Storm Water Quality Plan Executive Summary
Sharp Metropolitan Medical Campus

Prepared by BWE Inc.
Date: 04/22/2022

Introduction

The Sharp Metropolitan Medical Campus multi-phased development project will be constructed in a series of "Packages" corresponding to similarly named grading plan submittals. Separate Storm Water Quality Management Plans (SWQMPs) and Drainage Studies are prepared for each proposed development.

A combination of Source Control, Site Design, and Structural BMPs are proposed to mitigate impacts of the proposed development. Each design adheres to the requirements of the City of San Diego's BMP manual and provides treatment for the site's Design Capture Volume (DCV) defined as the 85th percentile, 24 hour storm event. A feasibility studies of all retention based BMPs (harvest and use, full and/or partial infiltration) is performed prior to selecting the biofiltration BMPs to comply with the pollutant control requirements. It is determined that the harvest and use of precipitation is infeasible as the site has a low 36-hour water demand (less than 25% of the Design Capture Volume).

Three different parcels are disturbed due to the proposed redevelopment. Amount of impervious area replaced/created is calculated for each parcel to determine if City's 50% rule for storm water management is triggered. Out of three, only one parcel (APN 4275400100) triggers 50% rule where entire impervious area is considered for pollutant and hydromodification control. Remainder two parcels (APNs 4275300200 and 4275402400) do not trigger 50% rule and therefore, only the newly replaced impervious area is considered for pollutant and hydromodification control. See exhibits for pervious/impervious areas calculation.

See the attached Site Map for locations of the proposed development "Packages" and their corresponding reports.

Package 4 (PTS # 694841)

Package 4 includes construction of the Stephen Birch Addition, associated drive areas and fire access roads, ambulance parking, and emergency room drop-off. Runoff from the ambulance parking and emergency drop-off area flows west along the Stephen Birch Addition via two storm drain systems: a bypass line which collects existing impervious area and surcharges to the City's existing storm drain, and a system which routes on-site runoff to a Modular Wetland Biofiltration BMP and Underground Vault for

9449 Balboa Avenue • Suite 270 • San Diego • CA • 92123
P 619 299 5550 • F 619 299 9934 • www.bwesd.com

pollutant and hydromodification control (BMP #5, BMP #6). The Stephen Birch drop-off area contains Permeable Pavers Structural BMP (BMP #14) to provide pollutant control prior to being conveyed to the Underground Vault (BMP #6).

Runoff leaves the site through an 18" RCP pipe and connects to the city's storm drain system at the southeast corner of the intersection of Health Center Drive and Frost Street. The city storm drain flows west, crossing under Health Center Drive and Highway 163, and then discharges to the South Fork of Tecolote Creek and then flows to Mission Bay and then discharges to the Pacific Ocean.

Package 5A (PTS # 694839)

Package 5A will construct a new Central Energy Plant (CEP) and associated improvements. Ribbon gutters and curb and gutters direct flow to proposed catch basins, which direct flow to another proposed storm drain that conveys the runoff to a Modular Wetland Biofiltration BMP (BMP #7) followed by an underground vault (BMP #8), which provides hydromodification and peak flow mitigation.

Both the bypass storm pipe and storm drain conveying the mitigated runoff connect to the same existing manhole west of the proposed site. A 15" PVC pipe conveys the total runoff from the site and eventually connects to the city storm drain which crosses Health Center Drive, Highway 163, and then discharges to the South Fork of Tecolote Creek and then flows to Mission Bay and then discharges to the Pacific Ocean.

CUP - Package 3A

Package 3A includes construction of the Mary Birch building, associated drive areas, loading dock, and waste storage area. Runoff from the northern portion of the site flows south via a storm drain system which routes on-site runoff to a Biofiltration BMP and Underground Vault for pollutant and hydromodification control (BMP #2 and BMP #3). Runoff from the southern portion of the site sheet flows to another Biofiltration BMP for pollutant and hydromodification control (BMP #4). A portion of the waste storage area utilizes impervious area dispersion with amended soils for pollutant and hydromodification control.

Runoff leaves the site through an 18" RCP pipe and connects to the city's storm drain system at the on Birmingham Way. The city storm drain is conveyed to the San Diego River and ultimately discharges to the Pacific Ocean.

CUP - Package 7A

Package 7A includes construction of the New Tower building, engineering shop, as well as associated drive areas and fire access roads. Runoff from the northern half of the New Tower flows north via roof drain which routes runoff to a Modular Wetland Biofiltration BMP and Underground Vault for pollutant and hydromodification control (BMP #9 and #10). Runoff from the southern half of New Tower as well as the rest of the site flows south via a storm drain system which routes on-site runoff to a Biofiltration BMP and Underground Vault for pollutant and hydromodification control (BMP #2 and BMP #3).

Runoff leaves the site through an 18" RCP pipe and connects to the city's storm drain system at the on Birmingham Way. The city storm drain is conveyed to the San Diego River and ultimately discharges to the Pacific Ocean.

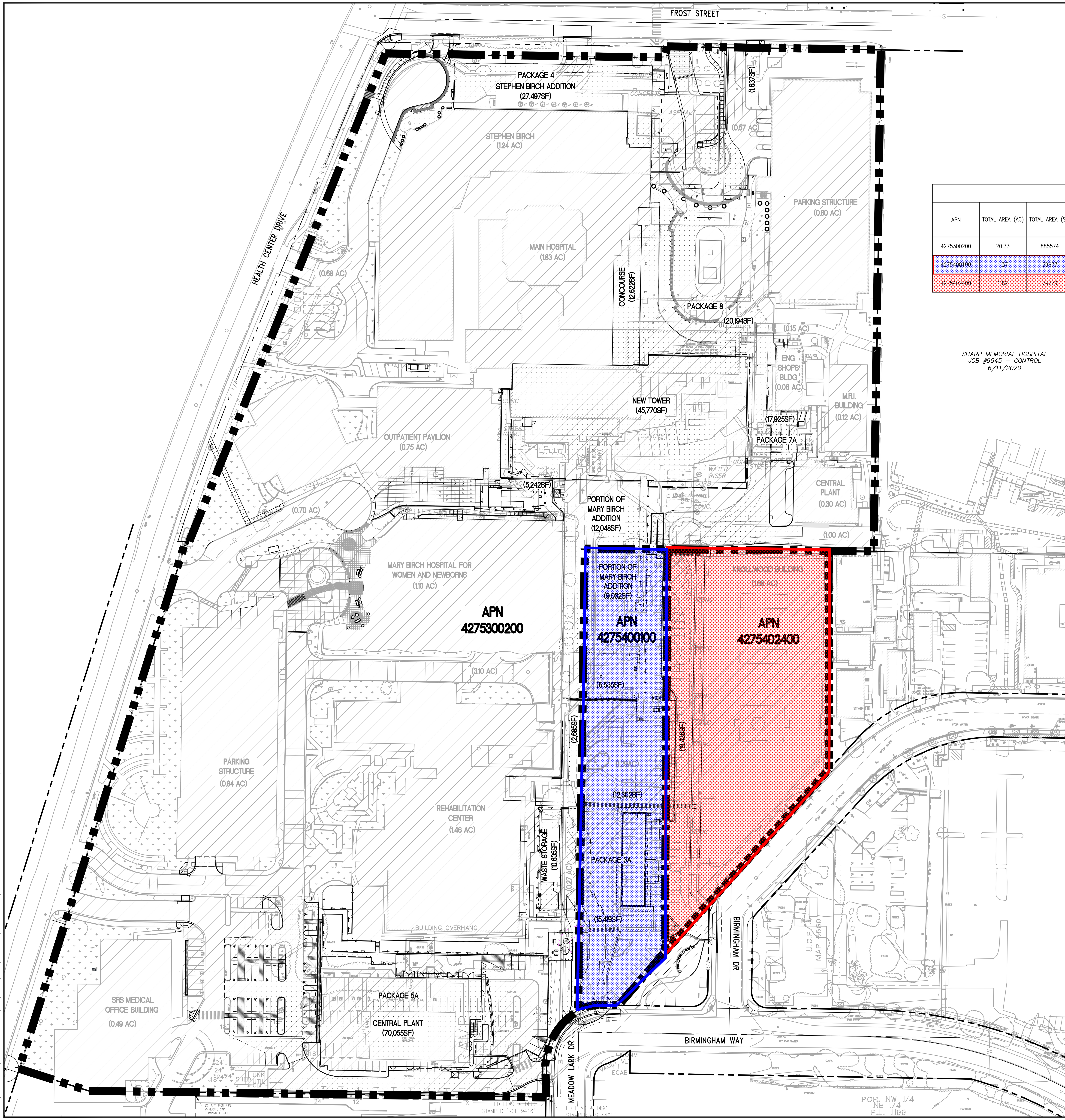
CUP - Package 8

Package 8 will construct the Concourse Addition and associated improvements. The Concourse Addition conveys runoff via roof drains to a Modular Wetland Biofiltration BMP and Underground Vault for pollutant and hydromodification control (BMP #11 and #12). The majority of the site sheet flows to the southeast to the Permeable Pavers Structural BMP (BMP #13) for pollutant control and to an Underground Vault for hydromodification control (BMP #12). Excess area is treated in Package 4 to offset the required area of the northern driveway.

A 24" RCP pipe conveys the total runoff from the site and eventually connects to the city storm drain which crosses Health Center Drive, Highway 163, and then discharges to the South Fork of Tecolote Creek and then flows to Mission Bay and then discharges to the Pacific Ocean.

References

1. Package 4 Storm Water Quality Management Plan (SWQMP), Prepared by BWE Inc
2. Package 5A Storm Water Quality Management Plan (SWQMP), Prepared by BWE Inc
3. Package 3A Storm Water Quality Management Plan (SWQMP), Prepared by BWE Inc
4. Package 7A Storm Water Quality Management Plan (SWQMP), Prepared by BWE Inc
5. Package 8 Storm Water Quality Management Plan (SWQMP), Prepared by BWE Inc
6. Sharp MMC Drainage Study, Prepared by BWE Inc
7. City of San Diego BMP Design Manual (2018)
8. City of San Diego Drainage Design Manual (2017)



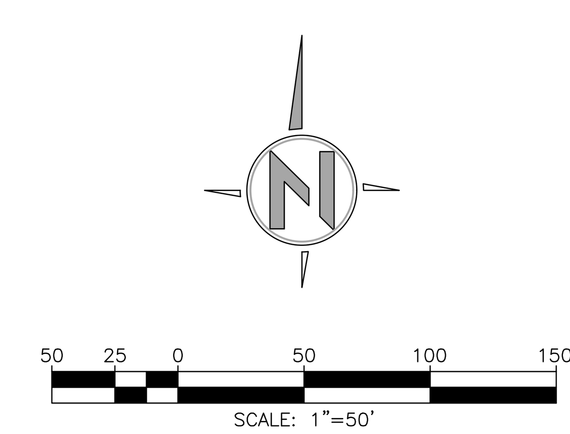
LEGEND

LEGEND	SYMBOL
PARCEL AREA BOUNDARY APN 4275300200	
PARCEL AREA BOUNDARY APN 4275400100	
PARCEL AREA BOUNDARY APN 4275402400	
EXISTING IMPERVIOUS	
PROPOSED IMPERVIOUS	
EX LANDSCAPE	

PARCEL AREA INFORMATION

APN	TOTAL AREA (AC)	TOTAL AREA (SF)	DISTURBED AREA (SF)	EXISTING IMPERVIOUS AREA (SF)	NEW OR REPLACED IMPERVIOUS AREA (SF)	NEW OR REPLACED IMPERVIOUS (%)	NOTES
4275300200	20.33	885574	298583	661676	226985	34	STORMWATER MITIGATION PROVIDED FOR DISTURBED AREA ONLY
4275400100	1.37	59677	59677	56157	43847	78	STORMWATER MITIGATION PROVIDED FOR ENTIRE AREA
4275402400	1.82	79279	21785	73115	19436	27	STORMWATER MITIGATION PROVIDED FOR DISTURBED AREA ONLY

SHARP MEMORIAL HOSPITAL
JOB #9545 – CONTROL
6/11/2020



BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

SYM	DESCRIPTION	DATE	APPR

BENCHMARK:

ISSUE DATE:	09/17/2021
DRAWN BY:	MDS
CHECKED BY:	MGC
B&W JOB NUMBER:	9545.10.00
CLIENT JOB NUMBER:	

PROJECT
SHARP MMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

SHEET TITLE
EXHIBIT FOR 50% RULE

SHEET 1 OF 3

PLOT: M:\PROJECTS\9500\9545\10.00 SHARP MMC\DWGS\EXHIBITS\SWQMP\OVERALL DMA\50 PERCENT RULE\9545\10.00 DMAS-OVER_50PERCENT-FINAL.DWG MH: GC 10/5/2022 3:15 PM

BMP SIZING / CALCULATIONS - PACKAGE 4
(Under Final Review by City, PTS # 694841)-Not A CUP

Project: Sharp MMC - Package 4 ED Expansion

DMA 4.0 (BMP #6)

Area Weighted Runoff Factor (C)

Surface Type	Area - A (sf)	C - Factor	C X A	Weighted C-Factor
Impervious	33,896	0.90	30,506	
Landscape	10,274	0.10	1,027	
Gravel/DG	0	0.30	0	
Total	**44,170**		**31,534**	**0.714**

1.01 Acres

Project: Sharp MMC - Package 4 ED Expansion

DMA 4.0 (BMP #6)

Design Capture Volume		Worksheet B.2-1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.58	inches
2	Area tributary to BMP (s)	A=	1.01	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.714	unitless
4	Trees Credit Volume Note: In the SWQMP list the number of trees, size of each tree, amount of soil volume installed for each tree, contributing area to each tree and the inlet opening dimension for each tree.	TCV=	0	cubic-feet
5	Rain barrels Credit Volume Note: In the SWQMP list the number of rain barrels, size of each rain barrel and the use of the captured storm water runoff.	RCV=	0	cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	**DCV=**	**1524**	cubic-feet

MWS Flow Based BMP Sizing

I_{TREAT} = 0.2 in/hr (Intensity of rainfall)

Q_{TREAT} = $C \times I_{TREAT} \times A$ cfs (Treatment flow rate)

Design Flow (cfs) = 1.5* Q_{Treat} (Per Section F.2.2 of Storm Water Standards)

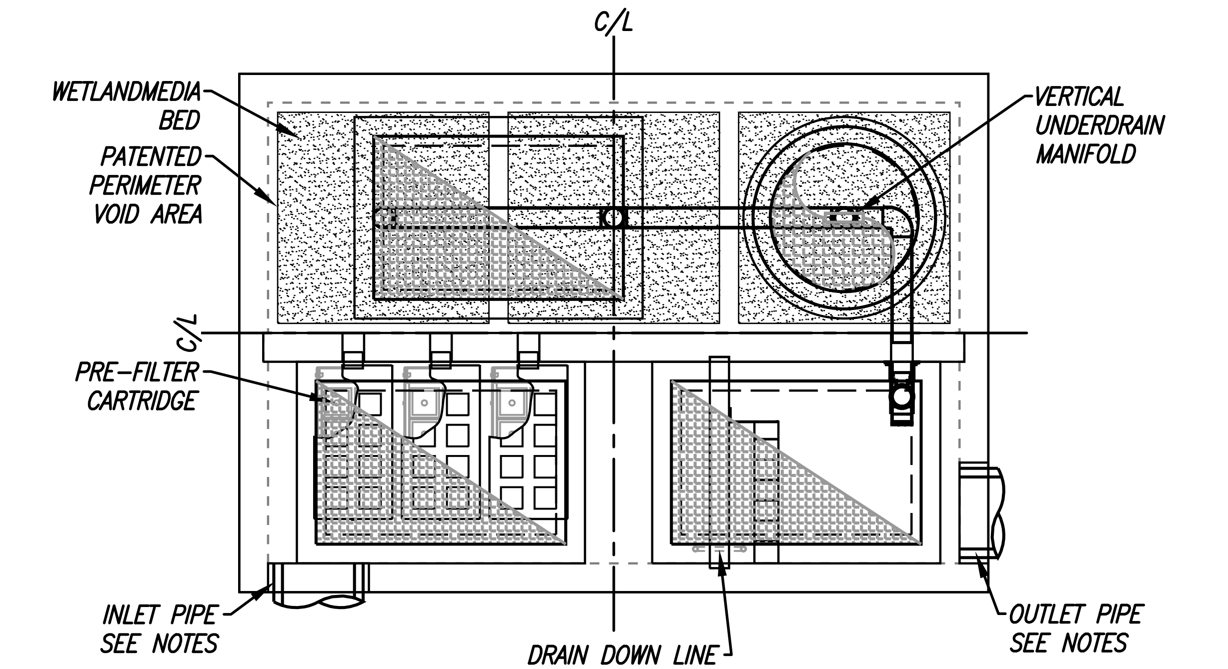
BMP #	DMA		Runoff Coefficient (C)	Q_{TREAT} =	Design Flow (cfs)	BMP Sizing	
	ID #	Area (ac)				MWS Model	Selected BMP's Flow Rate (cfs)
6	4.0	1.01	0.71	0.14	0.216	MWS-L-8-12	0.346

Note: All selected modular wetlands treatment flow rates exceed the DMAs' design flow

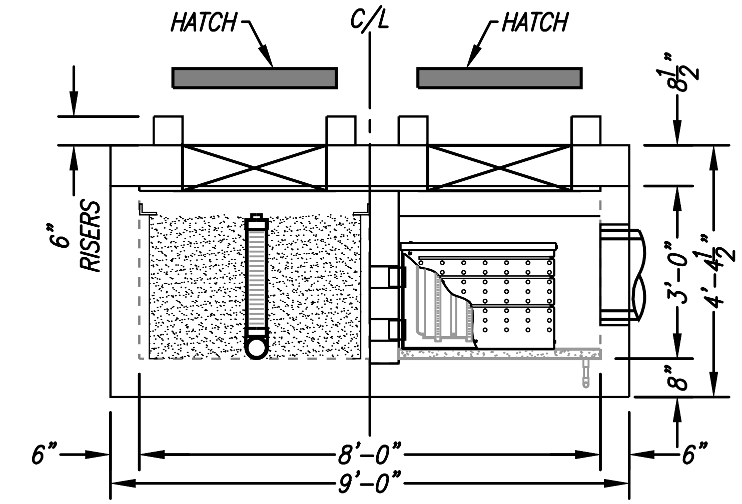
MODEL #	DIMENSIONS	WETLANDMEDIA SURFACE AREA (sq. ft.)	TREATMENT FLOW RATE (cfs)
MWS-L-4-4	4' x 4'	23	0.052
MWS-L-4-6	4' x 6'	32	0.073
MWS-L-4-8	4' x 8'	50	0.115
MWS-L-4-13	4' x 13'	63	0.144
MWS-L-4-15	4' x 15'	76	0.175
MWS-L-4-17	4' x 17'	90	0.206
MWS-L-4-19	4' x 19'	103	0.237
MWS-L-4-21	4' x 21'	117	0.268
MWS-L-6-8	7' x 9'	64	0.147
MWS-L-8-8	8' x 8'	100	0.230
MWS-L-8-12	8' x 12'	151	0.346
MWS-L-8-16	8' x 16'	201	0.462
MWS-L-8-20	9' x 21'	252	0.577
MWS-L-8-24	9' x 25'	302	0.693
MWS-L-10-20	10' x 20'	302	0.693

SITE SPECIFIC DATA

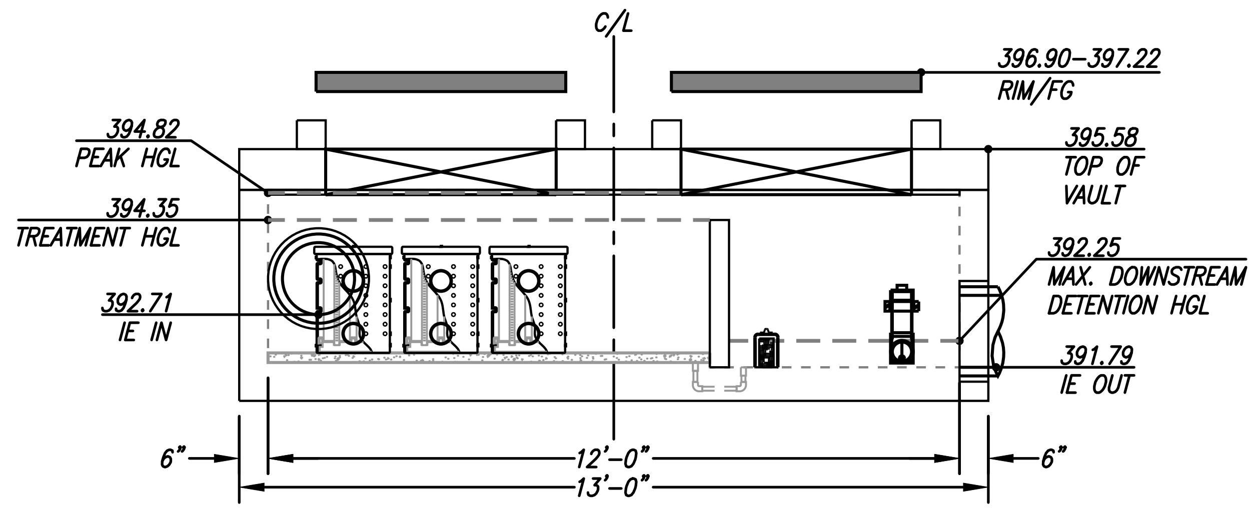
PROJECT NUMBER		12619	
PROJECT NAME		SHARP MMC	
PROJECT LOCATION		SAN DIEGO, CA	
STRUCTURE ID		BMP #6	
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
N/A		0.216	
TREATMENT HGL AVAILABLE (FT)			5.1
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			3.88
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	392.71	TBD	15"
INLET PIPE 2	N/A	N/A	N/A
OUTLET PIPE	391.79	TBD	15"
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION	396.90–397.22	396.90–397.22	396.90–397.22
SURFACE LOAD	PEDESTRIAN	PEDESTRIAN	PEDESTRIAN
FRAME & COVER	30"X48"	30"X48" & ø30"	30"X48"
WETLANDMEDIA VOLUME (CY)			3.80
ORIFICE SIZE (DIA. INCHES)			ø2.36"
NOTES:			



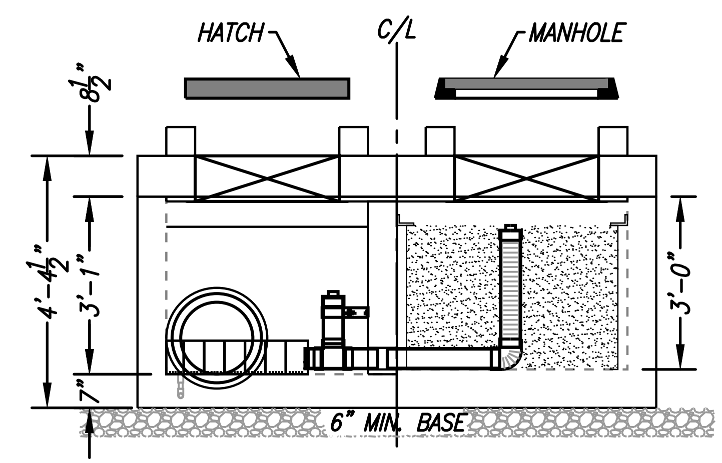
PLAN VIEW



LEFT END VIEW



ELEVATION VIEW



RIGHT END VIEW

INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS' SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATERTIGHT PER MANUFACTURER'S STANDARD CONNECTION DETAIL.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL PIPES, RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. CONTRACTOR RESPONSIBLE FOR CONTACTING BIO CLEAN FOR ACTIVATION OF UNIT. MANUFACTURER'S WARRANTY IS VOID WITHOUT PROPER ACTIVATION BY A BIO CLEAN REPRESENTATIVE.

GENERAL NOTES

1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT BIO CLEAN.

INTERNAL BYPASS DISCLOSURE:

THE DESIGN AND CAPACITY OF THE PEAK CONVEYANCE METHOD TO BE REVIEWED AND APPROVED BY THE ENGINEER OF RECORD. HGL(S) AT PEAK FLOW SHALL BE ASSESSED TO ENSURE NO UPSTREAM FLOODING. PEAK HGL AND BYPASS CAPACITY SHOWN ON DRAWING ARE USED FOR GUIDANCE ONLY.

LOW INFLOW PIPE DISCLOSURE:

IT IS RECOMMENDED THAT A SUFFICIENT VARIATION IN ELEVATION BETWEEN THE INLET AND OUTLET BE PROVIDED TO ALLOW FOR ACCUMULATION OF SEDIMENT IN THE PRE-TREATMENT CHAMBER. FAILURE TO DO SO MAY RESULT IN BLOCKAGE AT INFLOW POINT(S) WHICH MAY CAUSE UPSTREAM FLOODING.

Bio Clean
A Forterra Company

TREATMENT FLOW (CFS)	0.216
OPERATING HEAD (FT)	2.1
PRETREATMENT LOADING RATE (GPM/SF)	1.3
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

MODULAR WETLANDS

THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING US PATENTS: 7,425,262; 7,470,362; 7,674,378; 8,303,816; RELATED FOREIGN PATENTS OR OTHER PATENTS PENDING

MWS-L-8-12-3'-0"-V-UG
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

1/26/22GSCHIPPER

<table>
<tr><th colspan="2">Compact (high rate) Biofiltration BMP Checklist</th><th>Form I-10</th></tr>
<tr><td colspan="3">Compact (high rate) biofiltration BMPs have a media filtration rate greater than 5 in/hr. and a media surface area smaller than 3% of contributing area times adjusted runoff factor. Compact biofiltration BMPs are typically proprietary BMPs that may qualify as biofiltration.

A compact biofiltration BMP may satisfy the pollutant control requirements for a DMA onsite in some cases. This depends on the characteristics of the DMA <u>and</u> the performance certification/data of the BMP. If the pollutant control requirements for a DMA are met onsite, then the DMA is not required to participate in an offsite storm water alternative compliance program to meet its pollutant control obligations.

An applicant using a compact biofiltration BMP to meet the pollutant control requirements onsite must complete Section 1 of this form and include it in the PDP SWQMP. A separate form must be completed for each DMA. In instances where the City Engineer does not agree with the applicant's determination, Section 2 of this form will be completed by the City and returned to the applicant.</td></tr>
<tr><td colspan="3">Section 1: Biofiltration Criteria Checklist (Appendix F)</td></tr>
<tr><td colspan="3">Refer to Part 1 of the Storm Water Standards to complete this section. When separate forms/worksheets are referenced below, the applicant must also complete these separate forms/worksheets (as applicable) and include in the PDP SWQMP. The criteria numbers below correspond to the criteria numbers in Appendix F.</td></tr>
<tr><th>Criteria</th><th>Answer</th><th>Progression</th></tr>
<tr><td rowspan="3"><u>Criteria 1 and 3</u>:

What is the infiltration condition of the DMA?

Refer to Section 5.4.2 and Appendix C of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.

Applicant must complete and include the following in the PDP SWQMP submittal to support the feasibility determination:
• Infiltration Feasibility Condition Letter; or
• Worksheet C.4-1: Form I-8A and Worksheet C.4-2: Form I-8B.

Applicant must complete and include all applicable sizing worksheets in the SWQMP submittal</td><td>○ Full Infiltration Condition</td><td>Stop. Compact biofiltration BMP is not allowed.</td></tr>
<tr><td>○ Partial Infiltration Condition</td><td>Compact biofiltration BMP is only allowed, if the target volume retention is met onsite (Refer to Table B.5-1 in Appendix B.5). Use Worksheet B.5-2 in Appendix B.5 to estimate the target volume retention (Note: retention in this context means reduction).

If the required volume reduction is achieved proceed to Criteria 2.

If the required volume reduction is not achieved, compact biofiltration BMP is not allowed. Stop.</td></tr>
<tr><td>⦿ No Infiltration Condition</td><td>Compact biofiltration BMP is allowed if volume retention criteria in Table B.5-1 in Appendix B.5 for the no infiltration condition is met. Compliance with this criterion must be documented in the PDP SWQMP.

If the criteria in Table B.5-1 is met proceed to Criteria 2.

If the criteria in Table B.5-1 is not met, compact biofiltration BMP is not allowed. Stop.</td></tr>
</table>

Compact (high rate) Biofiltration BMP Checklist	Form I-10

Provide basis for Criteria 1 and 3:

Feasibility Analysis:

Summarize findings and include either infiltration feasibility condition letter or Worksheet C.4-1: Form I-8A and Worksheet C.4-2: Form I-8B in the PDP SWQMP submittal.

If Partial Infiltration Condition:

Provide documentation that target volume retention is met (include Worksheet B.5-2 in the PDP SWQMP submittal). Worksheet B.5-7 in Appendix B.5 can be used to estimate volume retention benefits from landscape areas.

If No Infiltration Condition:

Provide documentation that the volume retention performance standard is met (include Worksheet B.5-2 in the PDP SWQMP submittal) in the PDP SWQMP submittal. Worksheet B.5-6 in Appendix B.5 can be used to document that the performance standard is met.

Volume retention requirements have been met through landscape areas with amended soil and storage below the underground storage vault outlet (BMP #8). Worksheets have been provided in this Attachment.

Criteria	Answer	Progression
Criteria 2: Is the compact biofiltration BMP sized to meet the performance standard from the MS4 Permit? Refer to Appendix B.5 and Appendix F.2 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	◉ Meets Flow based Criteria	Use guidance from **Appendix F.2.2** to size the compact biofiltration BMP to meet the flow based criteria. Include the calculations in the PDP SWQMP. Use parameters for sizing consistent with manufacturer guidelines and conditions of its third party certifications (i.e. a BMP certified at a loading rate of 1 gpm/sq. ft. cannot be designed using a loading rate of 1.5 gpm/sq. ft.) **Proceed to Criteria 4.**
	○ Meets Volume based Criteria	Provide documentation that the compact biofiltration BMP has a total static (i.e. non-routed) storage volume, including pore-spaces and pre-filter detention volume (Refer to Appendix B.5 for a schematic) of at least 0.75 times the portion of the DCV not reliably retained onsite. **Proceed to Criteria 4.**
	○ Does not Meet either criteria	**Stop**. Compact biofiltration BMP is not allowed.

Compact (high rate) Biofiltration BMP Checklist	Form I-10

Provide basis for Criteria 2:

Provide documentation that the BMP meets the numeric criteria and is designed consistent with the manufacturer guidelines and conditions of its third-party certification (i.e., loading rate, etc., as applicable).

MWS Linear BMPs are designed by utilizing the treatment flow sizing table given in the manufacturer's guidelines. These proprietary BMPs are designed as flow based BMPs according to the section F.2.2 of the storm water standards as follows;

• The treatment runoff rate is determined by using 0.2 in/hr uniform intensity precipitation event.
• The calculated flow rate is multiplied by 1.5 to compute the design flow rate for the BMP.
• Appropriate size is selected from the sizing table to treat the design flow rate.

