Appendix I Water Quality Management Plan

Appendix

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City of Hesperia
Regulated Project
Water Quality Management Plan

For:

Pathways to College K-8 Charter School

APN: 0414-212-08-0 AND 0414-212-09-0

Prepared for:

Pathways to College K-8 Charter School

9144 Third Avenue

Hesperia, CA. 92345

760-949-8002

Prepared by:

Kolibrien Corp.

27919 Jefferson Ave., Suite 201

Temecula, CA. 92590

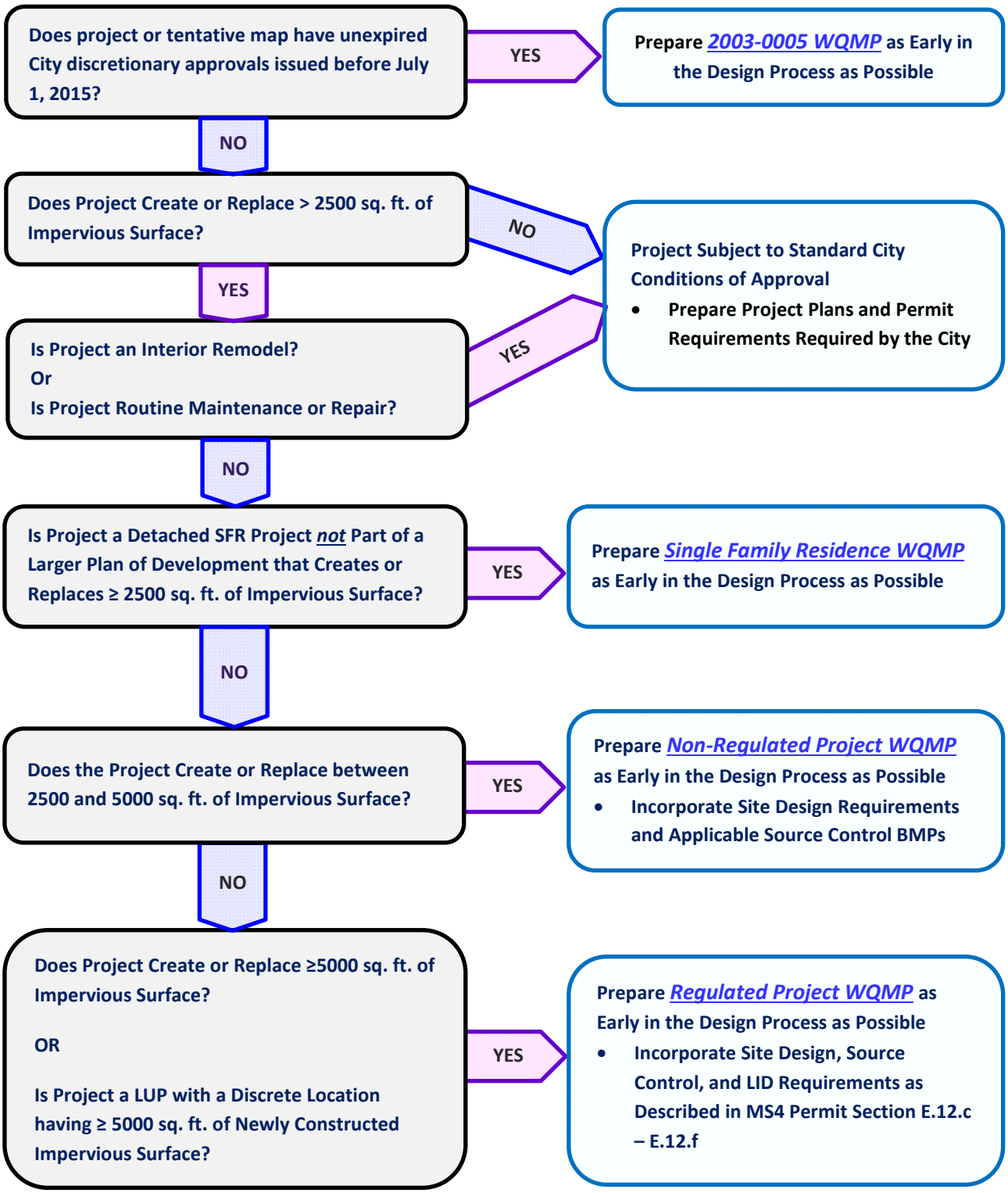
951-252-1034

Submittal Date: 1/31/2021

Revision No. 1 Date: 5/12/2022

Final Approval Date:_____

Project WQMP Selection Diagram



Project Owner's Certification

This WQMP has been prepared for Pathways to College K-8 Chart School by Kolibrien Corp. The WQMP includes requirements of the Phase II Small MS4 NPDES General Permit (Water Quality Order 2013-0001) (MS4 Permit) and the City of Hesperia (City). The undersigned, while it owns the subject property, shall implement the provisions of this plan and shall ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site consistent with the MS4 Permit. Once the undersigned transfers its interest in the property, its successors in interest and the City shall be notified of the transfer. The new owner shall implement the provisions of this plan and shall ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site consistent with the MS4 Permit. A copy of the approved WQMP shall be available on the subject site in perpetuity.

"I certify under a penalty of law that the provisions (implementation, operation, maintenance, and funding) of the WQMP have been accepted and that the plan will be transferred to future successors."

Project Data			
Permit/Application Number(s):		Grading Permit Number(s):	
Tract/Parcel Map Number(s):		Building Permit Number(s):	
CUP, SUP, and/or APN (Specify Lot Numbers if Portions of Tract):			0414-212-08-0 and 0414-212-09-0

Owner's Signature		
Owner Name:	Craig Merrill	
Title	Owner	
Company	Pathways to College K-8 Charter School	
Address	9144 Third Avenue, Hesperia, CA 92345	
Email	craig.merrill@pathwaysk8.com	
Telephone #	760-949-8002	
Signature	Date	

WQMP Preparer's Certification

Project Data			
Permit/Application Number(s):		Grading Permit Number(s):	
Tract/Parcel Map Number(s):		Building Permit Number(s):	
CUP, SUP, and/or APN (Specify Lot Numbers if Portions of Tract):			0414-212-08-0 0414-212-09-0

"The selection, sizing and design of stormwater treatment and other stormwater quality and quantity control measures in this plan were prepared under my oversight and meet the requirements of the California State Water Resources Control Board Order No. 2013-0001-DWQ."

Engineer: John H. Johnson		PE Stamp Below
Title	Principal Engineer	
Company	Kolibrien Corp.	
Address	27919 Jefferson Ave., STE. 201, Temecula, CA 92590	
Email	info@kolibrien.biz	
Telephone #	951-252-1034	
Signature		
Date	1/31/22	

Table of Contents

Section I Introduction

This WQMP template has been prepared specifically to implement requirements of the Phase II Small MS4 NPDES General Permit; Water Quality Order 2013-0001 (MS4 Permit). This location is within the jurisdiction of the Lahontan Regional Water Quality Control Board (LRWQCB). This document should not be confused with the City of Hesperia Non-Regulated Project WQMP Template or the 2003-0005 WQMP Template.

Section 1 Permit(s) and Project Information

Form 1-1 Project Information					
Project Name	Pathways to College K-8 Charter School				
Project Owner Contact Name:	Craig Merrill				
Mailing Address:	9144 Third Avenue, Hesperia, CA 92345	E-mail Address:	craig.merrill@pathwaysk8.com	Telephone:	760-949-8002
Permit/Application Number(s): (Obtain from City staff)		Tract/Parcel Map Number(s):	0414-212-08-0 0414-212-09-0		
Additional Information/ Comments:	South of Mojave St., East of 3rd Ave., North of Hercules St., West of Hesperia Rd.				
Site coordinates *take GPS measurement at approximate center of site*	Latitude 34.435454	Longitude -117.301483	Thomas Bros Map page 4476		
Provide summary of WQMP conditions	The project will construct an elementary school on the existing vacant portions of the lot. Project includes buildings, hardscape, parking and landscaped areas. The site will drain to by surface flow to swales and gutters, which will convey flow to the retention basion on site.				

Section 2 Project Description

2.1 Project Information

The WQMP requires Project information needed to determine the applicable development category, pollutants of concern, watershed description, and long term maintenance responsibilities for the project. This information will be used in conjunction with the information in Section 3, Site Description, to establish the performance criteria and Section 4, to select the LID BMP or other BMP for the project.

2.1.1 Project Sizing Categorization

Projects that create and/or replace ≥ 5,000 square feet of impervious surface are Regulated Projects.

Form 2.1-1 Description of Proposed Project

1 Development Project Category (Select all that apply):

☒ **#1:** New development involving the creation or replacement of 5,000 sq. ft. or more of impervious surface collectively over entire site	☐ **#2:** Significant re-development involving the creation or replacement of 5,000 sq. ft. or more of impervious surface on an already developed site	☐ **#3:** Road Project – any road, sidewalk, or bicycle lane project that creates 5,000 sq. ft. or more of newly constructed contiguous impervious surface	☐ **#4:** LUPs – linear underground/overhead projects that has a discrete location with 5,000 sq. ft. or more newly constructed contiguous impervious surface

☐ **#5:** Non-Regulated Project (Project Total Impervious Area Square Feet > 2,500 but < 5,000 sq.) ***Do not use this WQMP Template.*** *Use the "Non-Regulated Project WQMP" Template.*

2 Total Project Impervious Area (sq. ft.):	233,837	**3** Number of Dwelling Units:		**4** SIC Code:	821

5 Is Project going to be phased? Yes ☐ No ☒ *If yes, ensure that the WQMP evaluates each phase as a distinct DMA, requiring LID BMPs to address runoff at time of completion.*

2.2 Property Ownership/Management

Describe the ownership/management of all portions of the project and site. State whether any infrastructure will transfer to public agencies (City, County, Caltrans, etc.) after project completion. State if a homeowners or property owners association will be formed and be responsible for the long-term maintenance of project stormwater facilities. Describe any lot-level stormwater features that will be the responsibility of individual property owners.

Form 2.2-1 Property Ownership/Management

Describe property ownership/management responsible for long-term maintenance of WQMP stormwater facilities:
Pathways to College K-8 Charter School will be responsible for long-term maintenance of WQMP stormwater facilities.

Describe any infrastructure that will transfer to a public agency: ☒ N/A

Will a property owners association be responsible for long-term BMP maintenance? ☐Yes ☒No If yes, list association and BMPs to be maintained.

Describe lot-level features that will be maintained by individual property owners: ☒ N/A

2.3 Potential Stormwater Pollutants

BMPs for pollutant-generating activities and sources shall be designed consistent with recommendations from the CASQA Stormwater BMP Handbook for New Development and Redevelopment (or equivalent manual or resource if recommended by the City).

Complete Form 2.3-1: determine and describe expected stormwater pollutants of concern based on land uses and site activities using Table 2-1, below.

Form 2.3-1 Pollutants of Concern

Pollutant	Please check: E=Expected, N=Not Expected		Additional Information and Comments
Pathogens (Bacterial / Virus)	E ☒	N ☐	
Nutrients - Phosphorous	E ☒	N ☐	
Nutrients - Nitrogen	E ☒	N ☐	
Sediment	E ☒	N ☐	
Metals	E ☐	N ☒	
Oil and Grease	E ☒	N ☐	
Trash/Debris	E ☒	N ☐	
Pesticides / Herbicides	E ☒	N ☐	
Organic Compounds	E ☒	N ☐	
Other:	E ☐	N ☐	
Other:	E ☐	N ☐	
Other:	E ☐	N ☐	

Table 2-1: Pollutants of Concern for Project Categories and Land Uses

Regulated Project Categories and/or Project Features	General Pollutant Categories							
	Pathogen Indicators (Bacterial / Virus)	Metals	Nutrients	Toxic Organic Compounds	Pesticides / Herbicides	Sediments / Total Suspended Solids	Trash & Debris	Oil & Grease
Detached Residential Development	E	N	E	N	E	E	E	E
Attached Residential Development	E	N	E	N	E	E	E	E(2)
Commercial / Industrial Development	E(3)	E(5)	E(1)	E	E(1)	E(1)	E	E
Automotive Repair Shops	N	E	N	E	N	N	E	E
Restaurants	E	E(2)	E(1)	N	E(1)	E(1)(2)	E	E
Hillside Development (>5,000 ft^2)	E	N	E	N	E	E	E	E
Streets and Parking Lots (>5,000 ft^2)	E(4)	E	E(1)	E	E(1)	E	E	E
Retail Gasoline Outlets	N	E	N	E	N	N	E	E

E = Expected to be a concern in stormwater runoff
N = Not expected to be a concern in stormwater runoff
(1) Expected pollutant if landscaping or open area is present on site, otherwise not expected.
(2) Expected pollutant if the project includes uncovered parking areas, otherwise not expected.
(3) Expected pollutant if land use involves food or animal waste products, otherwise not expected.
(4) Bacterial indicators are routinely detected in pavement runoff.
(5) Expected pollutant if outdoor storage or metal roofs, otherwise not expected.

Section 3 Site and Watershed Description

Describe and evaluate the physical conditions and limitations of the site and its receiving waters to determine the applicability of potential BMPs. Provide a Site Map which shows how the developed portions of the project site are divided into discrete Drainage Management Areas (DMAs)[1]; in order to manage runoff from each DMA using Site Design Measures, Source Controls and/or Storm Water Treatment and Baseline Hydromodification Measures[2]. Complete Form 3.1 for each DMA on the project site-use extra form copies as needed. Complete Form 3-2 to describe the watershed attributes for the project site. Use additional copies of Form 3-2 if needed for different DMAs.

Provide the following information in the Project Description:

- For the entire parcel, list and describe the proposed land uses, the area of each land use, and the estimated imperviousness for each land use.
- List and show on the Site Map where facilities will be located and what activities will be conducted:
  - List what kinds of materials and products will be used (if known), how and where materials will be received and stored (if applicable), and what kinds of wastes will be generated (if any).
  - Describe all paved areas, including the type of parking areas.
  - Describe all landscaped areas and open space areas (if any).
- For commercial and industrial projects:
  - Provide the Standard Industrial Classification (SIC) Code which best describes the facilities operations.
  - Describe the type of use (or uses) for each building or tenant space (if known).
  - If the project includes food preparation, cooking, and eating areas, specify the location and type of area.
  - Describe delivery areas and loading docks (specify location, design, if below grade, and types of materials expected to be transferred).
  - Describe outdoor materials storage areas (describe and depict location(s), specify type(s) of materials expected to be stored).
  - Describe activities that will be routinely conducted outdoors.
  - Describe any activities associated with equipment or vehicle maintenance and repair, including washing or cleaning.
  - Indicate the number of service bays or number of fueling islands/fuel pumps, if applicable.

[1] DMAs on the Site Map should be consistent with DMAs as described in text and tables

[2] Hydromodification controls apply only to projects that create or replace ≥ 1-acre of impervious area. In addition, the hydromodification requirement is met for projects which comply with Onsite Drainage Impact Prevention conditions to control peak discharge for the 10-year, 24-hour storm event.

- **Provide Detailed Narrative Project Description (including Project areas; Land uses; Land cover; and Design elements):**

  The project will construct an elementary school (SIC Code 821) on the existing vacant portions of the lot. Project includes buildings, hardscape, standard parking including a loading zone for students and landscaped areas. Outdoor activities would include typical school activities such as sports and playground area. The site will drain by surface flow through swale and gutters to a large retention basin. The site is 513,480 sf or 11.79 acres. The total impervious area for the project including buildings, sidewalk, parking and paved areas is 233,837 sf. The landscaped area or total pervious area is 201,454 sf or 4.62 acres. The site has one drainage management area, which flows to the retention basin.

- **Provide a site map showing the Drainage Management Area(s) as described above, showing drainage pathways and the proposed site design, source control, LID, and/or Storm Water Treatment BMPs. Also show any subareas within the DMAs.**

  The comprehensive Site Map required for Section 6 can be used here.

  Site map included in the appendix.

Form 3-1: Existing Hydrologic Characteristics for Drainage Area 1[3]				
For sub-watershed DMAs within Drainage Area 1, provide the following information:	DMA A	DMA B	DMA C	DMA D
[1] DMA drainage area (ft^2)	513,480			
[2] Existing site impervious area (ft^2)	0			
[3] Antecedent moisture condition *For desert areas, use http://www.sbcounty.gov/dpw/floodcontrol/pdf/20100412_map.pdf*	2			
[4] Hydrologic soil group *Refer to County Hydrology Manual Addendum for Arid Regions – http://www.sbcounty.gov/dpw/floodcontrol/pdf/20100412_addendum.pdf*	C			
[5] Longest flowpath length (ft)	824.95			
[6] Longest flowpath slope (ft/ft)	0.0158			
[7] Current land cover type(s) *Select from Fig C-3 of Hydrology Manual*	Barren			
8 Pre-developed pervious area condition: *Based on the extent of wet season vegetated cover: good >75%; Fair 50-75%; Poor <50%* ***Attach photos of site to support rating***	Barren			

Attach Photo(s) here

[3] Add additional sheets as needed.

