

- UNDERLYING HYDROLOGIC SOIL GROUP:
SOIL GROUP C.
HISTORIC DEPTH TO GROUND WATER:
10.1 FEET BELOW EXISTING GROUND
CRITICAL COARSE SEDIMENT YIELD AREAS:
NONE ONSITE
OFFSITE COARSE SEDIMENT YIELD AREAS -
NONE TRIBUTARY TO THE PROJECT LIMITS

- SCOH REFUSE AREAS
(REFUSE AREA WILL BE COVERED, GRADED
AND PAVED TO PREVENT RUN-ON AND
PROTECTED WITH DOORS AND BIN COVERS
TO PREVENT WIND DISPERSAL)

- SOB6 PLAZAS, SIDEWALKS AND PARKING LOTS
(SWEEP REGULARLY TO PREVENT THE
ACCUMULATION OF LITTER & DEBRIS)

- SD3 MINIMIZE INTERVIOUS AREAS
(MINIMIZE THE USE OF INTERVIOUS AREAS
IN LANDSCAPING DESIGN)
- SD4 MINIMIZE SOIL COMPACTION
(MINIMIZE SOIL COMPACTION IN
LANDSCAPED AREAS)
- SD7 LANDSCAPE WITH NATIVE OR DROUGHT
TOLERANT SPECIES

- SELF-IRRIGATING DAMS MUST MEET THE FOLLOWING TO BE ELIGIBLE FOR EXCLUSION.
 - VEGETATION IN THE NATURAL OR LANDSCAPED AREA IS MAINTAINED AND/OR NON-IRRIGATING NON-INVASIVE BROUGHT APPLICATION SPECIES THAT DO NOT REQUIRE REGULAR APPLICATION OF FERTILIZERS AND PESTICIDES. SEE LANDSCAPING AND LANDSCAPE PLANS (PDS2017-LP-17-096) FOR PROPOSED LANDSCAPING.
 - SOLLS ARE UNDISTURBED WITHIN THE TOPSOIL, OR DISTURBED TO PROMOTE WATER RETENTION CHARACTERISTICS TO UNDISTURBED WITHIN THE TOPSOIL. CONTRACTOR SHALL ALTERE THE SOIL WITHIN THE LIMITS OF GRADING IN THIS AREA UPON COMPLETION OF GRADING ACTIVITIES AND PRIOR TO INSTALLATION OF LANDSCAPING AND IRRIGATION.
 - THE INCIDENTAL INTERVENOUS AREAS ARE LESS THAN 5 PERCENT OF THE SELF-IRRIGATING AREA (INFORMATION ONLY).
 - THE IMPERVIOUS AREA WITHIN THE SELF-IRRIGATED AREA SHOULD NOT BE HYDRAULICALLY CONNECTED TO OTHER IMPERVIOUS AREAS UNLESS IT IS A STORM DRAIN CONFORMANCE SYSTEM SUCH AS A BROW DITCH (INFORMATION ONLY).
- THE SELF-IRRIGATING AREA IS HYDRAULICALLY SEPARATE FROM DAMS THAT CONTAIN PERMANENT STORM WATER POLLUTANT CONTROL BARRS (INFORMATION ONLY).



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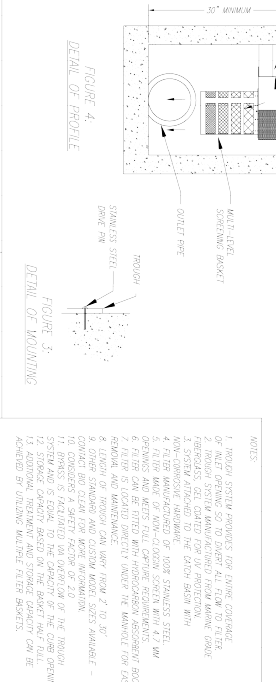
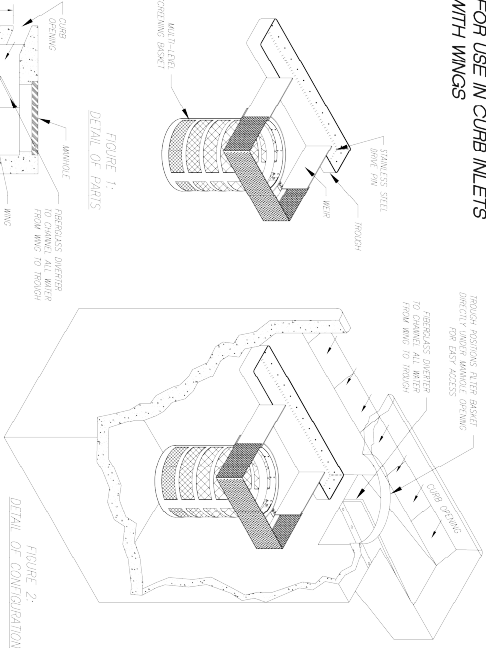
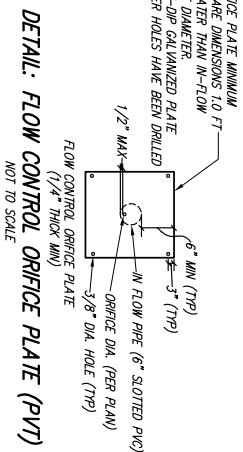
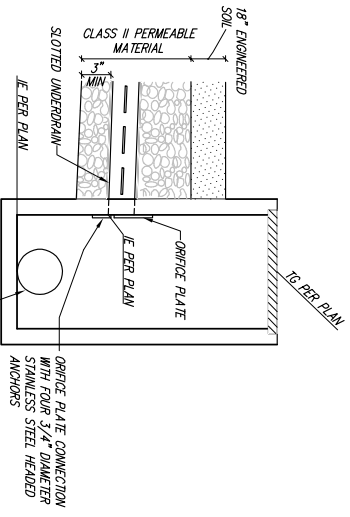
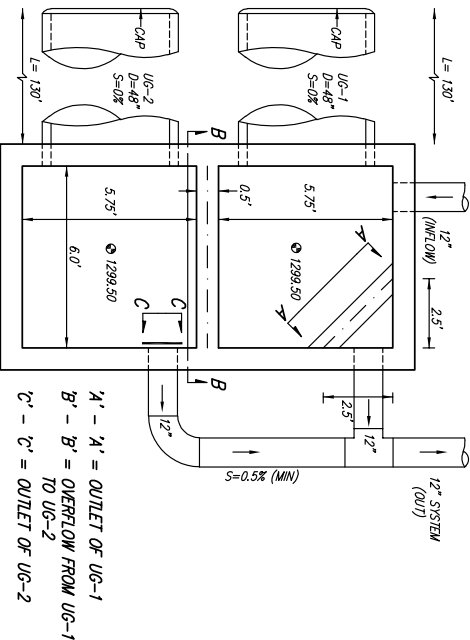
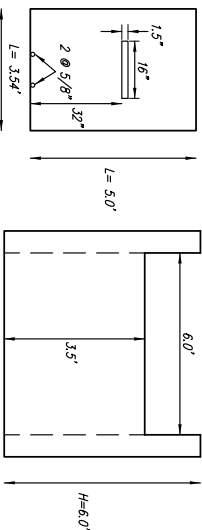
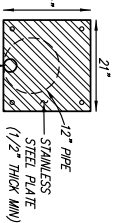
	DMA AREA (T ²)	POST-PROJECT SURFACE TYPE INTERIORS	DMA RUNOFF FACTOR	DMA AREA X RUNOFF FACTOR	SLOPE TYPE C
DMA2	50		0.9	45.0	