Criteria	Answer	Progression
Criteria 4: Does the compact biofiltration BMP meet the pollutant treatment performance standard for the projects most significant pollutants of concern? Refer to Appendix B.6 and Appendix F.1 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	◉ Yes, meets the TAPE certification.	Provide documentation that the compact BMP has an appropriate TAPE certification for the projects most significant pollutants of concern. **Proceed to Criteria 5.**
	○ Yes, through other third-party documentation	Acceptance of third-party documentation is at the discretion of the City Engineer. The City engineer will consider, (a) the data submitted; (b) representativeness of the data submitted; and (c) consistency of the BMP performance claims with pollutant control objectives in Table F.1-2 and Table F.1-1 while making this determination. If a compact biofiltration BMP is not accepted, a written explanation/ reason will be provided in Section 2. **Proceed to Criteria 5.**
	○ No	**Stop**. Compact biofiltration BMP is not allowed.

Provide basis for Criteria 4:

Provide documentation that identifies the projects most significant pollutants of concern and TAPE certification or other third party documentation that shows that the compact biofiltration BMP meets the pollutant treatment performance standard for the projects most significant pollutants of concern.

Refer to the attached performance summary and TAPE certification for details.

Compact (high rate) Biofiltration BMP Checklist		Form I-10
Criteria	**Answer**	**Progression**
<u>Criteria 5</u>: Is the compact biofiltration BMP designed to promote appropriate biological activity to support and maintain treatment process? Refer to Appendix F of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	◉ Yes	Provide documentation that the compact biofiltration BMP support appropriate biological activity. Refer to Appendix F for guidance. **Proceed to Criteria 6.**
	○ No	**Stop**. Compact biofiltration BMP is not allowed.

Provide basis for Criteria 5:

Provide documentation that appropriate biological activity is supported by the compact biofiltration BMP to maintain treatment process.

See attached TAPE certification for details.

Criteria	**Answer**	**Progression**
<u>Criteria 6</u>: Is the compact biofiltration BMP designed with a hydraulic loading rate to prevent erosion, scour and channeling within the BMP?	◉ Yes	Provide documentation that the compact biofiltration BMP is used in a manner consistent with manufacturer guidelines and conditions of its third-party certification. **Proceed to Criteria 7.**
	○ No	**Stop**. Compact biofiltration BMP is not allowed.

Provide basis for Criteria 6:

Provide documentation that the BMP meets the numeric criteria and is designed consistent with the manufacturer guidelines and conditions of its third-party certification (i.e., maximum tributary area, maximum inflow velocities, etc., as applicable).

Refer to loading Rates in TAPE certification. Rates are given based on a per gallon flow rate. It is a self-contained bio filter that has a controlled discharge thus there is no scouring and channeling within the BMP. Refer to basis for criteria 2 for design guidelines.

Compact (high rate) Biofiltration BMP Checklist		Form I-10
Criteria	**Answer**	**Progression**
Criteria 7: Is the compact biofiltration BMP maintenance plan consistent with manufacturer guidelines and conditions of its third-party certification (i.e., maintenance activities, frequencies)?	◉ Yes, and the compact BMP is privately owned, operated and not in the public right of way.	Submit a maintenance agreement that will also include a statement that the BMP will be maintained in accordance with manufacturer guidelines and conditions of third-party certification. **Stop**. The compact biofiltration BMP meets the required criteria.
	○ Yes, and the BMP is either owned or operated by the City or in the public right of way.	Approval is at the discretion of the City Engineer. The city engineer will consider maintenance requirements, cost of maintenance activities, relevant previous local experience with operation and maintenance of the BMP type, ability to continue to operate the system in event that the vending company is no longer operating as a business or other relevant factors while making the determination. **Stop**. Consult the City Engineer for a determination.
	○ No	**Stop**. Compact biofiltration BMP is not allowed.

Provide basis for Criteria 7:

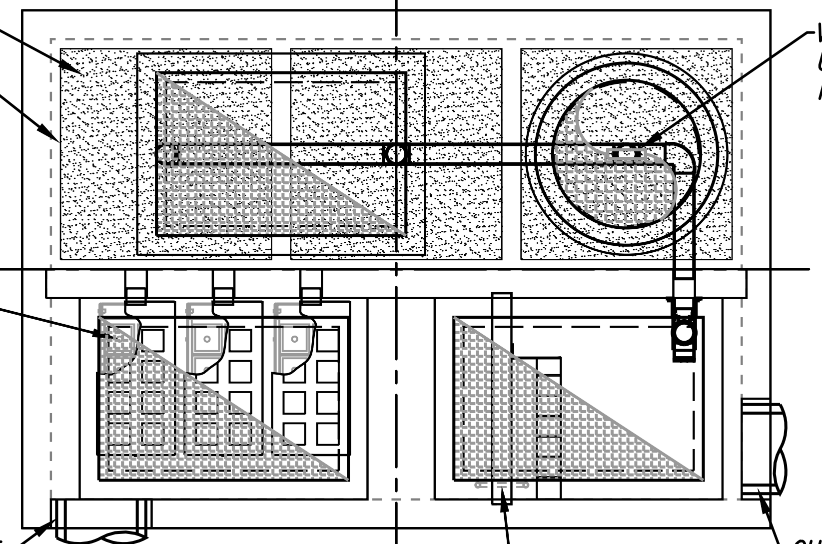
Include copy of manufacturer guidelines and conditions of third-party certification in the maintenance agreement. PDP SWQMP must include a statement that the compact BMP will be maintained in accordance with manufacturer guidelines and conditions of third-party certification.

Manufacturer guidelines are included in Attachment 3.

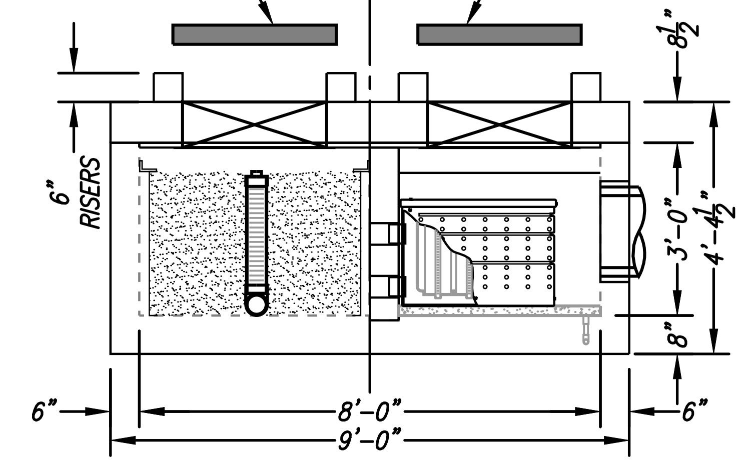
Compact (high rate) Biofiltration BMP Checklist	Form I-10
Section 2: Verification (For City Use Only)	
Is the proposed compact BMP accepted by the City Engineer for onsite pollutant control compliance for the DMA?	○ Yes ○ No, See explanation below
Explanation/reason if the compact BMP is not accepted by the City for onsite pollutant control compliance:	

SITE SPECIFIC DATA

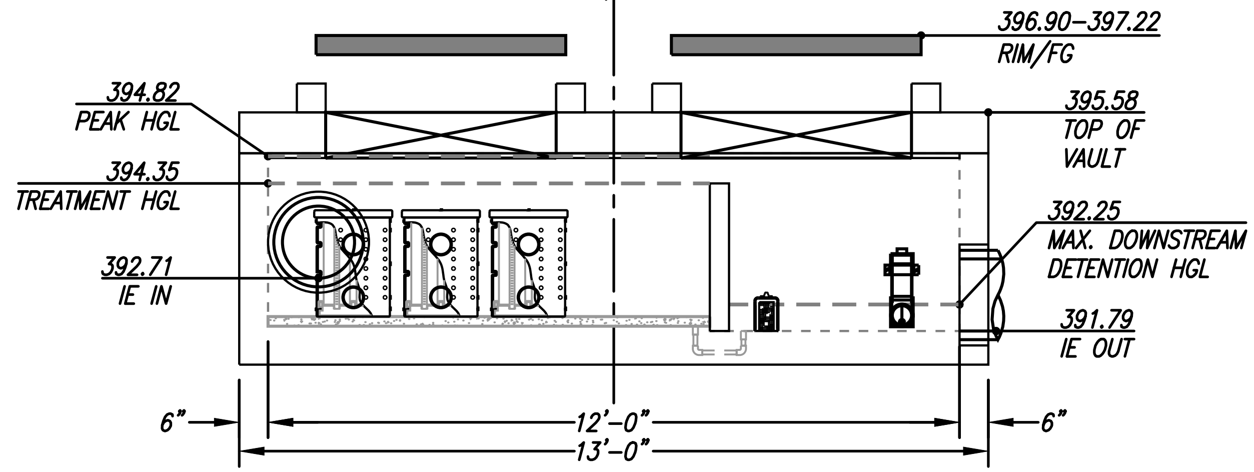
PROJECT NUMBER	12619		
PROJECT NAME	SHARP MMC		
PROJECT LOCATION	SAN DIEGO, CA		
STRUCTURE ID	BMP #6		
TREATMENT REQUIRED			
VOLUME BASED (CF)	FLOW BASED (CFS)		
N/A	0.216		
TREATMENT HGL AVAILABLE (FT)			5.1
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			3.88
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	392.71	TBD	15"
INLET PIPE 2	N/A	N/A	N/A
OUTLET PIPE	391.79	TBD	15"
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION	396.90–397.22	396.90–397.22	396.90–397.22
SURFACE LOAD	PEDESTRIAN	PEDESTRIAN	PEDESTRIAN
FRAME & COVER	30"X48"	30"X48" & ø30"	30"X48"
WETLANDMEDIA VOLUME (CY)			3.80
ORIFICE SIZE (DIA. INCHES)			ø2.36"
NOTES:			



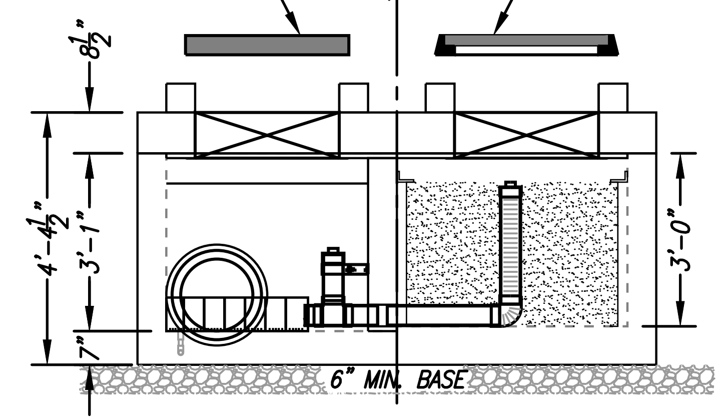
PLAN VIEW



LEFT END VIEW



ELEVATION VIEW



RIGHT END VIEW

INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS' SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATERTIGHT PER MANUFACTURER'S STANDARD CONNECTION DETAIL.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL PIPES, RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. CONTRACTOR RESPONSIBLE FOR CONTACTING BIO CLEAN FOR ACTIVATION OF UNIT. MANUFACTURER'S WARRANTY IS VOID WITHOUT PROPER ACTIVATION BY A BIO CLEAN REPRESENTATIVE.

GENERAL NOTES

1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT BIO CLEAN.

INTERNAL BYPASS DISCLOSURE:

THE DESIGN AND CAPACITY OF THE PEAK CONVEYANCE METHOD TO BE REVIEWED AND APPROVED BY THE ENGINEER OF RECORD. HGL(S) AT PEAK FLOW SHALL BE ASSESSED TO ENSURE NO UPSTREAM FLOODING. PEAK HGL AND BYPASS CAPACITY SHOWN ON DRAWING ARE USED FOR GUIDANCE ONLY.

LOW INFLOW PIPE DISCLOSURE:

IT IS RECOMMENDED THAT A SUFFICIENT VARIATION IN ELEVATION BETWEEN THE INLET AND OUTLET BE PROVIDED TO ALLOW FOR ACCUMULATION OF SEDIMENT IN THE PRE-TREATMENT CHAMBER. FAILURE TO DO SO MAY RESULT IN BLOCKAGE AT INFLOW POINT(S) WHICH MAY CAUSE UPSTREAM FLOODING.

Bio Clean
A Forterra Company

TREATMENT FLOW (CFS)	0.216
OPERATING HEAD (FT)	2.1
PRETREATMENT LOADING RATE (GPM/SF)	1.3
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

MODULAR WETLANDS

THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING US PATENTS: 7,425,262; 7,470,362; 7,674,378; 8,303,816; RELATED FOREIGN PATENTS OR OTHER PATENTS PENDING

MWS-L-8-12-3'-0"-V-UG
STORMWATER BIOFILTRATION SYSTEM STANDARD DETAIL

1/26/22GSCHIPPER

BMP Sizing Spreadsheet V3.1

Project Name:	Sharp MMC - Package 4
Project Applicant:	BWE Inc
Jurisdiction:	City of San Diego
Parcel (APN):	427-530-02-00
Hydrologic Unit:	San Diego
Rain Gauge:	Oceanside
Total Project Area (sf):	50,230
Channel Susceptibility:	High

BMP Sizing Spreadsheet V3.1

Project Name:	Sharp MMC - Package 4	Hydrologic Unit:	San Diego
Project Applicant:	BWE Inc	Rain Gauge:	Oceanside
Jurisdiction:	City of San Diego	Total Project Area:	50,230
Parcel (APN):	427-530-02-00	Low Flow Threshold:	0.1Q2
BMP Name:	BMP #5	BMP Type:	Cistern
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	NA

Areas Draining to BMP						HMP Sizing Factors	Minimum BMP Size
DMA Name	Area (sf)	Pre Project Soil Type	Pre-Project Slope	Post Project Surface Type	Area Weighted Runoff Factor (Table G.2-1)[1]	Volume	Volume (CF)
4	15,973	D	Flat	Roofs	1.0	0.12	1917
4	16,345	D	Flat	Concrete	1.0	0.12	1961
4	11,852	D	Flat	Landscape	0.1	0.12	142
4.1	2,757	D	Flat	Concrete	1.0	0.12	331
4.1	4,361	D	Flat	d Unit Pavers on granular l	0.2	0.12	105
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
BMP Tributary Area	51,288					Minimum BMP Size	4456
						Proposed BMP Size*	4475

* Assumes standard configuration

Standard Cistern Depth (Overflow Elevation)	3.5	ft
Provided Cistern Depth (Overflow Elevation)	3.5	ft
Minimum Required Cistern Footprint)	1273	CF

Notes:

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

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

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

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

BMP Sizing Spreadsheet V3.1

Project Name:	Sharp MMC - Package 4	Hydrologic Unit:	San Diego
Project Applicant:	BWE Inc	Rain Gauge:	Oceanside
Jurisdiction:	City of San Diego	Total Project Area:	50,230
Parcel (APN):	427-530-02-00	Low Flow Threshold:	0.1Q2
BMP Name	BMP #5	BMP Type:	Cistern

DMA Name	Rain Gauge	Pre-developed Condition		Unit Runoff Ratio (cfs/ac)	DMA Area (ac)	Orifice Flow - %Q_2 (cfs)	Orifice Area (in^2)
		Soil Type	Slope				
4	Oceanside	D	Flat	0.571	0.367	0.021	**0.29**
4	Oceanside	D	Flat	0.571	0.375	0.021	**0.30**
4	Oceanside	D	Flat	0.571	0.272	0.016	**0.21**
4.1	Oceanside	D	Flat	0.571	0.063	0.004	**0.05**
4.1	Oceanside	D	Flat	0.571	0.100	0.006	**0.08**

4.00	**0.067**	**0.93**	**1.09**
Max Orifice Head (feet)	**Max Tot. Allowable Orifice Flow (cfs)**	**Max Tot. Allowable Orifice Area (in^2)**	**Max Orifice Diameter (in)**

Provide Hand Calc.	**0.057**	**0.79**	**1.000**
Average outflow during surface drawdown (cfs)	Max Orifice Outflow (cfs)	Actual Orifice Area (in^2)	Selected Orifice Diameter (in)

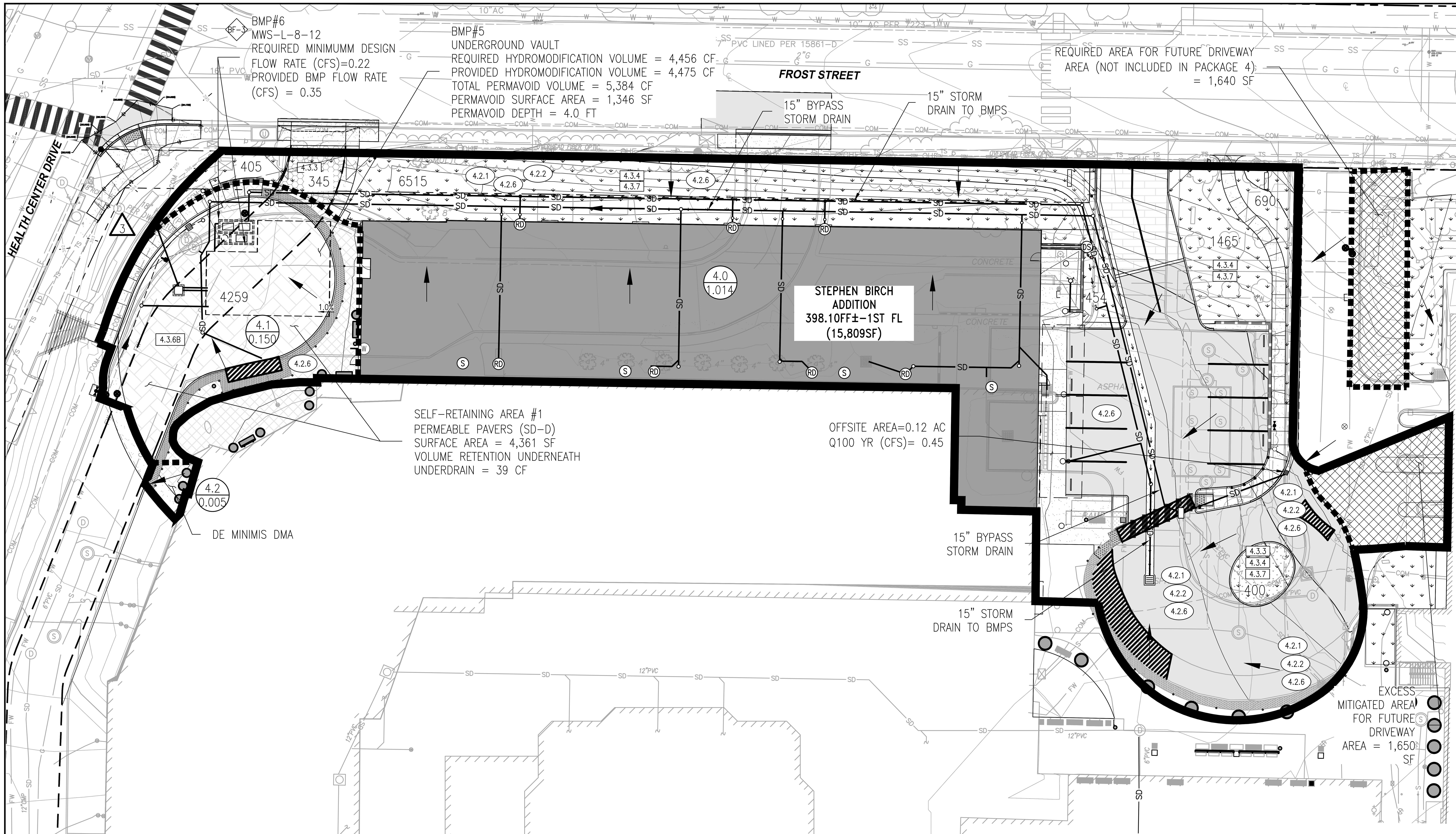
Drawdown (Hrs)	Provide Hand Calculation

Drawdown Time For BMP #5 (Permavoid Structure)

Storage Depth above Orifice Invert (H) =	42	inch	(from hydromodification analysis)
BMP Area (A) =	1,346	sf	(from hydromodification analysis)
Drawdown Volume =	4,475	cf	Volume below invert of bypass pipe

Orifice D :	1	in		.... (from hydromodification analysis)
D/2:	0.5	in		
Orifice Area, A:	0.7854	in^2	0.0055	ft^2
Q :	0.050	cfs		.... Q = Cd . A . {2g (H-D/2}^0.5

Drawdown Time, T (hrs) =	**25.04**	**hours**	.... T (hrs) = (Volume/Q*3600) hrs
	< 96 hrs	**Ok**	



LEGEND

LEGEND	SYMBOL
OUTER DMA BOUNDARY	
MAJOR DMA BOUNDARY	
MINOR DMA BOUNDARY	
EXISTING STORM DRAIN	SD
NEW STORM DRAIN	SD
EXISTING CONTOUR	XXX
NEW CONTOUR	XXX
FLOW DIRECTION	
FLOW PATH	
POINT OF COMPLIANCE (POC)	1
DRAINAGE MANAGEMENT AREA MARKER & AREA (AC)	B-X X.XX
CONCRETE PAVEMENT	
ASPHALT PAVEMENT	
PERMEABLE PAVERS	
EXCESS MITIGATED AREA TO OFFSET REQUIRED AREA FOR FUTURE DRIVEWAY	
REQUIRED AREA FOR FUTURE DRIVEWAY (NOT INCLUDED IN PACKAGE 4)	
PERVIOUS AREA — LANDSCAPE/DIRT AREA	

SWQMP NOTES

1. THE SITE IS COMPRISED OF HYDROLOGIC SOIL TYPE D.
2. NO CRITICAL COARSE SEDIMENT YIELD AREAS ARE PRESENT ON SITE.
3. THERE ARE NO NATURAL HYDROLOGIC FEATURES PRESENT ON SITE.
4. DEPTH TO GROUNDWATER IS UNKNOWN.

STRUCTURAL BMPS:

BF-3 COMPACT BIOFILTRATION BMP

SOURCE CONTROL BMPS:

4.2.1 PREVENTION OF ILLICIT DISCHARGE INTO THE MS4

4.2.6 ADDITIONAL BMPS
- ONSITE STORM DRAIN INLETS,
- INTERIOR FLOOR DRAIN AND ELEVATOR SHAFT PUMPS,
- NEED FOR FUTURE INDOOR & STRUCTURAL PEST CONTROL,
- LANDSCAPE/OUTDOOR PESTICIDE USE,
- FIRE TEST SPRINKLER WATER,
- MISCELLANEOUS DRAIN OR WASH WATER,
- PLAZAS, SIDEWALKS, AND PARKING LOTS

SITE DESIGN BMPS:

4.3.3 MINIMIZE IMPERVIOUS AREA
4.3.4 MINIMIZE SOIL COMPACTION
4.3.6 RUNOFF COLLECTION
4.3.6B PERMEABLE PAVEMENT
4.3.7 LANDSCAPING WITH NATIVE OR DROUGHT TOLERANT SPECIES

DMA AREA DETAILS

DMA ID	TOTAL AREA (AC)	TOTAL AREA (SF)	PERVIOUS AREA (SF)	IMPERVIOUS AREA (SF)	IMPERVIOUS RATIO (%)	VOLUME RETENTION REQUIRED (CF)	VOLUME RETENTION PROVIDED (CF)	NOTES
#4.0	1.014	44170	10274	33896	77	35	0	POLLUTANT CONTROL MITIGATION PROVIDED BY BMP #6, HYDROMODIFICATION MITIGATION PROVIDED BY BMP #5
#4.1	0.150	6540	4361	2179	39	3	39	POLLUTANT CONTROL MITIGATION PROVIDED BY SD-D PERMEABLE PAVEMENT. HYDROMODIFICATION MITIGATION PROVIDED BY BMP #5.
#4.2	0.005	237	0	240	39	0	0	DE MINIMIS AREA.
TOTAL	1.170	50947	14635	36315	71	38	39	–

NOTE:
1) DMA #4.0 ALSO INCLUDES EXCESS AREA OF 1,650 SF
2) EXCESS AREA IS GREATER THAN REQUIRED AREA

VOLUME RETENTION

REQUIRED PER WORKSHEET B.5-2: 38 CF

INFILTRATION RATE = 0.003 IN/HR
MAXIMUM DEPTH (36-HOUR DRAWDOWN TIME): 0.009 FT

VOLUME RETENTION UNDERNEATH PERMEABLE PAVEMENT/VAULT:
4,361 SF X 0.009 FT = 39 CF

PROVIDED PER WORKSHEET B.5-6: 39 CF

SCALE: 1"=20'

BWE
CIVIL·STRUCTURAL·SURVEY·PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

SYM	DESCRIPTION	DATE	APPR

ISSUE DATE:
DRAWN BY:
CHECKED BY:
BWE JOB NUMBER:
CLIENT JOB NUMBER:
MUNICIPALITY PROJECT NUMBER:

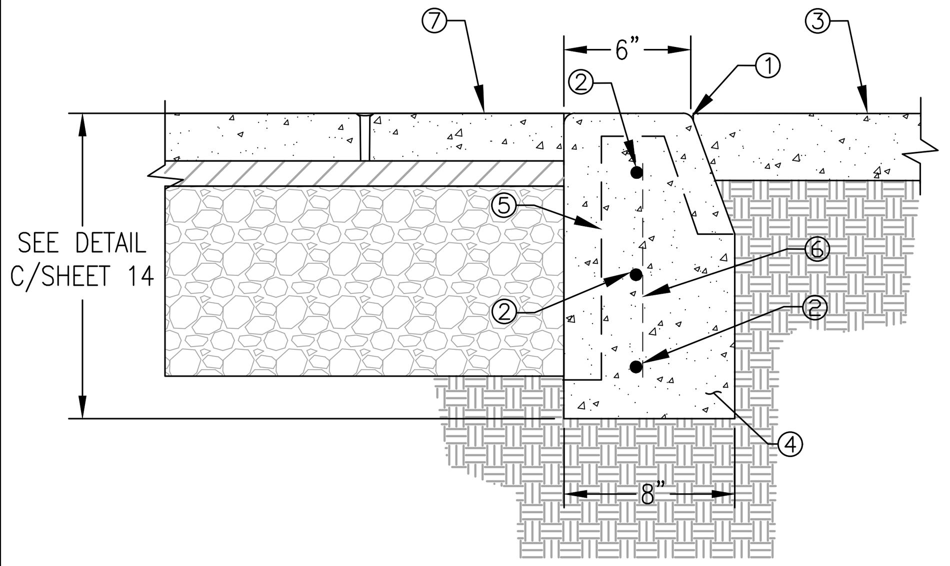
SHEET 1 OF 2

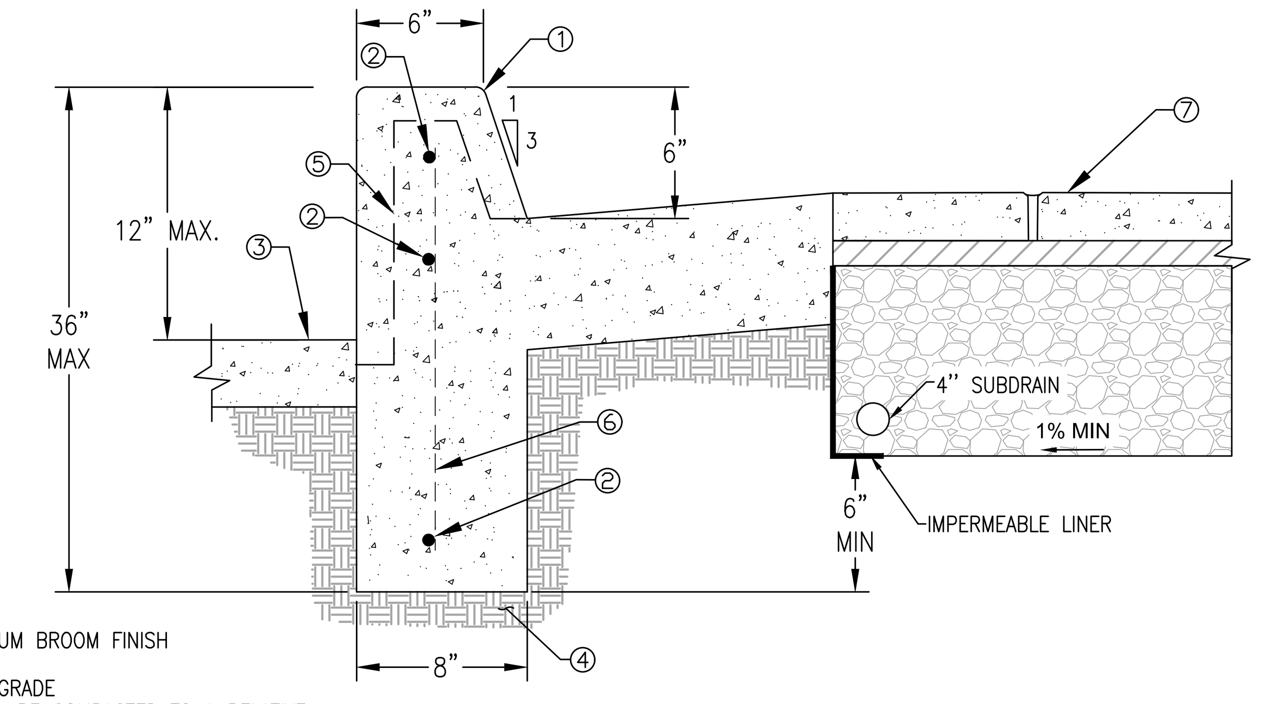
SHEET TITLE: DMA EXHIBIT

PROJECT: SMMC CAMPUS REDEVELOPMENT PACKAGE 4

SITE ADDRESS: 7901 FROST STREET SAN DIEGO, CA 92123

PLOT: M:\PROJECTS\9500\9545U.10.00 SHARP MMC\DWGS\EXHIBITS\SWQMP\PACKAGE 4\9545U.10.00 PK4-DMAS.DWG Mn OC 9/20/2022 10:08 AM





NOTES:
1. ½" TROWELLED EDGES AND MEDIUM BROOM FINISH
2. #4 BAR CONT. (TYP)
3. WALKWAY CONCRETE OR FINISH GRADE
4. UPPER 12" OF SUBGRADE SHALL BE COMPACTED TO A RELATIVE COMPACTION OF 90% OR MORE RELATIVE DENSITY PER ASTM D1557.
5. SCORE JOINT, DEPTH=2 INCHES
6. #4 @18" O.C.
7. PERVIOUS PAVERS PER LANDSCAPE DRAWINGS