Add sheets as needed here

Click here to enter text.

Site Characteristics

Fill out table with relevant information and include information regarding BMP sizing, suitability, and feasibility, as applicable.

Form 3-2 Site Characteristics	
Precipitation Zone	Desert Area
Topography	Ranges from 3165 in the southwest corner to 3147 in the northeast corner.
Drainage Patterns/Connections	The site drains from the southwest corner towards the northeast corner.
Soil Type, Geology, and Infiltration Properties	Soil type C with an infiltration rate of 0.20 to 0.57 in/hr.
Hydrogeologic (Groundwater) Conditions	Groundwater was not encountered.
Geotechnical Conditions (relevant to infiltration)	Soil is Bryman Loamy Fine Sand, 2 to 5 percent slopes
Off-Site Drainage	There is no offsite drainage run-on to the site. The project includes offsite street improvements.
Utility and Infrastructure Information	The existing site does not have storm drain infrastructure.

Watershed Description

Fill out table: indicate the Receiving Waters and any Environmentally Sensitive Areas.

Form 3-3 Watershed Description for Drainage Area

	X	Check One	Distance from Project	Direction
Receiving waters	☒	Mojave River	3.5 Miles	East
	☐	Antelope Valley Wash		
	☐	Oro Grande Wash		
	☐	Unnamed Wash		
	☐	MPD Drainage Channel		
Applicable TMDLs *http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml*	**None**			
303(d) listed impairments *http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml*	**Mojave River** Mojave Forks Reservoir Outlet to Upper Narrows: • Fluoride Upper Narrows to Lower Narrows: • Fluoride • Sulfates • Total Dissolved Solids			
Environmentally Sensitive Areas (ESA) (habitat, plant/animal species) *Refer to Watershed Mapping Tool – http://sbcounty.permitrack.com/WAP,* Or other reference relevant to the Mojave River Watershed; such areas may fall under the jurisdiction of other resource agencies	None found.			

Section 4 Best Management Practices (BMP)

4.1 Site Assessment, Site Design Measures, and Source Control BMPs

Regulated Projects shall conduct a Site Assessment, implement Site Design measures, and implement Source Control BMPs that address site-specific pollutant sources.

4.1.1 Site Assessment

Fill out Form 4.1-1 to show the assessment of how Project site conditions such as soils, vegetation, and flowpaths influence the placement of buildings and paved surfaces at the project, to facilitate capture and treatment of runoff. Regulated Projects must evaluate site conditions and must consider optimizing overall site design using the methods in Form 4.1-1. Use as much space as needed for complete explanation.

4.1.2 Site Design Measures

Use Form 4.1-2 to identify site design measures to reduce runoff generation and reduce the required Design Capture Volume; based on the objective of achieving infiltration, evapotranspiration and/or harvesting/reuse of the 85th percentile 24-hour storm runoff event. Site design measures shall be used to reduce the amount of runoff, to the extent technically feasible, for which retention and runoff is required. Describe the site design measures and drainage plan for each Drainage Management Area in the following Forms, including:

- A narrative of site design measures utilized or rationale for not using practices
- A narrative of how site plan incorporates preventive site design measures
- Include an attached Site Plan layout which shows how preventive site design measures are included in the WQMP
- Provide specific information for each site design measure as it applies to the project
- An explanation of how Site Design practices are incorporated into the project or a rationale for not incorporating them into the project

Form 4.1-1: Site Assessment Checklist

Site Assessment

For site assessment elements below: if yes, explain how preventive site design practices are addressed in project site plan. If no, explain why not included in the project and select other LID BMPs as needed to meet volume or flow design requirements

Define the development envelope and protected areas, identifying areas that are most suitable for development and areas to be left undisturbed:

Yes ☒ No ☐

Explanation: The site didn't contain protected areas. The retention basin was placed in the Northeast corner, which is the existing low point and is the most suitable area for the BMP.

Concentrate development on portions of the site with less permeable soils and preserve areas that can promote infiltration:

Yes ☒ No ☐

Explanation: The site is uniformly type c soils, but the BMP is placed in the existing low point.

Limit overall impervious coverage of the site with paving and roofs:

Yes ☒ No ☐

Explanation: The site attempts to minimize impervious surfaces and provides several landscaped areas. The site also uses dg in areas rather than paving.

Preserve significant trees:

Yes ☒ No ☐

Tree Planting and Preservation - planting and preservation of healthy, established trees that include both evergreens and deciduous, as applicable.

Explanation: The site area being improved does not have significant trees.

Conform the site layout along natural landforms:

Yes ☒ No ☐

Explanation: The proposed grading provides a drainage pattern similar to the existing across the site.

Avoid excessive grading and disturbance of vegetation and soils:

Yes ☒ No ☐

Explanation: Grading is miminize and is attempting to balance the site earthwork.

Replicate the site's natural drainage patterns:

Yes ☒ No ☐

Explanation: The site flows to the northeast corner as it does in the existing condition.

Detain and retain runoff throughout the site:

Yes ☒ No ☐

Explanation: The site has a retention basin.

Stake off areas that will be used for landscaping to minimize compaction during construction:

Yes ☒ No ☐

Explanation: Construction contractor will minimize compaction in those areas.

Add any additional information or tables here

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Form 4.1-2: Site Design Measures Checklist

Site Design Measures

For site design elements below: if yes, explain how site design practices are addressed in project site plan. If no, explain why not included in the project and select other LID BMPs as needed to meet volume or flow design requirements

Set back development from creeks or washes, wetlands, and riparian habitats:
Yes ☐ No ☒
A vegetated area including trees, shrubs, and herbaceous vegetation that exists or is established to protect a stream system, lake reservoir, or coastal estuarine area.

Explanation: The site doesn't have setback requirements from these features.

Soil Quality Improvement and Maintenance - improvement and maintenance of soil through soil amendments and creation of microbial community:
Yes ☐ No ☒
Explanation: The site has adequate soils.

Rooftop and Impervious Area Disconnection (Impervious Area Dispersion: HSC-2) - rerouting of rooftop drainage pipes to engineered permeable/bioretention areas instead of the storm sewer:
Yes ☒ No ☐
Explanation: All flows go to the retention basin.

Porous Pavement - pavement that allows runoff to pass through it, thereby reducing the runoff from a site and surrounding areas and filtering pollutants:
Yes ☐ No ☒
Explanation: Porous pavement is not proposed.

Engineered Arid-Region Rock Swales or Vegetated Swales (bioretention/biofiltration) – a vegetated or rock-lined, open-channel management practice designed to treat and attenuate stormwater runoff:
Yes ☐ No ☒
Explanation: These BMPs are not proposed.

Rain Barrels and Cisterns – system that collects and stores stormwater runoff from a roof or other impervious surface:
Yes ☐ No ☒
Explanation: These BMPs are not proposed.

Add any additional information or tables here

Click here to enter text.

The MS4 Permit (Section E.12.b) requires consideration of cisterns and green roofs. However, these BMPs are typically not practical in this region. Engineered vegetated swales may be used provided measures are taken to maximize the amount of drought tolerant vegetation. The project proponent should use locally recommended vegetation types for landscaping which can be found in the following references:

City of Hesperia:

Approved Plant List - http://www.cityofhesperia.us/DocumentCenter/Home/View/384

San Bernardino County Special Districts:

Guide to High Desert Landscaping - http://www.specialdistricts.org/Modules/ShowDocument.aspx?documentid=795

Recommended High-Desert Plants - http://www.specialdistricts.org/modules/showdocument.aspx?documentid=553

Mojave Water Agency:

Desert Ranch: http://www.mojavewater.org/files/desertranchgardenprototype.pdf

Summertree: http://www.mojavewater.org/files/Summertree-Native-Plant-Brochure.pdf

Thornless Garden: http://www.mojavewater.org/files/thornlessgardenprototype.pdf

Mediterranean Garden: http://www.mojavewater.org/files/mediterraneangardenprototype.pdf

Lush and Efficient Garden: http://www.mojavewater.org/files/lushandefficientgardenprototype.pdf

Alliance for Water Awareness and Conservation (AWAC) outdoor tips – http://hdawac.org/save-outdoors.html

4.1.3 Source Control BMPs

Non-structural and structural source control BMPs are required for all Regulated Projects. Complete Forms 4.1-3 and 4.1-4 to describe specific source control BMPs which are required to be used in the WQMP or to explain why a certain source-control BMP is not applicable. All source control BMPs must be implemented for projects with the respective specific types of potential pollutant sources or activities.

The identified list of source control BMPs corresponds to the CASQA Stormwater BMP Handbook for New Development and Redevelopment.

Form 4.1-3 Non-Structural Source Control BMPs

Identifier	Name	Check One		If not applicable, state reason
		Included	Not Applicable	
N1	Education of Property Owners, Tenants and Occupants on Stormwater BMPs	☒	☐	
N2	Activity Restrictions	☒	☐	
N3	Landscape Management BMPs	☒	☐	
N4	BMP Maintenance	☒	☐	
N5	Title 22 CCR Compliance (How development will comply)	☒	☐	
N7	Spill Contingency Plan	☐	☒	There are no activities that would require this at a school.
N8	Underground Storage Tank Compliance	☐	☒	Underground storage tanks are not proposed.
N9	Hazardous Materials Disclosure Compliance	☐	☒	There are no known hazard materials used on site.

Form 4.1-3 Non-Structural Source Control BMPs

Identifier	Name	Check One		If not applicable, state reason
		Included	Not Applicable	
N10	Uniform Fire Code Implementation	☒	☐	
N11	Litter/Debris Control Program	☒	☐	
N12	Employee Training	☒	☐	
N13	Housekeeping of Loading Docks	☐	☒	There are no loading docks proposed.
N14	Catch Basin Inspection Program	☒	☐	
N15	Vacuum Sweeping of Private Streets and Parking Lots	☒	☐	
N16	Other Non-structural Measures for Public Agency Projects	☐	☒	Not applicable since this is not a public project.

Form 4.1-4 Structural Source Control BMPs

Identifier	Name	Check One		If not applicable, state reason
		Included	Not Applicable	
S1	Provide storm drain system stencilling and signage (CASQA New Development BMP Handbook SD-13)	☒	☐	
S2	Design and construct outdoor material storage areas to reduce pollution introduction (CASQA New Development BMP Handbook SD-34)	☐	☒	There is no proposed outdoor storage.
S3	Design and construct trash and waste storage areas to reduce pollution introduction (CASQA New Development BMP Handbook SD-32)	☒	☐	
S4	Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control (Statewide Model Landscape Ordinance; CASQA New Development BMP Handbook SD-12)	☒	☐	
S5	Finish grade of landscaped areas at a minimum of 1-2 inches below top of curb, sidewalk, or pavement	☒	☐	
S6	Protect slopes and channels and provide energy dissipation (CASQA New Development BMP Handbook SD-10)	☒	☐	
S7	Covered dock areas (CASQA New Development BMP Handbook SD-31)	☐	☒	This is not proposed for this project.
S8	Covered maintenance bays with spill containment plans (CASQA New Development BMP Handbook SD-31)	☐	☒	This is not proposed for this project.
S9	Vehicle wash areas with spill containment plans (CASQA New Development BMP Handbook SD-33)	☐	☒	This is not proposed for this project.
S10	Covered outdoor processing areas (CASQA New Development BMP Handbook SD-36)	☐	☒	This is not proposed for this project.

Form 4.1-4 Structural Source Control BMPs

Identifier	Name	Check One		If not applicable, state reason
		Included	Not Applicable	
S11	Equipment wash areas with spill containment plans (CASQA New Development BMP Handbook SD-33)	☐	☒	This is not proposed for this project.
S12	Fueling areas (CASQA New Development BMP Handbook SD-30)	☐	☒	This is not proposed for this project.
S13	Hillside landscaping (CASQA New Development BMP Handbook SD-10)	☐	☒	This is not a hillside project.
S14	Wash water control for food preparation areas	☐	☒	This is not proposed for the project.
S15	Community car wash racks (CASQA New Development BMP Handbook SD-33)	☐	☒	This is not proposed for this project.

4.2 Treatment BMPs

All site runoff from impervious areas must be addressed by onsite treatment BMPs. Any runoff from areas within DMAs that is not addressed by proposed Site Design measures and Source Control BMPs must be directed to one or more onsite BMPs designed to infiltrate, evapotranspire, and/or bioretain the design capture volume as specified in 4.2.1.1, which include:

Infiltration/Bioretention BMPs

- Bioretention: Basin; Rain Garden; Linear Landscape Area; Planter Box
- Infiltration: Basin; Trench; Rock Landscape Feature; Pervious Pavement/Pavers

The BMPs must be demonstrated to be at least as effective as a bioretention system with the following design parameters:

1) Maximum surface loading rate of 5 inches per hour, based on the flow rates calculated. A sizing factor of 4% of tributary impervious area may be used.

2) Minimum surface reservoir volume equal to surface area times a depth of 6 inches.

3) Minimum planting medium depth of 18 inches. The planting medium must sustain a minimum infiltration rate of 5 inches per hour throughout the life of the project and must maximize runoff retention and pollutant removal. A mixture of sand (60%-70%) meeting the specifications of American Society for Testing and Materials (ASTM) C33 and compost (30%-40%) may be used.

4) Subsurface drainage/storage (gravel: Class 2 permeable material) layer with an area equal to the surface area and having a minimum depth of 12 inches.

5) Underdrain with discharge elevation at top of gravel layer. Underdrain is optional for Class A and B soils.

6) No compaction of soils beneath the facility, or ripping/loosening of soils if compacted.

7) No liners or other barriers interfering with infiltration.

8) Appropriate plant palette per resources in section 4.1.2, above.

All BMPs must include pretreatment features recommended in CASQA Handbooks or equivalent guidance.

If the Project Engineer determines that it is infeasible to infiltrate, evapotranspire, and/or bioretain the entire design capture volume, alternate treatment BMPs may be proposed to address any remaining portion of the DCV. Subject to City approval of any Project BMP infeasibility determination, the following BMPs may be considered:

Biotreatment/Treatment BMPs

- Biofiltration: Bioretention/Planterbox with Underdrain
- Filtration: Vegetated Buffer/Filter Strip; Swale; Trench with Underdrain

- Settling/Sedimentation: Detention Basin; Extended Detention Basin
- Other BMP designs subject to City approval

BMP designs must be consistent with the most current version of the following Guidance Resources:

- CASQA Stormwater BMP Handbook for New Development and Redevelopment
- Riverside County Design Handbook for Low Impact Development Best Management Practices: http://www.floodcontrol.co.riverside.ca.us/NPDES/LIDBMP.aspx

BMPs must be sized using the methods in this WQMP Template.

If the project has more than one outlet for stormwater runoff, then complete additional versions of these forms for each DMA / outlet.

4.2.1 Project Specific Hydrology Characterization[4]

The Project WQMP must meet the performance standards for post-development hydrology as specified in Section E.12.e.ii.c of the MS4 Permit. These standards include runoff volume and flow rates for water quality control (referred to as LID design capture volume and design flow rates).

4.2.1.1 Hydromodification Standard

Projects which create and/or replace one acre or more of impervious surface shall demonstrate that the project meets the required hydromodification performance standard:

Post-project runoff shall not exceed estimated pre-project flow rate for the 10-year, 24-hour storm.

Methods include:

4.2.1.2 Volume-Based Design Standard

For LID BMP Design Capture Volume (DCV), use the P_6 method (Form 4.2-1). For pre- and post-development hydrologic calculation, use methods in the San Bernardino Hydrology Manual: the Rational Method approach for projects ≤ 640 acres; for projects greater than 640 acres (1.0 mi^2), the Unit Hydrograph Method (San Bernardino County Hydrology Manual Section E) shall be used.

[4] Projects will also be required to comply with City flood protection requirements for Onsite and Offsite Drainage Impact Mitigation.

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume		
① Project area (for DMA) (ft^2): 513,480	②Imperviousness after applying preventative site design practices (Imp %): 45.5%	③Runoff Coefficient (Rc): _0.312 *$R_c = 0.858(Imp\%)^{\wedge 3}-0.78(Imp\%)^{\wedge 2}+0.774(Imp\%)+0.04$*
④ Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.400 http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html		
⑤ Compute P_6, Mean 6-hr Precipitation (inches): 0.495 *P_6 = Item 4 *C_1, where C_1 = 1.2371*		
⑥ Drawdown Rate *Use 24 hours as the default condition.*		24-hrs ☒ 48-hrs ☐
⑦ Compute design capture volume, DCV (ft^3): 10,443 *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C_2], where C_2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)* *Compute separate DCV for each outlet from the project site per site map from Form 3-1*		

Add any additional information or tables here

Show calculations in detail - attach a separate sheet of calculations and a table that summarizes the sizing parameters including size of impervious areas, relevant hydrologic characteristics, and design capture volume (s) for each BMP and contributing drainage management area, and demonstrates that the design criteria have been satisfied.