DMA3	DMA AREA (T*2)	POST-PROJECT SURFACE TYPE	DMA1 RUNOFF FACTOR	DMA AREA X RUNOFF FACTOR	SOIL TYPE
3	IMPERVIOUS	0.9	2.7	C	

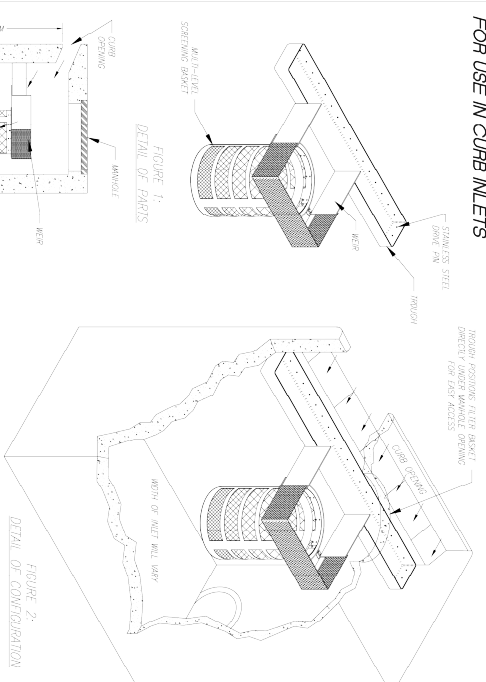
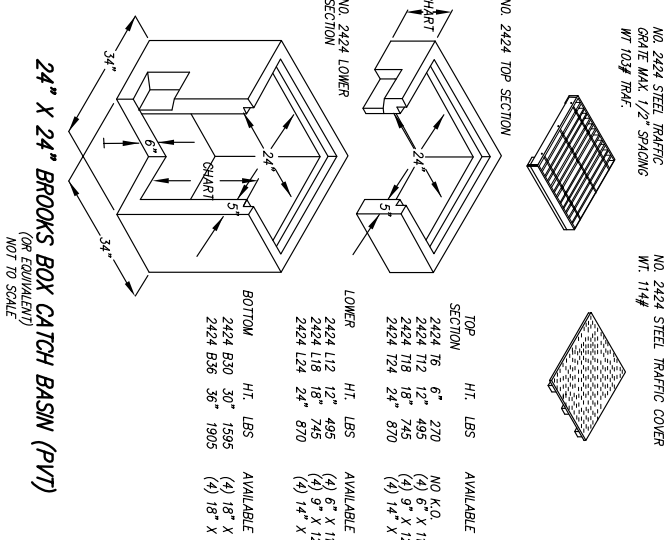
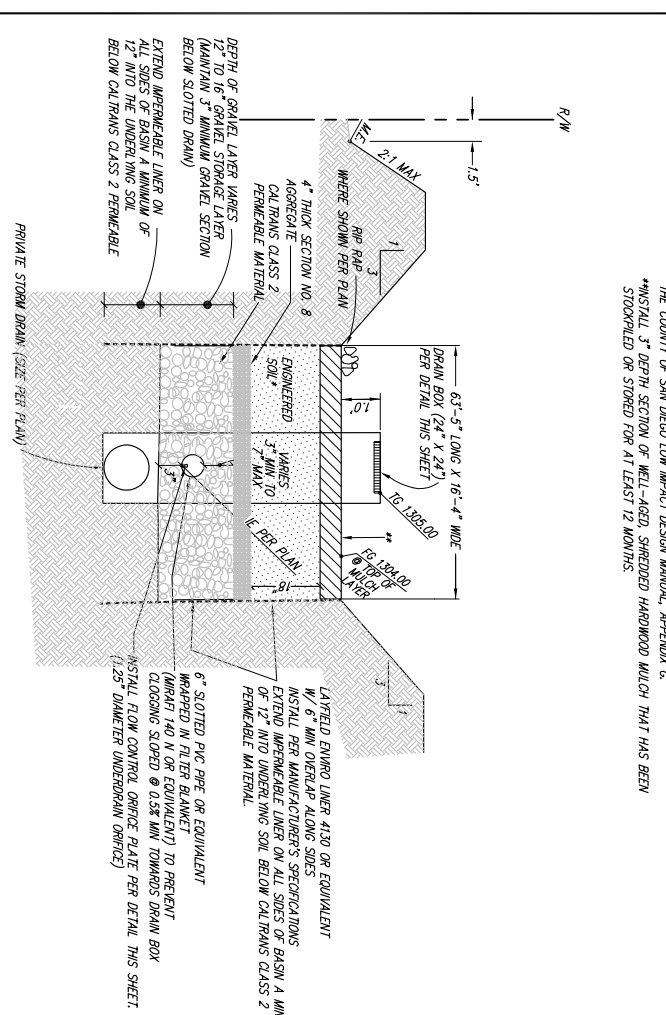
	AREA X ROUND FACTOR	SOIL TYPE C	
DMA AREA (FT ²)	172		
POST-PROJECT SURFACE TYPE	IMPERVIOUS		
LANDSCAPING	0.1		
TOTAL	34.31		SELF-MITIGATING
	497.9		

	DMA AREA X	SOL TYPE
DMA POST-PROJECT RUNOFF FACTOR	0.9	C
DMA5 AREA (F'2)	151	
IMPERVIOUS SURFACE TYPE	3.901	
LANDSCAPING	TOTAL	SELF-MITIGATING
	526.0	

SHEET FLOWS TO OLD MIRAR DE VALLE ROAD



DRAMING, BO, CLEANING, PAINT, PESTICIDES INHALATION FROM PAINT, PAINTS, ETC. AMBROPIA, S. 234, MARSHALLS RD BO, CLEAN, ENVIRONMENTAL SERVICES, INC. 304 W. A. CENTRAL, OCEANVIEW CA 91076 PHONE: 909-434-9640 FAX: 909-434-9176 DATE: 10/12/2017 SCALE: WMS DRYER: M-25 WMS - W-35 P-25000C P-25000C	MODEL # 60-2000-4-5 10/17-12/18-2000-4-5 10/17-12/18-2000-4-5 10/17-12/18-2000-4-5 10/17-12/18-2000-4-5	 BioClean A Forterra Company	Page 3
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ATTACHMENT 7

Copy of Project's Geotechnical and Groundwater Investigation Report

This is the cover sheet for Attachment 7.