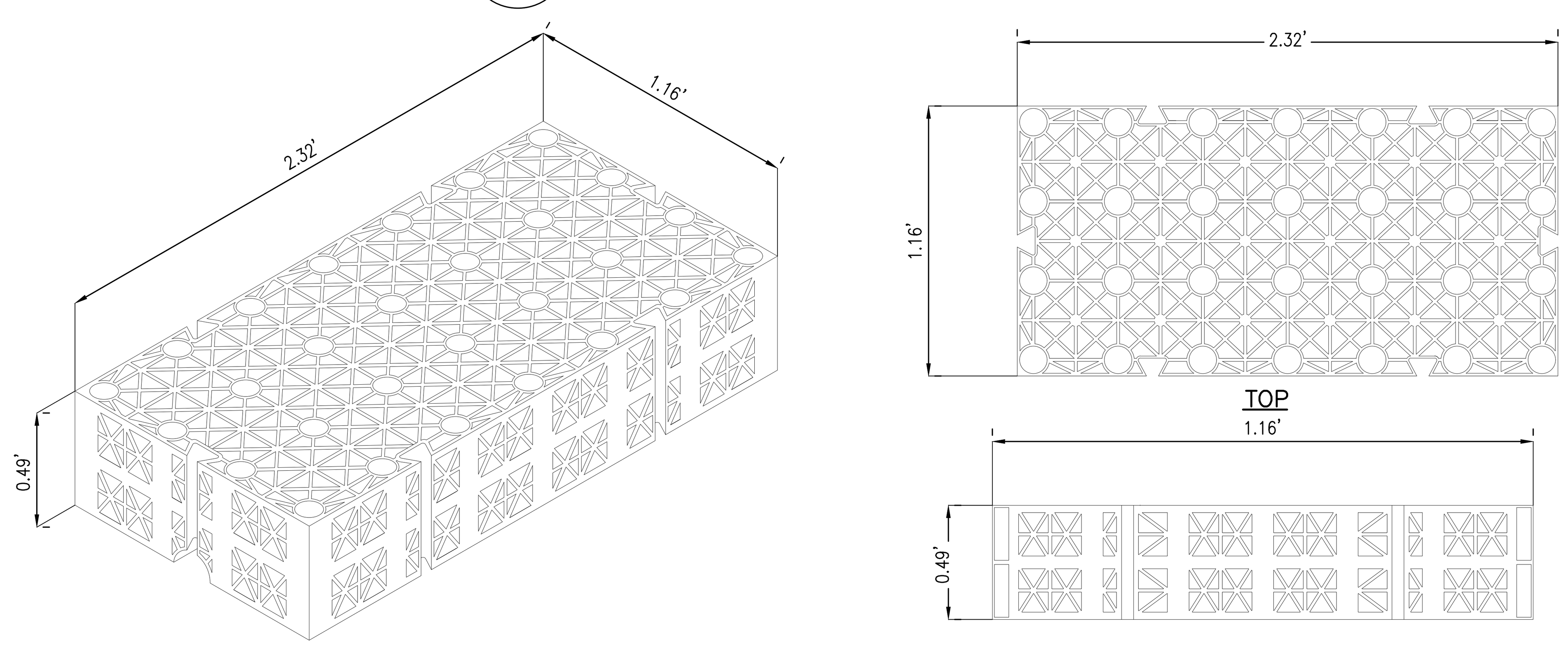
-PROVIDE EXPANSION JOINTS @ 30' O.C. AND SCORE JOINTS @ 10' O.C.
-CONCRETE SHALL BE 520-C-2500

0" DEEPENED CURB

6" DEEPENED CURB AND GUTTER

F — DEEPENED CONCRETE PAVEMENT CURBS

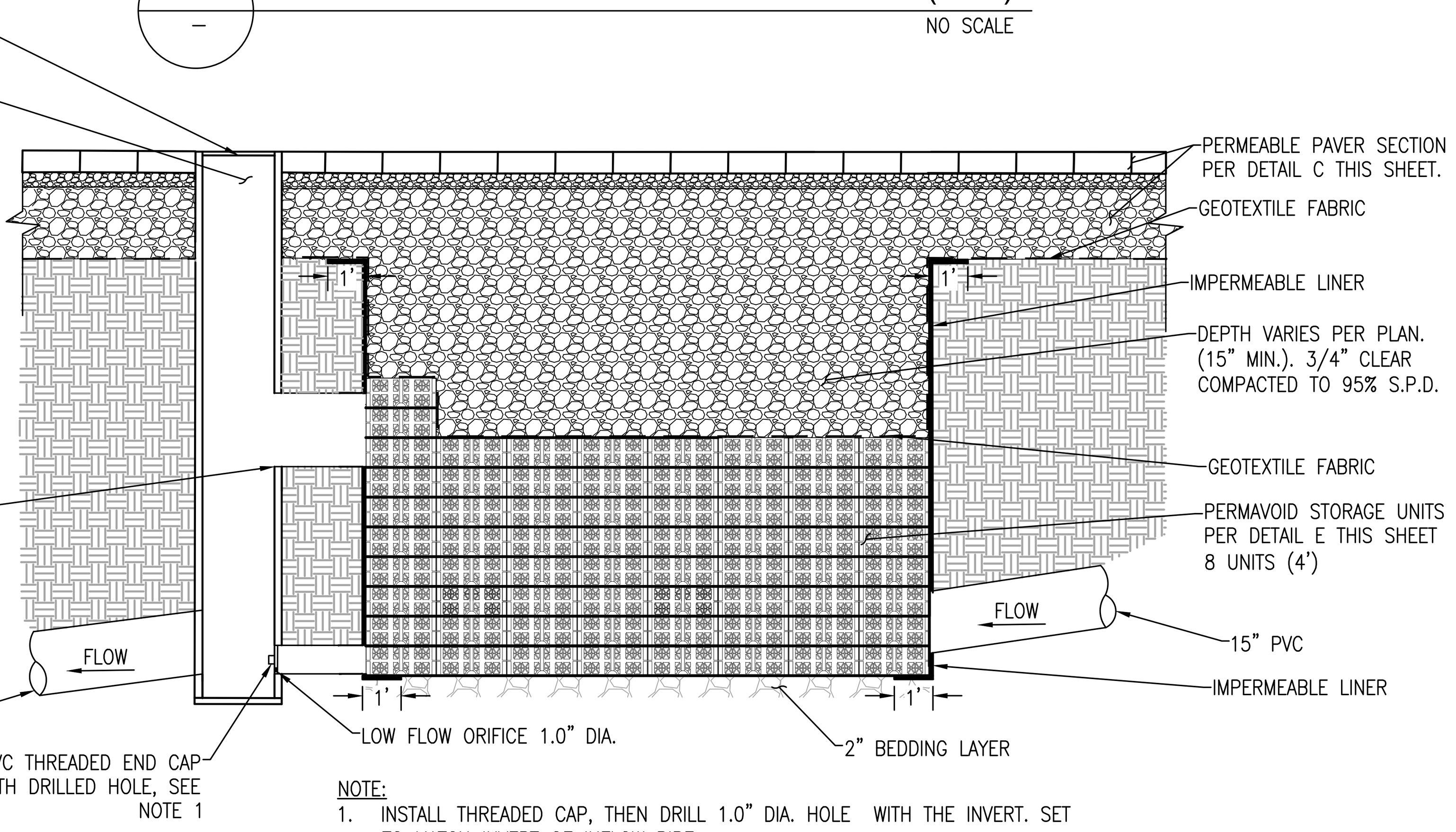
NO SCALE



TYPICAL PERMAVOID-150 SINGLE UNIT

E — PERMAVOID UNDERGROUND STORAGE (PVT)

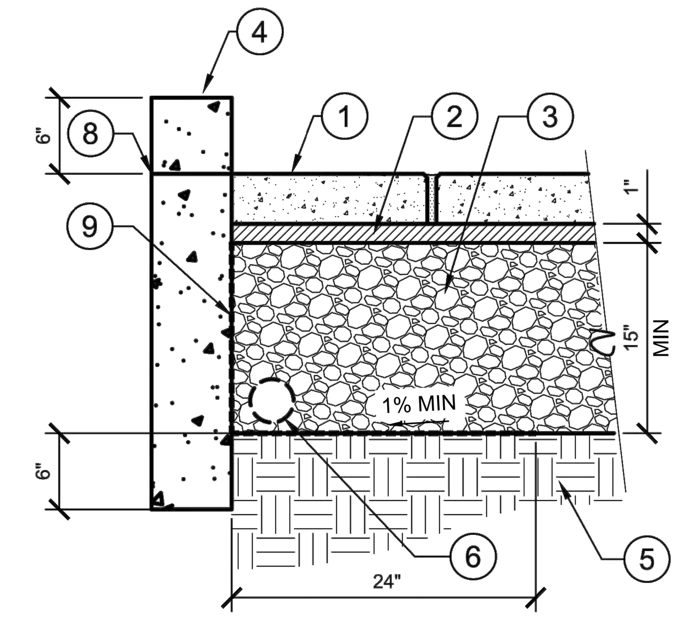
NO SCALE



NOTE:
1. INSTALL THREADED CAP, THEN DRILL 1.0" DIA. HOLE WITH THE INVERT. SET TO MATCH INVERT OF INFLOW PIPE.

D — PERMAVOID UNDERGROUND STORAGE (PVT) BMP #5

NO SCALE



1. "HYDROPAVERS" PERMEABLE PAVER SYSTEM. COLOR AND SIZE PER PLAN MAXIMUM SIZE 6" X 12".
2. 1" MIN. CHOKER COURSE OF 3/8" ANGULAR LIMESTONE WASHED CHIPS (HIGH PERFORMANCE BEDDING)
3. 12" MIN. BASE COURSE OF 3/4" CLEAN, SHARP AGGREGATE. COMPACT TO 95% PER GEOTECH. THICKNESS OF BASE COURSE PER GEOTECH TO ACHIEVE H2O LOADING.
4. 6" RAISED CURB WHERE OCCURS ON PLANS
5. SCARIFY AND COMPACT UPPER 12" OF SUBGRADE TO 90% PER GEOTECHNICAL REPORT
6. 4" PVC PERFORATED PIPE
7. ITEM OMITTED
8. 0" CURB WHERE OCCURS ON PLANS
9. 30 MIL HDPE LINER AT EDGE OF PAVING WHERE ADJACENT TO BUILDING STRUCTURES. EXTEND MINIMUM 24" HORIZONTAL FROM BUILDING FOUNDATION OR CURB.

NOTES:
1. ALL STONE LAYERS MUST BE CLEAN AND FREE OF FINE GRANULAR MATERIAL.
2. PAVERS SHALL BE INSTALLED PER MANUFACTURER SPECIFICATIONS.

C — PERVIOUS PAVERS (PER LANDSCAPE DWGS)

NOT TO SCALE

B — NOT USED

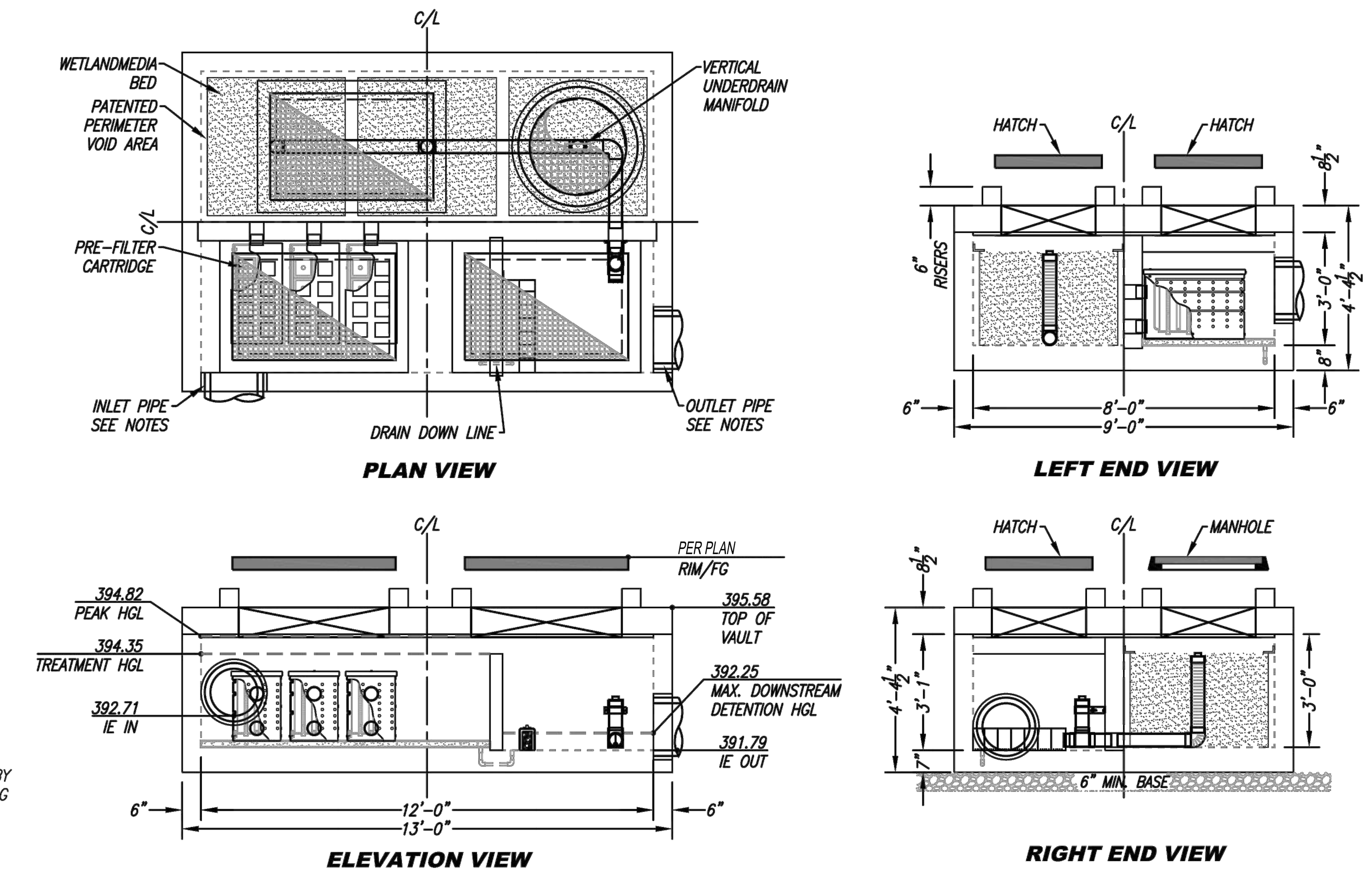
NOT TO SCALE

SITE SPECIFIC DATA

PROJECT NUMBER		12619	
PROJECT NAME		SHARP MMC	
PROJECT LOCATION		SAN DIEGO, CA	
STRUCTURE ID		BMP #6	
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
N/A		0.216	
TREATMENT HGL AVAILABLE (FT)			5.1
PEAK BYPASS REQUIRED (CFS) - IF APPLICABLE			3.88
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	392.71	TBD	15"
INLET PIPE 2	N/A	N/A	N/A
OUTLET PIPE	391.79	TBD	15"
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION	396.90-397.22	396.90-397.22	396.90-397.22
SURFACE LOAD	PEDESTRIAN	PEDESTRIAN	PEDESTRIAN
FRAME & COVER	30"X48"	30"X48" & ⌀30"	30"X48"
WETLANDMEDIA VOLUME (CY)			3.80
ORIFICE SIZE (DIA. INCHES)			⌀2.36"
NOTES:			

INSTALLATION NOTES
1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS' SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATERTIGHT PER MANUFACTURER'S STANDARD CONNECTION DETAIL.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL PIPES, RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. CONTRACTOR RESPONSIBLE FOR CONTACTING BIO CLEAN FOR ACTIVATION OF UNIT. MANUFACTURER'S WARRANTY IS VOID WITHOUT PROPER ACTIVATION BY A BIO CLEAN REPRESENTATIVE.

GENERAL NOTES
1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT BIO CLEAN.



INTERNAL BYPASS DISCLOSURE:
THE DESIGN AND CAPACITY OF THE PEAK CONVEYANCE METHOD TO BE REVIEWED AND APPROVED BY THE ENGINEER OF RECORD. HGL(S) AT PEAK FLOW SHALL BE ASSESSED TO ENSURE NO UPSTREAM FLOODING. PEAK HGL AND BYPASS CAPACITY SHOWN ON DRAWING ARE USED FOR GUIDANCE ONLY.

LOW INFLOW PIPE DISCLOSURE:
IT IS RECOMMENDED THAT A SUFFICIENT VARIATION IN ELEVATION BETWEEN THE INLET AND OUTLET BE PROVIDED TO ALLOW FOR ACCUMULATION OF SEDIMENT IN THE PRE-TREATMENT CHAMBER. FAILURE TO DO SO MAY RESULT IN BLOCKAGE AT INFLOW POINT(S) WHICH MAY CAUSE UPSTREAM FLOODING.

Bio Clean A Forterra Company

TREATMENT FLOW (CFS)	0.216
OPERATING HEAD (FT)	2.1
PRETREATMENT LOADING RATE (GPM/SF)	1.3
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

MWS-L-8-12-3'-0"-V-UG
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

A — MODULAR WETLAND SYSTEM L-8-12 (PVT)

NOT TO SCALE

MICHAEL A. SLAWSON
EXP. 12-31-2022
RCE NO. 56127

REGISTERED PROFESSIONAL ENGINEER — MICHAEL A. SLAWSON — No. 56127 — Exp. 12-31-22 — CIVIL — STATE OF CALIFORNIA
NOT FOR CONSTRUCTION PLAN CHECK APPROVAL

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

PRIVATE CONTRACT

DETAILS FOR:
SMMC CAMPUS REDEVELOPMENT
PACKAGE 4 ED EXPANSION
PARCEL 1 OF PARCEL MAP NO. 5131 AND PORTION OF PUEBLO LOT 1199 OF MISC MAP NO. 36

CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET 14 OF 38 SHEETS

I.O. NO. N/A
PROJECT NO. 694841
V.T.M. N/A

FOR CITY ENGINEER			DATE	
DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	BWE			
AS-BUILTS				

1870-6281
NAD83 COORDINATES
230-1721
LAMBERT COORDINATES

CONTRACTOR ______ DATE STARTED ______
INSPECTOR ______ DATE COMPLETED ______

42503- 14 -D

Project Name:	Sharp MMC - Package 4
Project Applicant:	BWE Inc.
BMP Name:	**BMP #5**

From HMP Analysis (hand calculation method)

Sizing calculations assuming 100% voids

Storage Depth, d (ft)	**4**	Per standard
HMP Volume Depth, d_{hmp} (ft) = d*7/8	**3.5**	
Required HMP Volume @ 3.5' depth, (CF) - V	**4,456**	From HMP Analysis
Void Ratio (100%)	1	
Required Surface area A, (sf) = V/d_{hmp}	**1,273**	
Required Volume @ 4' depth including 0.5' Freeboard	**5,093**	

Permavoid Sizing

Void ratio	0.95	Per Manufacturer
Required gross PV Volume for HMP Control @ 3.5' depth, V1 (cf) = V/0.95	4,691	
Required PV Surface area for HMP control @ 3.5' depth, A1 (sf)=	1,340	
Required gross volume at 4' depth (including 0.5' Freeboard), V2 (cf) = A1*d	**5,361**	
Volume of single unit (cf) = 2.32'*1.16'*0.49'	1.32	
Total units required =	4,065	
Permavoid Area per plan	**1,346**	**>1,340 required**
Net Vol. provided at 3.5' and 0.95 void ratio (cf)	**4,475**	**>4,456 required**
Gross Volume of Permavoid at 4' (cf)	**5,384**	**>5,360 required**

BMP SIZING / CALCULATIONS - PACKAGE 5A
(Permitted/Approved by City, PTS # 694839)-Not A CUP

Project: Sharp MMC 5A New CEP

Entire Site, Disturbed Area (DMA #5A.1,5,6,7,8,9,10A)

Area Weighted Runoff Factor (C)

Surface Type	Area - A (sf)	C - Factor	C X A	Weighted C-Factor
Impervious	75,016	0.90	67,514	
Landscape	15,813	0.10	1,581	
Gravel/DG	0	0.30	0	
Total	**90,829**		**69,096**	**0.761**

2.09 Acres

Project: Sharp MMC 5A New CEP

Entire Site, Disturbed Area (DMA #5A.1,5,6,7,8,9,10A)

Design Capture Volume		Worksheet B.2-1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.58	inches
2	Area tributary to BMP (s)	A=	2.09	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.761	unitless
4	Trees Credit Volume Note: In the SWQMP list the number of trees, size of each tree, amount of soil volume installed for each tree, contributing area to each tree and the inlet opening dimension for each tree.	TCV=	0	cubic-feet
5	Rain barrels Credit Volume Note: In the SWQMP list the number of rain barrels, size of each rain barrel and the use of the captured storm water runoff.	RCV=	0	cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	**DCV=**	**3340**	cubic-feet

Project: Sharp MMC 5A New CEP

<u>BMP #7 (DMA 5.1,#5A.2, #5A.3, #5A.4)</u>

Area Weighted Runoff Factor (C)

Surface Type	Area - A (sf)	C - Factor	C X A	Weighted C-Factor
Impervious	73,544	0.90	66,190	
Landscape	6,530	0.10	653	
Gravel/DG	0	0.30	0	
Total	**80,074**		**66,843**	**0.835**

1.84 Acres

Project: Sharp MMC 5A New CEP

BMP #7 (DMA 5.1,#5A.2, #5A.3, #5A.4)

	Design Capture Volume	Worksheet B.2-1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.58	inches
2	Area tributary to BMP (s)	A=	1.84	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.835	unitless
4	Trees Credit Volume Note: In the SWQMP list the number of trees, size of each tree, amount of soil volume installed for each tree, contributing area to each tree and the inlet opening dimension for each tree.	TCV=	0	cubic-feet
5	Rain barrels Credit Volume Note: In the SWQMP list the number of rain barrels, size of each rain barrel and the use of the captured storm water runoff.	RCV=	0	cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	**DCV=**	**3231**	cubic-feet

MWS Flow Based BMP Sizing

I_{TREAT} = 0.2 in/hr (Intensity of rainfall)

Q_{TREAT} = $C \times I_{TREAT} \times A$ cfs (Treatment flow rate)

Design Flow (cfs) = 1.5* Q_{Treat} (Per Section F.2.2 of Storm Water Standards)

BMP #	DMA		Runoff Coefficient (C)	Q_{TREAT} =	Design Flow (cfs)	BMP Sizing	
	ID #	Area (ac)				MWS Model	Selected BMP's Flow Rate (cfs)
7	#5A.1, #5A.2, #5A.3, #5A.4	1.84	0.84	0.31	0.460	MWS-L-8-16	0.462

Note: All selected modular wetlands treatment flow rates exceed the DMAs' design flow

Model #	Dimensions	WetlandMEDIA Surface Area	Treatment Flow Rate (cfs)
MWS-L-4-4	4' x 4'	23 sq. ft.	0.052
MWS-L-4-6	4' x 6'	32 sq. ft.	0.073
MWS-L-4-8	4' x 8'	50 sq. ft.	0.115
MWS-L-4-13	4' x 13'	63 sq. ft.	0.144
MWS-L-4-15	4' x 15'	76 sq. ft.	0.175
MWS-L-4-17	4' x 17'	90 sq. ft.	0.206
MWS-L-4-19	4' x 19'	103 sq. ft.	0.237
MWS-L-4-21	4' x 21'	117 sq. ft.	0.268
MWS-L-6-8	7' x 9'	64 sq. ft.	0.147
MWS-L-8-8	8' x 8'	100 sq. ft.	0.230
MWS-L-8-12	8' x 12'	151 sq. ft.	0.346
MWS-L-8-16	8' x 16'	201 sq. ft.	0.462
MWS-L-8-20	9' x 21'	252 sq. ft.	0.577
MWS-L-8-24	9' x 25'	302 sq. ft.	0.693

Compact (high rate) Biofiltration BMP Checklist	Form I-10

Compact (high rate) biofiltration BMPs have a media filtration rate greater than 5 in/hr. and a media surface area smaller than 3% of contributing area times adjusted runoff factor. Compact biofiltration BMPs are typically proprietary BMPs that may qualify as biofiltration.

A compact biofiltration BMP may satisfy the pollutant control requirements for a DMA onsite in some cases. This depends on the characteristics of the DMA **and** the performance certification/data of the BMP. If the pollutant control requirements for a DMA are met onsite, then the DMA is not required to participate in an offsite storm water alternative compliance program to meet its pollutant control obligations.

An applicant using a compact biofiltration BMP to meet the pollutant control requirements onsite must complete Section 1 of this form and include it in the PDP SWQMP. A separate form must be completed for each DMA. In instances where the City Engineer does not agree with the applicant's determination, Section 2 of this form will be completed by the City and returned to the applicant.

Section 1: Biofiltration Criteria Checklist (Appendix F)

Refer to Part 1 of the Storm Water Standards to complete this section. When separate forms/worksheets are referenced below, the applicant must also complete these separate forms/worksheets (as applicable) and include in the PDP SWQMP. The criteria numbers below correspond to the criteria numbers in Appendix F.

<table>
<tr><th>Criteria</th><th>Answer</th><th>Progression</th></tr>
<tr><td rowspan="3"><u>Criteria 1 and 3</u>:

What is the infiltration condition of the DMA?

Refer to Section 5.4.2 and Appendix C of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.

Applicant must complete and include the following in the PDP SWQMP submittal to support the feasibility determination:
• Infiltration Feasibility Condition Letter; or
• Worksheet C.4-1: Form I-8A and Worksheet C.4-2: Form I-8B.

Applicant must complete and include all applicable sizing worksheets in the SWQMP submittal</td><td>○ Full Infiltration Condition</td><td>Stop. Compact biofiltration BMP is not allowed.</td></tr>
<tr><td>○ Partial Infiltration Condition</td><td>Compact biofiltration BMP is only allowed, if the target volume retention is met onsite (Refer to Table B.5-1 in Appendix B.5). Use Worksheet B.5-2 in Appendix B.5 to estimate the target volume retention (Note: retention in this context means reduction).

If the required volume reduction is achieved proceed to Criteria 2.

If the required volume reduction is not achieved, compact biofiltration BMP is not allowed. Stop.</td></tr>
<tr><td>◉ No Infiltration Condition</td><td>Compact biofiltration BMP is allowed if volume retention criteria in Table B.5-1 in Appendix B.5 for the no infiltration condition is met. Compliance with this criterion must be documented in the PDP SWQMP.

If the criteria in Table B.5-1 is met proceed to Criteria 2.

If the criteria in Table B.5-1 is not met, compact biofiltration BMP is not allowed. Stop.</td></tr>
</table>

Compact (high rate) Biofiltration BMP Checklist	Form I-10

Provide basis for Criteria 1 and 3:

Feasibility Analysis:

Summarize findings and include either infiltration feasibility condition letter or Worksheet C.4-1: Form I-8A and Worksheet C.4-2: Form I-8B in the PDP SWQMP submittal.

If Partial Infiltration Condition:

Provide documentation that target volume retention is met (include Worksheet B.5-2 in the PDP SWQMP submittal). Worksheet B.5-7 in Appendix B.5 can be used to estimate volume retention benefits from landscape areas.

If No Infiltration Condition:

Provide documentation that the volume retention performance standard is met (include Worksheet B.5-2 in the PDP SWQMP submittal) in the PDP SWQMP submittal. Worksheet B.5-6 in Appendix B.5 can be used to document that the performance standard is met.

Volume retention requirements have been met through landscape areas with amended soil and storage below the underground storage vault outlet (BMP #8). Worksheets have been provided in this Attachment.

Criteria	Answer	Progression
Criteria 2: Is the compact biofiltration BMP sized to meet the performance standard from the MS4 Permit? Refer to Appendix B.5 and Appendix F.2 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	◉ Meets Flow based Criteria	Use guidance from **Appendix F.2.2** to size the compact biofiltration BMP to meet the flow based criteria. Include the calculations in the PDP SWQMP. Use parameters for sizing consistent with manufacturer guidelines and conditions of its third party certifications (i.e. a BMP certified at a loading rate of 1 gpm/sq. ft. cannot be designed using a loading rate of 1.5 gpm/sq. ft.) **Proceed to Criteria 4.**
	○ Meets Volume based Criteria	Provide documentation that the compact biofiltration BMP has a total static (i.e. non-routed) storage volume, including pore-spaces and pre-filter detention volume (Refer to Appendix B.5 for a schematic) of at least 0.75 times the portion of the DCV not reliably retained onsite. **Proceed to Criteria 4.**
	○ Does not Meet either criteria	**Stop**. Compact biofiltration BMP is not allowed.

Compact (high rate) Biofiltration BMP Checklist	Form I-10

Provide basis for Criteria 2:

Provide documentation that the BMP meets the numeric criteria and is designed consistent with the manufacturer guidelines and conditions of its third-party certification (i.e., loading rate, etc., as applicable).

MWS Linear BMPs are designed by utilizing the treatment flow sizing table given in the manufacturer's guidelines. These proprietary BMPs are designed as flow based BMPs according to the section F.2.2 of the storm water standards as follows;

- The treatment runoff rate is determined by using 0.2 in/hr uniform intensity precipitation event.
- The calculated flow rate is multiplied by 1.5 to compute the design flow rate for the BMP.
- Appropriate size is selected from the sizing table to treat the design flow rate.

Criteria	Answer	Progression
Criteria 4: Does the compact biofiltration BMP meet the pollutant treatment performance standard for the projects most significant pollutants of concern? Refer to Appendix B.6 and Appendix F.1 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	◉ Yes, meets the TAPE certification.	Provide documentation that the compact BMP has an appropriate TAPE certification for the projects most significant pollutants of concern. **Proceed to Criteria 5.**
	○ Yes, through other third-party documentation	Acceptance of third-party documentation is at the discretion of the City Engineer. The City engineer will consider, (a) the data submitted; (b) representativeness of the data submitted; and (c) consistency of the BMP performance claims with pollutant control objectives in Table F.1-2 and Table F.1-1 while making this determination. If a compact biofiltration BMP is not accepted, a written explanation/ reason will be provided in Section 2. **Proceed to Criteria 5.**
	○ No	**Stop**. Compact biofiltration BMP is not allowed.

Provide basis for Criteria 4:

Provide documentation that identifies the projects most significant pollutants of concern and TAPE certification or other third party documentation that shows that the compact biofiltration BMP meets the pollutant treatment performance standard for the projects most significant pollutants of concern.

Refer to the attached performance summary and TAPE certification for details.

Compact (high rate) Biofiltration BMP Checklist		Form I-10
Criteria	**Answer**	**Progression**
<u>Criteria 5</u>: Is the compact biofiltration BMP designed to promote appropriate biological activity to support and maintain treatment process? Refer to Appendix F of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	◉ Yes	Provide documentation that the compact biofiltration BMP support appropriate biological activity. Refer to Appendix F for guidance. **Proceed to Criteria 6.**
	○ No	**Stop**. Compact biofiltration BMP is not allowed.

Provide basis for Criteria 5:

Provide documentation that appropriate biological activity is supported by the compact biofiltration BMP to maintain treatment process.

See attached TAPE certification for details.

Criteria	**Answer**	**Progression**
<u>Criteria 6</u>: Is the compact biofiltration BMP designed with a hydraulic loading rate to prevent erosion, scour and channeling within the BMP?	◉ Yes	Provide documentation that the compact biofiltration BMP is used in a manner consistent with manufacturer guidelines and conditions of its third-party certification. **Proceed to Criteria 7.**
	○ No	**Stop**. Compact biofiltration BMP is not allowed.

Provide basis for Criteria 6:

Provide documentation that the BMP meets the numeric criteria and is designed consistent with the manufacturer guidelines and conditions of its third-party certification (i.e., maximum tributary area, maximum inflow velocities, etc., as applicable).

Refer to loading Rates in TAPE certification. Rates are given based on a per gallon flow rate. It is a self-contained bio filter that has a controlled discharge thus there is no scouring and channeling within the BMP. Refer to basis for criteria 2 for design guidelines.