Retention volumes provided by implementation of site design measures can be credited to offset a portion of the required onsite LID Design Capture Volume.

Any proposed retention/detention basins or underground systems must be reviewed and approved by the City Engineer. The proposed design shall meet City Standards and design criteria established by the City Engineer. A soils percolation test will be required for all onsite retention systems, using methods in Appendix A of the Riverside County Design Handbook for Low Impact Development Best Management Practices; available online at: http://www.floodcontrol.co.riverside.ca.us/NPDES/LIDBMP.aspx

4.2.1.3 Flow Based Design Standard

Flow-based BMPs should be designed and sized to provide treatment for the estimated range of flow rates expected from the DMA for the BMP. Calculate the target BMP flow rate, Q, using the formula:

Q = C* I * A

Where: **Q** = flow in $ft.^3/s$

I = rainfall intensity = 0.2 inches/hour[1]

A = Drainage Area in acres

C = composite runoff coefficient for the DMA

[1] Use the default value of I = 0.2 inches/hour; or use project-specific I-value that will ensure flow-based BMPs will effectively treat (or pre-treat) flows prior to discharge into onsite retention BMP(s) which must meet volume retention standard provided in 4.2.1.1.

Show calculations in detail - attach a separate sheet of calculations and a table that summarizes the sizing parameters including size of impervious areas, relevant hydrologic characteristics, and design flow rate (s) for each BMP and contributing drainage management area, and demonstrates that the design criteria have been satisfied.

4.3 BMP Selection and Sizing

Complete the following forms for each project site DMA to document that the proposed treatment (LID/Infiltration/Bioretention) BMPs conform to the project DCV. Use additional form sheets as necessary to describe the entire site. The forms help compute the following for onsite LID BMPs:

- Site Design BMPs (Form 4.3-1)
- Retention and Infiltration BMPs (Form 4.3-3) or
- Biotreatment BMPs (Form 4.3-4).

At the end of each form, additional fields facilitate the determination of the extent of mitigation provided by the specific BMP category, allowing for use of the next category of BMP in the hierarchy, if necessary.

Complete Form 4.3-1 to determine the feasibility of applicable Site Design BMPs, and, if their implementation is feasible, the extent of mitigation of the DCV.

Evaluate the use of combinations of LID BMPs, including all applicable Site Design BMPs, to maximize on-site retention of the DCV.

4.3.1 Site Design BMP

The MS4 Permit (Section E.12.e) emphasizes the use of LID preventive measures. Site design measures shall be used to reduce the amount of runoff, to the extent technically feasible, for which retention and runoff is required. Therefore, all applicable Site Design Measures shall be provided except where they are mutually exclusive with each other, or with other BMPs. Mutual exclusivity may result from overlapping BMP footprints such that either would be potentially feasible by itself, but both could not be implemented. Please note that while there are no numeric standards regarding the use of Site Design BMPs; if a project cannot feasibly meet BMP sizing requirements overall or cannot fully address hydromodification, then the feasibility of all applicable Site Design BMPs must be evaluated as part of demonstrating that the BMP system has been designed to retain the maximum feasible portion of the DCV. Complete Form 4.3-1 to identify and calculate estimated retention volume from implementing site design BMP.

Form 4.3-1 Site Design BMPs

1 Implementation of Impervious Area Dispersion BMP (i.e. routing runoff from impervious to pervious areas), excluding impervious areas planned for routing to on-lot infiltration BMP: Yes ☒ No ☐ *If yes, complete Items 2-5; If no, proceed to Item 6*	DMA 1 BMP Type Infiltration	DMA BMP Type	DMA BMP Type *(Use additional forms for more BMPs)*
2 Total impervious area draining to pervious area (ft^2)	233,837		
3 Ratio of pervious area receiving runoff to impervious area	1.196		
4 Retention volume achieved from impervious area dispersion (ft^3) *V = Item2 * Item 3 * (0.5/12), assuming retention of 0.5 inches of runoff*	11,652		
5 Sum of retention volume achieved from impervious area dispersion (ft^3): 11,652 *$V_{retention}$ =Sum of Item 4 for all BMPs*			
6 Implementation of Localized On-lot Infiltration BMPs (e.g. on-lot bioretention): Yes ☒ No ☐ *If yes, complete Items 7-13 for aggregate of all on-lot infiltration BMP in each DA; If no, proceed to Item 14*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
7 Ponding surface area (ft^2)	15,218		
8 Ponding depth (ft) (min. 0.5 ft.)	4		
9 Surface area of amended soil/gravel (ft^2)	7079		
10 Average depth of amended soil/gravel (ft) (min. 1 ft.)	1.5		
11 Average porosity of amended soil/gravel	0.40		
12 Retention volume achieved from on-lot infiltration (ft^3) *$V_{retention}$ = (Item 7 *Item 8) + (Item 9 * Item 10 * Item 11)*	65119		
13 Runoff volume retention from on-lot infiltration (ft^3): 65119 *$V_{retention}$ =Sum of Item 12 for all BMPs*			
14 Implementation of Street Trees: Yes ☐ No ☒ *If yes, complete Items 14-18. If no, proceed to Item 19*	DMA BMP Type	DMA BMP Type	DMA BMP Type *(Use additional forms for more BMPs)*
15 Number of Street Trees			
16 Average canopy cover over impervious area (ft^2)			
17 Runoff volume retention from street trees (ft^3) *$V_{retention}$ = Item 15 * Item 16 * (0.05/12) runoff retention = 0.05 in*			
18 Runoff volume retention from street tree BMPs (ft3): *$V_{retention}$ = Sum of Item 17 for all BMPs*			
19 Total Retention Volume from Site Design BMPs: 76,771 *Sum of Items 5, 13 and 18*			

Add any additional information or tables here

4.3.2 Retention/Infiltration BMPs

Use Form 4.3-2 to compute the volume of runoff captured by proposed onsite retention/infiltration BMPs. Volume retention estimates are sensitive to the percolation rate used, which determines the amount of runoff that can be infiltrated within the specified drawdown time. The infiltration safety factor reduces field measured percolation to account for potential inaccuracy associated with field measurements, declining BMP performance over time, and compaction during construction.

4.3.2.1 Allowed Variations for Special Site Conditions

The bioretention system design parameters of this Section may be adjusted for the following special site conditions:

1) Facilities located within 10 feet of structures or other potential geotechnical hazards established by the geotechnical expert for the project may incorporate an impervious cutoff wall between the bioretention facility and the structure or other geotechnical hazard.

2) Facilities with documented high concentrations of pollutants in underlying soil or groundwater, facilities located where infiltration could contribute to a geotechnical hazard, and facilities located on elevated plazas or other structures may incorporate an impervious liner and may locate the underdrain discharge at the bottom of the subsurface drainage/storage layer (this configuration is commonly known as a “flow-through planter”).

3) Facilities located in areas of high groundwater, highly infiltrative soils or where connection of underdrain to a surface drain or to a subsurface storm drain are infeasible, may omit the underdrain.

4) Facilities serving high-risk areas such as fueling stations, truck stops, auto repairs, and heavy industrial sites must provide adequate pretreatment to address pollutants of concern; these high-risk areas should be isolated from storm water runoff or bioretention areas to prevent any chance of spill migration.

Form 4.3-2 Infiltration LID BMP - including underground BMPs (per DMA)

1 Remaining LID DCV not met by site design BMP (ft^3): *V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-1 Item19*			
BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP - Use additional forms for more BMPs*	DMA 1 BMP Type Retention Basin	DMA BMP Type	DMA BMP Type *(Use additional forms for more BMPs)*
2 Infiltration rate of underlying soils (in/hr)	1.0		
3 Infiltration safety factor *(from percolation test method below*)*	1		
4 Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*	0.2		
5 Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*	24		
6 Maximum ponding depth (ft) *6 ft maximum per City code*	4		
7 Ponding Depth (ft) *d_{BMP} = Minimum of (1/12*Item 4*Item 5) or Item 6*	4		
8 Infiltrating surface area, SA_{BMP} (ft^2)	15218		
9 Amended soil depth, d_{media} (ft) If applicable *Only included in certain BMP types*	1.5		
10 Amended soil porosity	.4		
11 Gravel depth, d_{media} (ft) *Only included in certain BMP types*	1		
12 Gravel porosity	.4		
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	3		
14 Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*	76,851		
15 Underground Retention Volume (ft^3) *Volume determined using manufacturer's specifications and calculations*			
16 Total Retention Volume from LID Infiltration BMPs: 76,851 *(Sum of Items 14 and 15 for all infiltration BMPs included in plan)*			
17 Percentage of DCV achieved with infiltration BMP: 736% *Retention% =(Item 16 / Form 4.2-1 Item 7) *100*			
18 Is full LID DCV retained onsite with combination of hydrologic source control and LID retention/infiltration BMPs? Yes ☒ No ☐			

***Appendix A of the Riverside County Design Handbook for Low Impact Development Best Management Practices; available online at: http://www.floodcontrol.co.riverside.ca.us/NPDES/LIDBMP.aspx**

Add any additional information or tables here

4.3.3 Biotreatment BMP

Biotreatment BMPs may be considered if the full LID DCV cannot be met by maximizing retention and infiltration. A key consideration when using biotreatment BMP is the effectiveness of the proposed BMP in addressing the pollutants of concern for the project).

Use Form 4.3-3 to summarize the potential for volume based and/or flow based biotreatment options to biotreat the remaining unmet LID DCV. Biotreatment computations are included as follows:

- Use Form 4.3-4 to compute biotreatment in small volume based biotreatment BMP (e.g. bioretention w/underdrains);
- Use Form 4.3-5 to compute biotreatment in large volume based biotreatment BMP (e.g. extended detention);
- Use Form 4.3-6 to compute sizing criteria for flow-based biotreatment BMP (e.g. bioswales)

Form 4.3-3 Selection and Evaluation of Biotreatment BMP (per DMA)
Or check if N/A ☒

1 Remaining LID DCV not met by site design , or infiltration, BMP for potential biotreatment (ft^3): *Form 4.2-1 Item 7 - Form 4.3-2 Item 19 – Form 4.3-3 Item 16*	List pollutants of concern *Copy from Form 2.3-1.*	
2 Biotreatment BMP Selected *(Select biotreatment BMP(s) necessary to ensure all pollutants of concern are addressed through Unit Operations and Processes*	Volume-based biotreatment *Use Forms 4.3-5 and 4.3-6 to compute treated volume*	Flow-based biotreatment *Use Form 4.3-7 to compute treated flow*
	☐ Bioretention with underdrain ☐ Planter box with underdrain ☐ Dry extended detention	☐ Rock or Vegetated swale ☐ Vegetated buffer/filter strip ☐ Proprietary biotreatment
3 Volume biotreated in volume based biotreatment BMP (ft^3): *Form 4.3-5 Item 15 + Form 4.3-6 Item 13*	**4** Compute remaining LID DCV with implementation of volume based biotreatment BMP (ft^3): *Item 1 – Item 3*	**5** Remaining fraction of LID DCV for sizing flow based biotreatment BMP: % *Item 4 / Item 1*
6 Flow-based biotreatment BMP capacity provided (cfs):		
7 Metrics for MEP determination: • Provided a WQMP with the portion of site area used for suite of LID BMP equal to minimum thresholds for the proposed category of development: ☐		

Add any additional information or tables here

Click here to enter text.

Form 4.3-4 Volume Based Biotreatment (DA 1) – Bioretention and Planter Boxes with Underdrains; Or check if N/A ☒

Biotreatment BMP Type *(Bioretention w/underdrain, planter box w/underdrain, other comparable BMP)*	DMA BMP Type	DMA BMP Type	DMA BMP Type *(Use additional forms for more BMPs)*
1 Pollutants addressed with BMP *List all pollutants of concern that will be effectively reduced through specific Unit Operations and Processes*			
2 Amended soil infiltration rate *Typical ~ 5.0*			
3 Amended soil infiltration safety factor *Typical ~ 2.0*			
4 Amended soil design percolation rate (in/hr) P_{design} *= Item 2 / Item 3*			
5 Ponded water drawdown time (hr) *Copy Item 6 from Form 4.2-1*			
6 Maximum ponding depth (ft) *6 ft maximum per City code*			
7 Ponding Depth (ft) d_{BMP} *= Minimum of (1/12 * Item 4 * Item 5) or Item 6*			
8 Amended soil surface area (ft^2)			
9 Amended soil depth (ft)			
10 Amended soil porosity, *n*			
11 Gravel depth (ft)			
12 Gravel porosity, *n*			
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*			
14 Biotreated Volume (ft^3) $V_{biotreated}$ *= Item 8 * [(Item 7/2) + (Item 9 * Item 10) +(Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*			
15 Total biotreated volume from bioretention and/or planter box with underdrains BMP: *Sum of Item 14 for all volume-based BMPs included in this form*			

Add any additional information or tables here

Click here to enter text.

Form 4.3-5 Volume Based Biotreatment (per DMA) – Extended Detention; Or check if N/A ☒

Biotreatment BMP Type *Extended dry detention, or other comparable proprietary BMP. If BMP includes multiple modules (E.g. forebay and main basin), provide separate estimates for storage and pollutants treated in each module.*	DMA BMP Type		DMA BMP Type *(Use additional forms for more BMPs)*	
	Forebay	Basin	Forebay	Basin
1 Pollutants addressed with BMP forebay and basin *List all pollutant of concern that will be effectively reduced through specific Unit Operations and Processes*				
2 Bottom width (ft)				
3 Bottom length (ft)				
4 Bottom area (ft^2) A_{bottom} = *Item 2 * Item 3*				
5 Side slope (ft/ft)				
6 Depth of storage (ft)				
7 Water surface area (ft^2) $A_{surface}$ =*(Item 2 + (2 * Item 5 * Item 6)) * (Item 3 + (2 * Item 5 * Item 6))*				
8 Storage volume (ft^3) *For BMP with a forebay, ensure fraction of total storage is within ranges specified in BMP specific fact sheets* V =*Item 6 / 3 * [Item 4 + Item 7 + (Item 4 * Item 7)^0.5]*				
9 Drawdown Time (hrs) *Copy Item 6 from Form 2.1*				
10 Outflow rate (cfs) Q_{BMP} = *(Item* $8_{forebay}$ + *Item* 8_{basin}*) / (Item 9 * 3600)*				
11 Duration of design storm event (hrs)				
12 Biotreated Volume (ft^3) $V_{biotreated}$ = *(Item* $8_{forebay}$ + *Item* 8_{basin}*) +(Item 10 * Item 11 * 3600)*				
13 Total biotreated volume from extended detention : *(Sum of Item 12 for all BMP included in plan)*				

Add any additional information or tables here

Click here to enter text.

Form 4.3-6 Flow Based Biotreatment (per DMA)
Or check if N/A ☒

Biotreatment BMP Type *Vegetated swale, vegetated filter strip, or other comparable proprietary BMP*	DMA BMP Type	DMA BMP Type	DMA BMP Type *(Use additional forms for more BMPs)*
1 Pollutants addressed with BMP *List all pollutant of concern that will be effectively reduced through specific Unit Operations and Processes*			
2 Flow depth for water quality treatment (ft) *BMP specific*			
3 Bed slope (ft/ft) *BMP specific,*			
4 Manning's roughness coefficient			
5 Bottom width (ft)			
6 Side Slope (ft/ft) *BMP specific*			
7 Cross sectional area (ft^2) *A = (Item 5 * Item 2) + (Item 6 * Item 2^2)*			
8 Water quality flow velocity (ft/sec) *V = Form 4.3-5 Item 6 / Item 7*			
9 Hydraulic residence time (min)			
10 Length of flow based BMP (ft) *L = Item 8 * Item 9 * 60*			
11 Water surface area at water quality flow depth (ft^2) *SA_{top} = (Item 5 + (2 * Item 2 * Item 6)) * Item 10*			

Add any additional information or tables here

Click here to enter text.

4.3.5 Conformance Summary

Complete Form 4.3-7 to demonstrate how on-site LID DCV is met with proposed site design, infiltration, and/or biotreatment BMP. The bottom line of the form is used to describe the basis for infeasibility determination for on-site LID BMP to achieve full LID DCV, and provides methods for computing remaining volume to be addressed in an alternative compliance plan. If the project has more than one outlet, then complete additional versions of this form for each outlet.