If hardcopy or CD is not attached, the following information should be provided:

Title:

Prepared By:

Date:

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SDVOSB . DVBE

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March 30, 2018

SCST No. 170111N
Report No. 2

Mr. Mitch Bramlitt
Autozone Development Corporation
123 South Front Street
Memphis, Tennessee 98103

Subject: UPDATE INFILTRATION RECOMMENDATIONS
PROPOSED AUTOZONE
VALLEY CENTER ROAD
VALLEY CENTER, CALIFORNIA

References: 1) SCST, Inc., 2017, *Infiltration Feasibility Study, Proposed Autozone, Valley Center Road, Valley Center California*, SCST Report No. 170111N, dated February 1.
2) Terradyne LAX, Inc., 2016, *Geotechnical Investigation Report, Proposed Autozone Store 6173, Near Valley Center Road and Mirar De Valle Road, Valley Center, San Diego County, California, Terradyne Project No.: L161055*, dated October 10.

Dear Mr. Bramlitt:

SCST, Inc. (SCST) is pleased to submit this letter updating our recommendations for the proposed biofiltration basin at the subject project. We understand that the original design of the biofiltration basin has changed since our original report.



The new biofiltration basin will base elevation of approximately 1,304 feet above mean sea level (msl) and a maximum ponding depth of approximately 1.306 msl. The biofiltration basin will be surrounded on the north by 2:1 (horizontal:vertical) fill slope less than 5 feet in height, on the south by hardscape surfaces, on the west by the proposed building, and on the east by a retaining wall and a fill slope descending toward Valley Center Road.

UPDATED RECOMMENDATIONS

In order to minimize potential impacts to the adjacent improvements, we recommend that an impermeable barrier be installed on the north side (between the basin and the fill slope), and the west side (between the basin and the proposed building) of the biofiltration basin. The impermeable barrier should extend to a depth of at least 1 foot below the footing depth of the east side of the proposed building.

We appreciate the opportunity to be of service to you on this project. If you have any questions, comments, or require additional information, please call our office at (619) 280-4321.

Respectfully submitted,
SCST, INC.



Douglas A. Skinner, CEG 2472
Senior Geologist

DAS:aw

- (1) Addressee via e-mail: mitch.bramlitt@autozone.com
- (1) Mr. Brent Moore via e-mail: brent-alidade@att.net



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

February 26, 2016

Appendix C: Geotechnical and Groundwater Investigation Requirements

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

Appendix C: Geotechnical and Groundwater Investigation Requirements

Worksheet C.4-1 Page 3 of 4

Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria

Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?

Criteria	Screening Question	Yes	No
5	Do soil and geologic conditions allow for infiltration in any appreciable rate or volume? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		

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

Appendix C: Geotechnical and Groundwater Investigation Requirements

Worksheet C.4-1 Page 4 of 4			
Criteria	Screening Question	Yes	No
7	Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
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 must 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*	<p>If all answers from row 5-8 are yes then partial infiltration design is potentially feasible. The feasibility screening category is Partial Infiltration.</p> <p>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.</p>		

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



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February 9, 2017

SCST No. 170111N
Report No. 1

Mr. Mitch Bramlitt
Autozone Development Corporation
123 South Front Street
Memphis, Tennessee 98103

Subject: INFILTRATION FEASIBILITY STUDY
PROPOSED AUTOZONE
VALLEY CENTER ROAD
VALLEY CENTER, CALIFORNIA

Reference: 1.) Terradyne LAX, Inc., 2016, *Geotechnical Investigation Report, Proposed Autozone Store 6173, Near Valley Center Road and Mirar De Valle Road, Valley Center, San Diego County, California, Terradyne Project No.: L161055*, dated October 10.

Dear Mr. Bramlitt:

SCST, Inc. (SCST) is pleased to submit this report for the infiltration feasibility study performed at the subject project. The project is located at the intersection of Mirar de Valle Road and Valley Center Road in the community of Valley Center, California (Figure 1). We understand the project will consist of the design and construction of an Autozone development. Based on preliminary plans provided to us by the client, we understand that a single BMP location is proposed at the northeast corner of the project site. The purpose of our study was to assess the infiltration characteristics of the subsurface soils in the area of the planned BMP location in accordance with the County of San Diego BMP Design Manual.

SITE DESCRIPTION

The site consists of an empty lot located at the intersection of Mirar de Valle Road and Valley Center Road in the City of Valley Center, San Diego, California (Figure 1). The project site is surrounded by fields, farmland, and rural business developments. The lot is relatively flat, with general sheet flow from south to north and west to east, and bound by Mirar de Valle road to the north and Valley Center Road to the east. There are no existing improvements. The proposed BMP is located at northeast corner of the lot. Site elevations range from about 1308 feet at the northeast corner to about 1316 feet in the southwest corner of the lot.

PREVIOUS INVESTIGATION

Terradyne LAX, Inc. (Terradyne) performed a geotechnical investigation for the project in September of 2016 (Reference 1). As part of Terradyne's investigation, a total of 8 geotechnical borings were performed at the site. The depths of the borings rang from about 11½ feet to 16½ feet

below existing grade. Two of the borings, borings B-7 and B-9 are located within 50 feet of the proposed BMP (Reference 1).

FIELD EXPLORATION

SCST conducted an infiltration feasibility study at the project site on January 18 and 19, 2017. Our field work consisted of drilling two percolation borings to depths between approximately 4½ feet and 5 feet below the existing ground surface using a 6-inch diameter hand auger. Auger refusal was encountered in one boring at a depth of about 4½ feet. An SCST engineer logged the borings and collected representative soil samples of the materials encountered. Bulk samples were obtained from the borings and transported to our in-house geotechnical laboratory for testing.

Logs of the borings are presented in Appendix I. Soils are classified according to the Unified Soil Classification System (USCS) present on Figure I-1. Figure 2 presents a Subsurface Exploration Map showing the approximate locations of our percolation test borings and the borings drilled by Terradyne in 2016.