Compact (high rate) Biofiltration BMP Checklist		Form I-10
Criteria	**Answer**	**Progression**
Criteria 7: Is the compact biofiltration BMP maintenance plan consistent with manufacturer guidelines and conditions of its third-party certification (i.e., maintenance activities, frequencies)?	◉ Yes, and the compact BMP is privately owned, operated and not in the public right of way.	Submit a maintenance agreement that will also include a statement that the BMP will be maintained in accordance with manufacturer guidelines and conditions of third-party certification. **Stop**. The compact biofiltration BMP meets the required criteria.
	○ Yes, and the BMP is either owned or operated by the City or in the public right of way.	Approval is at the discretion of the City Engineer. The city engineer will consider maintenance requirements, cost of maintenance activities, relevant previous local experience with operation and maintenance of the BMP type, ability to continue to operate the system in event that the vending company is no longer operating as a business or other relevant factors while making the determination. **Stop**. Consult the City Engineer for a determination.
	○ No	**Stop**. Compact biofiltration BMP is not allowed.

Provide basis for Criteria 7:

Include copy of manufacturer guidelines and conditions of third-party certification in the maintenance agreement. PDP SWQMP must include a statement that the compact BMP will be maintained in accordance with manufacturer guidelines and conditions of third-party certification.

Manufacturer guidelines are included in Attachment 3.

Compact (high rate) Biofiltration BMP Checklist	Form I-10
Section 2: Verification (For City Use Only)	
Is the proposed compact BMP accepted by the City Engineer for onsite pollutant control compliance for the DMA?	○ Yes ○ No, See explanation below
Explanation/reason if the compact BMP is not accepted by the City for onsite pollutant control compliance:	

BMP Sizing Spreadsheet V3.1

Project Name:	Sharp MMC - Package 5A
Project Applicant:	BWE Inc
Jurisdiction:	City of San Diego
Parcel (APN):	427-530-02-00
Hydrologic Unit:	San Diego
Rain Gauge:	Oceanside
Total Project Area (sf):	91,249
Channel Susceptibility:	High

BMP Sizing Spreadsheet V3.1

Project Name:	Sharp MMC - Package 5A	Hydrologic Unit:	San Diego
Project Applicant:	BWE Inc	Rain Gauge:	Oceanside
Jurisdiction:	City of San Diego	Total Project Area:	91,249
Parcel (APN):	427-530-02-00	Low Flow Threshold:	0.1Q2
BMP Name:	BMP #8	BMP Type:	Cistern
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	NA

Areas Draining to BMP						HMP Sizing Factors	Minimum BMP Size
DMA Name	Area (sf)	Pre Project Soil Type	Pre-Project Slope	Post Project Surface Type	Area Weighted Runoff Factor (Table G.2-1)[1]	Volume	Volume (CF)
5A.1	24,046	D	Flat	Roofs	1.0	0.12	2886
5A.1	44,475	D	Flat	Concrete	1.0	0.12	5337
5A.1	6,530	D	Flat	Landscape	0.1	0.12	78
5A.2	2,657	D	Flat	Concrete	1.0	0.12	319
5A.3	1,654	D	Flat	Concrete	1.0	0.12	198
5A.4	712	D	Flat	Concrete	1.0	0.12	85
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
BMP Tributary Area	80,074					Minimum BMP Size	8904
						Proposed BMP Size*	8934

* Assumes standard configuration

Standard Cistern Depth (Overflow Elevation)	3.5	ft
Provided Cistern Depth (Overflow Elevation)	3.5	ft
Minimum Required Cistern Footprint)	2544	CF

Notes:

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

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

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

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

BMP Sizing Spreadsheet V3.1			
Project Name:	Sharp MMC - Package 5A	Hydrologic Unit:	San Diego
Project Applicant:	BWE Inc	Rain Gauge:	Oceanside
Jurisdiction:	City of San Diego	Total Project Area:	91,249
Parcel (APN):	427-530-02-00	Low Flow Threshold:	0.1Q2
BMP Name	BMP #8	BMP Type:	Cistern

DMA Name	Rain Gauge	Pre-developed Condition		Unit Runoff Ratio (cfs/ac)	DMA Area (ac)	Orifice Flow - %Q_2 (cfs)	Orifice Area (in^2)
		Soil Type	Slope				
5A.1	Oceanside	D	Flat	0.571	0.552	0.032	**0.47**
5A.1	Oceanside	D	Flat	0.571	1.021	0.058	**0.86**
5A.1	Oceanside	D	Flat	0.571	0.150	0.009	**0.13**
5A.2	Oceanside	D	Flat	0.571	0.061	0.003	**0.05**
5A.3	Oceanside	D	Flat	0.571	0.038	0.002	**0.03**
5A.4	Oceanside	D	Flat	0.571	0.016	0.001	**0.01**

3.50	**0.105**	**1.55**	**1.40**
Max Orifice Head (feet)	**Max Tot. Allowable Orifice Flow (cfs)**	**Max Tot. Allowable Orifice Area (in^2)**	**Max Orifice Diameter (in)**

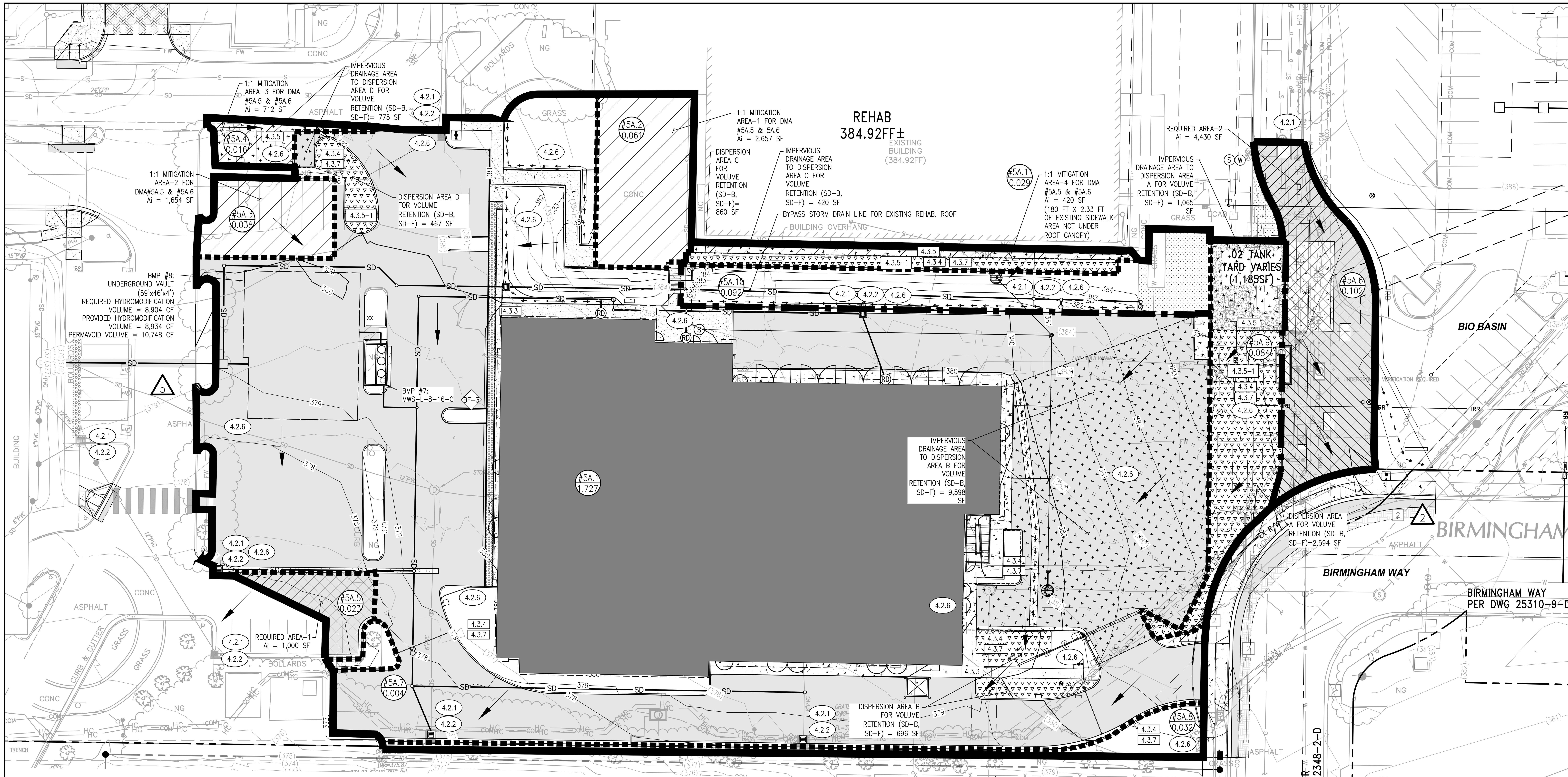
Provide Hand Calc.	**0.097**	**1.43**	**1.350**
Average outflow during surface drawdown (cfs)	Max Orifice Outflow (cfs)	Actual Orifice Area (in^2)	Selected Orifice Diameter (in)

Drawdown (Hrs)	Provide Hand Calculation

Project Name:	Sharp MMC - Package 5A
Project Applicant:	BWE Inc.
BMP Name:	BMP #8

BMP Sizing

Hydromod Volume (CF)	8904
Permavoid Hydromod Volume, 95% void (CF)	9372
Minimum Surface Area (depth = 4.0') (SF)	2678
Provided Surface Area (SF)	2687
Provided Hydromod Volume (SFx 3.5' x 95% volume efficiency), CF	8934
Total Permavoid BMP Volume, CF	10748



DMA AREA DETAILS

DMA ID	TOTAL AREA (AC)	TOTAL AREA (SF)	PERVIOUS AREA (SF)	IMPERVIOUS AREA (SF)	IMPERVIOUS RATIO (%)	VOLUME RETENTION REQUIRED (CF)	VOLUME RETENTION PROVIDED (CF)	NOTES
#5A.1	1.727	75216	6695	68521	91	69	44	POLLUTANT CONTROL AND HMP MITIGATED BY BMP#7 & #8
#5A.2	0.061	2657	0	2657	100	0	0	UNDISTURBED AREA. 1:1 MITIGATION AREA FOR DMA #5A.5 & #5A.6. POLLUTANT CONTROL AND HMP MITIGATED BY BMP#7 & #8
#5A.3	0.038	1654	0	1654	100	0	0	UNDISTURBED AREA. 1:1 MITIGATION AREA FOR DMA #5A.5 & #5A.6. POLLUTANT CONTROL AND HMP MITIGATED BY BMP#7 & #8
#5A.4	0.016	712	0	712	100	0	0	UNDISTURBED AREA. 1:1 MITIGATION AREA FOR DMA #5A.5 & #5A.6. POLLUTANT CONTROL AND HMP MITIGATED BY BMP#7 & #8
#5A.5	0.023	1000	0	1000	100	1	0	BYPASS AREA. 1:1 MITIGATION TREATMENT PROVIDED FOR DMA #5A.2,#5A.3, #5A.4, #5A.11
#5A.6	0.102	4430	0	4430	100	4	0	BYPASS AREA. 1:1 MITIGATION TREATMENT PROVIDED FOR DMA #5A.2,#5A.3, #5A.4, #5A.11
#5A.7	0.006	280	280	0	0	0	0	SELF-MITIGATING AREA.
#5A.8	0.032	1394	1394	0	0	1	0	SELF-MITIGATING AREA.
#5A.9	0.084	3659	2594	1065	29	1	26	SELF-RETAINING AREA. 1:2.4 IMPERVIOUS DRAINAGE AREA TO PERVIOUS AREA DISPERSION AREA WITH 11 INCHES OF AMENDED SOILS. HMP MITIGATED PER FACT SHEET SD-B.
#5A.10	0.092	3990	3990	0	0	0	0	SELF-MITIGATING AREA.
#5A.11	0.029	1280	860	420	100	0	10	UNDISTURBED IMPERVIOUS AREA. 1:1 MITIGATION AREA FOR DMA #5A.5 & #5A.6. SELF-RETAINING AREA. 1:2 IMPERVIOUS DRAINAGE AREA TO PERVIOUS AREA DISPERSION AREA WITH 11 INCHES OF AMENDED SOILS. HMP MITIGATED PER FACT SHEET SD-B.

IMPERVIOUS DRAINAGE AREAS TO PERVIOUS DISPERSION AREAS WITH AMENDED SOILS FOR VOLUME RETENTION

DISPERSION AREA	PERVIOUS DISPERSION AREA WITH AMENDED SOILS (SF)	IMPERVIOUS DRAINAGE AREA (SF)	DISPERSION RATIO (0.25-50.00 ACCEPTABLE)	VOLUME RETENTION PROVIDED (CF)
A	2594	1065	0.41	26.2
B	696	9598	13.79	26.2
C	860	420	2.05	10.0
D	467	775	12.47	17.7

VOLUME RETENTION

REQUIRED PER WORKSHEET B.5-2: 77 CF

PROVIDED PER WORKSHEET B.5-6: 80 CF

SWQMP NOTES

1. THE SITE IS COMPRISED OF HYDROLOGIC SOIL TYPE D.
2. NO CRITICAL COARSE SEDIMENT YIELD AREAS ARE PRESENT ON SITE.
3. THERE ARE NO NATURAL HYDROLOGIC FEATURES PRESENT ON SITE.
4. GROUNDWATER DEPTH GREATER THAN 20 FEET.

1:1 MITIGATION AREAS

REQUIRED TREATMENT AREAS, DISTURBED AREAS WITHOUT POLLUTANT AND HMP CONTROL ON-SITE
DMA #5A.5: 1,000 SF IMPERVIOUS
DMA #5A.6: 4,430 SF IMPERVIOUS
TOTAL: 5,430 SF IMPERVIOUS

1:1 MITIGATION AREAS, UNDISTURBED AREAS WITH POLLUTANT AND HMP CONTROL ON-SITE
DMA #5A.2: 2,657 SF IMPERVIOUS
DMA #5A.3: 1,654 SF IMPERVIOUS
DMA #5A.4: 712 SF IMPERVIOUS
DMA #5A.11: 420 SF IMPERVIOUS
TOTAL: 5,443 SF IMPERVIOUS

STRUCTURAL BMPS:

BF-3 COMPACT BIOFILTRATION BMP

SOURCE CONTROL BMPS:

- 4.2.1 PREVENTION OF ILLICIT DISCHARGE INTO THE MS4
- 4.2.2 STORM DRAIN STENCILING OR SIGNAGE
- 4.2.6 ADDITIONAL BMPS
  - ONSITE STORM DRAIN INLETS,
  - INTERIOR FLOOR DRAIN AND ELEVATOR SHAFT SUMP PUMPS
  - INTERIOR PARKING GARAGES
  - NEED FOR FUTURE INDOOR & STRUCTURAL PEST CONTROL
  - LANDSCAPE/OUTDOOR PESTICIDE USE
  - FIRE SPRINKLER TEST WATER
  - MISCELLANEOUS DRAIN OR WASH WATER
  - PLAZAS, SIDEWALKS, AND PARKING LOTS

SITE DESIGN BMPS:

- 4.3.3 MINIMIZE IMPERVIOUS AREA
- 4.3.4 MINIMIZE SOIL COMPACTION
- 4.3.5 IMPERVIOUS AREA DISPERSION
- 4.3.5-1 PERVIOUS AREA RECEIVING RUNOFF FROM IMPERVIOUS AREA
- 4.3.7 LANDSCAPING WITH NATIVE OR DROUGHT TOLERANT SPECIES

LEGEND

	SYMBOL
OUTER DMA BOUNDARY	
MAJOR DMA BOUNDARY	
MINOR DMA BOUNDARY	
EXISTING STORM DRAIN	SD
NEW STORM DRAIN	SD
EXISTING CONTOUR	XXX
NEW CONTOUR	XXX
FLOW DIRECTION	
FLOW PATH	
POINT OF COMPLIANCE (POC)	1
DRAINAGE MANAGEMENT AREA MARKER & AREA (AC)	B-X X.XX
BYPASS AREA. OFFSET BY MITIGATION PROVIDED FOR 1:1 MITIGATION AREAS	
1:1 MITIGATION AREAS (UNDISTURBED AREA TREATED BY PROPOSED BMPS).	
IMPERVIOUS AREA DISPERSING PERVIOUS DISPERSION AREAS.	
PERVIOUS AREA WITH 11" MIN. OF AMENDED SOILS MEETING SD-B AND SD-F FACT SHEET CRITERIA.	

PROJECT: SWMMC CAMPUS REDEVELOPMENT PACKAGE 5A. NEW CEP

SITE ADDRESS: 7901 FROST STREET SAN DIEGO, CA 92123

SHEET TITLE: DMA EXHIBIT

ISSUE DATE:
DRAWN BY:
CHECKED BY:
BWE JOB NUMBER:
CLIENT JOB NUMBER:
MUNICIPALITY PROJECT NUMBER:

SHEET OF

SYM	DESCRIPTION	DATE	APPR

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

BMP SIZING / CALCULATIONS - PACKAGE 1A
(NOT A CITY REVIEW PACKAGE)
Biofiltration BMP #1

Project: Sharp MMC Package 1B

BMP #1 (Biofiltration Basin)

Area Weighted Runoff Factor (C)

Surface Type	Area - A (sf)	C - Factor	C X A	Weighted C-Factor
Impervious	5,920	0.90	5,328	
Landscape	1,038	0.10	104	
Gravel/DG	1,930	0.30	579	
Total	**8,888**		**6,011**	**0.676**

0.20 Acres

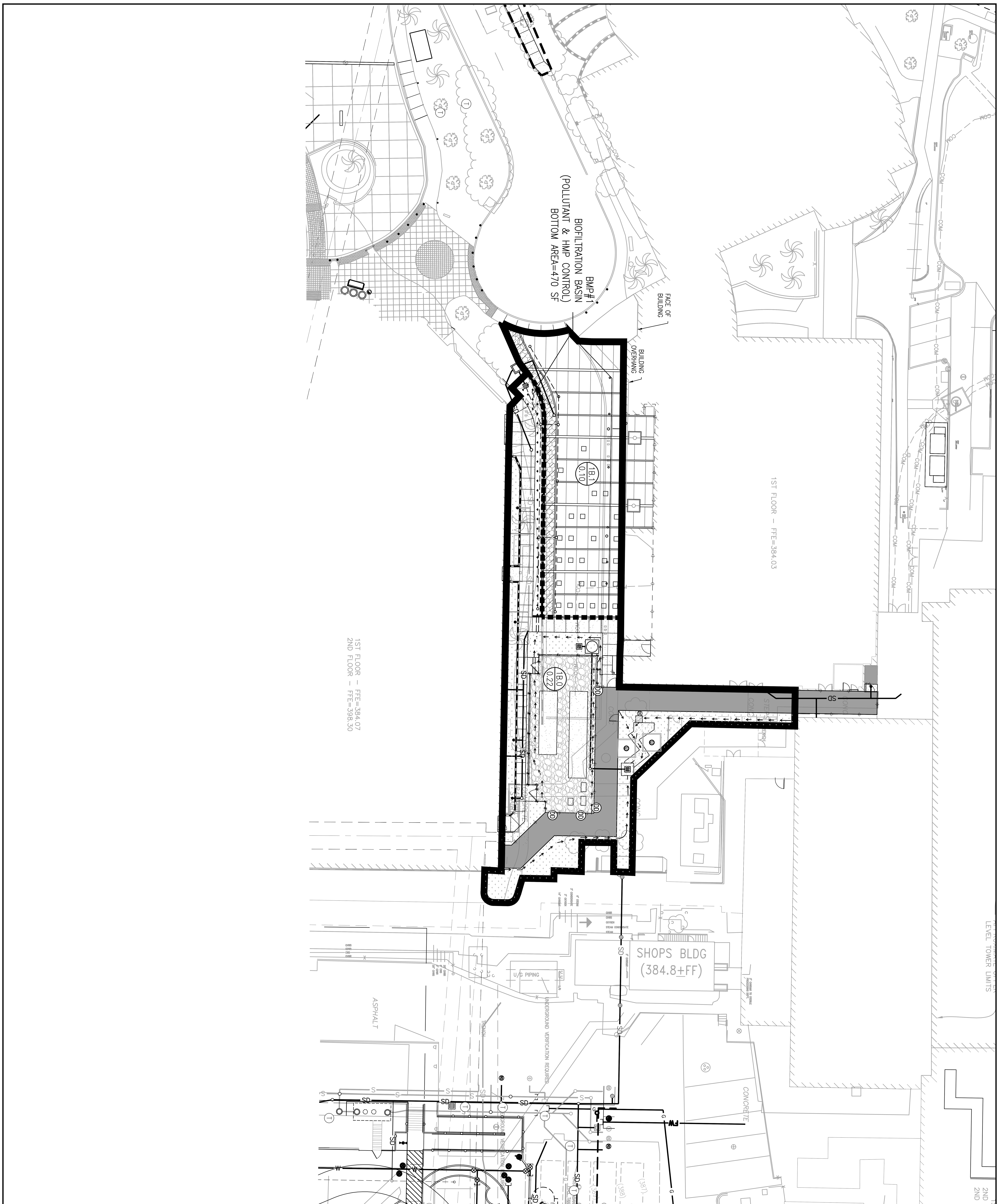
Project: Sharp MMC Package 1B

BMP #1 (Biofiltration Basin)

	Design Capture Volume	Worksheet B.2-1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.58	inches
2	Area tributary to BMP (s)	A=	0.20	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.676	unitless
4	Trees Credit Volume Note: In the SWQMP list the number of trees, size of each tree, amount of soil volume installed for each tree, contributing area to each tree and the inlet opening dimension for each tree.	TCV=	0	cubic-feet
5	Rain barrels Credit Volume Note: In the SWQMP list the number of rain barrels, size of each rain barrel and the use of the captured storm water runoff.	RCV=	0	cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	**DCV=**	**291**	cubic-feet

The City of SAN DIEGO	Project Name	Sharp MMC Package 1B	
	BMP ID	BMP #1	
Sizing Method for Pollutant Removal Criteria		**Worksheet B.5-1**	
1	Area draining to the BMP	8,888	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)	0.676	
3	85th percentile 24-hour rainfall depth	0.58	inches
4	Design capture volume [Line 1 x Line 2 x (Line 3/12)]	290	cu. ft.
BMP Parameters			
5	Surface ponding [6 inch minimum, 12 inch maximum]	12	inches
6	Media thickness [18 inches minimum], also add mulch layer and washed ASTM 33 fine aggregate sand thickness to this line for sizing calculations	21	inches
7	Aggregate storage (also add ASTM No 8 stone) above underdrain invert (12 inches typical) – use 0 inches if the aggregate is not over the entire bottom surface area	15	inches
8	Aggregate storage below underdrain invert (3 inches minimum) – use 0 inches if the aggregate is not over the entire bottom surface area	3	inches
9	Freely drained pore storage of the media	0.2	in/in
10	Porosity of aggregate storage	0.4	in/in
11	Media filtration rate to be used for sizing (maximum filtration rate of 5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate (includes infiltration into the soil and flow rate through the outlet structure) which will be less than 5 in/hr.)	0.62	in/hr.
Baseline Calculations			
12	Allowable routing time for sizing	6	hours
13	Depth filtered during storm [Line 11 x Line 12]	3.72	inches
14	Depth of Detention Storage [Line 5 + (Line 6 x Line 9) + (Line 7 x Line 10) + (Line 8 x Line 10)]	23.4	inches
15	Total Depth Treated [Line 13 + Line 14]	27.12	inches
Option 1 – Biofilter 1.5 times the DCV			
16	Required biofiltered volume [1.5 x Line 4]	436	cu. ft.
17	Required Footprint [Line 16/ Line 15] x 12	193	sq. ft.
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
18	Required Storage (surface + pores) Volume [0.75 x Line 4]	218	cu. ft.
19	Required Footprint [Line 18/ Line 14] x 12	112	sq. ft.
Footprint of the BMP			
20	BMP Footprint Sizing Factor (Default 0.03 or an alternative minimum footprint sizing factor from Line 11 in Worksheet B.5-4)	0.03	
21	Minimum BMP Footprint [Line 1 x Line 2 x Line 20]	180	sq. ft.
22	Footprint of the BMP = Maximum(Minimum(Line 17, Line 19), Line 21)	180	sq. ft.
23	Provided BMP Footprint	470	sq. ft.
24	Is Line 23 ≥ Line 22?	**Yes, Performance Standard is Met**	

PLOT: M:\PROJECTS\9500\9545U.10.00 SHARP MMC\DWGS\EXHIBITS\SWQMP\PACKAGE 1B\9545U.10.00 PK1B-DMAS.DWG Min GC 10/7/2022 8:15 AM



LEGEND

OUTER DMA BOUNDARY

SYMBOL

PROJECT	SHEET TITLE					
SWMMC CAMPUS REDEVELOPMENT PACKAGE 2A.5A. NEW CEP	DMA EXHIBIT	ISSUE DATE:	SYM	DESCRIPTION	DATE	APPR
SITE ADDRESS: 7901 FROST STREET SAN DIEGO, CA 92123	SHEET 1 OF 2	DRAWN BY:				
		CHECKED BY:				
		BWE JOB NUMBER:				
		CLIENT JOB NUMBER:				
		MUNICIPALITY PROJECT NUMBER:				

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

SDHM 3.1

PROJECT REPORT

General Model Information

Project Name:	SMMC Package 1B SDHM_2022-04
Site Name:	Sharp MMC
Site Address:	7901 Frost St
City:	San Diego
Report Date:	5/3/2022
Gage:	FASHIONV
Data Start:	10/01/1968
Data End:	09/30/2004
Timestep:	Hourly
Precip Scale:	1.000
Version Date:	2020/04/07

POC Thresholds

Low Flow Threshold for POC1:	10 Percent of the 2 Year
High Flow Threshold for POC1:	10 Year

Landuse Basin Data
Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
D,NatVeg,Flat	0.32
Pervious Total	0.32
Impervious Land Use	acre
Impervious Total	0
Basin Total	0.32

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
D,UrbNoIrr,Flat	0.03
D,Urban,Flat	0.08
Pervious Total	0.11
Impervious Land Use	acre
IMPERVIOUS-FLAT	0.1
Impervious Total	0.1
Basin Total	0.21

Element Flows To:

Surface	Interflow	Groundwater
Surface Biofilter 1	Surface Biofilter 1	

Routing Elements

Predeveloped Routing

Mitigated Routing

Biofilter 1

Bottom Length:	124.50 ft.
Bottom Width:	3.50 ft.
Material thickness of first layer:	0.25
Material type for first layer:	Mulch
Material thickness of second layer:	1.75
Material type for second layer:	ESM
Material thickness of third layer:	1.75
Material type for third layer:	GRAVEL
Underdrain used	
Underdrain Diameter (feet):	0.5
Orifice Diameter (in.):	0.6
Offset (in.):	9
Flow Through Underdrain (ac-ft.):	2.532
Total Outflow (ac-ft.):	2.728
Percent Through Underdrain:	92.82

Discharge Structure
Riser Height: 0.67 ft.
Riser Diameter: 6 in.
Element Flows To:
Outlet 1 Outlet 2

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0100	0.0000	0.0000	0.0000
0.0504	0.0100	0.0002	0.0000	0.0000
0.1008	0.0100	0.0003	0.0000	0.0000
0.1512	0.0100	0.0005	0.0000	0.0000
0.2016	0.0100	0.0006	0.0000	0.0000
0.2520	0.0100	0.0008	0.0000	0.0000
0.3024	0.0100	0.0009	0.0000	0.0000
0.3528	0.0100	0.0011	0.0000	0.0000
0.4032	0.0100	0.0012	0.0000	0.0000
0.4536	0.0100	0.0014	0.0000	0.0000
0.5040	0.0100	0.0015	0.0000	0.0000
0.5544	0.0100	0.0017	0.0000	0.0000
0.6047	0.0100	0.0018	0.0000	0.0000
0.6551	0.0100	0.0020	0.0000	0.0000
0.7055	0.0100	0.0021	0.0000	0.0000
0.7559	0.0100	0.0023	0.0000	0.0000
0.8063	0.0100	0.0024	0.0000	0.0000
0.8567	0.0100	0.0026	0.0000	0.0000
0.9071	0.0100	0.0027	0.0000	0.0000
0.9575	0.0100	0.0029	0.0000	0.0000
1.0079	0.0100	0.0030	0.0000	0.0000
1.0583	0.0100	0.0032	0.0000	0.0000
1.1087	0.0100	0.0033	0.0000	0.0000
1.1591	0.0100	0.0035	0.0000	0.0000
1.2095	0.0100	0.0036	0.0000	0.0000
1.2599	0.0100	0.0038	0.0000	0.0000
1.3103	0.0100	0.0039	0.0000	0.0000
1.3607	0.0100	0.0041	0.0000	0.0000
1.4111	0.0100	0.0042	0.0000	0.0000

1.4615	0.0100	0.0044	0.0000	0.0000
1.5119	0.0100	0.0045	0.0000	0.0000
1.5623	0.0100	0.0047	0.0000	0.0000
1.6127	0.0100	0.0048	0.0000	0.0000
1.6631	0.0100	0.0050	0.0000	0.0000
1.7135	0.0100	0.0051	0.0000	0.0000
1.7638	0.0100	0.0053	0.0000	0.0000
1.8142	0.0100	0.0054	0.0000	0.0000
1.8646	0.0100	0.0056	0.0000	0.0000
1.9150	0.0100	0.0057	0.0000	0.0000
1.9654	0.0100	0.0059	0.0000	0.0000
2.0158	0.0100	0.0061	0.0000	0.0000
2.0662	0.0100	0.0063	0.0000	0.0000
2.1166	0.0100	0.0065	0.0000	0.0000
2.1670	0.0100	0.0067	0.0000	0.0000
2.2174	0.0100	0.0069	0.0000	0.0000
2.2678	0.0100	0.0072	0.0000	0.0000
2.3182	0.0100	0.0074	0.0000	0.0000
2.3686	0.0100	0.0076	0.0000	0.0000
2.4190	0.0100	0.0078	0.0000	0.0000
2.4694	0.0100	0.0080	0.0000	0.0000
2.5198	0.0100	0.0082	0.0000	0.0000
2.5702	0.0100	0.0084	0.0000	0.0000
2.6206	0.0100	0.0086	0.0000	0.0000
2.6710	0.0100	0.0088	0.0000	0.0000
2.7214	0.0100	0.0090	0.0000	0.0000
2.7718	0.0100	0.0092	0.0000	0.0000
2.8222	0.0100	0.0095	0.0010	0.0000
2.8725	0.0100	0.0097	0.0019	0.0000
2.9229	0.0100	0.0099	0.0028	0.0000
2.9733	0.0100	0.0101	0.0035	0.0000
3.0237	0.0100	0.0103	0.0042	0.0000
3.0741	0.0100	0.0105	0.0047	0.0000
3.1245	0.0100	0.0107	0.0052	0.0000
3.1749	0.0100	0.0109	0.0057	0.0000
3.2253	0.0100	0.0111	0.0061	0.0000
3.2757	0.0100	0.0113	0.0065	0.0000
3.3261	0.0100	0.0115	0.0069	0.0000
3.3765	0.0100	0.0118	0.0072	0.0000
3.4269	0.0100	0.0120	0.0075	0.0000
3.4773	0.0100	0.0122	0.0079	0.0000
3.5277	0.0100	0.0124	0.0082	0.0000
3.5781	0.0100	0.0126	0.0085	0.0000
3.6285	0.0100	0.0128	0.0087	0.0000
3.6789	0.0100	0.0130	0.0090	0.0000
3.7293	0.0100	0.0132	0.0093	0.0000
3.7500	0.0100	0.0133	0.0169	0.0000