Form 4.3-7 Conformance Summary and Alternative Compliance Volume Estimate (DA 1)

1 Total LID DCV for the Project DA-1 (ft^3): 10,443 *Copy Item 7 in Form 4.2-1*

2 On-site retention with site design BMP (ft^3): 76850 *Copy Item18 in Form 4.3-2*

3 On-site retention with LID infiltration BMP (ft^3): 0 *Copy Item 16 in Form 4.3-3*

4 On-site biotreatment with volume based biotreatment BMP (ft^3): 0 *Copy Item 3 in Form 4.3-4*

5 Flow capacity provided by flow based biotreatment BMP (cfs): 0 *Copy Item 6 in Form 4.3-4*

6 LID BMP performance criteria are achieved if answer to any of the following is "Yes":

- Full retention of LID DCV with site design or infiltration BMP: Yes ☒ No ☐
  If yes, sum of Items 2, 3, and 4 is greater than Item 1
- Combination of on-site retention BMPs for a portion of the LID DCV and volume-based biotreatment BMP that address all pollutants of concern for the remaining LID DCV: Yes ☐ No ☐
  If yes, a) sum of Items 2, 3, 4, and 5 is greater than Item 1, and Items 2, 3 and 4 are maximized; or b) Item 6 is greater than Form 4.3--5 Item 6 and Items 2, 3 and 4 are maximized
- On-site retention and infiltration is determined to be infeasible; therefore biotreatment BMP provides biotreatment for all pollutants of concern for full LID DCV: Yes ☐ No ☐
  If yes, Form 4.3-1 Items 7 and 8 were both checked yes

7 If the LID DCV is not achieved by any of these means, then the project may be allowed to develop an alternative compliance plan. Check box that describes the scenario which caused the need for alternative compliance:

- Combination of Site Design, retention and infiltration, , and biotreatment BMPs provide less than full LID DCV capture: ☐
  Checked yes if Form 4.3-4 Item 7is checked yes, Form 4.3-4 Item 6 is zero, and sum of Items 2, 3, 4, and 5 is less than Item 1. If so, apply water quality credits and calculate volume for alternative compliance, V_{alt} *= (Item 1 – Item 2 – Item 3 – Item 4 – Item 5) * (100 - Form 2.4-1 Item 2)%*

- Facilities, or a combination of facilities, of a different design than in Section E.12.e.(ii)(f) may be permitted if all of the following measures of equivalent effectiveness are demonstrated:
  1) Equal or greater amount of runoff infiltrated or evapotranspired; ☐
  2) Equal or lower pollutant concentrations in runoff that is discharged after biotreatment; ☐
  3) Equal or greater protection against shock loadings and spills; ☐
  4) Equal or greater accessibility and ease of inspection and maintenance. ☐

Section 5 Inspection and Maintenance Responsibility for Post-Construction BMPs

All BMPs included as part of the project WQMP are required to be maintained through regular scheduled inspection and maintenance. Fully complete Form 5-1 summarizing all BMPs included in the WQMP. Attach additional forms as needed. The WQMP shall also include a detailed Operation and Maintenance Plan for all BMPs and a Maintenance Agreement prepared using the Template in Attachment A. The Maintenance Agreement must also be attached to the WQMP.

Note that the Maintenance Agreement must be completed, signed, notarized, and submitted to the City before construction permits are issued, and must be recorded before final inspection and submitted to the City

Form 5-1 BMP Inspection and Maintenance (use additional forms as necessary)

BMP	Reponsible Party(s)	Inspection/ Maintenance Activities Required	Minimum Frequency of Activities
TC-11 Retention Basin	Pathways to College	Maintenance per CASQA TC-11	After storm events and annually
SD-10 Site Design and Landscape Planning	Pathways to College	Maintain Landscaping and stabilize any eroded areas.	Weekly and after storm events.
SD-12 Efficient Irrigation	Pathways to College	Check irrigation systems and repair.	Monthly.
SD-32 Trash Storage Areas	Pathways to College	Check trash area and enclosure, repair as needed.	Monthly.

Section 6 WQMP Attachments

6.1 BMP Exhibit (Site Plan)

Include a BMP Exhibit (Site Plan), at a size no less than 24" by 36," which includes the following minimum information:

- Insert in the title block (lower right hand corner) of BMP Exhibit: the WQMP Number (assigned by staff) and the grading/building or Planning Application permit numbers
- Project location (address, tract/lot number(s), etc.)
- Site boundary
- Land uses and land covers, as applicable
- Suitability/feasibility constraints
- Locations of Structural Source Control, LID, and Treatment BMPs
- Drainage delineations and flow information
- Delineate the area being treated by each structural BMP
- GIS coordinates for LID and Treatment Control BMPs
- Drainage connections
- BMP details
- Preparer name and stamp
- Operations and Maintenance Plan as Plan Notes

Please do not include any areas outside of the project area or any information not related to drainage or water quality. The approved BMP Exhibit (Site Plan) shall be submitted as a plan sheet on all grading and building plan sets submitted for plan check review and approval. The BMP Exhibit shall be at the same size as the rest of the plan sheets in the submittal and shall have an approval stamp and signature prior to plan check submittal.

6.2 Operation and Maintenance Plan

Develop and attach an Operation and Maintenance Plan for the project BMPs. The Operation and Maintenance Plan must address the following concerns:

- What maintenance activities is/are needed based on BMP design features and operation?
- How frequently will maintenance be performed?
- What conditions will trigger maintenance activities?
- Who is/are responsible for these activities?

- What inspections are required, and what must be inspected?
- How frequently will inspections be required to be conducted?
- Who will conduct inspections?
- What inspection and maintenance records will be kept and be available for review?

Detailed descriptions of BMP maintenance activities are provided in these references:

Chapter 5 in the Riverside County WQMP Guidance Document:
http://www.waterboards.ca.gov/santaana/water_issues/programs/stormwater/docs/rcpermit/wqmp/final/Santa_Ana_WQMP_FINAL.pdf

Los Angeles County Stormwater BMP Operations and Maintenance Manual :
http://dpw.lacounty.gov/DES/design_manuals/StormwaterBMPDesignandMaintenance.pdf

6.3 Electronic Data Submittal

Minimum requirements include submittal of PDF exhibits in addition to hard copies. Format must not require specialized software to open.

6.4 Maintenance Agreement

Attach Maintenance Agreement for BMPs to the WQMP.

6.5 Other Supporting Documentation

- Activity Restriction – CC&R's & Lease Agreements; if applicable

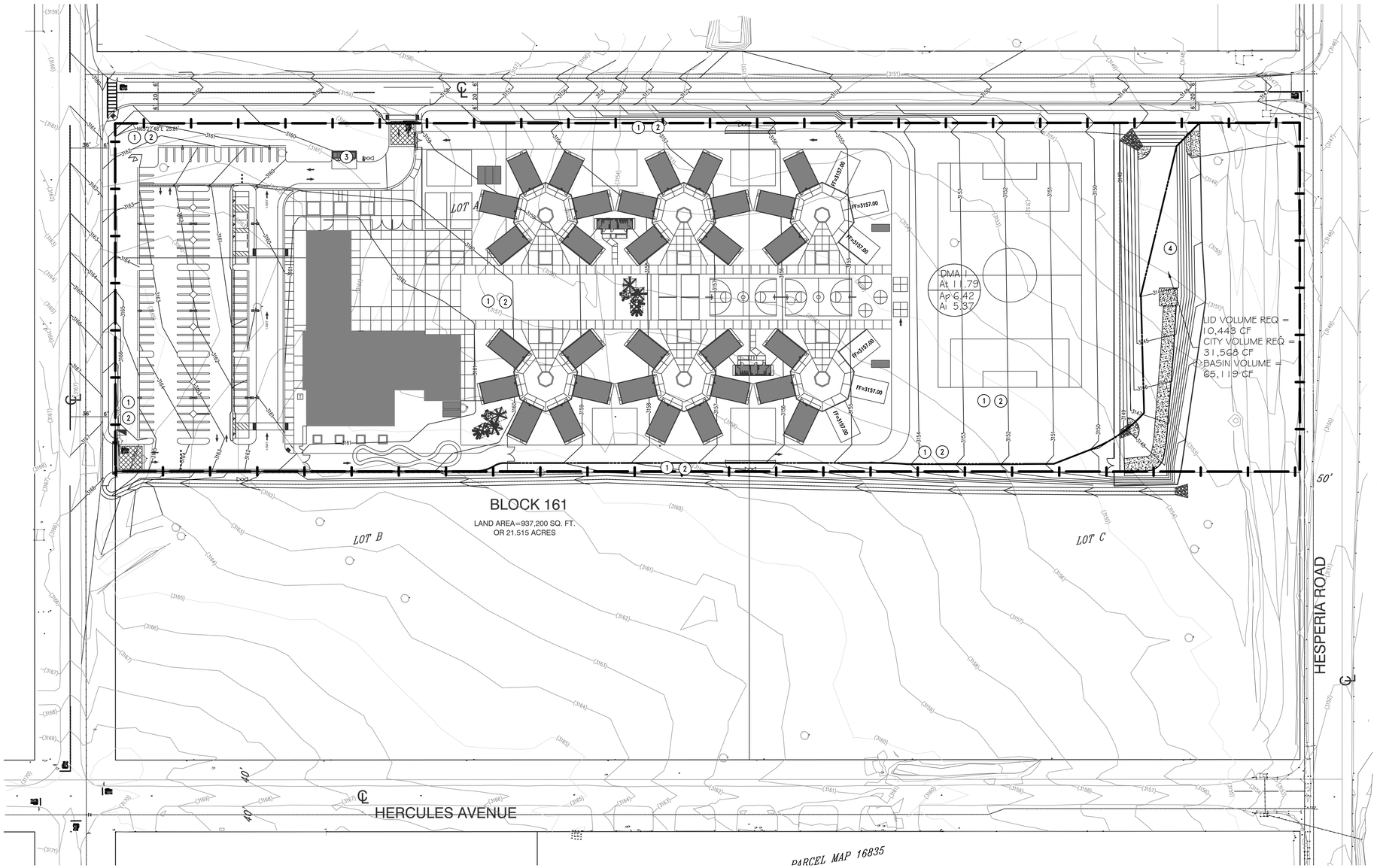
6.6 Submittal and Recordation of the Maintenance Agreement for the Water Quality Management Plan

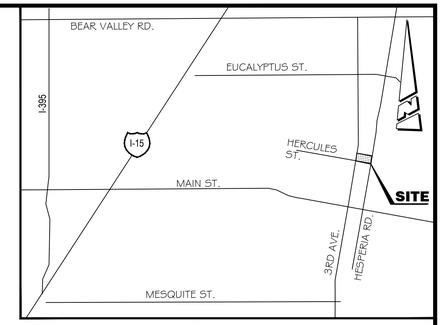
Following approval of the Final Project-Specific WQMP, two copies of the approved WQMP (including BMP Exhibit, Operations and Maintenance (O&M) Plan, and Appendices) shall be submitted. In addition, these documents shall be submitted in a PDF format.

The fully signed (with notarization) and executed Maintenance Agreement for each approved WQMP shall be submitted to the City for recordation in the San Bernardino County Clerk-Recorder's Office, prior to final inspection and issuance of a Certificate of Occupancy.

Appendix A
WQMP MAP

WATER QUALITY MANAGEMENT PLAN SITE MAP
for PATHWAYS TO COLLEGE K-8 CHARTER SCHOOL





VICINITY MAP
NOT TO SCALE

SITE ADDRESS:
3RD AVE, HESPERIA, CA 92345
SOUTH OF MOJAVE ST., EAST OF 3RD AVE., NORTH OF HERCULES ST., AND WEST OF HESPERIA AVE., HESPERIA, CA 92345

ASSESSOR'S PARCEL NO.:
0414-212-08-0 AND 0414-212-09-0

FLOOD ZONE DESIGNATION:
THIS PROPERTY IS IN FLOODWAY AREA ZONE X, AS IS SHOWN ON FLOOD INSURANCE RATE MAPS FOR THE COUNTY OF SAN BERNARDINO, CALIFORNIA, SHOWN ON COMMUNITY PANEL NUMBER 06071C6495H.

ON-SITE DISTURBED AREA:
11.79 ACRES

LEGEND:

- DMA # / At X.XX / Ap X.XX / Ai X.XX — DRAINAGE MANAGEMENT AREA NUMBER; TOTAL DMA AREA IN ACRES; DMA PERVIOUS AREA IN ACRES; DMA IMPERVIOUS AREA IN ACRES
- DMA I
- FLOW LINE
- DRAINAGE FLOW DIRECTION
- PROP. BLDG PERIMETER
- BOUNDARY LINE
- RIGHT OF WAY
- CENTERLINE
- FLOW LINE
- FENCE LINE
- DRAINAGE MANAGEMENT AREA
- (XXX) EX. CONTOUR
- [XXX] PROP. CONTOUR
- EX. PALM TREE
- EX. TREE
- EX. FIRE HYDRANT
- EX. BUILDING
- P.C.C. CONCRETE SURFACE
- PAINT HANDICAP/CROSSWALK
- PAINT DIRECTION ARROW
- PAINT PARKING STALL

BMP NOTES

1. SD-10 DROUGHT TOLERANT LANDSCAPING AREA PER LANDSCAPE ARCHITECTURE PLANS USED TO MAXIMIZE PERVIOUS AREAS AND TREAT RUNNOFF WHERE POSSIBLE.
2. SD-12 MINIMIZE NON-STORMWATER SITE RUNOFF THROUGH EFFICIENT IRRIGATION SYSTEM DESIGN AND CONTROLLERS
3. SD-32 PROVIDE SOLID ROOFS OVER TRASH ENCLOSURE.
4. TC-12 INFILTRATION BASIN

0' 30' 60' 120' 180' 240'
GRAPHIC SCALE IN FEET
1" = 60'

REGISTERED PROFESSIONAL ENGINEER — JOHN H. JOHNSON — No. 83934 Exp. 9/30/23 — CIVIL — STATE OF CALIFORNIA

JOHN H. JOHNSON R.C.E. 83934 DATE
MY REGISTRATION EXPIRES ON 09/30/2023

KOLIBRIEN®
LAND SURVEYING - CIVIL ENGINEERING - STRUCTURAL ENGINEERING

SHEET 3 OF 3

File:

Appendix B
Operation and Maintenance Plan

Stormwater BMP Operation & Maintenance Plan

I. Inspection Log

Site Inspection Log

Maintenance Engineer/Company:	
Date:	
Reason for Inspection:	

Inspection Item	A	M	U	N/A	Corrective Action Required
I. Landscaping					
Are grounds in good condition, clean and free of debris?					
Are lawn areas mowed and trimmed?					
Are plant beds and/or planter boxes well maintained?					
Are shrubs trimmed and maintained?					
Are dead trees or shrubs evident?					
Are lawn sprinkler systems operable?					
Are areas around trash receptacles clean?					
Do a sufficient quantity of receptacles exist?					
II. Hardscape					
Are sidewalks and trails in good condition, clean, and free of debris?					
III. Storm Drain System					
Are all stencils in good condition, visible and legible?					
Are all drains clean and free of obstructions?					
V. Retention Basin BMP					
Is the BMP in good condition, clean and free of debris?					
Is the BMP free of burrows?					
Is the BMP free of sediment accumulation?					
Is the BMP free of standing water					

Comments:

A Acceptable M Marginal U Unacceptable N/A Not Applicable

II. Updates, Revisions, Errata

Revision No.	Date	Brief Description of Revision, include section and page number	Prepared and Approved By:
			Name: Title:
			Name: Title:
			Name: Title:
			Name: Title:
			Name: Title:
			Name: Title:
			Name: Title:

III. Introduction

Drainage on the site flows to the retention basin. Impervious areas, such as the parking and walkways, drain to the retention basin. Impervious areas should be maintained clean by sweeping and collecting trash and debris. The basin should be maintained for landscaping, sediment and debris removal.

IV. Responsibility for Maintenance and Funding

A. General

1) Responsible Party during Construction

Identify the parties responsible for maintenance during construction phase of BMPs identified and source controls specified.

Developer's Name	Pathways to College K-8 Charter School		
Address	9144 3rd Avenue		
	Hesperia	State: CA	Zip: 92345
Email Address			
Phone Number	760-949-8002		
Engineer of Work	Kolibrien Corp.		
Engineer's Phone Number	(562) 538 - 9484		

2) Responsible Party for Ongoing Maintenance

Owner Responsible for Negotiating and Executing Contracts Responsible for Maintenance

Owner's Name			
Address			
	City:	State:	Zip:
Email Address			
Phone Number			

Supervisor Responsible for Responding to problems with Stormwater BMPs

Supervisor's Name	TBD		
Address			
	City:	State:	Zip:
Email Address			
Phone Number			

3) Employees or Contractors Responsible for conducting Stormwater BMP Operation and Maintenance

Employees	
Name	TBD
Title	
Phone	
Email	
Contractors	
Company	TBD
Employee	
Title	
Phone	
Email	

4) Funding

Funding for installation, operation, and maintenance of all stormwater BMPs will be the responsibility of the property owner. Funding for stormwater facility maintenance shall be paid for from ordinary incomes generated from the apartment complex. Any future owners will be required to maintain BMPs as per manufacturer's specifications.