SUBSURFACE CONDITIONS

The materials encountered in the percolation borings consist of artificial fill underlain by alluvium. The alluvium consists of moist medium dense clayey sand and poorly graded sand. Groundwater was not encountered in the borings. Additionally, groundwater was not reported in the borings drilled at the site by Terradyne. However, groundwater levels may fluctuate in the future due to rainfall, irrigation, broken pipes, or changes in site drainage. Because groundwater rise or seepage is difficult to predict, such conditions are typically mitigated if and when they occur.

LABORATORY TESTING

Selected samples obtained from the borings were tested to evaluate pertinent classification and engineering properties and enable development of geotechnical conclusions. Laboratory testing of representative soil samples included sieve analyses. Brief descriptions of the laboratory test procedures and the test results are presented in Appendix II.

PERCOLATION TESTING

In situ borehole percolation tests were performed at two locations at depths of approximately 4½ and 5 feet below the existing ground surface. The test locations were situated so that a minimum of two tests were within 50 feet of the proposed infiltration basin. The testing was performed by an SCST engineer in general accordance with the City of San Diego BMP Design Manual. Table 1 presents the tested infiltration rates. The data and results of the percolation testing are presented in Appendix III.

Table 1: Infiltration Rate Test Results

Test Location	Test Depth (feet)	Material Type at Test Depth (USCS Classification)	Infiltration Rate (inches/hour)
I-1	4½	Poorly Graded Sand (SP)	0.2
I-2	5	Poorly Graded Sand (SP)	0.6


CONCLUSIONS AND RECOMMENDATIONS

Evaluation of storm water infiltration feasibility was performed in general accordance with Appendix I of the County of San Diego BMP Design Manual. Form I-8 from the manual is provided in Appendix IV. In our opinion, alluvial deposits tested during our study are generally representative of the materials that may be encountered between 2 and 15 feet below the existing ground surface.


The tested infiltration rates are greater than 0.1 inch per hour. The tested infiltration rates support partial infiltration based on the County of San Diego definition (greater than 0.01 inches per hour).

We appreciate the opportunity to be of service to you on this project. If you have any questions, comments, or require additional information, please call our office at (619) 280-4321.

Respectfully submitted,
SCST, INC.


Douglas A. Skinner, CEG 2472
Senior Geologist




Chelsea L. Feeney
Staff Engineer

DAS:clf:aw

Attachments:

Figures

Figure 1 - Site Vicinity Map

Figure 2 - Subsurface Exploration Map

Appendices

Appendix I - Field Investigation

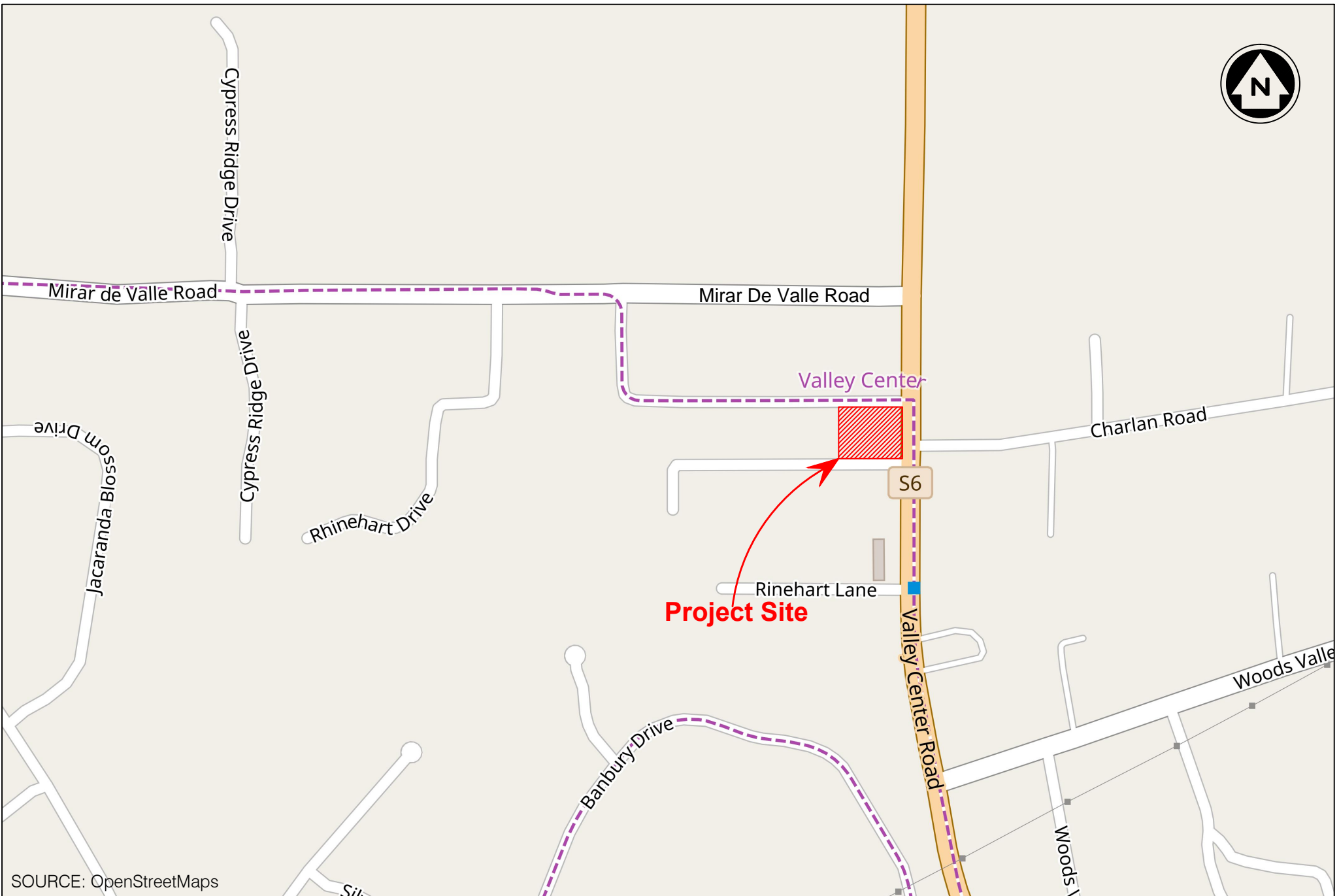
Appendix II - Laboratory Testing

Appendix III - Infiltration Testing Results

Appendix IV - Form I-8 Categorization of Infiltration Feasibility Condition

(1) Addressee via e-mail: mitch.bramlitt@autozone.com

(1) Mr. Larry Dutton via e-mail: larry-alidade@att.net



SOURCE: OpenStreetMaps

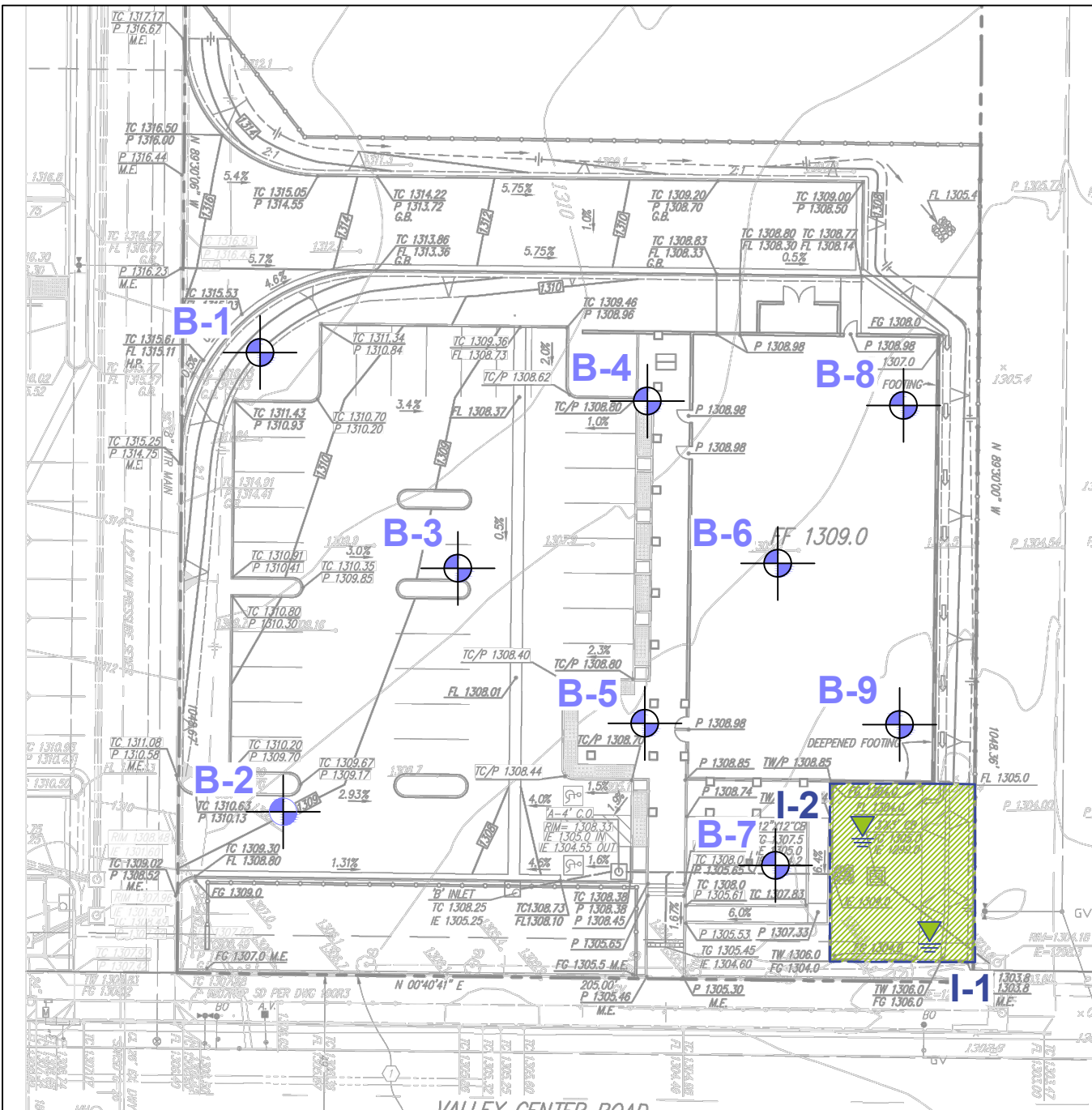


SCST, Inc.

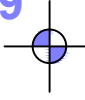


SITE VICINITY MAP
Proposed Autozone
Valley Center Road
Valley Center, California

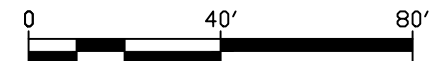
Date: February, 2017
By: MAW
Job No.: 170111N-1

Figure:
1



SCST LEGEND:

- B-9**  Location of Previous Boring (Terradyne, 2016)
- I-2**  Location of Infiltration Test
-  Location of Infiltration Basin



Scale

NOTE: All Locations are Approximate



SCST, Inc.

SUBSURFACE EXPLORATION MAP
Proposed Autozone
Valley Center Road
Valley Center, California

Date: February, 2017
By: MAW
Job No.: 170111N-1

Figure:
2




APPENDIX I FIELD INVESTIGATION

Our infiltration feasibility study was conducted on January 18 and 19, 2017 and consisted of drilling two percolation borings to depths of between approximately 4½ feet and 5 feet below the existing surface using a 6-inch diameter hand auger. Auger refusal was encountered in one of the percolation borings at a depth of about 4½ feet. An SCST engineer logged and sampled the materials encountered.

The soils are classified in accordance with the Unified Soil Classification System as illustrated on Figure I-1. The logs of the percolation borings are presented on Figures I-2 and I-3.