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
3.7500	0.0100	0.0133	0.0000	0.0504	0.0000
3.8004	0.0100	0.0138	0.0000	0.0504	0.0000
3.8508	0.0100	0.0143	0.0000	0.0605	0.0000
3.9012	0.0100	0.0148	0.0000	0.0620	0.0000
3.9516	0.0100	0.0153	0.0000	0.0634	0.0000
4.0020	0.0100	0.0158	0.0000	0.0649	0.0000
4.0524	0.0100	0.0163	0.0000	0.0664	0.0000
4.1028	0.0100	0.0168	0.0000	0.0678	0.0000

4.1532	0.0100	0.0173	0.0000	0.0693	0.0000
4.2036	0.0100	0.0178	0.0000	0.0707	0.0000
4.2540	0.0100	0.0183	0.0000	0.0722	0.0000
4.3044	0.0100	0.0189	0.0000	0.0736	0.0000
4.3547	0.0100	0.0194	0.0000	0.0751	0.0000
4.4051	0.0100	0.0199	0.0000	0.0765	0.0000
4.4555	0.0100	0.0204	0.0355	0.0780	0.0000
4.5059	0.0100	0.0209	0.1299	0.0794	0.0000
4.5563	0.0100	0.0214	0.2393	0.0809	0.0000
4.5860	0.0100	0.0217	0.3292	0.0817	0.0000

Surface Biofilter 1

Element Flows To:

Outlet 1	Outlet 2
	Biofilter 1

Porous Pavement -SD BMP

Pavement Area:0.0999 acre.Pavement Length:145.00 ft.
Pavement Width: 30.00 ft.
Pavement slope 1:0.01 To 1
Pavement thickness: 0.5
Pour Space of Pavement: 0
Material thickness of second layer: 1
Pour Space of material for second layer: 0.4
Material thickness of third layer: 0
Pour Space of material for third layer: 0
Infiltration On
Infiltration rate: 0.006
Infiltration safety factor: 1
Total Volume Infiltrated (ac-ft.): 1.221
Total Volume Through Riser (ac-ft.): 0.404
Total Volume Through Facility (ac-ft.): 1.625
Percent Infiltrated: 75.14
Total Precip Applied to Facility: 0
Total Evap From Facility: 0.671
Element Flows To:
Outlet 1 Outlet 2
Surface Biofilter 1

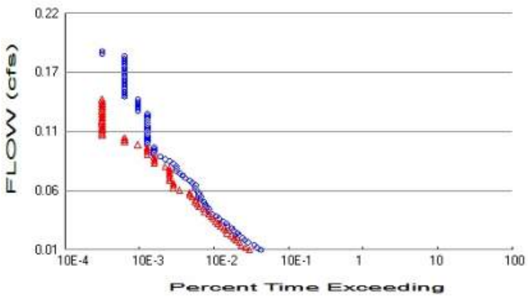
Porous Pavement Hydraulic Table

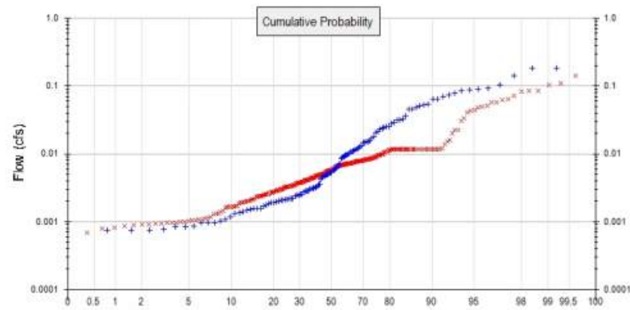
Stage(feet)	**Area(ac.)**	**Volume(ac-ft.)**	**Discharge(cfs)**	**Infilt(cfs)**
0.0000	0.099	0.000	0.000	0.000
0.0178	0.099	0.000	0.000	0.000
0.0356	0.099	0.001	0.000	0.000
0.0533	0.099	0.002	0.000	0.000
0.0711	0.099	0.002	0.000	0.000
0.0889	0.099	0.003	0.000	0.000
0.1067	0.099	0.004	0.000	0.000
0.1244	0.099	0.005	0.000	0.000
0.1422	0.099	0.005	0.000	0.000
0.1600	0.099	0.006	0.000	0.000
0.1778	0.099	0.007	0.000	0.000
0.1956	0.099	0.007	0.000	0.000
0.2133	0.099	0.008	0.112	0.000
0.2311	0.099	0.009	0.172	0.000
0.2489	0.099	0.009	0.216	0.000
0.2667	0.099	0.010	0.252	0.000
0.2844	0.099	0.011	0.283	0.000
0.3022	0.099	0.012	0.312	0.000
0.3200	0.099	0.012	0.338	0.000
0.3378	0.099	0.013	0.362	0.000
0.3556	0.099	0.014	0.385	0.000
0.3733	0.099	0.014	0.406	0.000
0.3911	0.099	0.015	0.427	0.000
0.4089	0.099	0.016	0.446	0.000
0.4267	0.099	0.017	0.465	0.000
0.4444	0.099	0.017	0.483	0.000
0.4622	0.099	0.018	0.500	0.000
0.4800	0.099	0.019	0.516	0.000
0.4978	0.099	0.019	0.533	0.000
0.5156	0.099	0.020	0.548	0.000
0.5333	0.099	0.021	0.564	0.000

0.5511	0.099	0.022	0.578	0.000
0.5689	0.099	0.022	0.593	0.000
0.5867	0.099	0.023	0.607	0.000
0.6044	0.099	0.024	0.621	0.000
0.6222	0.099	0.024	0.634	0.000
0.6400	0.099	0.025	0.648	0.000
0.6578	0.099	0.026	0.661	0.000
0.6756	0.099	0.027	0.673	0.000
0.6933	0.099	0.027	0.686	0.000
0.7111	0.099	0.028	0.698	0.000
0.7289	0.099	0.029	0.710	0.000
0.7467	0.099	0.029	0.722	0.000
0.7644	0.099	0.030	0.734	0.000
0.7822	0.099	0.031	0.745	0.000
0.8000	0.099	0.032	0.756	0.000
0.8178	0.099	0.032	0.767	0.000
0.8356	0.099	0.033	0.778	0.000
0.8533	0.099	0.034	0.789	0.000
0.8711	0.099	0.034	0.800	0.000
0.8889	0.099	0.035	0.810	0.000
0.9067	0.099	0.036	0.821	0.000
0.9244	0.099	0.036	0.831	0.000
0.9422	0.099	0.037	0.841	0.000
0.9600	0.099	0.038	0.851	0.000
0.9778	0.099	0.039	0.861	0.000
0.9956	0.099	0.039	0.871	0.000
1.0133	0.099	0.039	0.881	0.000
1.0311	0.099	0.039	0.890	0.000
1.0489	0.099	0.039	0.900	0.000
1.0667	0.099	0.039	0.909	0.000
1.0844	0.099	0.039	0.918	0.000
1.1022	0.099	0.039	0.927	0.000
1.1200	0.099	0.039	0.937	0.000
1.1378	0.099	0.039	0.946	0.000
1.1556	0.099	0.039	0.955	0.000
1.1733	0.099	0.039	0.963	0.000
1.1911	0.099	0.039	0.972	0.000
1.2089	0.099	0.039	0.981	0.000
1.2267	0.099	0.039	0.989	0.000
1.2444	0.099	0.039	0.998	0.000
1.2622	0.099	0.039	1.006	0.000
1.2800	0.099	0.039	1.015	0.000
1.2978	0.099	0.039	1.023	0.000
1.3156	0.099	0.039	1.031	0.000
1.3333	0.099	0.039	1.040	0.000
1.3511	0.099	0.039	1.048	0.000
1.3689	0.099	0.039	1.056	0.000
1.3867	0.099	0.039	1.064	0.000
1.4044	0.099	0.039	1.072	0.000
1.4222	0.099	0.039	1.080	0.000
1.4400	0.099	0.039	1.087	0.000
1.4578	0.099	0.039	1.095	0.000
1.4756	0.099	0.039	1.103	0.000
1.4933	0.099	0.039	1.111	0.000
1.5111	0.099	0.041	1.118	0.000
1.5289	0.099	0.043	1.126	0.000
1.5467	0.099	0.045	1.133	0.000
1.5644	0.099	0.046	1.141	0.000

1.5822	0.099	0.048	1.148	0.000
1.6000	0.099	0.050	1.155	0.000

Analysis Results
POC 1





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 0.32
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0.11
Total Impervious Area: 0.199862

Flow Frequency Method: Cunnane

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.045202
5 year	0.086577
10 year	0.11237
25 year	0.182072

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.032214
5 year	0.068951
10 year	0.090978
25 year	0.121621

Duration Flows
The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0130	135	94	69	Pass
0.0151	118	84	71	Pass
0.0171	110	73	66	Pass
0.0192	91	69	75	Pass
0.0212	81	62	76	Pass
0.0233	76	59	77	Pass
0.0253	68	55	80	Pass
0.0274	67	48	71	Pass
0.0294	58	46	79	Pass
0.0315	55	43	78	Pass
0.0335	48	39	81	Pass
0.0356	47	36	76	Pass
0.0376	42	34	80	Pass
0.0397	37	31	83	Pass
0.0417	34	29	85	Pass
0.0438	30	27	90	Pass
0.0458	27	24	88	Pass
0.0479	27	23	85	Pass
0.0499	25	20	80	Pass
0.0520	24	19	79	Pass
0.0540	23	18	78	Pass
0.0561	21	18	85	Pass
0.0581	21	16	76	Pass
0.0602	20	15	75	Pass
0.0622	20	15	75	Pass
0.0643	18	11	61	Pass
0.0663	18	9	50	Pass
0.0684	18	9	50	Pass
0.0704	16	9	56	Pass
0.0725	15	8	53	Pass
0.0745	13	8	61	Pass
0.0766	12	8	66	Pass
0.0786	11	8	72	Pass
0.0807	10	8	80	Pass
0.0827	10	8	80	Pass
0.0848	10	7	70	Pass
0.0868	9	5	55	Pass
0.0889	8	5	62	Pass
0.0909	7	5	71	Pass
0.0930	6	5	83	Pass
0.0950	5	4	80	Pass
0.0971	5	4	80	Pass
0.0991	5	4	80	Pass
0.1012	5	4	80	Pass
0.1032	4	3	75	Pass
0.1053	4	2	50	Pass
0.1073	4	2	50	Pass
0.1094	4	2	50	Pass
0.1114	4	1	25	Pass
0.1135	4	1	25	Pass
0.1155	4	1	25	Pass
0.1176	4	1	25	Pass
0.1196	4	1	25	Pass

0.1217	4	1	25	Pass
0.1237	4	1	25	Pass
0.1258	4	1	25	Pass
0.1278	4	1	25	Pass
0.1299	4	1	25	Pass
0.1319	3	1	33	Pass
0.1340	3	1	33	Pass
0.1360	3	1	33	Pass
0.1381	3	1	33	Pass
0.1401	3	1	33	Pass
0.1422	3	1	33	Pass
0.1442	2	0	0	Pass
0.1463	2	0	0	Pass
0.1483	2	0	0	Pass
0.1504	2	0	0	Pass
0.1524	2	0	0	Pass
0.1545	2	0	0	Pass
0.1565	2	0	0	Pass
0.1586	2	0	0	Pass
0.1606	2	0	0	Pass
0.1627	2	0	0	Pass
0.1647	2	0	0	Pass
0.1668	2	0	0	Pass
0.1688	2	0	0	Pass
0.1709	2	0	0	Pass
0.1729	2	0	0	Pass
0.1750	2	0	0	Pass
0.1770	2	0	0	Pass
0.1791	2	0	0	Pass
0.1811	1	0	0	Pass
0.1832	1	0	0	Pass
0.1852	0	0	0	Pass
0.1873	0	0	0	Pass
0.1893	0	0	0	Pass
0.1914	0	0	0	Pass
0.1934	0	0	0	Pass
0.1955	0	0	0	Pass
0.1975	0	0	0	Pass
0.1996	0	0	0	Pass
0.2016	0	0	0	Pass
0.2037	0	0	0	Pass
0.2057	0	0	0	Pass
0.2078	0	0	0	Pass
0.2098	0	0	0	Pass
0.2119	0	0	0	Pass
0.2139	0	0	0	Pass
0.2160	0	0	0	Pass

Water Quality

Model Default Modifications

Total of 0 changes have been made.

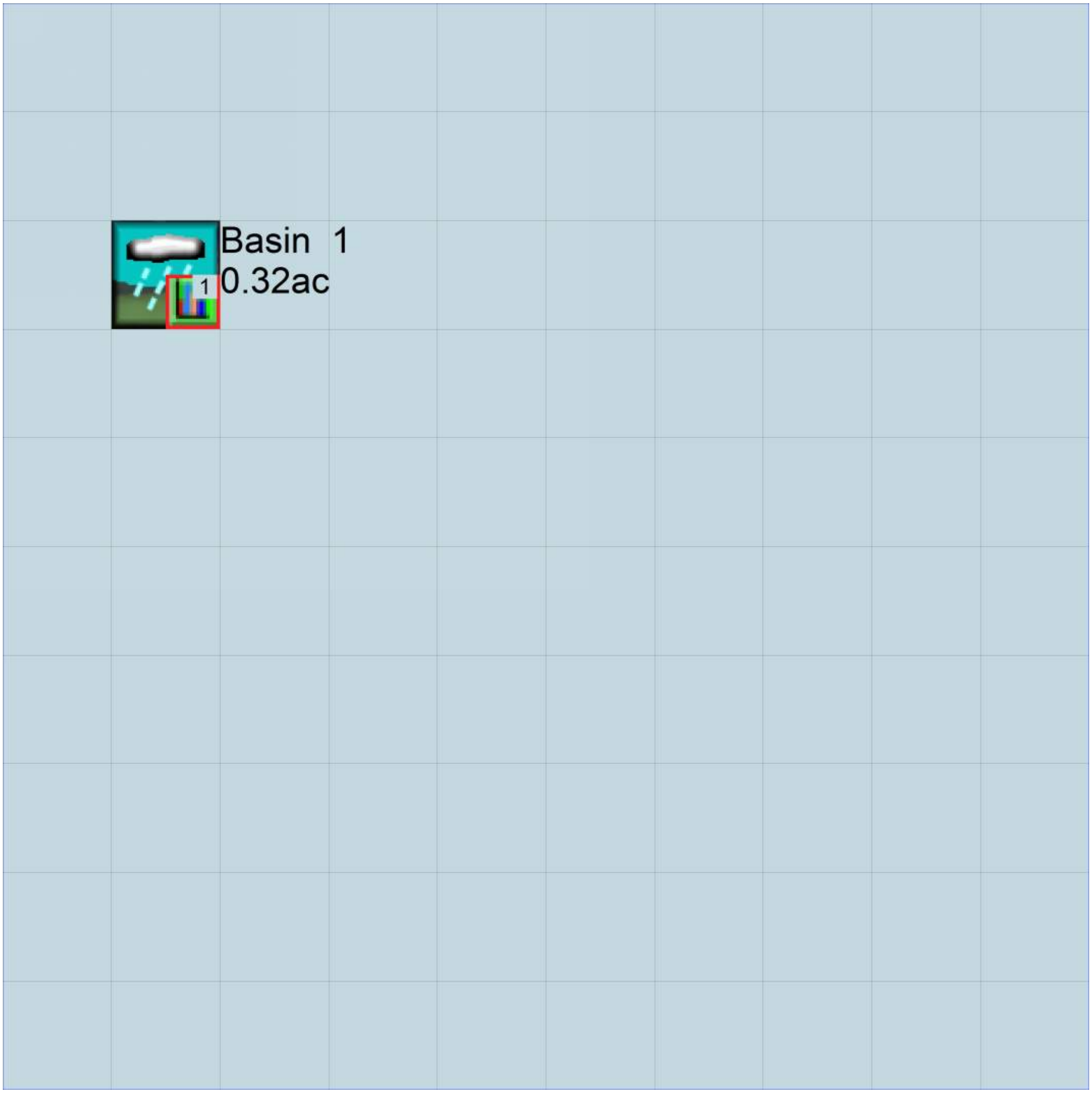
PERLND Changes

No PERLND changes have been made.

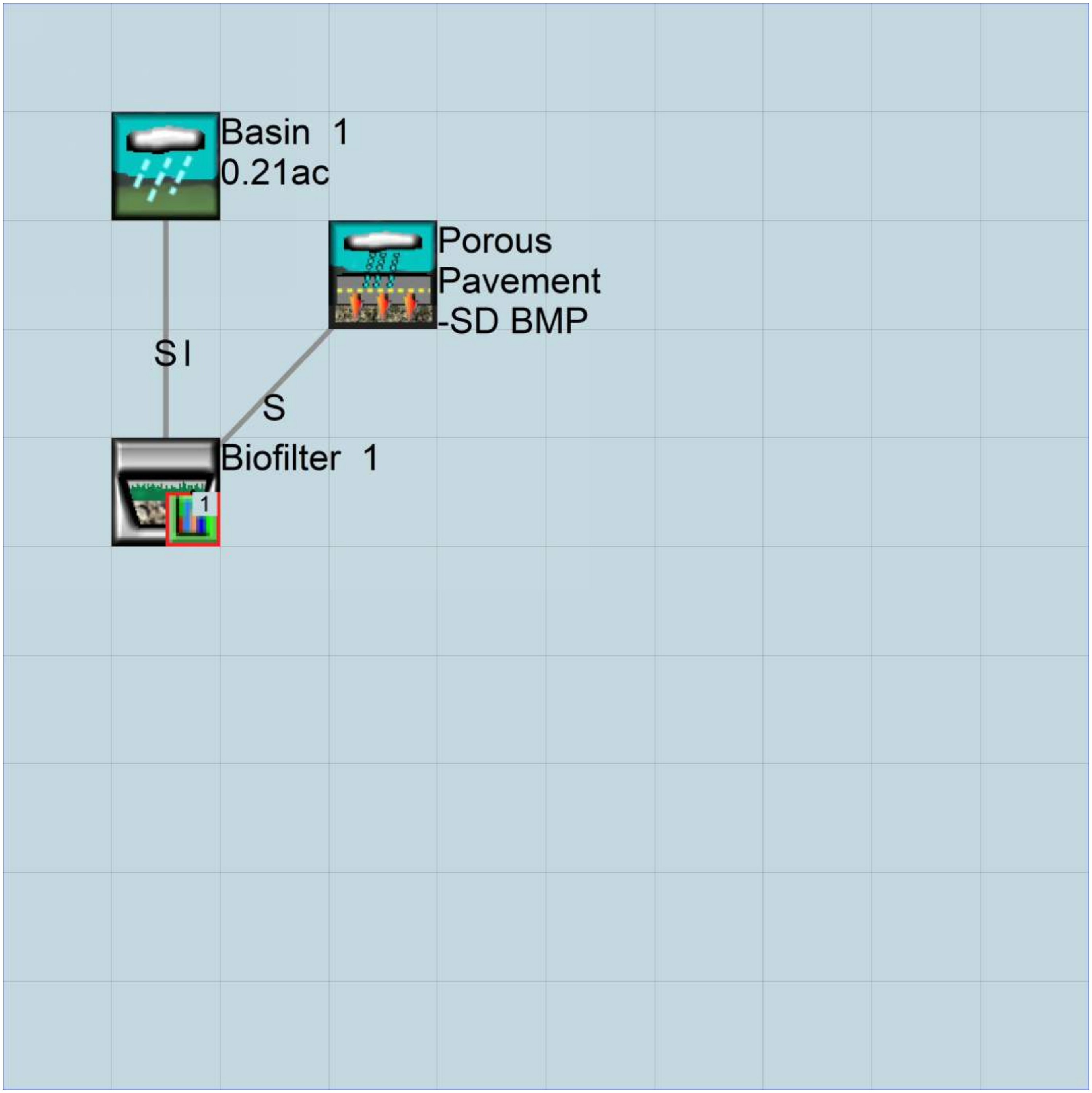
IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1968 10 01        END    2004 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                             ***
WDM        26   SMMC Package 1B SDHM_2022-04.wdm
MESSU      25   PreSMMC Package 1B SDHM_2022-04.MES
           27   PreSMMC Package 1B SDHM_2022-04.L61
           28   PreSMMC Package 1B SDHM_2022-04.L62
           30   POCSMMC Package 1B SDHM_2022-041.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:60
      PERLND      28
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                    MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                            User  t-series Engl Metr ***
                                            in  out           ***
   28      D,NatVeg,Flat          1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   28         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   28         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO
```

```
  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   28         0    1    1    1    0    0    0    0    1    1    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   28             0       3.3      0.03       100      0.05       2.5     0.915
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   28             0         0         2         2         0      0.05      0.05
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                               ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   28             0       0.6      0.04         1       0.3         0
  END PWAT-PARM4
  MON-LZETPARM
    <PLS >      PWATER input info: Part 3         ***
    # -  #  JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC  ***
   28       0.4  0.4  0.4  0.4  0.6  0.6  0.6  0.6  0.6  0.4  0.4  0.4
  END MON-LZETPARM
  MON-INTERCEP
    <PLS >      PWATER input info: Part 3         ***
    # -  #  JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC  ***
   28       0.1  0.1  0.1  0.1 0.06 0.06 0.06 0.06 0.06  0.1  0.1  0.1
  END MON-INTERCEP

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
              ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   28             0         0      0.01         0       0.4      0.01         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out            ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2
```

```
  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  28                        0.32     COPY   501     12
PERLND  28                        0.32     COPY   501     13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   12.1        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                 ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG            ***
                                         in  out                             ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ****************** PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                      ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *     *  *  *  *  *       *  *  *  *  *        ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                         ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit       for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES
```

```
SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    1              PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1              IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     12.1      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1968 10 01        END    2004 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM        26   SMMC Package 1B SDHM_2022-04.wdm
MESSU      25   MitSMMC Package 1B SDHM_2022-04.MES
           27   MitSMMC Package 1B SDHM_2022-04.L61
           28   MitSMMC Package 1B SDHM_2022-04.L62
           30   POCSMMC Package 1B SDHM_2022-041.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:60
      PERLND      58
      PERLND      46
      IMPLND       1
      IMPLND       6
      RCHRES       1
      GENER        3
      RCHRES       2
      RCHRES       3
      COPY         1
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Surface Biofilter  1        MAX                     1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
    3        24
  END OPCODE
  PARM
    #    #         K ***
    3             0.
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out           ***
   58      D,UrbNoIrr,Flat        1    1    1    1   27    0
   46      D,Urban,Flat           1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
```

```
    <PLS > ************* Active Sections *****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   58         0    0    1    0    0    0    0    0    0    0    0    0
   46         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   58         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   46         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   58         0    1    1    1    0    0    0    0    1    1    0
   46         0    1    1    1    0    0    0    0    1    1    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   58              0       3.8      0.03        50      0.05       2.5     0.915
   46              0       3.8      0.03        50      0.05       2.5     0.915
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   58              0         0         2         2         0      0.05      0.05
   46              0         0         2         2         0      0.05      0.05
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                               ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   58              0       0.6      0.03         1       0.3         0
   46              0       0.6      0.03         1       0.3         0
  END PWAT-PARM4
  MON-LZETPARM
    <PLS >      PWATER input info: Part 3         ***
    # -  #  JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC  ***
   58       0.4  0.4  0.4  0.4  0.7  0.7  0.7  0.7  0.7  0.4  0.4  0.4
   46       0.6  0.6  0.6  0.6  0.7  0.7  0.7  0.7  0.7  0.6  0.6  0.6
  END MON-LZETPARM
  MON-INTERCEP
    <PLS >      PWATER input info: Part 3         ***
    # -  #  JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC  ***
   58       0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1
   46       0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1
  END MON-INTERCEP

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
              ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   58              0         0      0.01         0       0.4      0.01         0
   46              0         0      0.15         0         1      0.05         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                       in  out           ***
    1      IMPERVIOUS-FLAT        1    1    1   27    0
    6      Porous Pavement        1    1    1   27    0
  END GEN-INFO
```

```
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
    6         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
    6         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    1
    6         0    0    0    0    1
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            100      0.05     0.011       0.1
    6            100      0.01     0.011       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
    6              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
    6              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  58                        0.03     RCHRES   2      2
PERLND  58                        0.03     RCHRES   2      3
PERLND  46                        0.08     RCHRES   2      2
PERLND  46                        0.08     RCHRES   2      3
IMPLND   1                         0.1     RCHRES   2      5
IMPLND   6                      0.0999     RCHRES   1      5

******Routing******
PERLND  58                        0.03     COPY     1     12
PERLND  46                        0.08     COPY     1     12
IMPLND   1                         0.1     COPY     1     15
PERLND  58                        0.03     COPY     1     13
PERLND  46                        0.08     COPY     1     13
RCHRES   2                           1     RCHRES   3      8
RCHRES   1                           1     RCHRES   2      7
RCHRES   1                                 COPY     1     17
RCHRES   3                           1     COPY   501     16
RCHRES   2                           1     COPY   501     17
END SCHEMATIC
```

```
NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   12.1        DISPLY   1     INPUT  TIMSER 1
GENER    3 OUTPUT TIMSER      .0002778     RCHRES   2     EXTNL  OUTDGT 1


<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                 ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG            ***
                                          in  out                            ***
    1     Porous Pavement -007    2    1    1    1   28    0    1
    2     Surface Biofilte-004    2    1    1    1   28    0    1
    3     Biofilter  1            1    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
    1         1    0    0    0    0    0    0    0    0    0
    2         1    0    0    0    0    0    0    0    0    0
    3         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ****************** PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
    2         4    0    0    0    0    0    0    0    0    0    1    9
    3         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                      ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *     *  *  *  *  *       *  *  *  *  *       ***
    1        0  1  0  0    4  5  0  0  0       0  0  0  0  0      2  2  2  2  2
    2        0  1  0  0    4  5  0  0  0       0  1  0  0  0      2  1  2  2  2
    3        0  1  0  0    4  0  0  0  0       0  0  0  0  0      2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
    1             1      0.03       0.0       0.0       0.5       0.0
    2             2      0.01       0.0       0.0       0.0       0.0
    3             3      0.02       0.0       0.0       0.0       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                         ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
         *** ac-ft     for each possible exit       for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1           0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    2           0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    3           0         4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
*** User-Defined Variable Quantity Lines
***                          addr
```