Budget for Maintenance will be determined by property owner/management.

B. Training

Training of employees responsible for BMP maintenance procedures will be provided by the owner and the type of training will be at the discretion of the owner. Any contractors will be trained by their respective company and this will not be the property owner's responsibility.

C. Records

Insert maintenance records here.

Storm Water BMP Maintenance Log

Maintenance Engineer/ Company	Maintenance Type	Date	Comments

D. Safety

Insert Company's Safety Training Documentation here.

Employee Training Log

Training Type: _____

_____

Instructor: _____ **Date:** _____

Company: _____

Attendees

Name	Signature	Name	Signature

V. Summary of Drainage Management Areas and Stormwater BMPs

A. Drainage Areas

This site includes landscaping. These areas will not require specialized O&M or inspections, but will require typical landscape maintenance. Landscape maintenance activities are described in Section VII. Maintenance Schedule.

Stormwater runoff from the areas are directed to the retention basin.

B. Structural Post-Construction BMPs

VI. Stormwater BMP Design Documentation

These BMPs will be "As Built" by a licensed civil/geotechnical engineer registered in the state of California and submitted to the Co-Permittee.

VII. Maintenance Schedule or Matrix

A. Maintenance Schedule

BMP	Responsible Party	Maintenance Activity	Inspection/Maintenance Frequency
Self-Treating Areas			
Landscape Maintenance	Property Owner	Inspect landscape areas for litter and debris daily. Weekly preform landscape area inspections and preform required landscape maintenance activities when it is needed. These maintenance activities include irrigating, weeding, applying fertilizers and pesticides in minimum required quantities, remulching, trimming vegetation, raking leaves, removing detritus, and replacing diseased or dead plants.	Continuous, as needed
Source Control BMPs {Structural and Nonstructural)			
Education for Property Owner	Property Owner	Education program as it would apply to future tenants and maintenance staff. The owner shall prepare manual{s) for tenants and maintenance staff.	Continuous. Provide regular training to field employees regarding all the BMPs proposed in this document.
Activity Restriction	Property Owner	No sidewalk or driveway washing.	Continuous
Common Area Landscape Maintenance	Property Owner	Manage landscaping in accordance with: the City Regulations, and with management guidelines for use of fertilizers and pesticides and with the County of Riverside.	Monthly during regular maintenance.
BMP Maintenance	Property Owner	The maintenance staff and tenants will be instructed in environmental procedures regarding contamination and cleanup.	Per established maintenance BMP schedule.
Common Area Litter Control/ Refuse	Property Owner	A contract for trash management and litter control and landscaped maintenance will be made with outside contractors as necessary.	Daily, during regular maintenance. Litter patrol and emptying trash receptacles.
Employee Training	Property Owner	Educational materials.	When maintenance staff are hired or for new tenants, and once every six months.

Common catch basin Inspection	Property Owner	Inspect inlet for debris and clean with required.	Monthly, after rain events and prior to October 1st each year.
Private Street Sweeping	Property Owner	Post "No Littering" signs and enforce anti-litter laws. A contract for street sweeping and litter control will be mad with outside contractors as necessary. The contractor will clean out and cover litter receptacles frequently to prevent spillage. The contractor will routinely sweep, shovel, and dispose of litter in the trash. The contractor will use dry cleaning methods to prevent the discharge of pollutants into the stormwater conveyance system. A contract for oil and petroleum hydrocarbons removal will be made with cleaning services contractor.	Sweep private alleys and parking lots weekly and prior to the storm season. Remove oil and petroleum hydrocarbons if any at the drive-way once every 6 months.
Storm Drain System Stenciling and Signage	Property Owner	Inspect for re-stenciling needs and re-stencil as necessary.	Once every 6 months.
Efficient Irrigation System	Property Owner	Verify that the runoff minimizing landscape design continues to function by checking that water sensors are functioning properly, that irrigation heads are adjusted properly to eliminate overspray to landscape areas, and to verify that irrigation timing and cycle lengths are adjusted in accordance with water demands, given time of day or night time temperatures.	Once a week with maintenance activities.

BMP Maintenance			
Retention Basin	Property Owner or City if BMP is in Public ROW	Inspection Activities • Inspect soil and repair eroded areas. • Inspect for erosion or damage to vegetation, preferably at the end of the wet season to schedule summer maintenance and before major fall runoff to be sure the strips are ready for winter. However, additional inspection after periods of heavy runoff is desirable. • Inspect to ensure grass is well established. If not, either prepare soil and reseed or replace with alternative species. Install erosion control blanket. • Check for debris and litter, and areas of sediment accumulation. • Inspect health of trees and shrubs. Maintenance Activities • Water plants daily for 2 weeks after project completion. • Remove litter and debris monthly. • Remove sediment as needed. • Remulch void areas as needed. • Treat diseased trees and shrubs as needed. • Mow turf areas as needed. • Repair erosion at inflow points as needed. • Repair outflow structures as needed. • Unclog underdrain as needed. • Regulate soil pH regulation as needed. • Remove and replace dead and diseased vegetation semi-annually.	Monthly, after rain events and prior to October 1st each year.

B. Service Agreement Information

Insert Service Agreement here.

Appendix C
SOILS

John R. Byerly
INCORPORATED

January 20, 2022

Pathways to College
9144 Third Avenue
Hesperia, California 92804

Rpt. No.: 7258
File No.: S-14446

Attention: Craig Merrill, Executive Director and Richard Hansberger, Attorney

Project: Charter School Development, Assessor's Parcel No. 0414-212-08, Southeast Corner of Third Avenue and Mojave Street, Hesperia, California

Subject: Infiltration Rate Study for Storm Water Disposal

References:
(a) San Bernardino County Stormwater Program, Technical Guidance Document for Water Quality Management Plans (WQMP), June 7, 2013

(b) e-mail re: Request for Proposal, Pathways to College Charter School RFP in Hesperia, Andy Champion, Kirk Moeller Architects, Inc., October 26, 2021 with attached Site Plan

(c) Geotechnical Investigation, Charter School Development, Assessor's Parcel No. 0414-212-08, Southeast Corner of Third Avenue and Mojave Street, Hesperia, California, John R. Byerly, Inc., Rpt. No. 7253, January 14, 2022

Ladies and Gentlemen:

We understand that development of the proposed charter school site will include the construction of an infiltration system for storm water disposal. The referenced site plan identifies an area in which an infiltration basin will be constructed for storm water disposal. An investigation of the percolation characteristics of the soils in the area of the storm water disposal system was performed by our firm during November of 2021. The purpose of our investigation was to assist in the determination of a design infiltration rate for the proposed storm water disposal system.

PROJECT DESCRIPTION

For the preparation of this report, we reviewed the referenced San Bernardino County's Technical Guidance Document for Water Quality Management Plans (Reference a), the referenced geotechnical investigation report (Reference c), and the referenced site plan. We understand the proposed construction will consist of a new charter school facility that will primarily consist of a main permanent (site-built) building that will have a total footprint area of 21,400 square feet. Six classroom pods are planned east of the tilt-up building. Each pod will include six modular buildings. The modular buildings will have plan areas of 960 square feet. Parking facilities paved with asphalt concrete are proposed between the tilt-up building and 3rd Avenue. A fire lane paved with asphalt concrete is planned immediately east of the new parking lot. A turf soccer field and turf playfield are planned in the eastern part of the property. An infiltration basin noted as a "storm water facility" on the referenced site plan is also planned. We anticipate that the bottom of the infiltration basin will be about 2 to 4 feet below the adjacent ground surface. The site configuration is illustrated on Enclosure 1.

REVIEW OF GEOTECHNICAL REPORT

A geotechnical investigation for the proposed charter school site was conducted by this firm as described in Reference (c). The subsurface explorations consisted of 17 test borings drilled with a truck-mounted flight-auger to depths of up to 51.5 feet below the existing ground surface. A test boring was placed in close proximity to the infiltration system area to explore for ground water or impermeable soil strata. Laboratory testing included maximum density, consolidation, gradation, sand equivalent, and "R" value tests. This report presented grading and foundation design recommendations. Preliminary recommendations were presented for the design of asphalt concrete pavement for a fire lane and parking and driveway areas, and for the expansion of Third Avenue and improvement of Mojave Street.

SITE CONDITIONS

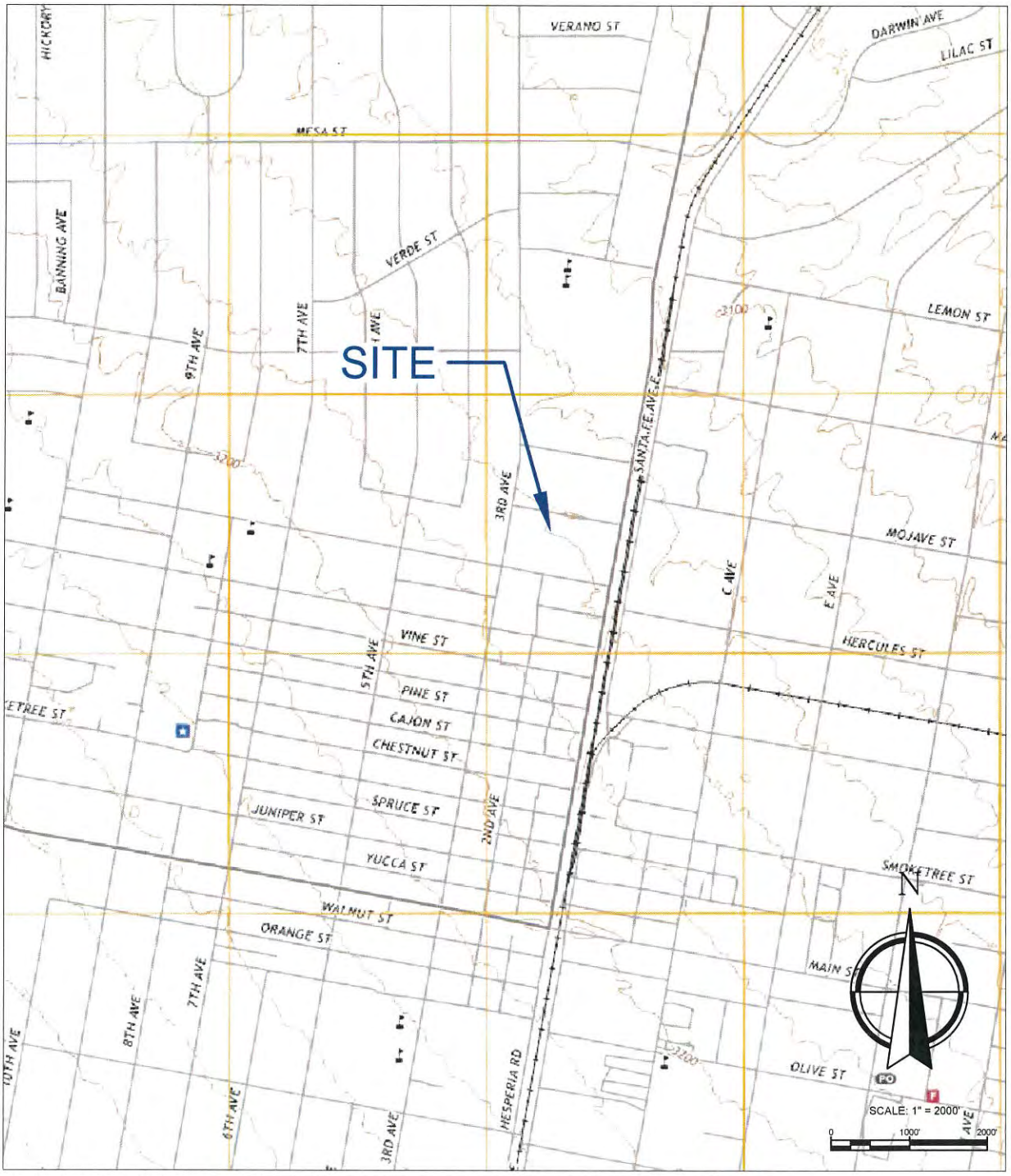
The 10.9-acre site is located on the southeast corner of Third Avenue and Mojave Street in the city of Hesperia. An Index Map showing the general vicinity of the site is presented on the following page. The coordinates of the site are latitude 34.4353° N and longitude 117.3027° W (World Geodetic System of 1984). Mojave Street is an unpaved road that borders the northern site perimeter. The area to be developed for the storm water disposal system is currently dirt-covered and vacant, and is covered with a light growth of typical desert brush. The properties surrounding the proposed charter school site are either occupied by single-family residences or are vacant. The site is relatively flat, sloping downward to the east at a gradient of less than 3 percent.

FIELD INVESTIGATION

We explored the soils underlying the area currently proposed for the storm water disposal system by means of four percolation test borings drilled with a truck-mounted flight-auger to depths of about 2 to 4 feet below the existing ground surface. The approximate locations of the field explorations are shown on Enclosure 1. The soils encountered were examined and visually classified by one of our field engineers. A summary of the soil classifications appears as Enclosure 2. The exploration logs show subsurface conditions at the dates and locations indicated and may not be representative of subsurface conditions at other locations and times. The stratification depths presented on the logs represent the approximate soil type boundaries. We investigated the percolation characteristics of the soils underlying the proposed infiltration basin by four percolation tests using the falling-head test method. Percolation testing was performed using the borehole-type method and following test procedures required by Reference (a).

On November 21, 2021, percolation testing was performed at four locations. The weather condition was dry and cool with an average temperature of 66 degrees Fahrenheit. Two inches of clean gravel were placed in the bottoms of the test holes. Perforated plastic cans, 12 inches

INDEX MAP



SOURCE DOCUMENTS: USGS HESPERIA QUADRANGLE, CALIFORNIA, 7.5 MINUTE SERIES, 2018

TOWNSHIP AND RANGE: SECTION 16, T4N, R4W

LATITUDE: 34.4353° N

LONGITUDE: 117.3027° W

in height and 6 inches in diameter, were then placed in the test holes to control scour. Clear water was introduced into each test hole, and the soils were allowed to soak and condition overnight prior to determination of the percolation rate. The following day, approximately 4.5 inches and 7.5 inches of caving occurred in the bottom of percolation test locations P-1 and P-3, respectively. Water was reintroduced into the test holes, and the water was allowed to percolate into the soil. At timed intervals, the level of water was measured, and additional water was added to the test holes. The test was continued until steady-state conditions were attained. Enclosure 3 presents the percolation test data. Percolation rates have been corrected for the contribution of the test hole sidewall.

SOIL CONDITIONS

The upper natural soils consisted of dense silty sands to the maximum depth penetrated. The underlying soils encountered in our recent percolation investigation are consistent with the findings of our referenced geotechnical investigation. As described in Reference (c), neither bedrock nor ground water was encountered in our explorations. Based on water well data from the State of California, the closest water well (State Well No. 04N04W21C001S) to the site is located approximately 0.7 mile to the south-southwest. The highest measured ground water in this well was at a depth of 342 feet below grade on January 1, 2017. A second well (State Well No. 04N04W15F001S) is situated approximately 0.9 mile to the east and measured a high ground water level of 298 feet below grade on November 8, 1995. Based on water well data from the State of California, we have assumed an historic high ground water table of 200 feet below the ground surface. Due to the great depth to ground water, we conclude that the potential for storm water runoff contamination of ground water at this location is low.

CONCLUSIONS AND RECOMMENDATIONS

The percolation tests yielded infiltration rates of 0.9 inch per hour and 1.1 inches per hour. The infiltration rates were computed utilizing the percolation rate conversion equation (Porchet Method, aka Inverse Borehole Method) provided by the San Bernardino County's Technical

Guidance Document for Water Quality Management Plans (Reference a), which accommodates the contribution of the test hole sidewall to the measured percolation rate. The percolation rate conversion equation is presented below.

$$I_t = \frac{\Delta H\ (60\ \text{min./hr.})\ r}{\Delta t\ (r+2\ H_{avg})}$$

Where: I_t = *tested infiltration rate (in./hr.)*
Δt = *time interval (min.)*
r = *test hole radius (in.)*
ΔH = *change in height over the time interval (in.)*
H_{avg} = *average head height over the time interval (in.)*

The converted percolation rates are presented in the following table.