SUBSURFACE EXPLORATION LEGEND

UNIFIED SOIL CLASSIFICATION CHART

SOIL DESCRIPTION		GROUP SYMBOL	TYPICAL NAMES
I. COARSE GRAINED, more than 50% of material is larger than No. 200 sieve size.			
<u>GRAVELS</u> More than half of coarse fraction is larger than No. 4 sieve size but smaller than 3".	CLEAN GRAVELS	GW	Well graded gravels, gravel-sand mixtures, little or no fines
		GP	Poorly graded gravels, gravel sand mixtures, little or no fines.
	GRAVELS WITH FINES (Appreciable amount of fines)	GM	Silty gravels, poorly graded gravel-sand-silt mixtures.
		GC	Clayey gravels, poorly graded gravel-sand, clay mixtures.
<u>SANDS</u> More than half of coarse fraction is smaller than No. 4 sieve size.	CLEAN SANDS	SW	Well graded sand, gravelly sands, little or no fines.
		SP	Poorly graded sands, gravelly sands, little or no fines.
		SM	Silty sands, poorly graded sand and silty mixtures.
		SC	Clayey sands, poorly graded sand and clay mixtures.
II. FINE GRAINED, more than 50% of material is smaller than No. 200 sieve size.			
	SILTS AND CLAYS (Liquid Limit less than 50)	ML	Inorganic silts and very fine sands, rock flour, sandy silt or clayey-silt-sand mixtures with slight plasticity.
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
		OL	Organic silts and organic silty clays or low plasticity.
	SILTS AND CLAYS (Liquid Limit greater than 50)	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
		CH	Inorganic clays of high plasticity, fat clays.
		OH	Organic clays of medium to high plasticity.
III. HIGHLY ORGANIC SOILS		PT	Peat and other highly organic soils.
<u>SAMPLE SYMBOLS</u>		<u>LABORATORY TEST SYMBOLS</u>	
<div><div><div></div><div>CAL</div><div>CK</div><div>MS</div><div>ST</div><div>SPT</div></div><div><div>- Bulk Sample</div><div>- Modified California sampler</div><div>- Undisturbed Chunk sample</div><div>- Maximum Size of Particle</div><div>- Shelby Tube</div><div>- Standard Penetration Test sampler</div></div></div>		<div><div>AL - Atterberg Limits</div><div>CON - Consolidation</div><div>COR - Corrosivity Tests (Resistivity, pH, Chloride, Sulfate)</div><div>DS - Direct Shear</div><div>EI - Expansion Index</div><div>MAX - Maximum Density</div><div>RV - R-Value</div><div>SA - Sieve Analysis</div><div>UC - Unconfined Compression</div></div>	
<u>GROUNDWATER SYMBOLS</u>			
<div><div><div></div><div></div></div><div><div></div><div></div></div></div>			
<div><div><div><div>S</div><div>C</div><div>S</div><div>T</div></div><div>ENGINEERING</div></div><div>SCST, Inc.</div></div>		<div>Autozone Valley Center Infiltration Valley Center, California</div> <div><div>By: CLF</div><div>Date: February, 2017</div></div> <div><div>Job Number: 170111N-1</div><div>Figure: I-1</div></div>	

LOG OF BORING I-1

Date Drilled: 1/19/2017

Equipment: 6-inch Hand Auger

Elevation (ft): 1307

Logged by: JD

Project Manager: DAS

Groundwater Depth (ft): Not Encountered

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES		MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LABORATORY TESTS
			DRIVEN	BULK			
1	SM	<u>FILL (Qf)</u> : SILTY SAND, dark brown, moist, organics observed.					SA
2	SC	<u>ALLUVIUM (Qal)</u> : CLAYEY SAND, very dark gray, moist.					
4	SP	POORLY GRADED SAND, orange brown, moist.					
5		AUGER REFUSAL AT 4.5 FEET.					
6							
7							
8							
9							
10							



SCST, Inc.

Autozone Valley Center Infiltration

Valley Center, California

By: CLF

Date: February, 2017

Job Number: 170111N-1

Figure: I-2

LOG OF BORING I-2

Date Drilled: 1/19/2017

Equipment: 6-inch Hand Auger

Elevation (ft): 1308

Logged by: JD

Project Manager: DAS

Groundwater Depth (ft): Not Encountered

DEPTH (ft)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES		MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LABORATORY TESTS
			DRIVEN	BULK			
1	SM	FILL (Qf): SILTY SAND, dark brown, moist, organic.	X	X			SA
2	SC	ALLUVIUM (Qal): CLAYEY SAND, black, moist.					
3		Orange brown.					
4	SP	POORLY GRADED SAND, yellowish brown, moist, small amount of clay.					
5		BORING TERMINATED AT 5 FEET.					
6							
7							
8							
9							
10							



SCST, Inc.

AutoZone Valley Center Infiltration
Valley Center, California

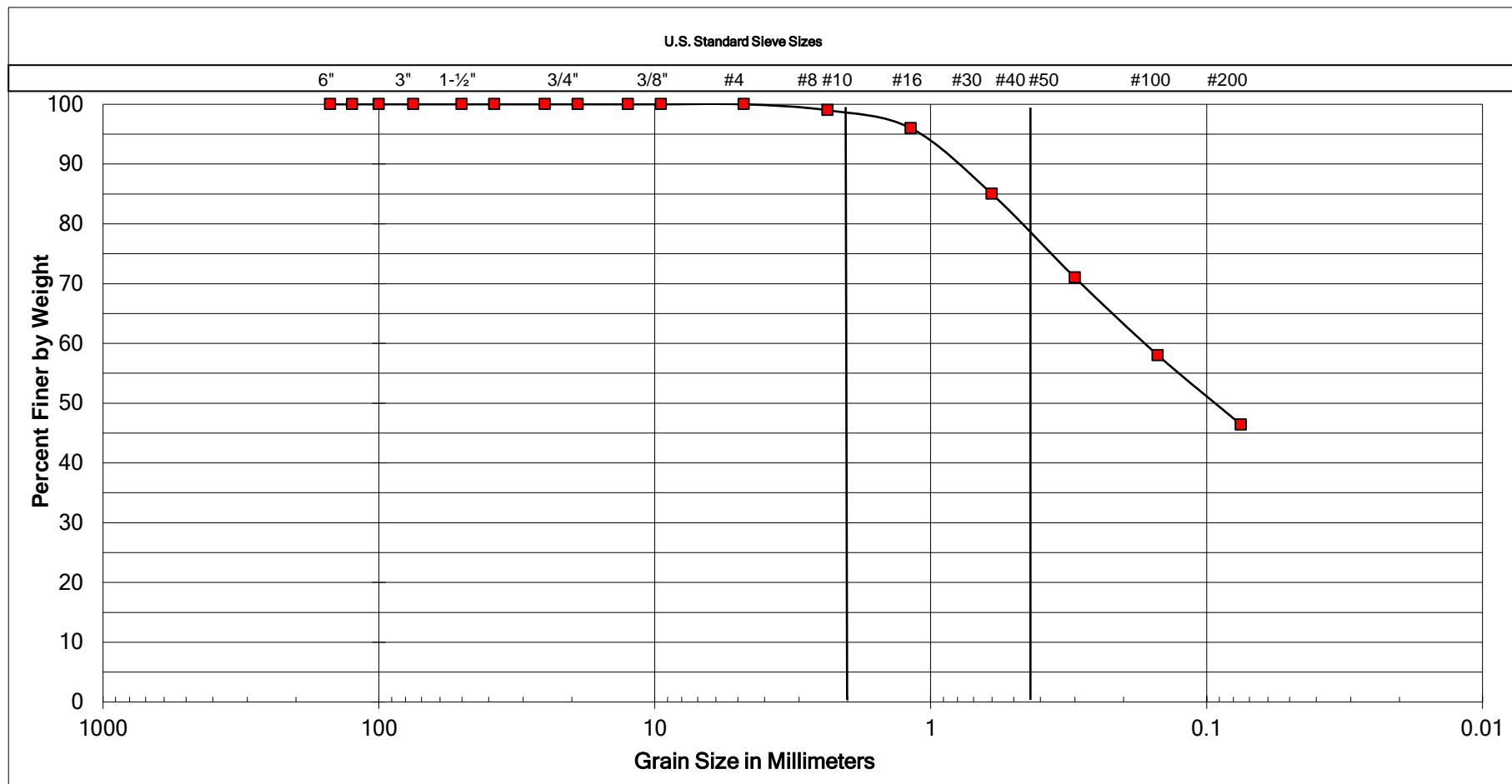
By: CLF	Date: February, 2017
Job Number: 170111N-1	Figure: I-3