```
***                        <------>
*** kwd  varnam optyp  opn  vari  s1 s2 s3 tp multiply  lc ls ac as agfn ***
  <****> <----> <----> <-> <----><-><-><-><-><--------> <><-> <><-> <--> ***
  UVQUAN vol3   RCHRES   3 VOL               4
  UVQUAN v2m3   GLOBAL     WORKSP  2         3
  UVQUAN vpo3   GLOBAL     WORKSP  3         3
  UVQUAN v2d3   GENER    3 K       1         3
*** User-Defined Target Variable Names
***                  addr or                          addr or
***                 <------>                         <------>
*** kwd   varnam ct  vari  s1 s2 s3  frac oper     vari  s1 s2 s3  frac oper
  <****>  <----><-> <----><-><-><-> <---> <-->    <----><-><-><-> <---> <-->
  UVNAME  v2m3    1 WORKSP  2         1.0 QUAN
  UVNAME  vpo3    1 WORKSP  3         1.0 QUAN
  UVNAME  v2d3    1 K       1         1.0 QUAN
*** opt foplop dcdts  yr mo dy hr mn d t   vnam  s1 s2 s3 ac quantity  tc  ts rp
  <****><-><--><><-><--> <> <> <> <><><>  <----><-><-><-><-><---------> <> <-><->
  GENER   3                              v2m3            =  640.56
*** Compute remaining available pore space
  GENER   3                              vpo3            =  v2m3
  GENER   3                              vpo3           -=  vol3
*** Check to see if VPORA goes negative; if so set VPORA = 0.0
IF (vpo3 < 0.0) THEN
  GENER   3                              vpo3            =  0.0
END IF
*** Infiltration volume
  GENER   3                              v2d3            =  vpo3
END SPEC-ACTIONS
FTABLES
  FTABLE      3
   76    4
     Depth      Area    Volume  Outflow1 Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.010003  0.000000  0.000000
  0.050396  0.010003  0.000151  0.000000
  0.100791  0.010003  0.000302  0.000000
  0.151187  0.010003  0.000454  0.000000
  0.201582  0.010003  0.000605  0.000000
  0.251978  0.010003  0.000756  0.000000
  0.302374  0.010003  0.000907  0.000000
  0.352769  0.010003  0.001059  0.000000
  0.403165  0.010003  0.001210  0.000000
  0.453560  0.010003  0.001361  0.000000
  0.503956  0.010003  0.001512  0.000000
  0.554352  0.010003  0.001664  0.000000
  0.604747  0.010003  0.001815  0.000000
  0.655143  0.010003  0.001966  0.000000
  0.705538  0.010003  0.002117  0.000000
  0.755934  0.010003  0.002269  0.000000
  0.806330  0.010003  0.002420  0.000000
  0.856725  0.010003  0.002571  0.000000
  0.907121  0.010003  0.002722  0.000000
  0.957516  0.010003  0.002874  0.000000
  1.007912  0.010003  0.003025  0.000000
  1.058308  0.010003  0.003176  0.000000
  1.108703  0.010003  0.003327  0.000000
  1.159099  0.010003  0.003478  0.000000
  1.209495  0.010003  0.003630  0.000000
  1.259890  0.010003  0.003781  0.000000
  1.310286  0.010003  0.003932  0.000000
  1.360681  0.010003  0.004083  0.000000
  1.411077  0.010003  0.004235  0.000000
  1.461473  0.010003  0.004386  0.000000
  1.511868  0.010003  0.004537  0.000000
  1.562264  0.010003  0.004688  0.000000
  1.612659  0.010003  0.004840  0.000000
  1.663055  0.010003  0.004991  0.000000
  1.713451  0.010003  0.005142  0.000000
  1.763846  0.010003  0.005293  0.000000
  1.814242  0.010003  0.005445  0.000000
```

1.864637	0.010003	0.005596	0.000000
1.915033	0.010003	0.005747	0.000000
1.965429	0.010003	0.005898	0.000000
2.015824	0.010003	0.006108	0.000000
2.066220	0.010003	0.006317	0.000000
2.116615	0.010003	0.006526	0.000000
2.167011	0.010003	0.006735	0.000000
2.217407	0.010003	0.006944	0.000000
2.267802	0.010003	0.007154	0.000000
2.318198	0.010003	0.007363	0.000000
2.368593	0.010003	0.007572	0.000000
2.418989	0.010003	0.007781	0.000000
2.469385	0.010003	0.007990	0.000000
2.519780	0.010003	0.008200	0.000000
2.570176	0.010003	0.008409	0.000000
2.620571	0.010003	0.008618	0.000000
2.670967	0.010003	0.008827	0.000000
2.721363	0.010003	0.009037	0.000000
2.771758	0.010003	0.009246	0.000000
2.822154	0.010003	0.009455	0.000958
2.872549	0.010003	0.009664	0.001938
2.922945	0.010003	0.009873	0.002797
2.973341	0.010003	0.010083	0.003532
3.023736	0.010003	0.010292	0.004167
3.074132	0.010003	0.010501	0.004725
3.124527	0.010003	0.010710	0.005224
3.174923	0.010003	0.010919	0.005678
3.225319	0.010003	0.011129	0.006097
3.275714	0.010003	0.011338	0.006487
3.326110	0.010003	0.011547	0.006854
3.376505	0.010003	0.011756	0.007203
3.426901	0.010003	0.011966	0.007534
3.477297	0.010003	0.012175	0.007852
3.527692	0.010003	0.012384	0.008157
3.578088	0.010003	0.012593	0.008452
3.628484	0.010003	0.012802	0.008737
3.678879	0.010003	0.013012	0.009014
3.729275	0.010003	0.013221	0.009288
3.750000	0.010003	0.014705	0.016921

END FTABLE 3
FTABLE 2
18 5

Depth (ft)	Area (acres)	Volume (acre-ft)	Outflow1 (cfs)	Outflow2 (cfs)	Velocity (ft/sec)	Travel Time*** (Minutes)***
0.000000	0.010003	0.000000	0.000000	0.000000		
0.050396	0.010003	0.000504	0.000000	0.050434		
0.100791	0.010003	0.001008	0.000000	0.060544		
0.151187	0.010003	0.001512	0.000000	0.061996		
0.201582	0.010003	0.002017	0.000000	0.063448		
0.251978	0.010003	0.002521	0.000000	0.064901		
0.302374	0.010003	0.003025	0.000000	0.066353		
0.352769	0.010003	0.003529	0.000000	0.067806		
0.403165	0.010003	0.004033	0.000000	0.069258		
0.453560	0.010003	0.004537	0.000000	0.070710		
0.503956	0.010003	0.005041	0.000000	0.072163		
0.554352	0.010003	0.005545	0.000000	0.073615		
0.604747	0.010003	0.006050	0.000000	0.075067		
0.655143	0.010003	0.006554	0.000000	0.076520		
0.705538	0.010003	0.007058	0.035452	0.077972		
0.755934	0.010003	0.007562	0.129895	0.079425		
0.806330	0.010003	0.008066	0.239279	0.080877		
0.836000	0.010003	0.008363	0.329192	0.081732		

END FTABLE 2
FTABLE 1
91 5

Depth (ft)	Area (acres)	Volume (acre-ft)	Outflow1 (cfs)	Outflow2 (cfs)	Velocity (ft/sec)	Travel Time*** (Minutes)***
0.000000	0.099862	0.000000	0.000000	0.000000		
0.017778	0.099862	0.000710	0.000000	0.000604		
0.035556	0.099862	0.001420	0.000000	0.000604		

0.053333	0.099862	0.002130	0.000000	0.000604
0.071111	0.099862	0.002841	0.000000	0.000604
0.088889	0.099862	0.003551	0.000000	0.000604
0.106667	0.099862	0.004261	0.000000	0.000604
0.124444	0.099862	0.004971	0.000000	0.000604
0.142222	0.099862	0.005681	0.000000	0.000604
0.160000	0.099862	0.006391	0.000000	0.000604
0.177778	0.099862	0.007101	0.000000	0.000604
0.195556	0.099862	0.007811	0.000000	0.000604
0.213333	0.099862	0.008522	0.112806	0.000604
0.231111	0.099862	0.009232	0.172313	0.000604
0.248889	0.099862	0.009942	0.216006	0.000604
0.266667	0.099862	0.010652	0.252241	0.000604
0.284444	0.099862	0.011362	0.283888	0.000604
0.302222	0.099862	0.012072	0.312345	0.000604
0.320000	0.099862	0.012782	0.338417	0.000604
0.337778	0.099862	0.013493	0.362619	0.000604
0.355556	0.099862	0.014203	0.385304	0.000604
0.373333	0.099862	0.014913	0.406726	0.000604
0.391111	0.099862	0.015623	0.427075	0.000604
0.408889	0.099862	0.016333	0.446497	0.000604
0.426667	0.099862	0.017043	0.465109	0.000604
0.444444	0.099862	0.017753	0.483005	0.000604
0.462222	0.099862	0.018463	0.500260	0.000604
0.480000	0.099862	0.019174	0.516940	0.000604
0.497778	0.099862	0.019884	0.533098	0.000604
0.515556	0.099862	0.020594	0.548781	0.000604
0.533333	0.099862	0.021304	0.564028	0.000604
0.551111	0.099862	0.022014	0.578873	0.000604
0.568889	0.099862	0.022724	0.593347	0.000604
0.586667	0.099862	0.023434	0.607477	0.000604
0.604444	0.099862	0.024144	0.621285	0.000604
0.622222	0.099862	0.024855	0.634792	0.000604
0.640000	0.099862	0.025565	0.648019	0.000604
0.657778	0.099862	0.026275	0.660980	0.000604
0.675556	0.099862	0.026985	0.673693	0.000604
0.693333	0.099862	0.027695	0.686170	0.000604
0.711111	0.099862	0.028405	0.698424	0.000604
0.728889	0.099862	0.029115	0.710466	0.000604
0.746667	0.099862	0.029826	0.722308	0.000604
0.764444	0.099862	0.030536	0.733959	0.000604
0.782222	0.099862	0.031246	0.745428	0.000604
0.800000	0.099862	0.031956	0.756723	0.000604
0.817778	0.099862	0.032666	0.767852	0.000604
0.835556	0.099862	0.033376	0.778822	0.000604
0.853333	0.099862	0.034086	0.789639	0.000604
0.871111	0.099862	0.034796	0.800310	0.000604
0.888889	0.099862	0.035507	0.810841	0.000604
0.906667	0.099862	0.036217	0.821237	0.000604
0.924444	0.099862	0.036927	0.831503	0.000604
0.942222	0.099862	0.037637	0.841644	0.000604
0.960000	0.099862	0.038347	0.851663	0.000604
0.977778	0.099862	0.039057	0.861567	0.000604
0.995556	0.099862	0.039767	0.871358	0.000604
1.013333	0.099862	0.039767	0.881040	0.000604
1.031111	0.099862	0.039767	0.890617	0.000604
1.048889	0.099862	0.039767	0.900091	0.000604
1.066667	0.099862	0.039767	0.909468	0.000604
1.084444	0.099862	0.039767	0.918748	0.000604
1.102222	0.099862	0.039767	0.927936	0.000604
1.120000	0.099862	0.039767	0.937034	0.000604
1.137778	0.099862	0.039767	0.946044	0.000604
1.155556	0.099862	0.039767	0.954969	0.000604
1.173333	0.099862	0.039767	0.963811	0.000604
1.191111	0.099862	0.039767	0.972573	0.000604
1.208889	0.099862	0.039767	0.981257	0.000604
1.226667	0.099862	0.039767	0.989865	0.000604
1.244444	0.099862	0.039767	0.998398	0.000604
1.262222	0.099862	0.039767	1.006860	0.000604
1.280000	0.099862	0.039767	1.015250	0.000604

```
  1.297778  0.099862  0.039767  1.023572  0.000604
  1.315556  0.099862  0.039767  1.031827  0.000604
  1.333333  0.099862  0.039767  1.040016  0.000604
  1.351111  0.099862  0.039767  1.048141  0.000604
  1.368889  0.099862  0.039767  1.056204  0.000604
  1.386667  0.099862  0.039767  1.064206  0.000604
  1.404444  0.099862  0.039767  1.072148  0.000604
  1.422222  0.099862  0.039767  1.080031  0.000604
  1.440000  0.099862  0.039767  1.087858  0.000604
  1.457778  0.099862  0.039767  1.095628  0.000604
  1.475556  0.099862  0.039767  1.103344  0.000604
  1.493333  0.099862  0.039767  1.111006  0.000604
  1.511111  0.099862  0.041543  1.118616  0.000604
  1.528889  0.099862  0.043318  1.126174  0.000604
  1.546667  0.099862  0.045093  1.133682  0.000604
  1.564444  0.099862  0.046869  1.141141  0.000604
  1.582222  0.099862  0.048644  1.148551  0.000604
  1.600000  0.099862  0.050419  1.155913  0.000604
  END FTABLE  1
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    1              PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1              IMPLND   1 999 EXTNL  PETINP
WDM     22 IRRG     ENGL    0.7       SAME PERLND  46     EXTNL  SURLI
WDM      2 PREC     ENGL    1              RCHRES   2     EXTNL  PREC
WDM      1 EVAP     ENGL    1              RCHRES   1     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.5            RCHRES   2     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.7            RCHRES   3     EXTNL  POTEV

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY     1 OUTPUT MEAN   1 1     12.1      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     12.1      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    2

  MASS-LINK        3
PERLND     PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    3

  MASS-LINK        5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK        7
RCHRES     OFLOW  OVOL   1                 RCHRES         INFLOW IVOL
  END MASS-LINK    7

  MASS-LINK        8
RCHRES     OFLOW  OVOL   2                 RCHRES         INFLOW IVOL
  END MASS-LINK    8

  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12
```

```
  MASS-LINK        13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK    13