Percolation Number	Depth of Test (inches)	Converted Percolation Rate (inch per hour)
P-1	41.5	0.9
P-2	22.0	1.1
P-3	38.5	1.0
P-4	22.0	1.0

A safety factor has not been applied to these design values. We note that the tests conducted in Percolation Nos. P-1, P-2, P-3, and P-4 yielded acceptable percolation rates. Our field test boring logs presented in Reference (c) demonstrate that the soils conditions encountered at the depths of our percolation tests are similar to the soils encountered at the maximum depth drilled for the test borings.

We appreciate this opportunity to be of service. Should there be questions, please feel free to contact this office.

Respectfully submitted,

JOHN R. BYERLY, INC.

John R. Byerly, Geotechnical Engineer
President

JRB:MLL:jet

Enclosures: (1) Plot Plan
(2) Exploration Logs
(3) Summary of Field Test Data

Copies: (1) Client
(1) Kirk Moeller Architects, Inc.

LEGEND

APPROX. BORING LOCATION

MOJAVE STREET
(UNIMPROVED)

PROPOSED SEWER LINE EXTENSION FROM HESPERIA ROAD TO 3RD AVENUE

PROPOSED 26' PAVED ROAD

(2) 24'X 40' MODULAR BUILDINGS TO BE INSTALLED IN THE FUTURE (DASHED)

P-1 P-2 P-3 P-4

STORM WATER FACILITY

462'-1"

(3) 24'X 40' MODULAR BUILDINGS TO BE INSTALLED IN THE FUTURE (DASHED)

PROPOSED WATER LINE EXTENSION FROM HERCULES STREET TO MOJAVE STREET

CONE BARRIER FOR DROP-OFF/ PICK/ UP ONLY

FIRE LANE

LOADING ZONE

FARM AREA

CONTAINER STORAGE

TURF AREA

82'-6"

130 PARKING SPACES

LUNCH PATIO ASSEMBLY

73'-6"

TURF AREA/ ZEN GARDEN

MAIN BUILDING 21,400 S.F.

KINDER. LUNCH PATIO

KINDER. PLAYGROUND

6-8 TURF SOCCER FIELD

390'-0"

K-5 TURF PLAYING FIELD

3RD AVENUE

HESPERIA ROAD

CONE BARRIER FOR DROP-OFF/ PICK/ UP ONLY

TYPICAL CLASSROOM POD CONSISTING OF (6) 24'X 40' MODULAR BUILDINGS

1120'-0"

LOT A

LOT B

LOT C

200'-0"

320'-0"

HERCULES STREET

N

SCALE: 1" = 100'

0 100' 200'

SOURCE DOCUMENT: SITE PLAN, KIRK MOELLER ARCHITECTS, INC., 26 OCTOBER 2021

John R. Byerly INCORPORATED	INFILTRATION RATE STUDY	APN 0414-212-08 SOUTHEAST CORNER OF THIRD AVENUE AND MOJAVE STREET HESPERIA, CALIFORNIA I-72	Enclosure 1 Rpt. No.: 7258 File No.: S-14446

P-1

Depth | Std. Pen. "N" Value | Blows/Ft. | Dry Density (PCF) | Moisture Content (%) | Rel. Compaction (%) | Water Table

Boring Date: 11/20/21
Surface Elevation:
Drilling Method: 4x4 Drill Rig

0 — 5 — 10 — 15 — 20 — 25 — 30 — 35

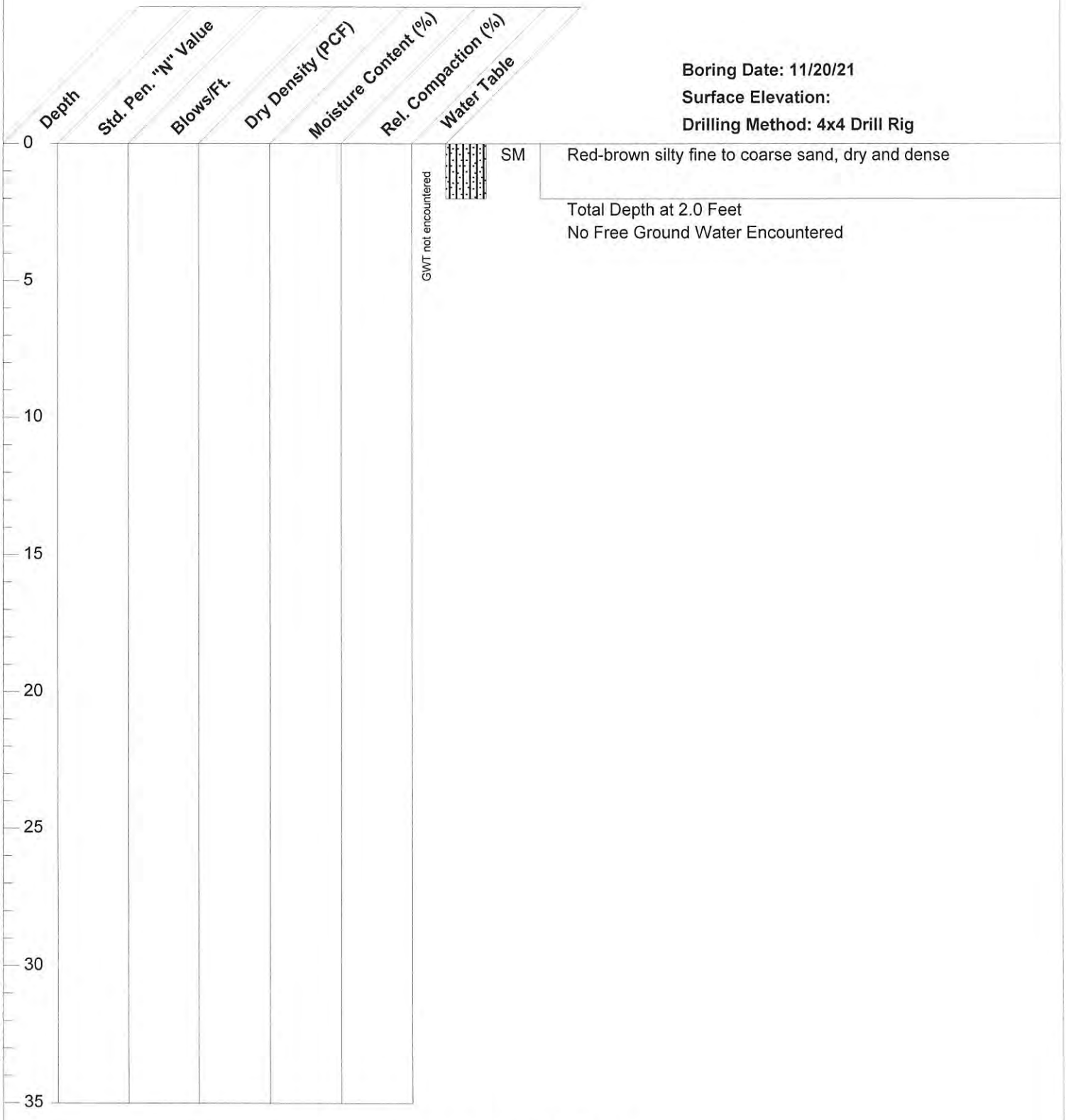
GWT not encountered

SM — Red-brown silty fine to coarse sand, dry and dense

Total Depth at 4.0 Feet
No Free Ground Water Encountered

LOG OF BORING

P-2



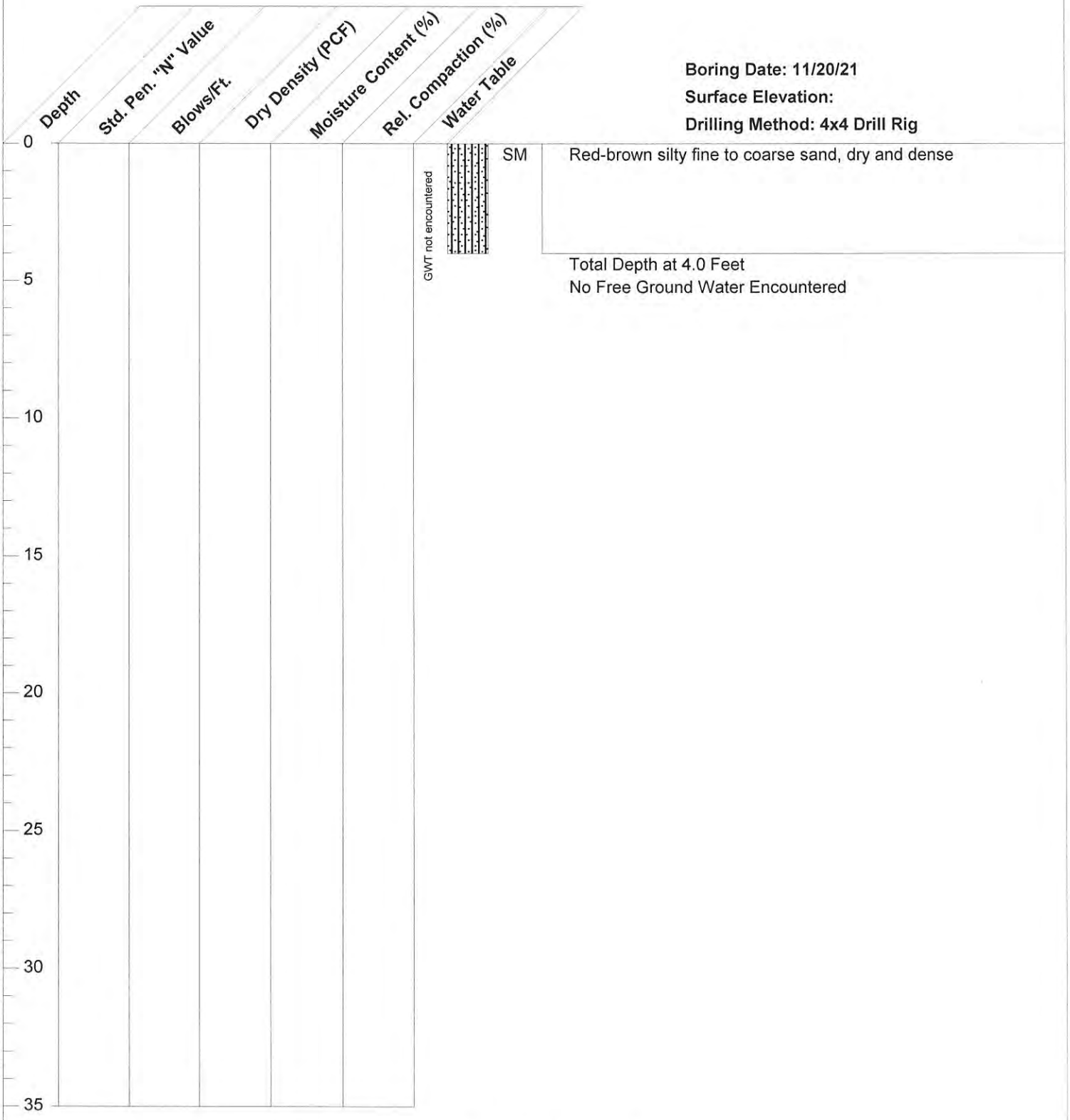
Boring Date: 11/20/21
Surface Elevation:
Drilling Method: 4x4 Drill Rig

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECTS-14446 (Rpt. No. 7258).log Date: 1/19/2022

LOG OF BORING

John R. Byerly, Inc.	**Pathways to College** **Hesperia, California**	**Enclosure 2, Page 2** **Rpt. No.: 7258** **File No.: S-14446**

P-3



Boring Date: 11/20/21
Surface Elevation:
Drilling Method: 4x4 Drill Rig

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECTS-14446 (Rpt. No. 7258).log Date: 1/19/2022

LOG OF BORING

John R. Byerly, Inc.	**Pathways to College** **Hesperia, California**	**Enclosure 2, Page 3** **Rpt. No.: 7258** **File No.: S-14446**

P-4

Depth | Std. Pen. "N" Value | Blows/Ft. | Dry Density (PCF) | Moisture Content (%) | Rel. Compaction (%) | Water Table

Boring Date: 11/20/21
Surface Elevation:
Drilling Method: 4x4 Drill Rig

0 — 5 — 10 — 15 — 20 — 25 — 30 — 35

GWT not encountered

SM — Red-brown silty fine to coarse sand, dry and dense

Total Depth at 2.0 Feet
No Free Ground Water Encountered

LOG OF BORING

JOHN R. BYERLY, INC.

2257 South Lilac Avenue, Bloomington, CA 92316-2907
Phone: (909) 877-1324
Fax: (909) 877-5210

Percolation Test Data Sheet

Project:	Pathways to College – Charter School	File No.:	S-14446	Date:	11-21-21
Test Hole No.:	P-1	Tested By:	Rocky Casino		
Depth of Test Hole, (D_T)	41.5 in.	USCS Soil Classification:	SM		
Test Hole Dimensions (inches)			Length	Width	
Diameter (if round)	8.0 in.	Sides (if irregular)			

Sandy Soil Criteria Test*

Trial No.	Start Time	Stop Time	Time Interval, (min.)	Initial Depth to Water (in.)	Final Depth to Water (In.)	Change In Water Level (in.)	≥ 6" ? (Y/N)
1							
2							

*If two consecutive measurements show that 6 inches of water seeps away in less than 25 minutes the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25".

Trial No.	Start Time	Stop Time	Δt Time Interval, (min.)	D_o Initial Depth to Water (in.)	D_f Final Depth to Water (In.)	ΔD Change In Water Level (in.)	Percolation Rate (min./in.)
1	9:00	9:30	30	21.5	30.0	8.5	3.5
2	9:31	10:01	30	21.5	29.0	7.5	4.0
3	10:02	10:12	10	21.5	24.0	2.5	4.0
4	10:13	10:23	10	21.5	24.0	2.5	4.0
5	10:24	10:34	10	21.5	24.0	2.5	4.0
6	10:35	10:45	10	21.5	23.5	2.0	5.0
7	10:46	10:56	10	21.5	23.5	2.0	5.0
8	10:57	11:07	10	21.5	23.0	1.5	6.7
9	11:08	11:18	10	21.5	23.0	1.5	6.7
10	11:19	11:29	10	21.5	23.0	1.5	6.7
11	11:30	11:40	10	21.5	23.0	1.5	6.7
12	11:41	11:51	10	21.5	23.0	1.5	6.7
13							
14							
15							

Comments: The percolation test yielded a percolation rate of 6.7 minutes per inch which converts to an infiltration rate of 0.9 inch per hour. The infiltration rate was computed utilizing the percolation rate conversion equation (Porchet Method) provided by the San Bernardino County's Technical Guidance Document for Water Quality Management Plans.

JOHN R. BYERLY, INC.

2257 South Lilac Avenue, Bloomington, CA 92316-2907
Phone: (909) 877-1324
Fax: (909) 877-5210

Percolation Test Data Sheet

Project:	Pathways to College – Charter School	File No.:	S-14446	Date:	11-21-21
Test Hole No.:	P-2	Tested By:	Rocky Casino		
Depth of Test Hole, (D_T)	22.0 in.	USCS Soil Classification:	SM		
Test Hole Dimensions (inches)			Length	Width	
Diameter (if round)	8.0 in.	Sides (if irregular)			

Sandy Soil Criteria Test*

Trial No.	Start Time	Stop Time	Time Interval, (min.)	Initial Depth to Water (in.)	Final Depth to Water (In.)	Change In Water Level (in.)	≥ 6" ? (Y/N)
1							
2							

*If two consecutive measurements show that 6 inches of water seeps away in less than 25 minutes the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25".

Trial No.	Start Time	Stop Time	Δt Time Interval, (min.)	D_o Initial Depth to Water (in.)	D_f Final Depth to Water (In.)	ΔD Change In Water Level (in.)	Percolation Rate (min./in.)
1	9:03	9:33	30	2.0	16.0	14.0	2.1
2	9:34	10:04	30	2.0	14.0	12.0	2.5
3	10:05	10:15	10	2.0	6.0	4.0	2.5
4	10:16	10:26	10	2.0	6.0	4.0	2.5
5	10:27	10:37	10	2.0	6.0	4.0	2.5
6	10:38	10:48	10	2.0	5.25	3.25	3.1
7	10:49	10:59	10	2.0	4.5	2.5	4.0
8	11:00	11:10	10	2.0	4.0	2.0	5.0
9	11:11	11:21	10	2.0	4.0	2.0	5.0
10	11:22	11:32	10	2.0	4.0	2.0	5.0
11	11:33	11:43	10	2.0	4.0	2.0	5.0
12	11:44	11:54	10	2.0	4.0	2.0	5.0
13							
14							
15							

Comments: The percolation test yielded a percolation rate of 5.0 minutes per inch which converts to an infiltration rate of 1.1 inches per hour. The infiltration rate was computed utilizing the percolation rate conversion equation (Porchet Method) provided by the San Bernardino County's Technical Guidance Document for Water Quality Management Plans.