APPENDIX II LABORATORY TESTING

Laboratory tests were performed to provide geotechnical parameters for engineering analyses. The following tests were performed:

- **CLASSIFICATION:** Field classifications were verified in the laboratory by visual examination. The final soil classifications are in accordance with the Unified Soil Classification System.
- **GRAIN SIZE DISTRIBUTION:** The grain size distribution was determined on one sample in accordance with ASTM D422. Figure II-1 present the test results.

Soil samples not tested are now stored in our laboratory for future reference and analysis, if needed. Unless notified to the contrary, all samples will be disposed of 30 days from the date of this report.



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B1: 0' to 4.5'

UNIFIED SOIL CLASSIFICATION:	SC
DESCRIPTION	CLAYEY SAND

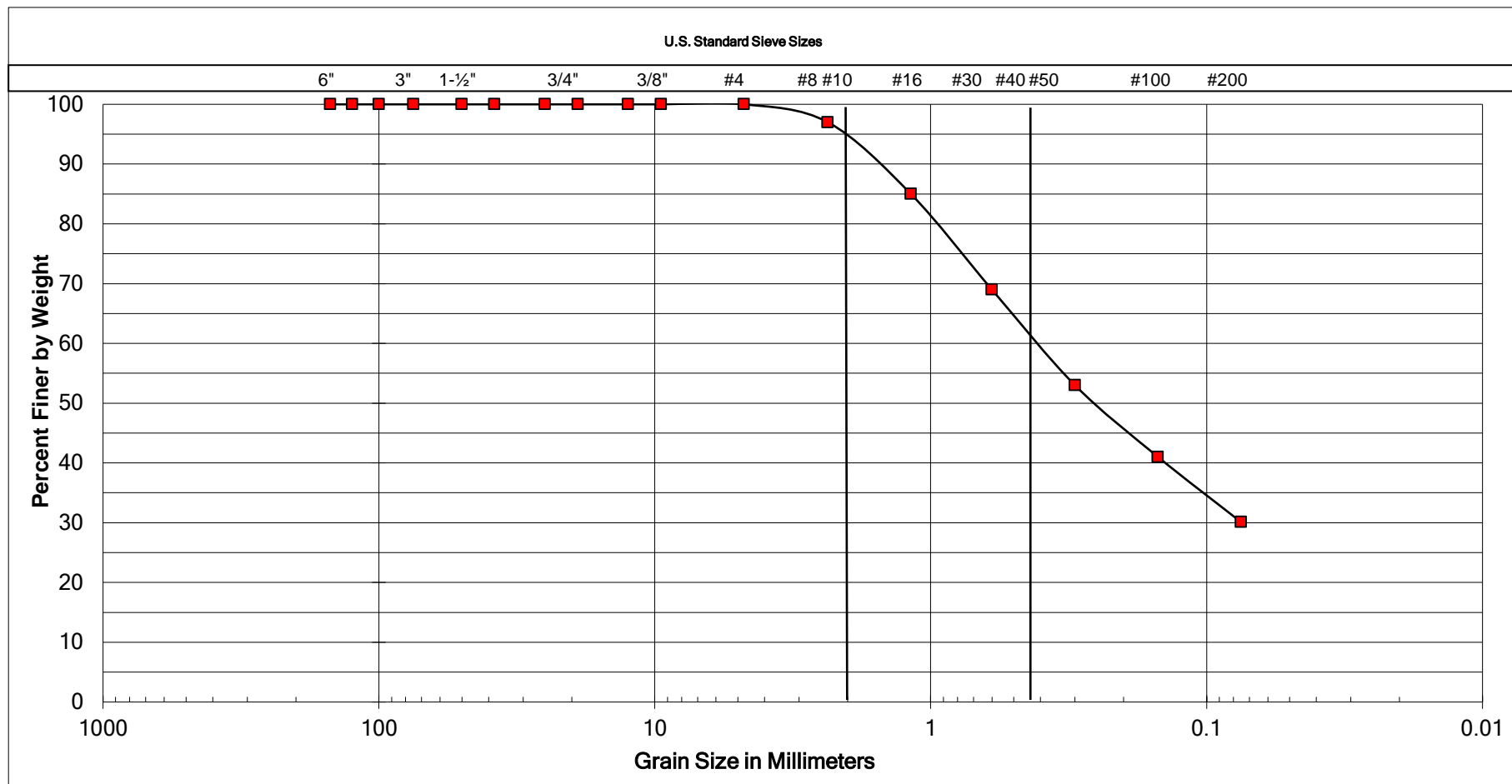
ATTERBERG LIMITS	
LIQUID LIMIT	--
PLASTIC LIMIT	--
PLASTICITY INDEX	--



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Autozone Valley Center Infiltration
Valley Center, California

By:	CLF	Date:	February, 2017
Job Number:	170111N-1	Figure:	II-1



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B2: 0' to 5'

UNIFIED SOIL CLASSIFICATION:	SC
DESCRIPTION	CLAYEY SAND

ATTERBERG LIMITS	
LIQUID LIMIT	
PLASTIC LIMIT	
PLASTICITY INDEX	



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Valley Center, California

By:	CLF	Date:	February, 2017
Job Number:	170111N-1	Figure:	II-2

APPENDIX III INFILTRATION RATE TEST RESULTS

We performed falling head borehole infiltration tests at two locations (I-1 and I-2) in general conformance with Appendix C of the BMP Design Manual for the San Diego Region. The percolation test holes were prepared by placing about 2 inches of gravel in the bottom of the test hole and installing a 4-inch diameter perforated PVC pipe from the top of the pea gravel to the ground surface or higher. Prior to starting the percolation tests, the holes were filled with water to presoak the soil materials. The percolation tests were performed approximately 24 hours after presoaking by placing clean potable water in the PVC pipe and measuring the drop in the water level. Figures III-1 and III-2 present the results of the testing.