  MASS-LINK        15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK    15

  MASS-LINK        16
RCHRES     ROFLOW                          COPY           INPUT  MEAN
  END MASS-LINK    16

  MASS-LINK        17
RCHRES     OFLOW  OVOL   1                 COPY           INPUT  MEAN
  END MASS-LINK    17

END MASS-LINK

END RUN
```

Disclaimer

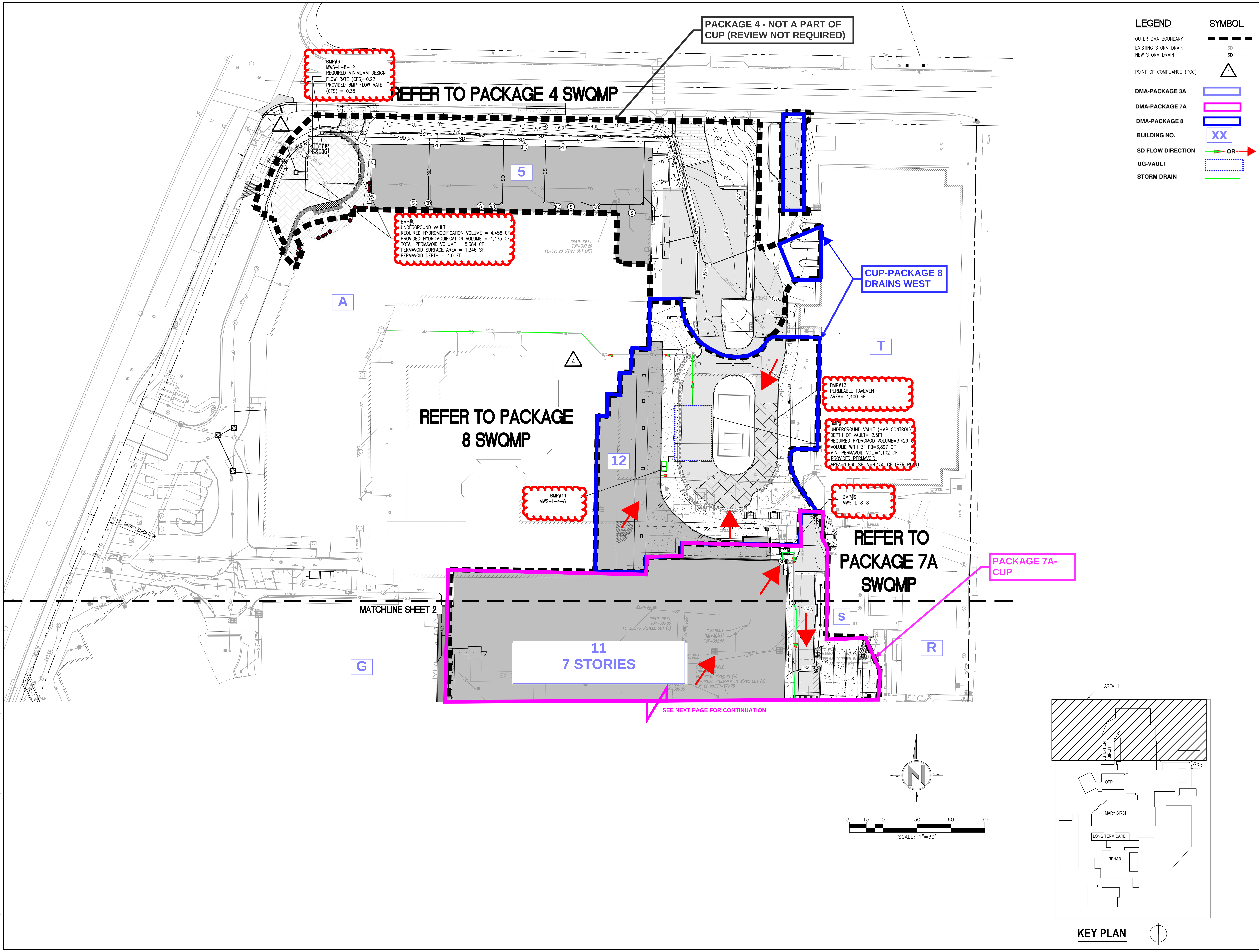
Legal Notice

Clear Creek Solutions, Inc.
6200 Capitol Blvd. Ste F
Olympia, WA. 98501
Toll Free 1(866)943-0304
Local (360)943-0304

www.clearcreeksolutions.com

OVERALL DMA EXHIBIT

(FOR REFERENCE ONLY)



BWE
CIVIL • STRUCTURAL • SURVEY • PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123
619.299.5550

SYM	DESCRIPTION	DATE	APPR

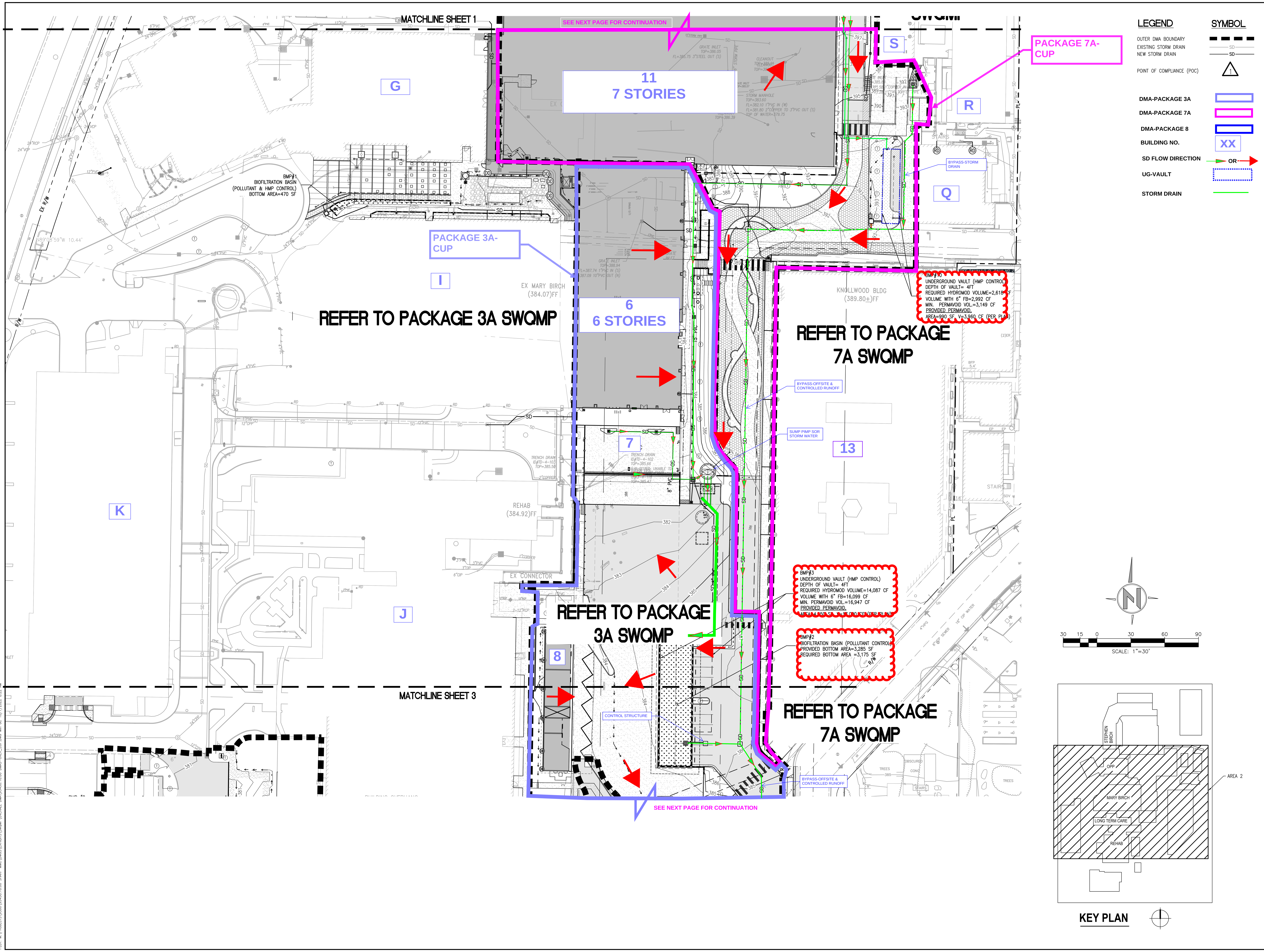
BENCHMARK:	
ISSUE DATE:	09/17/2021
DRAWN BY:	MDS
CHECKED BY:	MGC
B&W JOB NUMBER:	9545.10.00
CLIENT JOB NUMBER:	

PROJECT
SHARP MMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

SHEET TITLE
OVERALL DMA EXHIBIT

SHEET 1 OF 3

PLOT: M:\PROJECTS\9500\9545\10.00 SHARP MMC\DWGS\EXHIBITS\SWQMP\OVERALL DMA\9545U.10.00 DMAS-OVER_CUP.DWG MH. CC 10/6/2022 11:27 PM



BWE
CIVIL • STRUCTURAL • SURVEY • PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123
619.299.5550

APPR	DATE	DESCRIPTION	SYM

BENCHMARK:

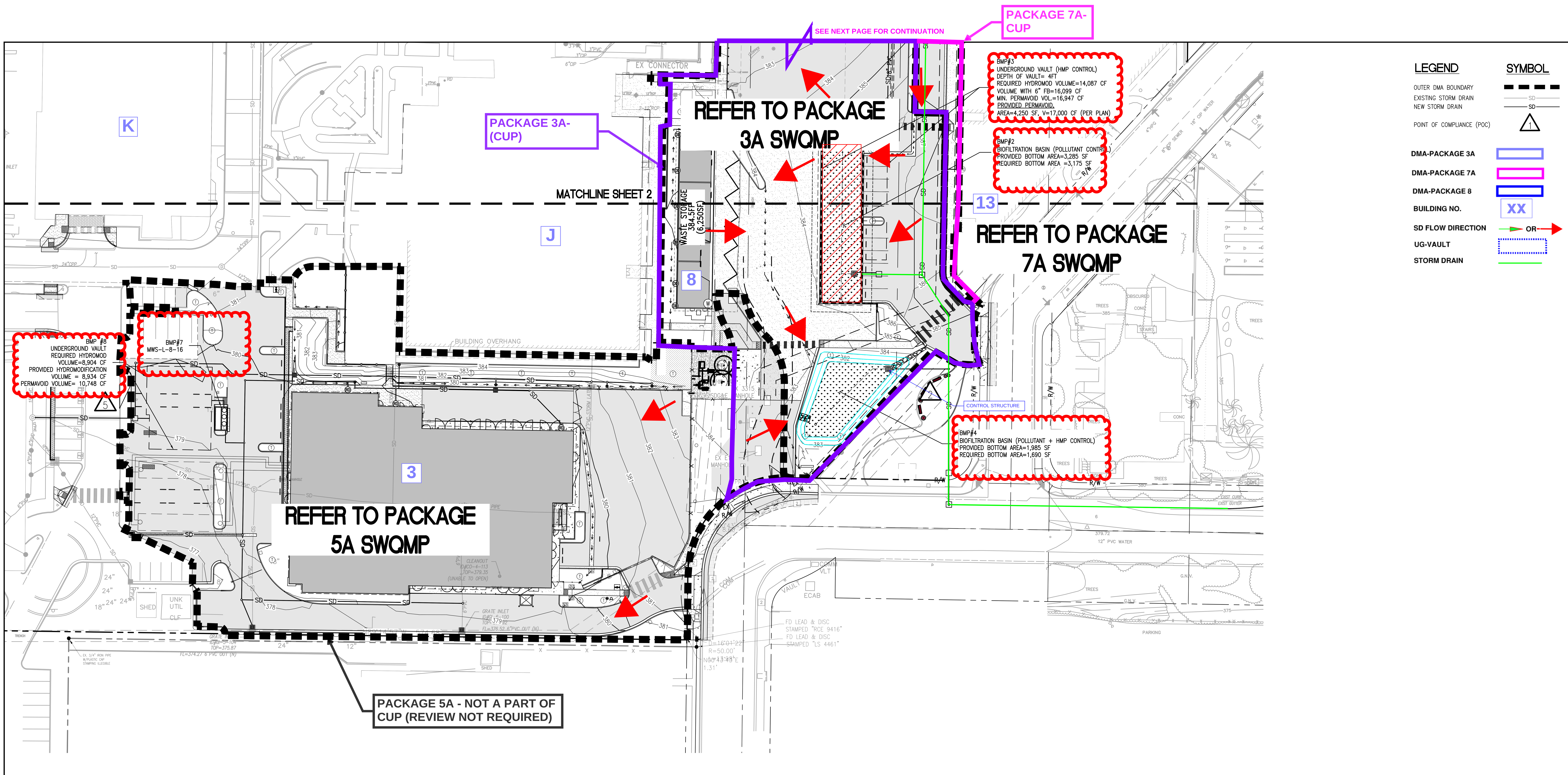
ISSUE DATE:	09/17/2021
DRAWN BY:	MDS
CHECKED BY:	MGC
B&W JOB NUMBER:	9545.10.00
CLIENT JOB NUMBER:	

PROJECT
SHARP MMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

SHEET TITLE
OVERALL DMA EXHIBIT

SHEET 2 OF 3

PLOT: W:\PROJECTS\9500\9545\10.00 SHARP MMC\DWGS\EXHIBITS\SWQMP\OVERALL DMA\9545U.10.00 DMAS-OVER_CUP.DWG Min GC 10/7/2022 8:22 AM



BW E
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123
619.299.5550

SYM	DESCRIPTION	DATE	APPR

BENCHMARK:

ISSUE DATE:	09/17/2021
DRAWN BY:	MDS
CHECKED BY:	MGC
B&W JOB NUMBER:	9545.10.00
CLIENT JOB NUMBER:	

PROJECT
SHARP MMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

SHEET TITLE
OVERALL DMA EXHIBIT

SHEET 3 OF 3

PLOT: W:\PROJECTS\9500\9545\10.00 SHARP MMC\DWGS\EXHIBITS\SWQMP\OVERALL DMA\9545\10.00 DMAS-OVER_CUP.DWG MH: CC 10/6/2022 11:31 PM

PACKAGE 3A SWQMP

Priority Development Project (PDP)
Storm Water Quality Management Plan (SWQMP)

Sharp MMC - Package 3A (PK3A)

MARY BIRCH

☐ **Check if electing for offsite alternative compliance**

Engineer of Work:

REGISTERED PROFESSIONAL ENGINEER
MICHAEL A. SLAWSON
No. C 056127
Exp. 12-31-22
CIVIL
STATE OF CALIFORNIA
FOR REVIEW ONLY

Michael A. Slawson, PE # C056127

Provide Wet Signature and Stamp Above Line

Prepared For:

Sharp Healthcare

7901 Frost Street

San Diego, CA 92123

(858) 939-8323

Prepared By:

BWE Inc

9449 Balboa Ave, Suite 270

San Diego, CA 92123

(619) 299-5550

Date:

10/07/2022

Approved by: City of San Diego   Date

The City of SAN DIEGO

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Table of Contents

- Attachment 3: Structural BMP Maintenance Plan
    - Maintenance Agreement (Form DS-3247) (when applicable)
- Attachment 4: Copy of Plan Sheets Showing Permanent Storm Water BMPs
- Attachment 5: Project's Drainage Report
- Attachment 6: Project's Geotechnical and Groundwater Investigation Report

Acronyms

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

Certification Page

Project Name:
Permit Application

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

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

Engineer of Work's Signature

C056127

PE#

12/31/2022

Expiration Date

Michael A. Slawson

Print Name

BWE Inc

Company

06/03/2022

Date

Engineer's Stamp

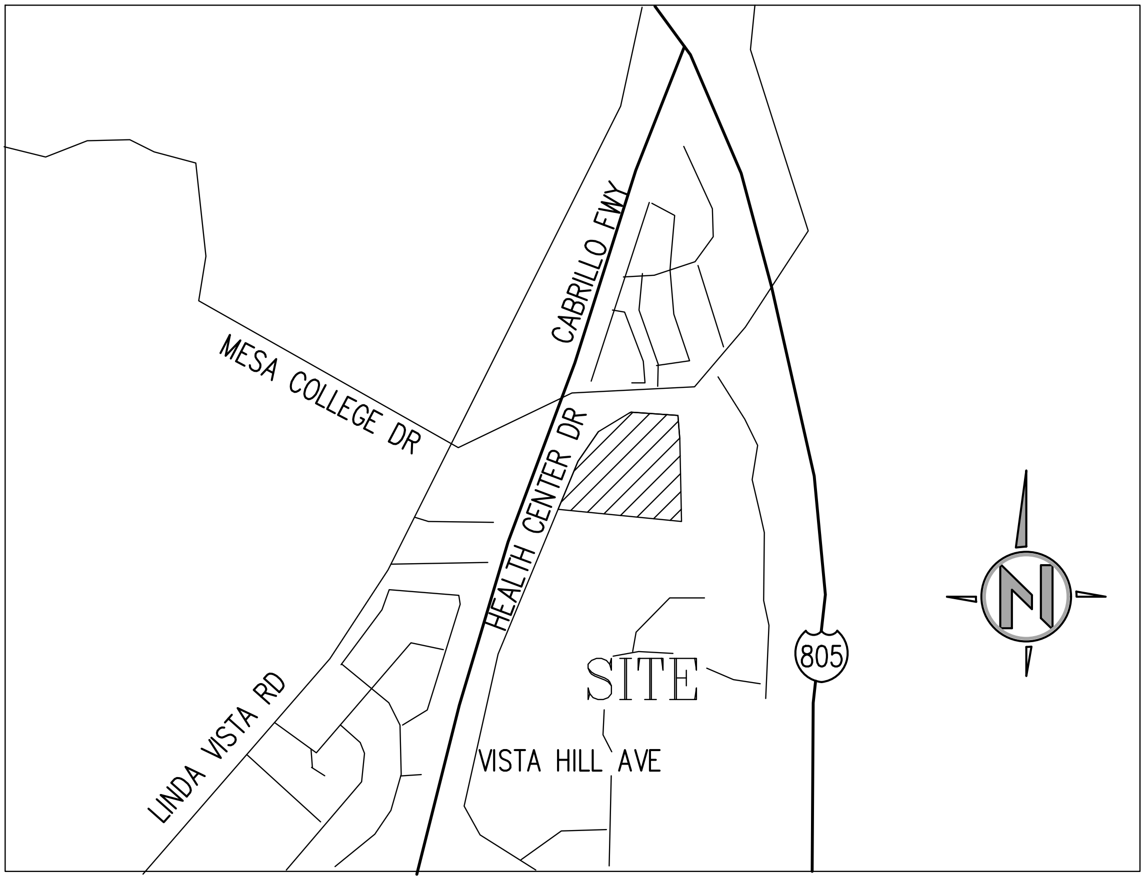
Submittal Record

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

Submittal Number	Date	Project Status	Changes
1	07/09/2021	☑ Preliminary Design/Planning/CEQA ☐ Final Design	**Initial Submittal**
2		☐ Preliminary Design/Planning/CEQA ☐ Final Design	
3		☐ Preliminary Design/Planning/CEQA ☐ Final Design	
4		☐ Preliminary Design/Planning/CEQA ☐ Final Design	

Project Vicinity Map

Project Name: Sharp MMC - Package 3A (PK3A)
Permit Application



City of San Diego Form DS-560
Storm Water Requirements Applicability Checklist

Attach DS-560 form.

Development Services

THE CITY OF SAN DIEGO

FORM
DS-560
September 2021

Stormwater Requirements Applicability Checklist

Project Address: 7901 Frost Street, San Diego, CA

Project Number:

SECTION 1: Construction Stormwater Best Management Practices (BMP) Requirements

All construction sites are required to implement construction BMPs per the performance standards in the Stormwater Standards Manual. Some sites are also required to obtain coverage under the State Construction General Permit (CGP)[1], administered by the California State Water Resources Control Board.

For all projects, complete Part A - If the project is required to submit a Stormwater Pollution Prevention Plan (SWPPP) or Water Pollution Control Plan (WPCP), continue to Part B.

PART A – Determine Construction Phase Stormwater Requirements

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

   ◉ Yes, SWPPP is required; skip questions 2-4. ○ No; proceed to the next question.

2. Does the project propose construction or demolition activity, including but not limited to, clearing, grading, grubbing, excavation, or any other activity resulting in ground disturbance and/or contact with stormwater?

   ○ Yes, WPCP is required; skip questions 3-4. ○ No; proceed to the next question.

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

   ○ Yes, WPCP is required; skip question 4. ○ No; proceed to the next question.

4. Does the project only include the following Permit types listed below?

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

   ☐ Yes, no document is required.

Check one of the boxes below and continue to Part B

◉ **If you checked "Yes" for question 1**, an SWPPP is REQUIRED – **continue to Part B**

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

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

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

CLEAR FORM

PART B – Determine Construction Site Priority

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

Complete Part B and continue to Section 2

☐ **1. ASBS**

A. Projects located in the ASBS watershed.

☑ **2. High Priority**

A. Projects that qualify as Risk Level 2 or Risk Level 3 per the Construction General Permit (CGP) and are not located in the ASBS watershed.
B. Projects that qualify as LUP Type 2 or LUP Type 3 per the CGP and are not located in the ASBS watershed.

☐ **3. Medium Priority**

A. Projects that are not located in an ASBS watershed or designated as a High priority site.
B. Projects that qualify as Risk Level 1 or LUP Type 1 per the CGP and are not located in an ASBS watershed.
C. WPCP projects (>5,000 square feet of ground disturbance) located within the Los Peñasquitos watershed management area.

☐ **4. Low Priority**

A. Projects not subject to a Medium or High site priority designation and are not located in an ASBS watershed.

Section 2: Construction Stormwater BMP Requirements

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

PART C – Determine if Not Subject to Permanent Stormwater Requirements

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

- **If "yes" is checked for any number in Part C**: Proceed to Part F and check "Not Subject to Permanent Stormwater BMP Requirements."
- **If "no" is checked for all the numbers in Part C:** Continue to Part D.

1. Does the project only include interior remodels and/or is the project entirely within an existing enclosed structure and does not have the potential to contact stormwater?

   ○ Yes ◉ No

2. Does the project only include the construction of overhead or underground utilities without creating new impervious surfaces?

   ○ Yes ◉ No

3. Does the project fall under routine maintenance? Examples include but are not limited to roof or exterior structure surface replacement, resurfacing or reconfiguring surface parking lots or existing roadways without expanding the impervious footprint, and routine replacement of damaged pavement (grinding, overlay and pothole repair).

   ○ Yes ◉ No

CLEAR FORM

PART D – PDP Exempt Requirements

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

- **If "yes" is checked for any questions in Part D**, continue to Part F and check the box labeled "PDP Exempt."
- **If "no" is checked for all questions in Part D**, continue to Part E.

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

   ○ Yes, PDP exempt requirements apply ◉ No, proceed to next question

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

   ○ Yes, PDP exempt requirements apply ◉ No, proceed to next question

PART E – Determine if Project is a Priority Development Project (PDP)

Projects that match one of the definitions below are subject to additional requirements, including preparation of a Stormwater Quality Management Plan (SWQMP).

- **If "yes" is checked for any number in Part E**, continue to Part F and check the box labeled "Priority Development Project."
- **If "no" is checked for every number in Part E**, continue to Part F and check the box labeled "Standard Development Project."

1. **New development that creates 10,000 square feet or more of impervious surfaces collectively over the project site.** This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land. ○ Yes ◉ No

2. **Redevelopment project that creates and/or replaces 5,000 square feet or more of impervious surfaces on an existing site of 10,000 square feet or more of impervious surfaces.** This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land. ◉ Yes ○ No

3. **New development or redevelopment of a restaurant.** Facilities that sell prepared foods and beverages for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (Standard Industrial Classification (SIC) 5812), and where the land development creates and/or replaces 5,000 square feet or more of impervious surface. ○ Yes ◉ No

4. **New development or redevelopment on a hillside.** The project creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site) and where the development will grade on any natural slope that is twenty-five percent or greater. ○ Yes ◉ No

5. **New development or redevelopment of a parking lot that creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site).** ○ Yes ◉ No

6. **New development or redevelopment of streets, roads, highways, freeways, and driveways.** The project creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site). ○ Yes ◉ No

CLEAR FORM

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

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

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

10. **Other Pollutant Generating Project.** These projects are not covered in any of the categories above but involve the disturbance of one or more acres of land and are expected to generate post-construction phase pollutants, including fertilizers and pesticides. This category does not include projects creating less than 5,000 square feet of impervious area and projects containing landscaping without a requirement for the regular use of fertilizers and pesticides (such as a slope stabilization project using native plants). Impervious area calculations need not include linear pathways for infrequent vehicle use, such as emergency maintenance access or bicycle and pedestrian paths if the linear pathways are built with pervious surfaces or if runoff from the pathway sheet flows to adjacent pervious areas. ○ Yes ◉ No

PART F – Select the appropriate category based on the outcomes of Part C through Part E

1. The project is **NOT SUBJECT TO PERMANENT STORMWATER REQUIREMENTS** ○ Yes ○ No

2. The project is a **STANDARD DEVELOPMENT PROJECT**. Site design and source control BMP requirements apply. See the Stormwater Standards Manual for guidance. ○ Yes ○ No

3. The Project is **PDP EXEMPT**. Site design and source control BMP requirements apply. Refer to the Stormwater Standards Manual for guidance. ○ Yes ○ No

4. The project is a **PRIORITY DEVELOPMENT PROJECT**. Site design, source control and structural pollutant control BMP requirements apply. Refer to the Stormwater Standards Manual for guidance on determining if the project requires hydromodification plan management. ○ Yes ◉ No

Michael A. Slawson, P.E.

Name of Owner or Agent

Principal

Title

Signature

06/03/2022

Date

CLEAR FORM

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

<table>
<tr><td colspan="2">Applicability of Permanent, Post-Construction Storm Water BMP Requirements</td><td>Form I-1</td></tr>
<tr><td colspan="3">Project Identification</td></tr>
<tr><td colspan="3">Project Name: Sharp MMC - Package 3A (PK3A)</td></tr>
<tr><td colspan="2">Permit Application Number:</td><td>Date: 07/09/2021</td></tr>
<tr><td colspan="3">Determination of Requirements</td></tr>
<tr><td colspan="3">The purpose of this form is to identify permanent, post-construction requirements that apply to the project. This form serves as a short <u>summary</u> of applicable requirements, in some cases referencing separate forms that will serve as the backup for the determination of requirements.

Answer each step below, starting with Step 1 and progressing through each step until reaching "Stop". Refer to the manual sections and/or separate forms referenced in each step below.</td></tr>
<tr><td>Step</td><td>Answer</td><td>Progression</td></tr>
<tr><td rowspan="2">Step 1: Is the project a "development project"? See Section 1.3 of the manual (Part 1 of Storm Water Standards) for guidance.</td><td>☑ Yes</td><td>Go to Step 2.</td></tr>
<tr><td>☐ No</td><td>Stop. Permanent BMP requirements do not apply. No SWQMP will be required. Provide discussion below.</td></tr>
<tr><td colspan="3">Discussion / justification if the project is <u>not</u> a "development project" (e.g., the project includes only interior remodels within an existing building):</td></tr>
<tr><td rowspan="3">Step 2: Is the project a Standard Project, PDP, or PDP Exempt?
To answer this item, see Section 1.4 of the manual in its entirety for guidance AND complete Form DS-560, Storm Water Requirements Applicability Checklist.</td><td>☐ Standard Project</td><td>Stop. Standard Project requirements apply</td></tr>
<tr><td>☑ PDP</td><td>PDP requirements apply, including PDP SWQMP. Go to Step 3.</td></tr>
<tr><td>☐ PDP Exempt</td><td>Stop. Standard Project requirements apply. Provide discussion and list any additional requirements below.</td></tr>
<tr><td colspan="3">Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:</td></tr>
</table>

Project Name: Sharp MMC - Package 3A (PK3A)

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

HMP Exemption Exhibit

Attach a HMP Exemption Exhibit that shows direct storm water runoff discharge from the project site to HMP exempt area. Include project area, applicable underground storm drain line and/or concrete lined channels, outfall information and exempt waterbody. Reference applicable drawing number(s).

Exhibit must be provided on 11"x17" or larger paper.

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Site Information Checklist For PDPs	Form I-3B
Project Summary Information	
Project Name	Sharp MMC - Package 3A (PK3A)
Project Address	7901 Frost Street, San Diego, CA 92123
Assessor's Parcel Number(s) (APN(s))	427-530-02-00
Permit Application Number	
Project Watershed	Select One: ☐ San Dieguito River ☐ Penasquitos ☐ Mission Bay ☑ San Diego River ☐ San Diego Bay ☐ Tijuana River
Hydrologic subarea name with Numeric Identifier up to two decimal places (9XX.XX)	Mission San Diego, 907.11
Project Area (total area of Assessor's Parcel(s) associated with the project or total area of the right-of-way)	20.49 Acres (892,544 Square Feet)
Area to be disturbed by the project (Project Footprint)	2.27 Acres (99,016 Square Feet)
Project Proposed Impervious Area (subset of Project Footprint)	2.03 Acres (88,595 Square Feet)
Project Proposed Pervious Area (subset of Project Footprint)	0.24 Acres (10,511 Square Feet)
Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Project Area.	
The proposed increase or decrease in impervious area in the proposed condition as compared to the pre-project condition	-9.5 %

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

Project Name: Sharp MMC - Package 3A (PK3A)

Form I-3B Page 3 of 11
Description of Existing Site Topography and Drainage
How is storm water runoff conveyed from the site? At a minimum, this description should answer: 1. Whether existing drainage conveyance is natural or urban; 2. If runoff from offsite is conveyed through the site? If yes, quantification of all offsite drainage areas, design flows, and locations where offsite flows enter the project site and summarize how such flows are conveyed through the site; 3. Provide details regarding existing project site drainage conveyance network, including storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, and natural and constructed channels; 4. Identify all discharge locations from the existing project along with a summary of the conveyance system size and capacity for each of the discharge locations. Provide summary of the pre-project drainage areas and design flows to each of the existing runoff discharge locations.
Descriptions/Additional Information
The existing urban drainage pattern for this particular area generally flows from northeast to southwest. Through a series of gutters, runoff sheet flows to an existing inlet located south of the project on Meadow Lark Dr with a peak 100 year flow rate of 3.25 cfs. The existing 18" RCP pipe flows to the San Diego River and ultimately to the Pacific Ocean. See Attachment 5 for more detailed information.

Form I-3B Page 4 of 11
Description of Proposed Site Development and Drainage Patterns
Project Description / Proposed Land Use and/or Activities: The proposed project includes the development of a medical facility, waste storage area, loading dock, parking, and associated hardscape and landscape.
List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features): The proposed impervious features include a medical building, waste storage area, loading dock, and parking area.
List/describe proposed pervious features of the project (e.g., landscape areas): The pervious features is landscaping located in planter islands.
Does the project include grading and changes to site topography? ☐ Yes ☑ No Description / Additional Information:

Form I-3B Page 5 of 11

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

☐ Yes

☐ No

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

Description / Additional Information:

The proposed drainage continues to sheet flow from northeast to southwest. Catch basins are proposed on the northern portion of the site to convey runoff to the biofiltration basin along with an underground vault. The southern portion of the site sheet flows to the biofiltration basin through curb and gutters and curb cuts and then to the underground vault. The underground vault is connected to an outlet control structure for hydromodification control. The southwestern portion of the site sheet flows to the southerly biofiltration basin. The treated runoff is conveyed to the existing inlet along Birmingham Way (POC #2), leaving the site through an 18" RCP.

See Attachment 5 for calculations and more detailed information.

Discharge Points #1 & 2

	Drainage Area (acres)		100 Yr Flow (cfs)		
Discharge Point(s) #	**Existing Condition**	**Proposed Condition**	**Existing Condition**	**Proposed Condition (Unmitigated)**	**% Change from Existing Condition**
1	3.34		15.40		
2	2.20	5.66	8.45	26.10	
Total	5.54	5.66	23.85	26.10	**9.43%**

Project Name: Sharp MMC - Package 3A (PK3A)

Form I-3B Page 6 of 11
Identify whether any of the following features, activities, and/or pollutant source areas will be present (select all that apply): ☑Onsite storm drain inlets ☑Interior floor drains and elevator shaft sump pumps ☐Interior parking garages ☑Need for future indoor & structural pest control ☑Landscape/outdoor pesticide use ☐Pools, spas, ponds, decorative fountains, and other water features ☐Food service ☑Refuse areas ☐Industrial processes ☐Outdoor storage of equipment or materials ☐Vehicle and equipment cleaning ☐Vehicle/equipment repair and maintenance ☐Fuel dispensing areas ☑Loading docks ☑Fire sprinkler test water ☑Miscellaneous drain or wash water ☑Plazas, sidewalks, and parking lots Description/Additional Information:

Form I-3B Page 7 of 11
Identification and Narrative of Receiving Water
Narrative describing flow path from discharge location(s), through urban storm conveyance system, to receiving creeks, rivers, and lagoons and ultimate discharge location to Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable) From the inlet located on Birmingham Way (POC #2), the run-off drains to the San Diego River (~2 miles from the project site). The San Diego River ultimately drains to the Pacific Ocean (~8.3 miles from the project site).
Provide a summary of all beneficial uses of receiving waters downstream of the project discharge locations The beneficial uses of receiving waters are: cold freshwater habitat, industrial service supply, municipal and domestic supply, rare, threatened or endangered species, water contact recreation, non-contact water recreation, warm freshwater habitat, and wildlife habitat.
Identify all ASBS (areas of special biological significance) receiving waters downstream of the project discharge locations There are no ASBS receiving water downstream of the project discharge locations.
Provide distance from project outfall location to impaired or sensitive receiving waters The distance to the Lower San Diego River is approximately 2 miles from the project site.
Summarize information regarding the proximity of the permanent, post-construction storm water BMPs to the City's Multi-Habitat Planning Area and environmentally sensitive lands The project site is located approximately 0.3 miles from the City's Multi-Habitat Planning Area and approximately 0.6 miles from environmentally sensitive lands. See Attachment 1 for exhibit.

Form I-3B Page 8 of 11		
Identification of Receiving Water Pollutants of Concern		
List any 303(d) impaired water bodies within the path of storm water from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable), identify the pollutant(s)/stressor(s) causing impairment, and identify any TMDLs and/or Highest Priority Pollutants from the WQIP for the impaired water bodies:		
303(d) Impaired Water Body (Refer to Appendix K)	**Pollutant(s)/Stressor(s) (Refer to Appendix K)**	**TMDLs/WQIP Highest Priority Pollutant (Refer to Table 1-4 in Chapter 1)**
San Diego River (Lower)	Benthic community effects, Cadium	Indicator Bacteria
San Diego River (Lower)	Indicator Bacteria, Nitrogen, Toxicity	Indicator Bacteria
San Diego River (Lower)	Dissolved Oxygen, Phosphorus	Indicator Bacteria
San Diego River (Lower)	Total Dissolved Solids	Indicator Bacteria
Pacific Ocean Shoreline	Indicator Bacteria, Trash	Indicator Bacteria
Alvarado Creek	Nitrogen, Selenium	
Famosa, Slough and Channel	Eutropic	

Identification of Project Site Pollutants*			
*Identification of project site pollutants is only required if flow-thru treatment BMPs are implemented onsite in lieu of retention or biofiltration BMPs (note the project must also participate in an alternative compliance program unless prior lawful approval to meet earlier PDP requirements is demonstrated) Identify pollutants anticipated from the project site based on all proposed use(s) of the site (see Appendix B.6):			
Pollutant	**Not Applicable to the Project Site**	**Anticipated from the Project Site**	**Also a Receiving Water Pollutant of Concern**
Sediment	☐	☐	☐
Nutrients	☐	☐	☐
Heavy Metals	☐	☐	☐
Organic Compounds	☐	☐	☐
Trash & Debris	☐	☐	☐
Oxygen Demanding Substances	☐	☐	☐
Oil & Grease	☐	☐	☐
Bacteria & Viruses	☐	☐	☐
Pesticides	☐	☐	☐

Form I-3B Page 9 of 11
Hydromodification Management Requirements
Do hydromodification management requirements apply (see Section 1.6)? ☑ Yes, hydromodification management flow control structural BMPs required. ☐ No, the project will discharge runoff directly to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. ☐ No, the project will discharge runoff directly to conveyance channels whose bed and bank are concrete-lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. ☐ No, the project will discharge runoff directly to an area identified as appropriate for an exemption by the WMAA for the watershed in which the project resides. Description / Additional Information (to be provided if a 'No' answer has been selected above): Note: If "No" answer has been selected the SWQMP must include an exhibit that shows the storm water conveyance system from the project site to an exempt water body. The exhibit should include details about the conveyance system and the outfall to the exempt water body.
Critical Coarse Sediment Yield Areas* ***This Section only required if hydromodification management requirements apply**
Based on Section 6.2 and Appendix H does CCSYA exist on the project footprint or in the upstream area draining through the project footprint? ☐ Yes ☑ No Discussion / Additional Information: Per the Potential Critical Coarse Sediment Yield Area Map of the Watershed Management Area Analysis (WMAA), there are no CCSYAs located onsite or upstream of the project. See the Critical Coarse Yield Area Exhibit in Attachment 2.

Form I-3B Page 10 of 11
Flow Control for Post-Project Runoff* ***This Section only required if hydromodification management requirements apply**
List and describe point(s) of compliance (POCs) for flow control for hydromodification management (see Section 6.3.1). For each POC, provide a POC identification name or number correlating to the project's HMP Exhibit and a receiving channel identification name or number correlating to the project's HMP Exhibit. The point of compliance (POC #2) is located at the existing curb and gutter along Birmingham Way. From POC #2, the run-off is conveyed to the San Diego River through an 18" RCP (~2 miles from the project site). The San Diego River ultimately drains to the Pacific Ocean (~8.3 miles from the project site).
Has a geomorphic assessment been performed for the receiving channel(s)? ☑ No, the low flow threshold is $0.1Q_2$ (default low flow threshold) ☐ Yes, the result is the low flow threshold is $0.1Q_2$ ☐ Yes, the result is the low flow threshold is $0.3Q_2$ ☐ Yes, the result is the low flow threshold is $0.5Q_2$ If a geomorphic assessment has been performed, provide title, date, and preparer:
Discussion / Additional Information: (optional)

Form I-3B Page 11 of 11
Other Site Requirements and Constraints
When applicable, list other site requirements or constraints that will influence storm water management design, such as zoning requirements including setbacks and open space, or local codes governing minimum street width, sidewalk construction, allowable pavement types, and drainage requirements.
Optional Additional Information or Continuation of Previous Sections As Needed
This space provided for additional information or continuation of information from previous sections as needed.

Source Control BMP Checklist for PDPs			Form I-4B
Source Control BMPs			
All development projects must implement source control BMPs where applicable and feasible. See Chapter 4 and Appendix E of the BMP Design Manual (Part 1 of the Storm Water Standards) for information to implement source control BMPs shown in this checklist. Answer each category below pursuant to the following. • "Yes" means the project will implement the source control BMP as described in Chapter 4 and/or Appendix E of the BMP Design Manual. Discussion / justification is not required. • "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided. • "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification may be provided.			
Source Control Requirement	**Applied?**		
4.2.1 Prevention of Illicit Discharges into the MS4	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.2.1 not implemented:			
4.2.2 Storm Drain Stenciling or Signage	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.2.2 not implemented:			
4.2.3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.2.3 not implemented:			
4.2.4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.2.4 not implemented:			
4.2.5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.2.5 not implemented:			

Form I-4B Page 2 of 2			
Source Control Requirement	**Applied?**		
4.2.6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below)			
On-site storm drain inlets	☑ Yes	☐ No	☐ N/A
Interior floor drains and elevator shaft sump pumps	☑ Yes	☐ No	☐ N/A
Interior parking garages	☐ Yes	☐ No	☑ N/A
Need for future indoor & structural pest control	☑ Yes	☐ No	☐ N/A
Landscape/Outdoor Pesticide Use	☑ Yes	☐ No	☐ N/A
Pools, spas, ponds, decorative fountains, and other water features	☐ Yes	☐ No	☑ N/A
Food service	☐ Yes	☐ No	☑ N/A
Refuse areas	☑ Yes	☐ No	☐ N/A
Industrial processes	☐ Yes	☐ No	☑ N/A
Outdoor storage of equipment or materials	☐ Yes	☐ No	☑ N/A
Vehicle/Equipment Repair and Maintenance	☐ Yes	☐ No	☑ N/A
Fuel Dispensing Areas	☐ Yes	☐ No	☑ N/A
Loading Docks	☑ Yes	☐ No	☐ N/A
Fire Sprinkler Test Water	☑ Yes	☐ No	☐ N/A
Miscellaneous Drain or Wash Water	☑ Yes	☐ No	☐ N/A
Plazas, sidewalks, and parking lots	☑ Yes	☐ No	☐ N/A
SC-6A: Large Trash Generating Facilities	☐ Yes	☐ No	☑ N/A
SC-6B: Animal Facilities	☐ Yes	☐ No	☑ N/A
SC-6C: Plant Nurseries and Garden Centers	☐ Yes	☐ No	☑ N/A
SC-6D: Automotive Facilities	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.2.6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for all "No" answers shown above.			

Project Name: Sharp MMC - Package 3A (PK3A)

Site Design BMP Checklist for PDPs			Form I-5B
Site Design BMPs			
All development projects must implement site design BMPs where applicable and feasible. See Chapter 4 and Appendix E of the BMP Design Manual (Part 1 of Storm Water Standards) for information to implement site design BMPs shown in this checklist. Answer each category below pursuant to the following. • "Yes" means the project will implement the site design BMP as described in Chapter 4 and/or Appendix E of the BMP Design Manual. Discussion / justification is not required. • "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided. • "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification may be provided. A site map with implemented site design BMPs must be included at the end of this checklist.			
Site Design Requirement	**Applied?**		
4.3.1 Maintain Natural Drainage Pathways and Hydrologic Features	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.3.1 not implemented:			
1-1 Are existing natural drainage pathways and hydrologic features mapped on the site map?	☐ Yes	☐ No	☑ N/A
1-2 Are trees implemented? If yes, are they shown on the site map?	☐ Yes	☐ No	☑ N/A
1-3 Implemented trees meet the design criteria in 4.3.1 Fact Sheet (e.g. soil volume, maximum credit, etc.)?	☐ Yes	☐ No	☑ N/A
1-4 Is tree credit volume calculated using Appendix B.2.2.1 and SD-1 Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A
4.3.2 Have natural areas, soils and vegetation been conserved?	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.3.2 not implemented:			

Form I-5B Page 2 of 4			
Site Design Requirement	**Applied?**		
4.3.3 Minimize Impervious Area	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.3 not implemented:			
4.3.4 Minimize Soil Compaction	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.4 not implemented:			
4.3.5 Impervious Area Dispersion	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.5 not implemented:			
5-1 Is the pervious area receiving runon from impervious area identified on the site map?	☑ Yes	☐ No	☐ N/A
5-2 Does the pervious area satisfy the design criteria in 4.3.5 Fact Sheet in Appendix E (e.g. maximum slope, minimum length, etc.)	☑ Yes	☐ No	☐ N/A