JOHN R. BYERLY, INC.

2257 South Lilac Avenue, Bloomington, CA 92316-2907
Phone: (909) 877-1324
Fax: (909) 877-5210

Percolation Test Data Sheet

Project:	Pathways to College – Charter School	File No.:	S-14446	Date:	11-21-21
Test Hole No.:	P-3	Tested By:	Rocky Casino		
Depth of Test Hole, (D_T)	38.5 in.	USCS Soil Classification:	SM		
Test Hole Dimensions (inches)			Length	Width	
Diameter (if round)	8.0 in.	Sides (if irregular)			

Sandy Soil Criteria Test*

Trial No.	Start Time	Stop Time	Time Interval, (min.)	Initial Depth to Water (in.)	Final Depth to Water (In.)	Change In Water Level (in.)	≥ 6" ? (Y/N)
1							
2							

*If two consecutive measurements show that 6 inches of water seeps away in less than 25 minutes the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25".

Trial No.	Start Time	Stop Time	Δt Time Interval, (min.)	D_o Initial Depth to Water (in.)	D_f Final Depth to Water (In.)	ΔD Change In Water Level (in.)	Percolation Rate (min./in.)
1	9:06	9:36	30	18.5	28.25	9.75	3.1
2	9:37	10:07	30	18.5	27.5	9.0	3.3
3	10:08	10:18	10	18.5	21.0	2.5	4.0
4	10:19	10:29	10	18.5	21.0	2.5	4.0
5	10:30	10:40	10	18.5	21.0	2.5	4.0
6	10:41	10:51	10	18.5	20.75	2.25	4.4
7	10:52	11:02	10	18.5	20.5	2.0	5.0
8	11:03	11:13	10	18.5	20.25	1.75	5.7
9	11:14	11:24	10	18.5	20.25	1.75	5.7
10	11:25	11:35	10	18.5	20.25	1.75	5.7
11	11:36	11:46	10	18.5	20.25	1.75	5.7
12	11:47	11:57	10	18.5	20.25	1.75	5.7
13							
14							
15							

Comments: The percolation test yielded a percolation rate of 5.7 minutes per inch which converts to an infiltration rate of 1.0 inch per hour. The infiltration rate was computed utilizing the percolation rate conversion equation (Porchet Method) provided by the San Bernardino County's Technical Guidance Document for Water Quality Management Plans.

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Percolation Test Data Sheet

Project:	Pathways to College – Charter School	File No.:	S-14446	Date:	11-21-21
Test Hole No.:	P-4	Tested By:	Rocky Casino		
Depth of Test Hole, (D_T)	22.0 in.	USCS Soil Classification:	SM		
Test Hole Dimensions (inches)			Length	Width	
Diameter (if round)	8.0 in.	Sides (if irregular)			

Sandy Soil Criteria Test*

Trial No.	Start Time	Stop Time	Time Interval, (min.)	Initial Depth to Water (in.)	Final Depth to Water (In.)	Change In Water Level (in.)	≥ 6" ? (Y/N)
1							
2							

*If two consecutive measurements show that 6 inches of water seeps away in less than 25 minutes the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25".

Trial No.	Start Time	Stop Time	Δt Time Interval, (min.)	D_o Initial Depth to Water (in.)	D_f Final Depth to Water (In.)	ΔD Change In Water Level (in.)	Percolation Rate (min./in.)
1	9:09	9:39	30	2.0	15.5	13.5	2.2
2	9:40	10:10	30	2.0	14.25	12.25	2.4
3	10:11	10:21	10	2.0	6.0	4.0	2.5
4	10:22	10:32	10	2.0	6.0	4.0	2.5
5	10:33	10:43	10	2.0	5.0	3.0	3.3
6	10:44	10:54	10	2.0	4.75	2.75	3.6
7	10:55	11:05	10	2.0	4.0	2.0	5.0
8	11:06	11:16	10	2.0	3.75	1.75	5.7
9	11:17	11:27	10	2.0	3.75	1.75	5.7
10	11:28	11:38	10	2.0	3.75	1.75	5.7
11	11:39	11:49	10	2.0	3.75	1.75	5.7
12	11:50	12:00	10	2.0	3.75	1.75	5.7
13							
14							
15							

Comments: The percolation test yielded a percolation rate of 5.7 minutes per inch which converts to an infiltration rate of 1.0 inch per hour. The infiltration rate was computed utilizing the percolation rate conversion equation (Porchet Method) provided by the San Bernardino County's Technical Guidance Document for Water Quality Management Plans.

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for San Bernardino County, California, Mojave River Area

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:2,600 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Bernardino County, California, Mojave River Area
Survey Area Data: Version 13, Sep 13, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 27, 2021—May 24, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
105	BRYMAN LOAMY FINE SAND, 0 TO 2 PERCENT SLOPES	19.3	78.0%
106	BRYMAN LOAMY FINE SAND, 2 TO 5 PERCENT SLOPES	5.3	21.4%
112	CAJON SAND, 0 TO 2 PERCENT SLOPES	0.2	0.6%
Totals for Area of Interest		**24.8**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or

landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

San Bernardino County, California, Mojave River Area

105—BRYMAN LOAMY FINE SAND, 0 TO 2 PERCENT SLOPES

Map Unit Setting

National map unit symbol: hkr9
Elevation: 2,800 to 3,200 feet
Mean annual precipitation: 3 to 6 inches
Mean annual air temperature: 59 to 63 degrees F
Frost-free period: 180 to 280 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Bryman and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bryman

Setting

Landform: Fan remnants
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite sources

Typical profile

H1 - 0 to 9 inches: loamy fine sand
H2 - 9 to 12 inches: sandy loam
H3 - 12 to 32 inches: sandy clay loam
H4 - 32 to 46 inches: sandy loam
H5 - 46 to 99 inches: loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: R030XF012CA - Sandy
Hydric soil rating: No

Minor Components

Cajon
Percent of map unit: 5 percent
Hydric soil rating: No

Helendale
Percent of map unit: 5 percent
Hydric soil rating: No

Mohave variant
Percent of map unit: 5 percent
Hydric soil rating: No

Bryman, gravelly surface
Percent of map unit: 5 percent
Hydric soil rating: No

106—BRYMAN LOAMY FINE SAND, 2 TO 5 PERCENT SLOPES

Map Unit Setting
National map unit symbol: hkrb
Elevation: 3,000 to 3,400 feet
Mean annual precipitation: 3 to 6 inches
Mean annual air temperature: 59 to 63 degrees F
Frost-free period: 180 to 280 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition
Bryman and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bryman

Setting
Landform: Fan remnants
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite sources

Typical profile
H1 - 0 to 9 inches: loamy fine sand
H2 - 9 to 43 inches: sandy clay loam
H3 - 43 to 60 inches: sandy loam

Properties and qualities
Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups
Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: R030XF012CA - Sandy
Hydric soil rating: No

Minor Components

Cajon, loamy surface
Percent of map unit: 5 percent
Hydric soil rating: No

Helendale
Percent of map unit: 5 percent
Hydric soil rating: No

Mohave variant
Percent of map unit: 5 percent
Hydric soil rating: No

Bryman, gravelly surface
Percent of map unit: 5 percent

112—CAJON SAND, 0 TO 2 PERCENT SLOPES

Map Unit Setting
National map unit symbol: hkrj
Elevation: 1,800 to 3,200 feet
Mean annual precipitation: 3 to 6 inches
Mean annual air temperature: 59 to 66 degrees F
Frost-free period: 180 to 290 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Cajon and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cajon

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite sources

Typical profile

H1 - 0 to 7 inches: sand
H2 - 7 to 25 inches: sand
H3 - 25 to 45 inches: gravelly sand
H4 - 45 to 60 inches: stratified sand to loamy fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: R030XF012CA - Sandy
Hydric soil rating: No

Minor Components

Manet

Percent of map unit: 5 percent
Landform: Playas
Hydric soil rating: Yes

Kimberlina

Percent of map unit: 5 percent

Helendale

Percent of map unit: 5 percent

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Appendix D
Education
Materials

Infiltration Basin TC-11

Design Considerations

- Soil for Infiltration
- Slope
- Aesthetics

Targeted Constituents

☑	Sediment	■
☑	Nutrients	■
☑	Trash	■
☑	Metals	■
☑	Bacteria	■
☑	Oil and Grease	■
☑	Organics	■

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

Description

An infiltration basin is a shallow impoundment that is designed to infiltrate stormwater. Infiltration basins use the natural filtering ability of the soil to remove pollutants in stormwater runoff. Infiltration facilities store runoff until it gradually exfiltrates through the soil and eventually into the water table. This practice has high pollutant removal efficiency and can also help recharge groundwater, thus helping to maintain low flows in stream systems. Infiltration basins can be challenging to apply on many sites, however, because of soils requirements. In addition, some studies have shown relatively high failure rates compared with other management practices.

California Experience

Infiltration basins have a long history of use in California, especially in the Central Valley. Basins located in Fresno were among those initially evaluated in the National Urban Runoff Program and were found to be effective at reducing the volume of runoff, while posing little long-term threat to groundwater quality (EPA, 1983; Schroeder, 1995). Proper siting of these devices is crucial as underscored by the experience of Caltrans in siting two basins in Southern California. The basin with marginal separation from groundwater and soil permeability failed immediately and could never be rehabilitated.

Advantages

- Provides 100% reduction in the load discharged to surface waters.
- The principal benefit of infiltration basins is the approximation of pre-development hydrology during which a

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CALIFORNIA STORMWATER QUALITY ASSOCIATION

significant portion of the average annual rainfall runoff is infiltrated and evaporated rather than flushed directly to creeks.

- If the water quality volume is adequately sized, infiltration basins can be useful for providing control of channel forming (erosion) and high frequency (generally less than the 2-year) flood events.

Limitations

- May not be appropriate for industrial sites or locations where spills may occur.
- Infiltration basins require a minimum soil infiltration rate of 0.5 inches/hour, not appropriate at sites with Hydrologic Soil Types C and D.
- If infiltration rates exceed 2.4 inches/hour, then the runoff should be fully treated prior to infiltration to protect groundwater quality.
- Not suitable on fill sites or steep slopes.
- Risk of groundwater contamination in very coarse soils.
- Upstream drainage area must be completely stabilized before construction.
- Difficult to restore functioning of infiltration basins once clogged.

Design and Sizing Guidelines

- Water quality volume determined by local requirements or sized so that 85% of the annual runoff volume is captured.
- Basin sized so that the entire water quality volume is infiltrated within 48 hours.
- Vegetation establishment on the basin floor may help reduce the clogging rate.

Construction/Inspection Considerations

- Before construction begins, stabilize the entire area draining to the facility. If impossible, place a diversion berm around the perimeter of the infiltration site to prevent sediment entrance during construction or remove the top 2 inches of soil after the site is stabililized. Stabilize the entire contributing drainage area, including the side slopes, before allowing any runoff to enter once construction is complete.
- Place excavated material such that it can not be washed back into the basin if a storm occurs during construction of the facility.
- Build the basin without driving heavy equipment over the infiltration surface. Any equipment driven on the surface should have extra-wide ("low pressure") tires. Prior to any construction, rope off the infiltration area to stop entrance by unwanted equipment.
- After final grading, till the infiltration surface deeply.
- Use appropriate erosion control seed mix for the specific project and location.

Performance

As water migrates through porous soil and rock, pollutant attenuation mechanisms include precipitation, sorption, physical filtration, and bacterial degradation. If functioning properly, this approach is presumed to have high removal efficiencies for particulate pollutants and moderate removal of soluble pollutants. Actual pollutant removal in the subsurface would be expected to vary depending upon site-specific soil types. This technology eliminates discharge to surface waters except for the very largest storms; consequently, complete removal of all stormwater constituents can be assumed.

There remain some concerns about the potential for groundwater contamination despite the findings of the NURP and Nightingale (1975; 1987a,b,c; 1989). For instance, a report by Pitt et al. (1994) highlighted the potential for groundwater contamination from intentional and unintentional stormwater infiltration. That report recommends that infiltration facilities not be sited in areas where high concentrations are present or where there is a potential for spills of toxic material. Conversely, Schroeder (1995) reported that there was no evidence of groundwater impacts from an infiltration basin serving a large industrial catchment in Fresno, CA.

Siting Criteria

The key element in siting infiltration basins is identifying sites with appropriate soil and hydrogeologic properties, which is critical for long term performance. In one study conducted in Prince George's County, Maryland (Galli, 1992), all of the infiltration basins investigated clogged within 2 years. It is believed that these failures were for the most part due to allowing infiltration at sites with rates of less than 0.5 in/hr, basing siting on soil type rather than field infiltration tests, and poor construction practices that resulted in soil compaction of the basin invert.

A study of 23 infiltration basins in the Pacific Northwest showed better long-term performance in an area with highly permeable soils (Hilding, 1996). In this study, few of the infiltration basins had failed after 10 years. Consequently, the following guidelines for identifying appropriate soil and subsurface conditions should be rigorously adhered to.

- Determine soil type (consider RCS soil type 'A, B or C' only) from mapping and consult USDA soil survey tables to review other parameters such as the amount of silt and clay, presence of a restrictive layer or seasonal high water table, and estimated permeability. The soil should not have more than 30% clay or more than 40% of clay and silt combined. Eliminate sites that are clearly unsuitable for infiltration.

- Groundwater separation should be at least 3 m from the basin invert to the measured ground water elevation. There is concern at the state and regional levels of the impact on groundwater quality from infiltrated runoff, especially when the separation between groundwater and the surface is small.

- Location away from buildings, slopes and highway pavement (greater than 6 m) and wells and bridge structures (greater than 30 m). Sites constructed of fill, having a base flow or with a slope greater than 15% should not be considered.

- Ensure that adequate head is available to operate flow splitter structures (to allow the basin to be offline) without ponding in the splitter structure or creating backwater upstream of the splitter.

- Base flow should not be present in the tributary watershed.

Secondary Screening Based on Site Geotechnical Investigation

- At least three in-hole conductivity tests shall be performed using USBR 7300-89 or Bouwer-Rice procedures (the latter if groundwater is encountered within the boring), two tests at different locations within the proposed basin and the third down gradient by no more than approximately 10 m. The tests shall measure permeability in the side slopes and the bed within a depth of 3 m of the invert.

- The minimum acceptable hydraulic conductivity as measured in any of the three required test holes is 13 mm/hr. If any test hole shows less than the minimum value, the site should be disqualified from further consideration.

- Exclude from consideration sites constructed in fill or partially in fill unless no silts or clays are present in the soil boring. Fill tends to be compacted, with clays in a dispersed rather than flocculated state, greatly reducing permeability.

- The geotechnical investigation should be such that a good understanding is gained as to how the stormwater runoff will move in the soil (horizontally or vertically) and if there are any geological conditions that could inhibit the movement of water.

Additional Design Guidelines

(1) Basin Sizing - The required water quality volume is determined by local regulations or sufficient to capture 85% of the annual runoff.

(2) Provide pretreatment if sediment loading is a maintenance concern for the basin.

(3) Include energy dissipation in the inlet design for the basins. Avoid designs that include a permanent pool to reduce opportunity for standing water and associated vector problems.

(4) Basin invert area should be determined by the equation:

$$A = \frac{WQV}{kt}$$

where A = Basin invert area (m^2)

WQV = water quality volume (m^3)

k = 0.5 times the lowest field-measured hydraulic conductivity (m/hr)

t = drawdown time (48 hr)

(5) The use of vertical piping, either for distribution or infiltration enhancement shall not be allowed to avoid device classification as a Class V injection well per 40 CFR146.5(e)(4).

Maintenance

Regular maintenance is critical to the successful operation of infiltration basins. Recommended operation and maintenance guidelines include:

- Inspections and maintenance to ensure that water infiltrates into the subsurface completely (recommended infiltration rate of 72 hours or less) and that vegetation is carefully managed to prevent creating mosquito and other vector habitats.
- Observe drain time for the design storm after completion or modification of the facility to confirm that the desired drain time has been obtained.
- Schedule semiannual inspections for beginning and end of the wet season to identify potential problems such as erosion of the basin side slopes and invert, standing water, trash and debris, and sediment accumulation.
- Remove accumulated trash and debris in the basin at the start and end of the wet season.
- Inspect for standing water at the end of the wet season.
- Trim vegetation at the beginning and end of the wet season to prevent establishment of woody vegetation and for aesthetic and vector reasons.
- Remove accumulated sediment and regrade when the accumulated sediment volume exceeds 10% of the basin.
- If erosion is occurring within the basin, revegetate immediately and stabilize with an erosion control mulch or mat until vegetation cover is established.
- To avoid reversing soil development, scarification or other disturbance should only be performed when there are actual signs of clogging, rather than on a routine basis. Always remove deposited sediments before scarification, and use a hand-guided rotary tiller, if possible, or a disc harrow pulled by a very light tractor.

