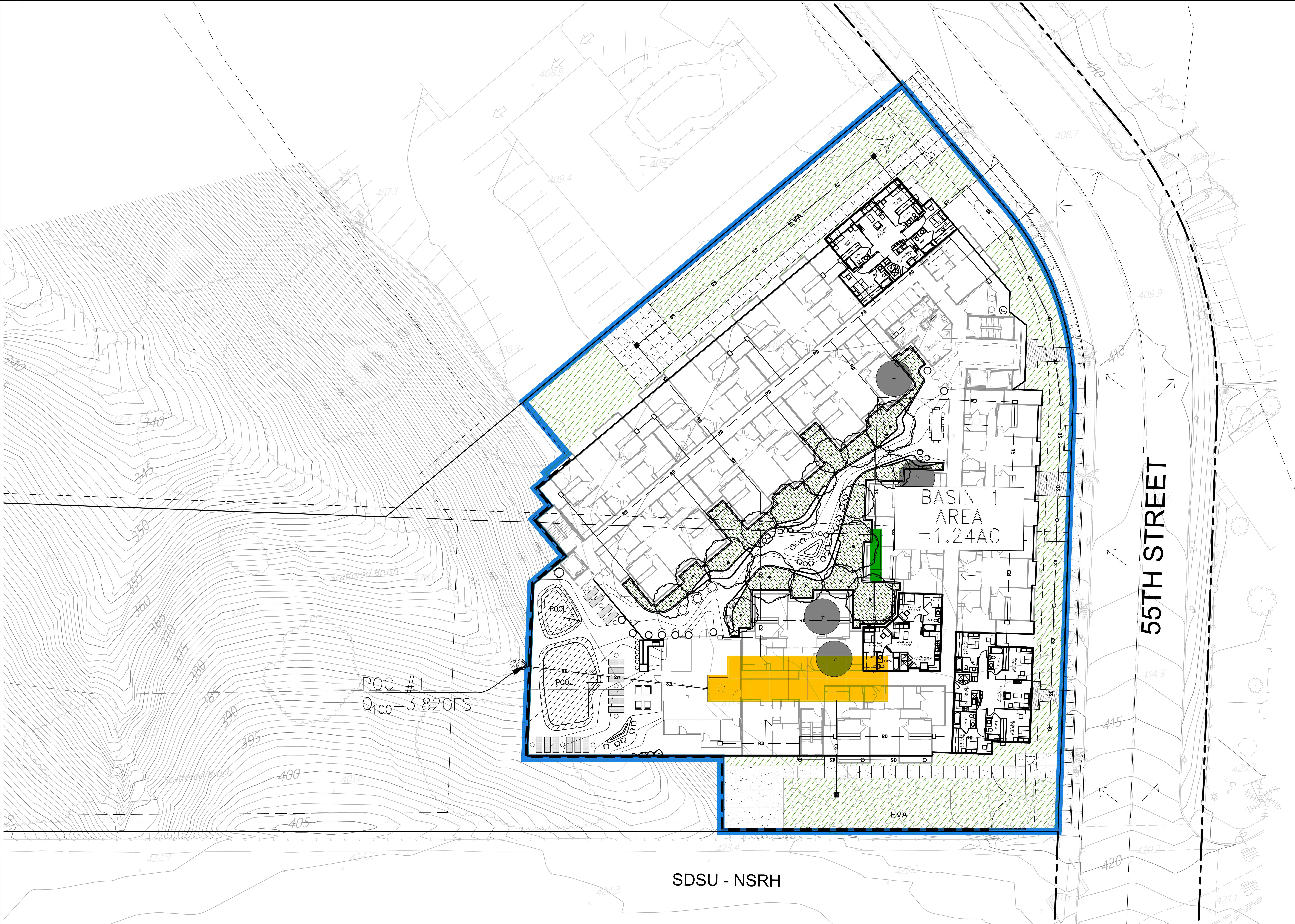

LEGEND

- PROPERTY LINE
- EXISTING EASEMENT
- RIGHT-OF-WAY
- STREET CENTERLINE
- EXISTING STORM DRAIN
- BASIN LIMITS
- SUB-BASIN LIMITS
- FLOW PATH
- DIRECTION OF FLOW
- BASIN DESIGNATION — BASIN 1 A=0.10 AC
- EXISTING CONTOUR — 260
- PROPOSED PERVIOUS AREA

TOTAL AREA = 53,828 SF
IMPERVIOUS AREA = 39,767 SF
PERVIOUS AREA = 14,061 SF

PROPOSED HYDROLOGY SUMMARY

BASIN NAME	AREA (AC)	% IMPERVIOUS	RUNOFF COEFF	TIME OF CONCENTRATION (MIN)	INTENSITY (IN/HR) 2-YEAR	INTENSITY (IN/HR) 10-YEAR	INTENSITY (IN/HR) 100-YEAR	PEAK RUNOFF, Q (CFS) 2-YEAR	PEAK RUNOFF, Q (CFS) 10-YEAR	PEAK RUNOFF, Q (CFS) 100-YEAR
BASIN 1	1.24	74%	0.70	5	2.4	3.4	4.4	2.08	2.95	3.82
TOTAL	1.24							2.08	2.95	3.82

NOTE:

HYDROLOGY CALCULATIONS PERFORMED PER CITY OF SAN DIEGO DRAINAGE DESIGN MANUAL (2017) APPENDIX A, RATIONAL METHOD (Q=CIA). TIME OF CONCENTRATION WAS CONSERVATIVELY ASSUMED TO BE 5 MINUTES DUE TO SHORT DRAINAGE FLOW LENGTHS.

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