Report of Borehole Percolation Testing

Storm Water Infiltration

Project Name: Valley Center Infiltration Testing
 Job Number: 170111N
 Date Drilled: 1/18/2017
 Drilling Method: Hand Tools
 Drilled Depth (feet): 4.5
 Test Hole Diameter (inches): 6
 Gravel Pack: Yes
 Pipe Diameter (inches): 4

Test Number: I-1
 Tested By: JRD
 Date Tested: 1/19/2017
 Presoak Time: 24 hours

Trial No.	Time	Time Interval, ΔT (min)	Initial Water Height, H _o (ft)	Final Water Height, H _f (ft)	Change in Water Height, ΔH (in)	Percolation Rate (min/in)
1	14:30	0:30	0.52	0.44	1.0	30
	15:00					
2	15:00	0:30	0.52	0.4375	1.0	30
	15:30					
3	15:30	0:30	0.52	0.43	1.1	27
	16:00					
4	16:00	0:30	0.5	0.4	0.9	34
	16:30					
5	16:30	0:30	0.52	0.34	2.1	14
	17:00					
6	17:00	0:30	0.52	0.48	0.5	60
	17:30					
7	17:30	0:30	0.52	0.42	1.3	24
	18:00					
8	18:00	0:30	0.52	0.43	1.1	27
	18:30					
Observed Percolation Rate:					60 min/in 1.0 in/hr	
Gravel Correction Factor:					1.50	
Corrected Percolation Rate:					90 min/in 0.7 in/hr	
*Tested Infiltration Rate, I _t :					0.2 in/hr	

*Tested infiltration rate using the Porchet Method:

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

ΔH = Change in water head height over the time interval [in] = 0.5

r = Test hole radius [in] = 3

ΔT = Time interval [min] = 30

H_{avg} = Average water height over time interval = 12(H_o + H_f)/2 [in] = 5.7



SCST, Inc.

Autozone Valley Center Infiltration
 Valley Center, California

By: JRD Date: February, 2017
 Job No: 170111N-1 Figure: III-1

Report of Borehole Percolation Testing

Storm Water Infiltration

Project Name: Valley Center Infiltration Testing
 Job Number: 170111N
 Date Drilled: 1/18/2017
 Drilling Method: Hand Tools
 Drilled Depth (feet): 5.0
 Test Hole Diameter (inches): 6
 Gravel Pack: Yes
 Pipe Diameter (inches): 4

Test Number: I-2
 Tested By: JRD
 Date Tested: 1/19/2017
 Presoak Time: 24 hours

Trial No.	Time	Time Interval, ΔT (min)	Initial Water Height, H _o (ft)	Final Water Height, H _f (ft)	Change in Water Height, ΔH (in)	Percolation Rate (min/in)
1	14:30	0:30	1.08	0.84	2.9	10
	15:00					
2	15:00	0:30	1.08	0.93	1.9	16
	15:30					
3	15:30	0:30	1.08	0.86	2.6	11
	16:00					
4	16:00	0:30	1.1	0.9	2.5	12
	16:30					
5	16:30	0:30	1.08	0.90	2.3	13
	17:00					
6	17:00	0:30	1.08	0.85	2.8	11
	17:30					
7	17:30	0:30	1.08	0.94	1.8	17
	18:00					
8	18:00	0:30	1.08	0.92	2.0	15
	18:30					
Observed Percolation Rate:					11 min/in 5.5 in/hr	
Gravel Correction Factor:					1.50	
Corrected Percolation Rate:					16 min/in 3.7 in/hr	
*Tested Infiltration Rate, I _t :					0.6 in/hr	

*Tested infiltration rate using the Porchet Method:

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

ΔH = Change in water head height over the time interval [in] = 2.8

r = Test hole radius [in] = 3

ΔT = Time interval [min] = 30

H_{avg} = Average water height over time interval = 12(H_o + H_f)/2 [in] = 11.8



SCST, Inc.

Autozone Valley Center Infiltration
 Valley Center, California

By: JRD Date: February, 2017
 Job No: 170111N-1 Figure: III-2

**APPENDIX IV
FORM I-8 CATEGORIZATION OF INFILTRATION FEASIBILITY CONDITION**

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.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Provide basis: Results of falling head borehole percolation testing were 0.2 and 0.6-inches per hour. The tested material is believed to be generally representative of the material that will be encountered below the proposed BMP location. The average of the tested infiltration rates do not support allowing infiltration greater than 0.5-inches per hour.			
Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide			
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.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Provide basis: The tested infiltration rate at the site does not support allowing infiltration greater than 0.5-inches per hour. Doing so will increase the risk of adverse settlement of the proposed structure to be located adjacent to the planned BMP. Additionally, due to the close proximity of the proposed structure to the proposed BMP location, we recommend the BMP be lined with an impermeable membrane to minimize this risk. SCST does not recommend allowing infiltration greater than 0.5 inches per hour.			
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.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Provide basis:</p> <p>Based on our experience with other sites in the site vicinity, historic high groundwater elevations are above the base elevation of the proposed infiltration basin and, if unlined, may increase the risk of groundwater contamination. Allowing infiltration at the site may increase the risk of adverse settlement of the proposed structure to be located adjacent to the planned BMP. SCST does not recommend allowing infiltration greater than 0.5 inches per hour.</p>			
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.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Provide basis:</p> <p>There are no known contaminants occurring at the proposed site, but our tested infiltration rate falls below 0.5 inches per hour so SCST does not recommend allowing infiltration greater than the tested amount.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>			
Part 1 Result*	<p>If all answers to rows 1 - 4 are "Yes" a full infiltration design is potentially feasible. The feasibility screening category is Full Infiltration</p> <p>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</p>		

*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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Provide basis:

There tested infiltration rates average 0.4 inches per hour. Boring logs show poorly graded sand at the bottom of our excavation which is believed to be generally representative of the material that will be encountered below proposed BMP locations. The tested infiltration rated support allowing partial infiltration design based on the City of San Diego's definition of partial infiltration being between 0.01 and 0.5 inches per hour. However, due to the close proximity of the proposed structure to the proposed BMP location, we recommend the BMP be lined with an impermeable membrane to minimize the risk of adverse settlement to the proposed structure.

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.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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Provide basis:

See responses to Criteria 2, 3, and 5.

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.

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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>Provide basis: See response to Criteria 3.</p>			
<p>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</p>			
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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>Provide basis:</p> <p>This Criteria Should be addressed by the Project Civil Engineer.</p>			
<p>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.</p>			
Part 2 Result*	<p>If all answers from row 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is Partial Infiltration.</p> <p>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.</p>		

*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