Cost

Infiltration basins are relatively cost-effective practices because little infrastructure is needed when constructing them. One study estimated the total construction cost at about $2 per ft (adjusted for inflation) of storage for a 0.25-acre basin (SWRPC, 1991). As with other BMPs, these published cost estimates may deviate greatly from what might be incurred at a specific site. For instance, Caltrans spent about $18/ft^3 for the two infiltration basins constructed in southern California, each of which had a water quality volume of about 0.34 ac.-ft. Much of the higher cost can be attributed to changes in the storm drain system necessary to route the runoff to the basin locations.

Infiltration basins typically consume about 2 to 3% of the site draining to them, which is relatively small. Additional space may be required for buffer, landscaping, access road, and fencing. Maintenance costs are estimated at 5 to 10% of construction costs.

One cost concern associated with infiltration practices is the maintenance burden and longevity. If improperly maintained, infiltration basins have a high failure rate. Thus, it may be necessary to replace the basin with a different technology after a relatively short period of time.

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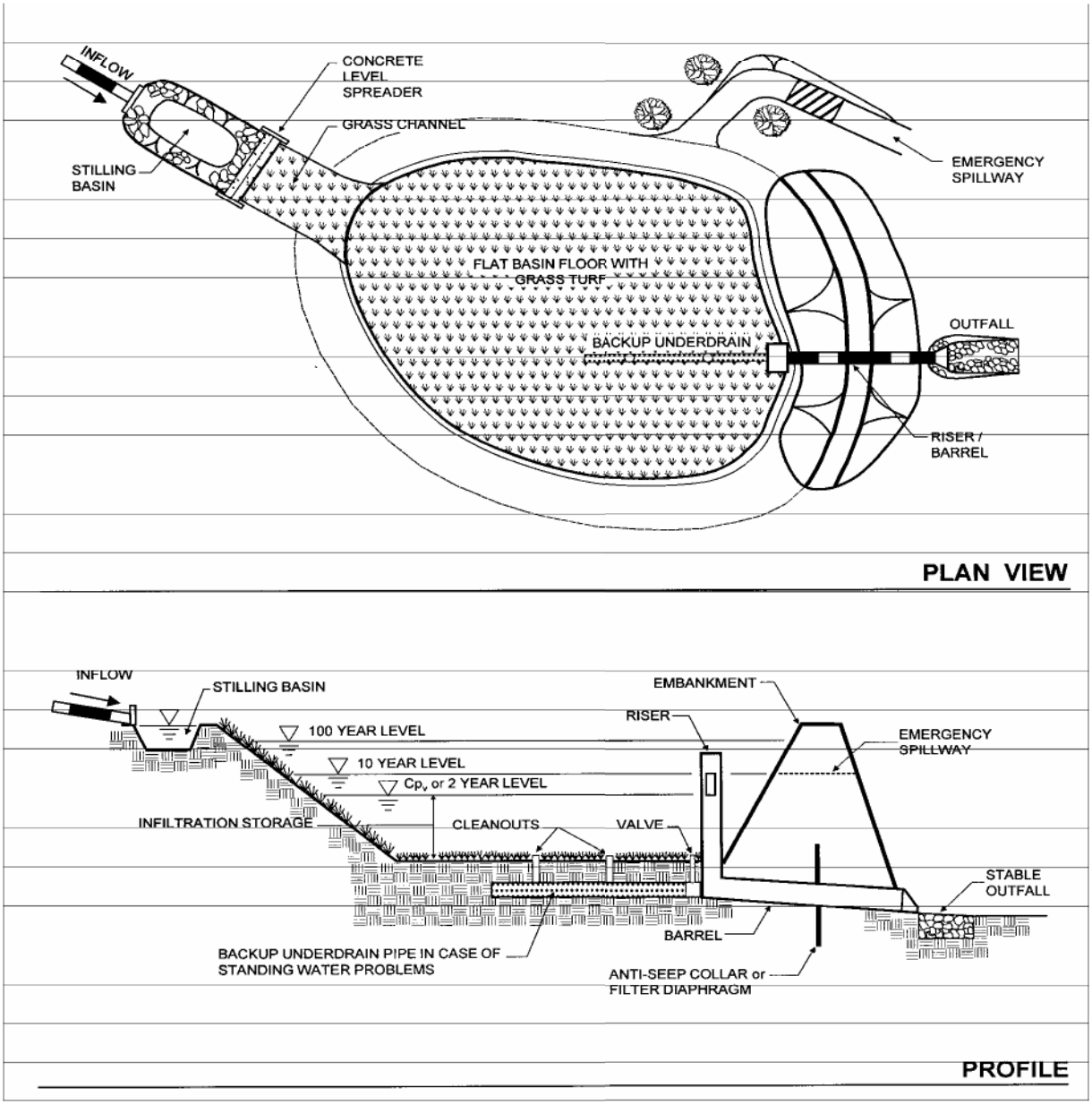
INFLOW
CONCRETE LEVEL SPREADER
GRASS CHANNEL
STILLING BASIN
EMERGENCY SPILLWAY
FLAT BASIN FLOOR WITH GRASS TURF
OUTFALL
BACKUP UNDERDRAIN
RISER / BARREL
PLAN VIEW
INFLOW
STILLING BASIN
EMBANKMENT
RISER
100 YEAR LEVEL
EMERGENCY SPILLWAY
10 YEAR LEVEL
Cpv or 2 YEAR LEVEL
INFILTRATION STORAGE
CLEANOUTS
VALVE
STABLE OUTFALL
BARREL
BACKUP UNDERDRAIN PIPE IN CASE OF STANDING WATER PROBLEMS
ANTI-SEEP COLLAR or FILTER DIAPHRAGM
PROFILE

Attachment A

WQMP Maintenance Agreement Template

Print Agreement Only as Single-Sided Document

RECORDING REQUESTED BY

City of Hesperia: Engineering Division

AND WHEN RECORDED MAIL DOCUMENT TO:

NAME **City Clerk: c/o _____**

STREET ADDRESS 9700 7th Avenue

CITY, STATE & ZIP CODE Hesperia, CA 92345

SPACE ABOVE FOR RECORDER'S USE ONLY

COVENANT AND AGREEMENT REGARDING WATER QUALITY MANAGEMENT PLAN AND STORMWATER BEST MANAGEMENT PRACTICES TRANSFER, ACCESS AND MAINTENANCE

Title of Document

Document exempt from recording fees pursuant to Cal. Gov. Code 6103 & 27383

THIS AREA FOR RECORDER'S USE ONLY

THIS COVER SHEET ADDED TO PROVIDE ADEQUATE SPACE FOR RECORDING INFORMATION

Covenant and Agreement Regarding Water Quality Management Plan and Stormwater Best Management Practices Transfer, Access and Maintenance

OWNER NAME: Pathways to College K-8 Charter School, Contact: Craig Merrill

PROPERTY ADDRESS: 9144 3rd Ave.

Hesperia, CA. 92345

APN: 0414-212-08-0 and 0414-212-09-0

THIS AGREEMENT is made and entered into in

CITY OF HESPERIA, COUNTY OF SAN BERNARDINO , California, this _____ day of

_____ , by and between

Pathwayst to College K-8 Charter School , hereinafter

referred to as Owner, and the CITY OF HESPERIA, a political subdivision of the State of California, hereinafter referred to as "the City";

WHEREAS, the Owner owns real property ("Property") in the State of California, County of San Bernardino, located at [STREET ADDRESS] within the City of Hesperia, more commonly referred to as San Bernardino County Tax Assessor Parcel No. [APN Number] specifically described in Exhibit "A" and depicted in Exhibit "B", each of which is attached hereto and incorporated herein by this reference; and

WHEREAS, at the time of initial approval of the development project known as

Pathwayst to College K-8 Charter School within the Property described herein, the City required the project to employ Best Management Practices, hereinafter referred to as "BMPs," to minimize pollutants in urban runoff; and

WHEREAS, the Owner has chosen to install and/or implement BMPs as described in the Water Quality Management Plan, dated _____, on file with the City and incorporated herein by this reference, hereinafter referred to as "WQMP", to minimize pollutants in stormwater and urban runoff and to minimize other adverse impacts of stormwater and urban runoff; and

WHEREAS, said WQMP has been certified by the Owner and reviewed and approved by the City; and

WHEREAS, the Owner is aware that periodic and continuous maintenance, including, but not necessarily limited to, filter material replacement and sediment removal, is required to assure peak performance of all BMPs in the WQMP and that, furthermore, such maintenance activity will require compliance with all Local, State, or Federal laws and regulations, including those pertaining to confined space and waste disposal methods, in effect at the time such maintenance occurs.

NOW THEREFORE, it is mutually stipulated and agreed as follows:

1. Owner shall comply with the WQMP.

2. All maintenance or replacement of any BMPs specified within the approved WQMP is the sole responsibility of the Owner in accordance with the terms of this Agreement.

3. Owner hereby provides the City's designee complete access, of any duration, to the BMPs and their immediate vicinity at any time, upon reasonable notice, or in the event of emergency, as determined by the City, no advance notice, for the purpose of inspection, sampling, testing of the BMPs, and in case of emergency, to undertake all necessary repairs or other preventative measures at owner's expense as provided in paragraph 5 below. The City shall make every effort at all times to minimize or avoid interference with Owner's use of the Property. Denial of access to any premises or facility that contains WQMP features is a breach of this Agreement and may also be a violation of the Clean Water Act, the California Water Code, and/or the City's NPDES Permit Implementation regulations. If there is reasonable cause to believe that an illicit discharge or breach of this Agreement is occurring on the premises then the authorized enforcement agency may seek issuance of a search warrant from any court of competent jurisdiction in addition to other enforcement actions. Owner recognizes that the City may perform routine and regular inspections, as well as emergency inspections, of the BMPs. Owner or Owner's successors or assigns shall pay City for all costs incurred by City in the inspection, sampling, testing of the BMPs within thirty (30) calendar days of City invoice.

4. Owner shall use its best efforts diligently to maintain all BMPs in a manner assuring peak performance at all times. All reasonable precautions shall be exercised by Owner and Owner's representative or contractor in the removal and extraction of any material(s) from the BMPs and the ultimate disposal of the material(s) in a manner consistent with all relevant laws and regulations in effect at the time. As may be requested from time to time by the City, the Owner shall provide the City with documentation identifying the material(s) removed, the quantity, and disposal destination, testing construction or reconstruction.

5. In the event Owner, or its successors or assigns, fails to accomplish the necessary maintenance contemplated by this Agreement, within five (5) business days of being given written notice by the City, the City is hereby authorized to cause any maintenance necessary to be done and charge the entire cost and expense against the Property and/or to the Owner or Owner's successors or assigns, including administrative costs, attorney's fees and interest thereon at the maximum rate authorized by the City Code from the date of the notice of expense until paid in full. Owner or Owner's successors or assigns shall pay City within thirty (30) calendar days of City invoice.

6. The City may require the owner to post security in form and for a time period satisfactory to the City to guarantee the performance of the obligations stated herein. Should the Owner fail to perform the obligations under the Agreement, the City may, in the case of a cash bond, act for the Owner using the proceeds from it, or in the case of a surety bond, require the surety (ies) to perform the obligations of this Agreement.

7. The City agrees, from time to time, within ten (10) business days after request of Owner, to execute and deliver to Owner, or Owner's designee, an estoppel certificate requested by Owner, stating that this Agreement is in full force and effect, and that Owner is not in default hereunder with regard to any maintenance or payment obligations (or specifying in detail the nature of Owner's default). Owner shall pay all costs and expenses incurred by the City in its investigation of whether to issue an estoppel certificate within thirty (30) calendar days after receipt of a City invoice and prior to the City's issuance of such certificate. Where the City cannot issue an estoppel certificate, Owner shall pay the City within thirty (30) calendar days of receipt of a City invoice.

8. Owner shall not change any BMPs identified in the WQMP without an amendment to this Agreement approved by authorized representatives of both the City and the Owner.

9. City and Owner shall comply with all applicable laws, ordinances, rules, regulations, court orders and government agency orders now or hereinafter in effect in carrying out the terms of this Agreement. If a provision of this Agreement is terminated or held to be invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining provisions shall remain in full effect.

10. In addition to any remedy available to City under this Agreement, if Owner violates any term of this Agreement and does not cure the violation within the time already provided in this Agreement, or, if not provided, within thirty (30) calendar days, or within such time authorized by the City if said cure reasonably requires more than the subject time, the City may bring an action at law or in equity in a court of competent jurisdiction to enforce compliance by the Owner with the terms of this Agreement. In such action, the City may recover any damages to which the City may be entitled for the violation, enjoin the violation by temporary or permanent injunction without the necessity of proving actual damages or the inadequacy of otherwise available legal remedies, or obtain other equitable relief, including, but not limited to, the restoration of the Property and/or the BMPs identified in the WQMP to the condition in which it/they existed prior to any such violation or injury.

11. This Agreement shall be recorded in the Office of the Recorder of San Bernardino County, California, at the expense of the Owner and shall constitute notice to all successors and assigns of the title to said Property of the obligation herein set forth, and also a lien in such amount as will fully reimburse the City, including interest as herein above set forth, subject to foreclosure in event of default in payment.

12. In event of legal action occasioned by any default or action of the Owner, or its successors or assigns, then the Owner and its successors or assigns agree(s) to hold the City harmless and pay all costs incurred by the City in enforcing the terms of this Agreement, including reasonable attorney's fees and costs, and that the same shall become a part of the lien against said Property.

13. It is the intent of the parties hereto that burdens and benefits herein undertaken shall constitute covenants that run with said Property and constitute a lien there against.

14. The obligations herein undertaken shall be binding upon the heirs, successors, executors, administrators and assigns of the parties hereto. The term "Owner" shall include not only the present Owner, but also its heirs, successors, executors, administrators, and assigns. Owner shall notify any successor to title of all or part of the Property about the existence of

this Agreement. Owner shall provide such notice prior to such successor obtaining an interest in all or part of the Property. Owner shall provide a copy of such notice to the City at the same time such notice is provided to the successor.

15. Time is of the essence in the performance of this Agreement.

16. Any notice to a party required or called for in this Agreement shall be served in person, or by deposit in the U.S. Mail, first class postage prepaid, to the address set forth below. Notice(s) shall be deemed effective upon receipt, or seventy-two (72) hours after deposit in the U.S. Mail, whichever is earlier. A party may change a notice address only by providing written notice thereof to the other party.

17. Owner agrees to indemnify, defend (with counsel reasonably approved by the City) and hold harmless the City and its authorized officers, employees, agents and volunteers from any and all claims, actions, losses, damages, and/or liability arising out of this Agreement from any cause whatsoever, including the acts, errors or omissions of any person and for any costs or expenses incurred by the City on account of any claim except where such indemnification is prohibited by law. This indemnification provision shall apply regardless of the existence or degree of fault of indemnitees. The Owner's indemnification obligation applies to the City's "active" as well as "passive" negligence but does not apply to the City's "sole negligence" or "willful misconduct" within the meaning of Civil Code Section 2782, or to any claims, actions, losses, damages, and/or liabilities, to the extent caused by the acts or omissions of any third party contractors undertaking any work (other than field inspections) or other maintenance on the Property on behalf of the City under this Agreement.

[REMAINDER OF THIS PAGE INTENTIONALLY LEFT BLANK]

IF TO CITY:

City of Hesperia

9700 Seventh Avenue

Hesperia, CA 92345

IF TO OWNER:

Pathwayst to College K-8 Charter School

9144 3rd Ave.

Hesperia, CA 92345

IN WITNESS THEREOF, the parties hereto have affixed their signatures as of the date first written above.

OWNER:
Signature: _____

Name: _____

Title: _____

Date: _____

FOR: Maintenance Agreement, dated _____, for the project known as

Pathwayst to College K-8 Charter School

(APN)__ 0414-212-08-0 and 0414-212-09-0_,

As described in the WQMP dated _____.

OWNER:

Signature: _____

Name: _____

Title: _____

Date: _____

NOTARIES ON FOLLOWING PAGE(S)

A notary acknowledgement for each signature is required for recordation.

ACCEPTED BY:

Director of Development Services or designee

Date: _____

Attachment: Notary Acknowledgement

ATTACHMENT 1

(Notary Acknowledgement)

ATTACHMENT 1, Page 2

(Notary Acknowledgement)

EXHIBIT A

(Legal Description)

EXHIBIT B

(Map/illustration)