5-3 Is impervious area dispersion credit volume calculated using Appendix B.2.1.1 and 4.3.5 Fact Sheet in Appendix E?	☑ Yes	☐ No	☐ N/A

Form I-5B Page 3 of 4			
Site Design Requirement	**Applied?**		
4.3.6 Runoff Collection	☐ Yes	☑ No	☐ N/A
Discussion / justification if 4.3.6 not implemented: Permeable pavement or rain barrels are not proposed on site due to native low infiltration rates.			
6a-1 Are green roofs implemented in accordance with design criteria in 4.3.6A Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☐ No	☑ N/A
6a-2 Is the green roof credit volume calculated using Appendix B.2.1.2 and 4.3.6A Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A
6b-1 Are permeable pavements implemented in accordance with design criteria in 4.3.6B Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☐ No	☑ N/A
6b-2 Is the permeable pavement credit volume calculated using Appendix B.2.1.3 and 4.3.6B Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A
4.3.7 Landscaping with Native or Drought Tolerant Species	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.7 not implemented:			
4.3.8 Harvest and Use Precipitation	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.3.8 not implemented:			
8-1 Are rain barrels implemented in accordance with design criteria in 4.3.8 Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☐ No	☑ N/A
8-2 Is the rain barrel credit volume calculated using Appendix B.2.2.2 and 4.3.8 Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A

Form I-5B Page 4 of 4
Insert Site Map with all site design BMPs identified:
See DMA exhibit in Attachment 1 for site design BMPs.

Project Name: Sharp MMC - Package 3A (PK3A)

Summary of PDP Structural BMPs	Form I-6
PDP Structural BMPs	
All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the BMP Design Manual, Part 1 of Storm Water Standards). Selection of PDP structural BMPs for storm water pollutant control must be based on the selection process described in Chapter 5. PDPs subject to hydromodification management requirements must also implement structural BMPs for flow control for hydromodification management (see Chapter 6 of the BMP Design Manual). Both storm water pollutant control and flow control for hydromodification management can be achieved within the same structural BMP(s). PDP structural BMPs must be verified by the City at the completion of construction. This includes requiring the project owner or project owner's representative to certify construction of the structural BMPs (complete Form DS-563). PDP structural BMPs must be maintained into perpetuity (see Chapter 7 of the BMP Design Manual). Use this form to provide narrative description of the general strategy for structural BMP implementation at the project site in the box below. Then complete the PDP structural BMP summary information sheet (page 3 of this form) for each structural BMP within the project (copy the BMP summary information page as many times as needed to provide summary information for each individual structural BMP).	
Describe the general strategy for structural BMP implementation at the site. This information must describe how the steps for selecting and designing storm water pollutant control BMPs presented in Section 5.1 of the BMP Design Manual were followed, and the results (type of BMPs selected). For projects requiring hydromodification flow control BMPs, indicate whether pollutant control and flow control BMPs are integrated or separate. A combination of Source Control, Site Design, and Structural BMPs are proposed to mitigate the impacts of the proposed development. The design of each BMP follows the regulations set forth in the City of San Diego BMP design manual as well as provides treatment for the sites Design Capture Volume (DCV), defined as the 85th percentile, 24 hour storm event. Harvest and use BMPs were evaluated and determined to be infeasible for our site, see calculations in Attachment 1. The proposed development includes a medical facility, waste storage area, loading dock, parking, and associated hardscape and landscape. A biofiltration basin (BMP #2) is proposed for pollutant control for the northern portion of the project site, while an underground vault (BMP #3) is proposed for hydromodification control. Another biofiltration basin (BMP#4) is proposed for pollutant and hydromodification control for the southern most portion of the site. Impervious area dispersion is uitilized for a portion of the roof of the waste storage area, meeting the standard requirements. The run-off from the BMPs drain to an existing inlet located on Birmingham Way (POC 2). (Continue on page 2 as necessary.)	

Form I-6 Page 2 of 8

(Continued from page 1)

DMAs 3A.1, 3A.2, and 3A.4 consist of the medical facility, loading dock, and parking area with associated sidewalk and landscape. Runoff from DMAs 3A.1, 3A.2, and 3A.4 are conveyed to BMP #2 and BMP #3 for pollutant and hydromodification control.

DMAs 3A.5 and 3A.7 comprise of a portion of the waste storage area roof and parking area with associated hardscape and landscape. DMAs 3A.5 and 3A.7 drain to BMP #4 for treatment and hydromodification control.

DMA 3A.3 is hydraulically disconnected from the other DMAs and is less than 250 sf. DMA 3A.3 is considered to be de minimis.

DMA 3A.6 meets an impervious to pervious area ratio of 1:1, pervious area achieving a minimum top amended soils depth of 11 inches, and meets the minimum slope and flow length requirements. DMA 3A.6 utilizes impervious area dispersion for pollutant and hydromodification control.

Project Name: Sharp MMC - Package 3A (PK3A)

Form I-6 Page 3 of 8 (Copy as many as needed)	
Structural BMP Summary Information	
Structural BMP ID No. BMP #2	
Construction Plan Sheet No.	
Type of Structural BMP: ☐ Retention by harvest and use (e.g. HU-1, cistern) ☐ Retention by infiltration basin (INF-1) ☐ Retention by bioretention (INF-2) ☐ Retention by permeable pavement (INF-3) ☐ Partial retention by biofiltration with partial retention (PR-1) ☑ Biofiltration (BF-1) ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☐ Detention pond or vault for hydromodification management ☐ Other (describe in discussion section below)	
Purpose: ☑ Pollutant control only ☐ Hydromodification control only ☐ Combined pollutant control and hydromodification control ☐ Pre-treatment/forebay for another structural BMP ☐ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification form DS-563	Ambrose Wong, BWE Inc. 9449 Balboa Ave, Suite 270 San Diego, CA 92123
Who will be the final owner of this BMP?	Sharp Healthcare 7901 Frost Street San Diego, CA 92123
Who will maintain this BMP into perpetuity?	Sharp Healthcare 7901 Frost Street San Diego, CA 92123
What is the funding mechanism for maintenance?	TBD

Project Name: Sharp MMC - Package 3A (PK3A)

Form I-6 Page 4 of 8 (Copy as many as needed)
Structural BMP ID No. BMP #2
Construction Plan Sheet No.
Discussion (as needed; must include worksheets showing BMP sizing calculations in the SWQMPs):

Form I-6 Page 5 of 8 (Copy as many as needed)	
Structural BMP Summary Information	
Structural BMP ID No. BMP #3	
Construction Plan Sheet No.	
Type of Structural BMP: ☐ Retention by harvest and use (e.g. HU-1, cistern) ☐ Retention by infiltration basin (INF-1) ☐ Retention by bioretention (INF-2) ☐ Retention by permeable pavement (INF-3) ☐ Partial retention by biofiltration with partial retention (PR-1) ☐ Biofiltration (BF-1) ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☑ Detention pond or vault for hydromodification management ☐ Other (describe in discussion section below)	
Purpose: ☐ Pollutant control only ☑ Hydromodification control only ☐ Combined pollutant control and hydromodification control ☐ Pre-treatment/forebay for another structural BMP ☐ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification form DS-563	Ambrose Wong, BWE Inc. 9449 Balboa Ave, Suite 270 San Diego, CA 92123
Who will be the final owner of this BMP?	Sharp Healthcare 7901 Frost Street San Diego, CA 92123
Who will maintain this BMP into perpetuity?	Sharp Healthcare 7901 Frost Street San Diego, CA 92123
What is the funding mechanism for maintenance?	TBD

Form I-6 Page 6 of 8 (Copy as many as needed)
Structural BMP ID No. BMP #3
Construction Plan Sheet No.
Discussion (as needed; must include worksheets showing BMP sizing calculations in the SWQMPs):

Form I-6 Page 7 of 8 (Copy as many as needed)	
Structural BMP Summary Information	
Structural BMP ID No. BMP #4	
Construction Plan Sheet No.	
Type of Structural BMP: ☐ Retention by harvest and use (e.g. HU-1, cistern) ☐ Retention by infiltration basin (INF-1) ☐ Retention by bioretention (INF-2) ☐ Retention by permeable pavement (INF-3) ☐ Partial retention by biofiltration with partial retention (PR-1) ☑ Biofiltration (BF-1) ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☐ Detention pond or vault for hydromodification management ☐ Other (describe in discussion section below)	
Purpose: ☐ Pollutant control only ☐ Hydromodification control only ☑ Combined pollutant control and hydromodification control ☐ Pre-treatment/forebay for another structural BMP ☐ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification form DS-563	Ambrose Wong, BWE Inc. 9449 Balboa Ave, Suite 270 San Diego, CA 92123
Who will be the final owner of this BMP?	Sharp Healthcare 7901 Frost Street San Diego, CA 92123
Who will maintain this BMP into perpetuity?	Sharp Healthcare 7901 Frost Street San Diego, CA 92123
What is the funding mechanism for maintenance?	TBD

Form I-6 Page 8 of 8 (Copy as many as needed)
Structural BMP ID No. BMP #4
Construction Plan Sheet No.
Discussion (as needed; must include worksheets showing BMP sizing calculations in the SWQMPs):

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Attachment 1
Backup For PDP Pollutant Control BMPs

This is the cover sheet for Attachment 1.

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Project Name: Sharp MMC - Package 3A (PK3A)

Indicate which Items are Included:

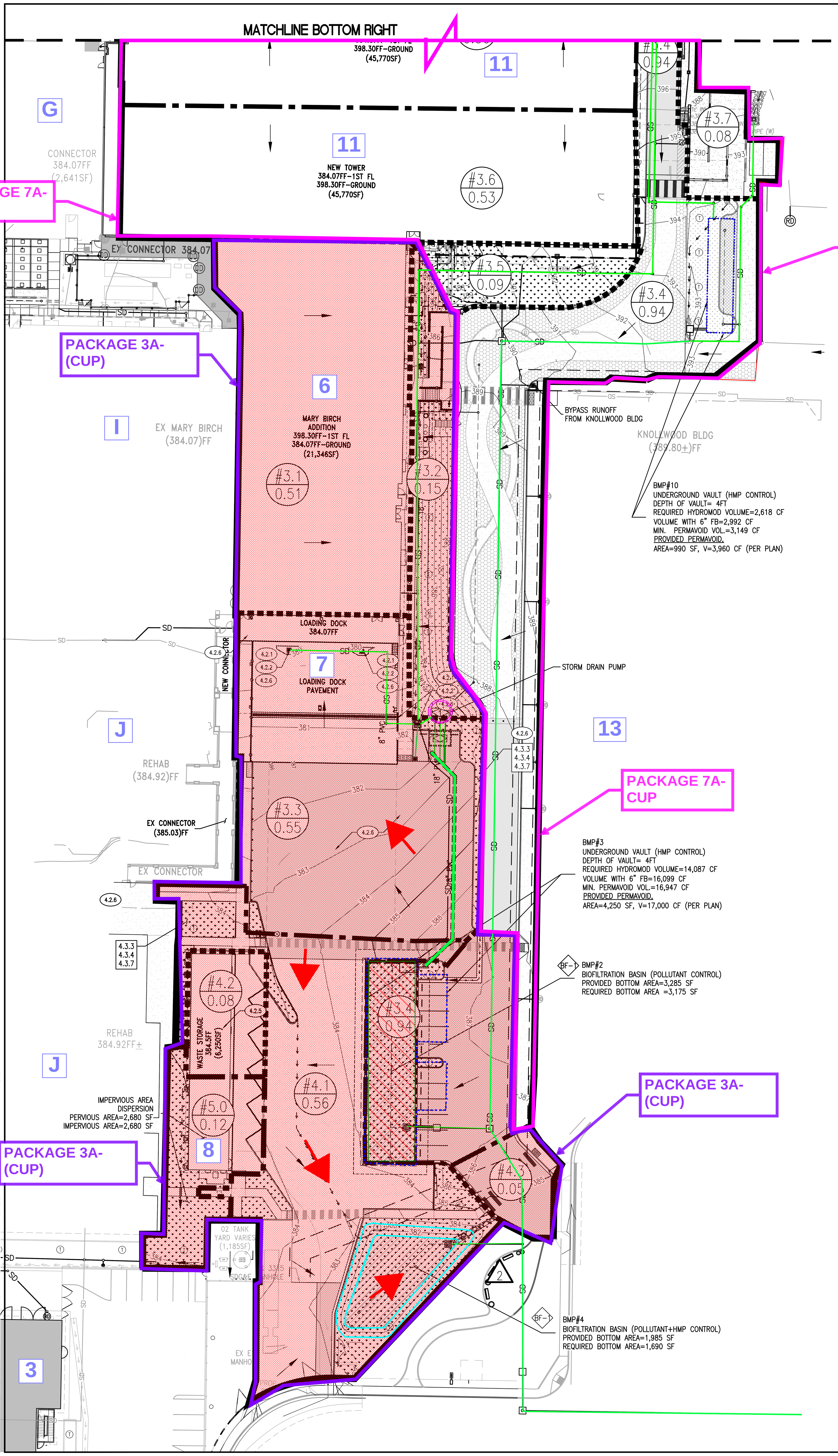
Attachment Sequence	Contents	Checklist
Attachment 1a	DMA Exhibit (Required) See DMA Exhibit Checklist.	☒ Included
Attachment 1b	Tabular Summary of DMAs Showing DMA ID matching DMA Exhibit, DMA Area, and DMA Type (Required)* *Provide table in this Attachment OR on DMA Exhibit in Attachment 1a	☑ Included on DMA Exhibit in Attachment 1a ☐ Included as Attachment 1b, separate from DMA Exhibit
Attachment 1c	Form I-7, Harvest and Use Feasibility Screening Checklist (Required unless the entire project will use infiltration BMPs) Refer to Appendix B.3-1 of the BMP Design Manual to complete Form I-7.	☑ Included ☐ Not included because the entire project will use infiltration BMPs
Attachment 1d	Infiltration Feasibility Information. Contents of Attachment 1d depend on the infiltration condition: • No Infiltration Condition: ○ Infiltration Feasibility Condition Letter (***Note: must be stamped and signed by licensed geotechnical engineer***) ○ Form I-8A (optional) ○ Form I-8B (optional) • Partial Infiltration Condition: ○ Infiltration Feasibility Condition Letter (***Note: must be stamped and signed by licensed geotechnical engineer***) ○ Form I-8A ○ Form I-8B • Full Infiltration Condition: ○ Form I-8A ○ Form I-8B ○ Worksheet C.4-3 ○ Form I-9 Refer to Appendices C and D of the BMP Design Manual for guidance.	☐ Included ☐ Not included because the entire project will use harvest and use BMPs
Attachment 1e	Pollutant Control BMP Design Worksheets / Calculations (Required) Refer to Appendices B and E of the BMP Design Manual for structural pollutant control BMP design guidelines and site design credit calculations	☑ Included

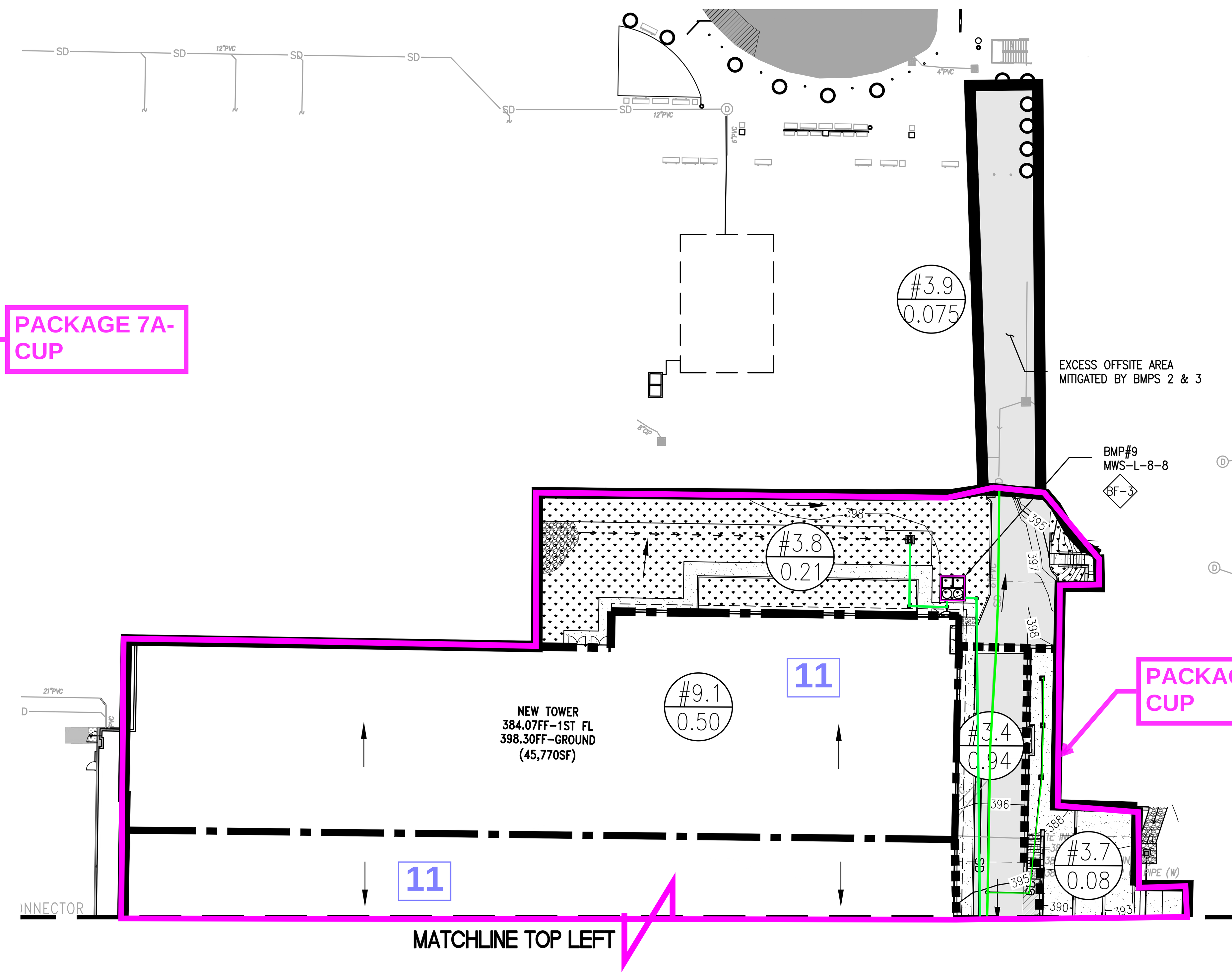
Use this checklist to ensure the required information has been included on the DMA Exhibit:

The DMA Exhibit must identify:

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

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING





LEGEND

LEGEND	SYMBOL
OUTER DMA BOUNDARY	
MAJOR DMA BOUNDARY	
MINOR DMA BOUNDARY	
EXISTING STORM DRAIN	SD
NEW STORM DRAIN	SD
EXISTING CONTOUR	
NEW CONTOUR	
FLOW DIRECTION	
FLOW PATH	
POINT OF COMPLIANCE (POC)	
DRAINAGE MANAGEMENT AREA MARKER & AREA (AC)	B-X X.XX
CONCRETE PAVEMENT	
ASPHALT PAVEMENT	
LANDSCAPING	
BIOFILTRATION BMP	
BUILDING ROOF	

SWQMP NOTES

1. THE SITE IS COMPRISED OF HYDROLOGIC SOIL TYPE D.
2. NO CRITICAL COARSE SEDIMENT YIELD AREAS ARE PRESENT ON SITE.
3. THERE ARE NO NATURAL HYDROLOGIC FEATURES PRESENT ON SITE.
4. DEPTH TO GROUNDWATER GREATER THAN 20 FT.
5. BMP #2 AND BMP #3 ARE ALSO DESIGNED TO MITIGATE RUNOFF FROM DMAS THAT ARE ASSOCIATED WITH IMPROVEMENTS IN PACKAGE 7A.

STRUCTURAL BMPS:

BF-1 BIOFILTRATION BMP

SOURCE CONTROL BMPS:

4.2.1 PREVENTION OF ILLICIT DISCHARGE INTO THE MS4

4.2.2 STORM DRAIN STENCILING OR SIGNAGE

4.2.5 PROTECT TRASH STORAGE AREAS FROM RAINFALL. RUN-ON, RUNOFF, AND WIND DISPERSAL

4.2.6 ADDITIONAL BMPS
- ONSITE STORM DRAIN INLETS
- INTERIOR FLOOR DRAINS AND ELEVATOR SHAFT SUMP PUMPS
- NEED FOR FUTURE INDOOR & STRUCTURAL PEST CONTROL
- LANDSCAPE/OUTDOOR PESTICIDE USE
- REFUSE AREAS
- LOADING DOCKS
- FIRE SPRINKLER TEST WATER
- MISCELLANEOUS DRAIN OR WASH WATER
- PLAZAS, SIDEWALKS, AND PARKING LOTS

SITE DESIGN BMPS:

4.3.3 MINIMIZE IMPERVIOUS AREA

4.3.4 MINIMIZE SOIL COMPACTION

4.3.5 IMPERVIOUS AREA DISPERSION

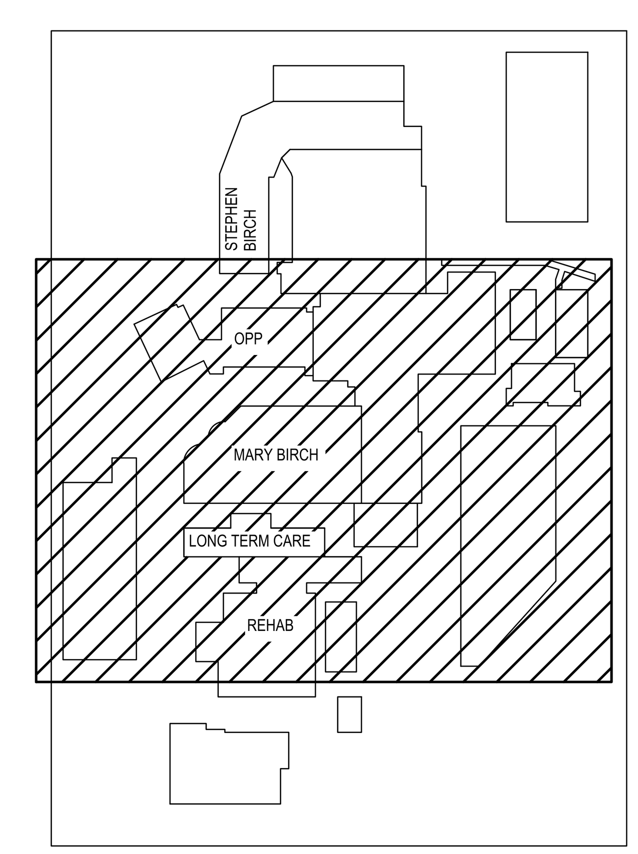
4.3.7 LANDSCAPING WITH NATIVE OR DROUGHT TOLERANT SPECIES

DMA-PACKAGE 3A
DMA-PACKAGE 7A
DMA-PACKAGE 8
BUILDING NO. XX
SD FLOW DIRECTION OR
UG-VAULT
STORM DRAIN

30 15 0 30 60 90
SCALE: 1"=30'

PACKAGE 3A – 7A DMA AREA DETAILS

DMA ID	TOTAL AREA (AC)	TOTAL AREA (SF)	PERVIOUS AREA (SF)	IMPERVIOUS AREA (SF)	IMPERVIOUS RATIO %	NOTES
3.1	0.51	22132	0	22132	100	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.2	0.15	6739	4607	2132	32	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.3	0.55	23812	993	22819	96	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.4	0.94	40664	5893	34771	85	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.5	0.09	4044	3393	651	16	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.6	0.53	23177	0	23089	100	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.7	0.08	3432	0	3432	100	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.8	0.21	9092	6267	2825	31	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.9	0.075	3287	0	3287	100	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
9.1	0.50	22013	0	22013	100	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
4.1	0.53	23285	6498	16787	72	POLLUTANT AND HMP CONTROL MITIGATED BY BMP #4
4.2	0.08	3495	420	3075	88	POLLUTANT AND HMP CONTROL MITIGATED BY BMP #4
4.3	0.05	2318	0	2318	100	POLLUTANT AND HMP CONTROL MITIGATED BY BMP #4
5.0	0.12	5360	2687	2673	50	SELF RETAINING DMA (1:1 DISPERSION)



KEY PLAN

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123
619.299.5550

APPR	DATE	DESCRIPTION	SYM

BENCHMARK:

ISSUE DATE: 09/17/2021
DRAWN BY: MDS
CHECKED BY: MGC
B&W JOB NUMBER: 9545.10.00
CLIENT JOB NUMBER:

PROJECT
SHARP MMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

SHEET TITLE
DMA EXHIBIT

SHEET 1 OF 2

85th % Rainfall Depth= 0.58 inch

Tabular Summary of DMAs								Worksheet B-1	
DMA Unique Identifier	Area (acres)	Impervious Area (acres)	% Imp	HSG	Area Weighted Runoff Coefficient (C)	DCV (cubic feet)	Migated By (BMP ID)	Pollutant Control Type	Drains to (POC ID)
3A.1	0.50	0.50	100.0%	D	0.900	940	BMP #2	Biofiltration	2
3A.2	0.15	0.05	30.9%	D	0.347	113	BMP #2	Biofiltration	2
3A.3*	0.06	0.06	100.0%	D	0.900	120	BMP #2	Biofiltration	2
3A.4A	0.54	0.53	96.8%	D	0.874	1001	BMP #2	Biofiltration	2
3A.4B	0.12	0.12	97.8%	D	0.882	227	BMP #2	Biofiltration	2
3A.4C*	0.07	0.07	100.0%	D	0.900	137	BMP #2	Biofiltration	2
3A.5	0.09	0.09	100.0%	D	0.900	178	BMP #4	Biofiltration	2
3A.6	0.09	0.06	65.2%	D	0.621	116	BMP #4	Biofiltration	2
3A.7A	0.56	0.43	76.1%	D	0.709	837	BMP #4	Biofiltration	2
3A.7B*	0.02	0.02	100.0%	D	0.900	30	BMP #4	Biofiltration	2
3A.8	0.04	0.04	100.0%	D	0.900	67	BMP #2	Biofiltration	2
3A.9	0.01	0.01	100.0%	D	0.900	17	BMP #2	Biofiltration	2

Summary of DMA Information (Must match project description and SWQMP Narrative)									
No. of DMAs	Total DMA Area (acres)	Total Impervious Area (acres)	% Imp	HSG	Area Weighted Runoff Coefficient	Total DCV (cubic feet)	Total Area Treated (acres)		No. of POCs
12	2.256	1.964	87.1%	D	0.797	3783	2.256		1

Where: DMA = Drainage Management Area; Imp = Imperviousness; HSG = Hydrologic Soil Group; DCV= Design Capture Volume; BMP = Best Management Practice; POC = Point of Compliance; ID = identifier; No. = Number

Harvest and Use Feasibility Checklist			Worksheet B.3-1 : Form I-7
1. Is there a demand for harvested water (check all that apply) at the project site that is reliably present during the wet season? ☑ Toilet and urinal flushing ☑ Landscape irrigation ☐ Other:___________			
2. If there is a demand; estimate the anticipated average wet season demand over a period of 36 hours. Guidance for planning level demand calculations for toilet/urinal flushing and landscape irrigation is provided in Section B.3.2. [Provide a summary of calculations here] See calculations attached.			
3. Calculate the DCV using worksheet B-2.1. DCV = 3883 (cubic feet) [Provide a summary of calculations here] Calculations for the entire site DCV is shown in the summary table. 3883 x 0.25 = 970.75 CF			
3a. Is the 36-hour demand greater than or equal to the DCV? ☐ Yes / ☐ No ⇨ ⇩	3b. Is the 36-hour demand greater than 0.25DCV but less than the full DCV? ☐ Yes / ☐ No ⇨ ⇩	3c. Is the 36-hour demand less than 0.25DCV? ☑ Yes ⇩	
Harvest and use appears to be feasible. Conduct more detailed evaluation and sizing calculations to confirm that DCV can be used at an adequate rate to meet drawdown criteria.	Harvest and use may be feasible. Conduct more detailed evaluation and sizing calculations to determine feasibility. Harvest and use may only be able to be used for a portion of the site, or (optionally) the storage may need to be upsized to meet long term capture targets while draining in longer than 36 hours.	Harvest and use is considered to be infeasible.	
Is harvest and use feasible based on further evaluation? ☐ Yes, refer to Appendix E to select and size harvest and use BMPs. ☐ No, select alternate BMPs.			

Modified Estimated Total Water Use Calculation

Modified ETWU = $(ET0_{wet}) \times [[\sum(PF \times HA)/IE] + SLA] \times 0.015$

where:

Modified ETWU	=	Estimated daily average water usage during wet season
ETo_{Wet}	=	Average reference evapotranspiration from November through April (use 2.7 inches per month, using CIMS Zone 4 from Table G.1-1)
PF	=	Plant Factor
HA	=	Hydrozone Area (sq-ft); A section or zone of the landscaped area having plants with similar water needs. $\Sigma(PF \times HA)$ = The sum of PF x HA for each individual Hydrozone (accounts for different landscaping zones).
IE	=	Irrigation Efficiency (assume 90 percent for demand calculations)
SLA	=	Special Landscape Area (sq-ft); Areas used for active and passive recreation areas, areas solely dedicated to the production of fruits and vegetables, and areas irrigated with reclaimed water.

Enter Irrigation Efficiency (IE)	0.90

Plant Water Use Type	Plant Factor
Low	0.1 - 0.2
Moderate	0.3 - 0.7
High	0.80
SLA	1.00

Hydrozone	Plant Water Use Type (s) (low, medium, high)	Plant Factor (PF)	Hydrozone Area (HA) (ft^2)	PF x HA (ft^2)
1	Low	0.10	10,384	1,038
2	Moderate	0.30	0	0
3	High	0.80	0	0
				1,038
	SLA	1	0	0
		Sum		**1,038**

Results

Modified ETWU=	47	**gal**
	6	**cf**
36 hr Demand=	**9**	**cf**

Toilet & Urinal Water Usage Calculation

Land Use Type: Medical Building

Total Toilets = 14

Total Urinals = 2

Item	Flushes/Day (gallons/day)	Daily Water Use (gal)
Toilet Flushing	18.5	259
Urinals	16	32
	Total Daily Volume	291

36 Hours Damand	**873**	**gal**
	117	**cf**

Total 36 hr Demand =	**126**	**cf**

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions[1]		Worksheet C.4–1: Form I–8A[2]
Part 1 - Full Infiltration Feasibility Screening Criteria		
DMA(s) Being Analyzed:		**Project Phase:**
Sharp Metropolitan Medical Campus Civil Improvements		Design
Criteria 1: Infiltration Rate Screening		
1A	Is the mapped hydrologic soil group according to the NRCS Web Soil Survey or UC Davis Soil Web Mapper Type A or B and corroborated by available site soil data[3]? ○ Yes; the DMA may feasibly support full infiltration. Answer "Yes" to Criteria 1 Result or continue to Step 1B if the applicant elects to perform infiltration testing. ● No; the mapped soil types are A or B but is not corroborated by available site soil data (continue to Step 1B). ○ No; the mapped soil types are C, D, or "urban/unclassified" and is corroborated by available site soil data. Answer "No" to Criteria 1 Result. ○ No; the mapped soil types are C, D, or "urban/unclassified" but is not corroborated by available site soil data (continue to Step 1B).	
1B	Is the reliable infiltration rate calculated using planning phase methods from Table D.3-1? ● Yes; Continue to Step 1C. ○ No; Skip to Step 1D.	
1C	Is the reliable infiltration rate calculated using planning phase methods from Table D.3–1 greater than 0.5 inches per hour? ○ Yes; the DMA may feasibly support full infiltration. Answer "Yes" to Criteria 1 Result. ● No; full infiltration is not required. Answer "No" to Criteria 1 Result.	
1D	**Infiltration Testing Method.** Is the selected infiltration testing method suitable during the design phase (see Appendix D.3)? Note: Alternative testing standards may be allowed with appropriate rationales and documentation. ● Yes; continue to Step 1E. ○ No; select an appropriate infiltration testing method.	

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

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

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

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4–1: Form I–8A[2]
1E	**Number of Percolation/Infiltration Tests.** Does the infiltration testing method performed satisfy the minimum number of tests specified in Table D.3-2? ● Yes; continue to Step 1F. ○ No; conduct appropriate number of tests.	
IF	**Factor of Safety.** Is the suitable Factor of Safety selected for full infiltration design? See guidance in D.5; Tables D.5–1 and D.5–2; and Worksheet D.5–1 (Form I–9). ● Yes; continue to Step 1G. ○ No; select appropriate factor of safety.	
1G	**Full Infiltration Feasibility.** Is the average measured infiltration rate divided by the Factor of Safety greater than 0.5 inches per hour? ○ Yes; answer "Yes" to Criteria 1 Result. ● No; answer "No" to Criteria 1 Result.	
Criteria 1 Result	Is the estimated reliable infiltration rate greater than 0.5 inches per hour within the DMA where runoff can reasonably be routed to a BMP? ○ Yes; the DMA may feasibly support full infiltration. Continue to Criteria 2. ● No; full infiltration is not required. Skip to Part 1 Result.	
Summarize infiltration testing methods, testing locations, replicates, and results and summarize estimates of reliable infiltration rates according to procedures outlined in D.5. Documentation should be included in project geotechnical report. Based on our field percolation testing, the in-situ infiltration rates of the soils within the limits of proposed DMA's range from no percolation to 125 minutes per inch. The calculated infiltration rates via the Porchet Method and applied safety factor of 2 ranges from no infiltration to 0.006 inches per hour.		

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

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

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

Summarize findings and basis; provide references to related reports or exhibits.

Based on our field percolation testing, the in-situ infiltration rates of the soils within the limits of proposed DMA's range from no percolation to 125 minutes per inch. The calculated infiltration rates via the Porchet Method and applied safety factor of 2 ranges from no infiltration to 0.006 inches per hour.

Part 1 Result – Full Infiltration Geotechnical Screening [4]	**Result**
If answers to both Criteria 1 and Criteria 2 are "Yes", a full infiltration design is potentially feasible based on Geotechnical conditions only. If either answer to Criteria 1 or Criteria 2 is "No", a full infiltration design is not required.	○ Full infiltration Condition ● Complete Part 2

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

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions	Worksheet C.4–1: Form I–8A[2]
Part 2 – Partial vs. No Infiltration Feasibility Screening Criteria	
DMA(s) Being Analyzed:	**Project Phase:**
Sharp Metropolitan Medical Campus Civil Improvements	Design
Criteria 3 : Infiltration Rate Screening	

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

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

Based on our field percolation testing, the in-situ infiltration rates of the soils within the limits of proposed DMA's range from no percolation to 125 minutes per inch. The calculated infiltration rates via the Porchet Method and applied safety factor of 2 ranges from no infiltration to 0.006 inches per hour.

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4–1: Form I–8A[2]	
4B-4	**Slope Stability**. If applicable, perform a slope stability analysis in accordance with the ASCE and Southern California Earthquake Center (2002) Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Landslide Hazards in California to determine minimum slope setbacks for full infiltration BMPs. See the City of San Diego's Guidelines for Geotechnical Reports (2011) to determine which type of slope stability analysis is required. Can partial infiltration BMPs be proposed within the DMA without increasing slope stability risks?	● Yes	○ No
4B-5	**Other Geotechnical Hazards.** Identify site-specific geotechnical hazards not already mentioned (refer to Appendix C.2.1). Can partial infiltration BMPs be proposed within the DMA without increasing risk of geologic or geotechnical hazards not already mentioned?	● Yes	○ No
4B-6	**Setbacks.** Establish setbacks from underground utilities, structures, and/or retaining walls. Reference applicable ASTM or other recognized standard in the geotechnical report. Can partial infiltration BMPs be proposed within the DMA using recommended setbacks from underground utilities, structures, and/or retaining walls?	○ Yes	● No
4C	**Mitigation Measures.** Propose mitigation measures for each geologic/geotechnical hazard identified in Step 4B. Provide a discussion on geologic/geotechnical hazards that would prevent partial infiltration BMPs that cannot be reasonably mitigated in the geotechnical report. See Appendix C.2.1.8 for a list of typically reasonable and typically unreasonable mitigation measures. Can mitigation measures be proposed to allow for partial infiltration BMPs? If the question in Step 4C is answered "Yes," then answer "Yes" to Criteria 4 Result. If the question in Step 4C is answered "No," then answer "No" to Criteria 4 Result.	○ Yes	● No
Criteria 4 Result	Can infiltration of greater than or equal to 0.05 inches/hour and less than or equal to 0.5 inches/hour be allowed without increasing the risk of geologic or geotechnical hazards that cannot be reasonably mitigated to an acceptable level?	○ Yes	● No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions	Worksheet C.4–1: Form I–8A[2]

Summarize findings and basis; provide references to related reports or exhibits.

Based on our field percolation testing, the in-situ infiltration rates of the soils within the limits of proposed DMA's range from no percolation to 125 minutes per inch. The calculated infiltration rates via the Porchet Method and applied safety factor of 2 ranges from no infiltration to 0.006 inches per hour.

Part 2 – Partial Infiltration Geotechnical Screening Result[5]	**Result**
If answers to both Criteria 3 and Criteria 4 are "Yes", a partial infiltration design is potentially feasible based on geotechnical conditions only. If answers to either Criteria 3 or Criteria 4 is "No", then infiltration of any volume is considered to be infeasible within the site.	○ Partial Infiltration Condition ● No Infiltration Condition

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

Project: Sharp MMC Pk 3A

DMAs #3.1, 3.2,3.3, 3.4,3.5, 3.6, 3.7, 3.8, & 3.9 (BMP #2)

Area Weighted Runoff Factor (C)

Surface Type	Area - A (sf)	C - Factor	C X A	Weighted C-Factor
Impervious	115,226	0.90	103,703	
Landscape	21,153	0.10	2,115	
Gravel/DG	0	0.30	0	
Total	**136,379**		**105,819**	**0.776**

3.13 Acres

Project: Sharp MMC Pk 3A

DMAs #3.1, 3.2,3.3, 3.4,3.5, 3.6, 3.7, 3.8, & 3.9 (BMP #2)

Design Capture Volume		Worksheet B.2-1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.58	inches
2	Area tributary to BMP (s)	A=	3.13	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.776	unitless
4	Trees Credit Volume Note: In the SWQMP list the number of trees, size of each tree, amount of soil volume installed for each tree, contributing area to each tree and the inlet opening dimension for each tree.	TCV=	0	cubic-feet
5	Rain barrels Credit Volume Note: In the SWQMP list the number of rain barrels, size of each rain barrel and the use of the captured storm water runoff.	RCV=	0	cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	**DCV=**	**5115**	cubic-feet

The City of SAN DIEGO	Project Name	Sharp MMC PK 3A & 7A	
	BMP ID	BMP #2	
Sizing Method for Pollutant Removal Criteria		**Worksheet B.5-1**	

1	Area draining to the BMP	136,379	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)	0.776	
3	85th percentile 24-hour rainfall depth	0.58	inches
4	Design capture volume [Line 1 x Line 2 x (Line 3/12)]	5115	cu. ft.
BMP Parameters			
5	Surface ponding [6 inch minimum, 12 inch maximum]	6	inches
6	Media thickness [18 inches minimum], also add mulch layer and washed ASTM 33 fine aggregate sand thickness to this line for sizing calculations	18	inches
7	Aggregate storage (also add ASTM No 8 stone) above underdrain invert (12 inches typical) – use 0 inches if the aggregate is not over the entire bottom surface area	12	inches
8	Aggregate storage below underdrain invert (3 inches minimum) – use 0 inches if the aggregate is not over the entire bottom surface area	3	inches
9	Freely drained pore storage of the media	0.2	in/in
10	Porosity of aggregate storage	0.4	in/in
11	Media filtration rate to be used for sizing (maximum filtration rate of 5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate (includes infiltration into the soil and flow rate through the outlet structure) which will be less than 5 in/hr.)	5	in/hr.
Baseline Calculations			
12	Allowable routing time for sizing	6	hours
13	Depth filtered during storm [Line 11 x Line 12]	30	inches
14	Depth of Detention Storage [Line 5 + (Line 6 x Line 9) + (Line 7 x Line 10) + (Line 8 x Line 10)]	15.6	inches
15	Total Depth Treated [Line 13 + Line 14]	45.6	inches
Option 1 – Biofilter 1.5 times the DCV			
16	Required biofiltered volume [1.5 x Line 4]	7673	cu. ft.
17	Required Footprint [Line 16/ Line 15] x 12	2019	sq. ft.
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
18	Required Storage (surface + pores) Volume [0.75 x Line 4]	3836	cu. ft.
19	Required Footprint [Line 18/ Line 14] x 12	2951	sq. ft.
Footprint of the BMP			
20	BMP Footprint Sizing Factor (Default 0.03 or an alternative minimum footprint sizing factor from Line 11 in Worksheet B.5-4)	0.03	
21	Minimum BMP Footprint [Line 1 x Line 2 x Line 20]	3175	sq. ft.
22	Footprint of the BMP = Maximum(Minimum(Line 17, Line 19), Line 21)	3175	sq. ft.
23	Provided BMP Footprint	3285	sq. ft.
24	Is Line 23 ≥ Line 22?	**Yes, Performance Standard is Met**	

Project: Sharp MMC Pk 3A

BMP #4 (DMA #4.1, 4.2 & 4.3) (PC and HMP Control)

Area Weighted Runoff Factor (C)

Surface Type	Area - A (sf)	C - Factor	C X A	Weighted C-Factor
Impervious	22,180	0.90	19,962	
Landscape	6,918	0.10	692	
Gravel/DG	0	0.30	0	
Total	**29,098**		**20,654**	**0.710**

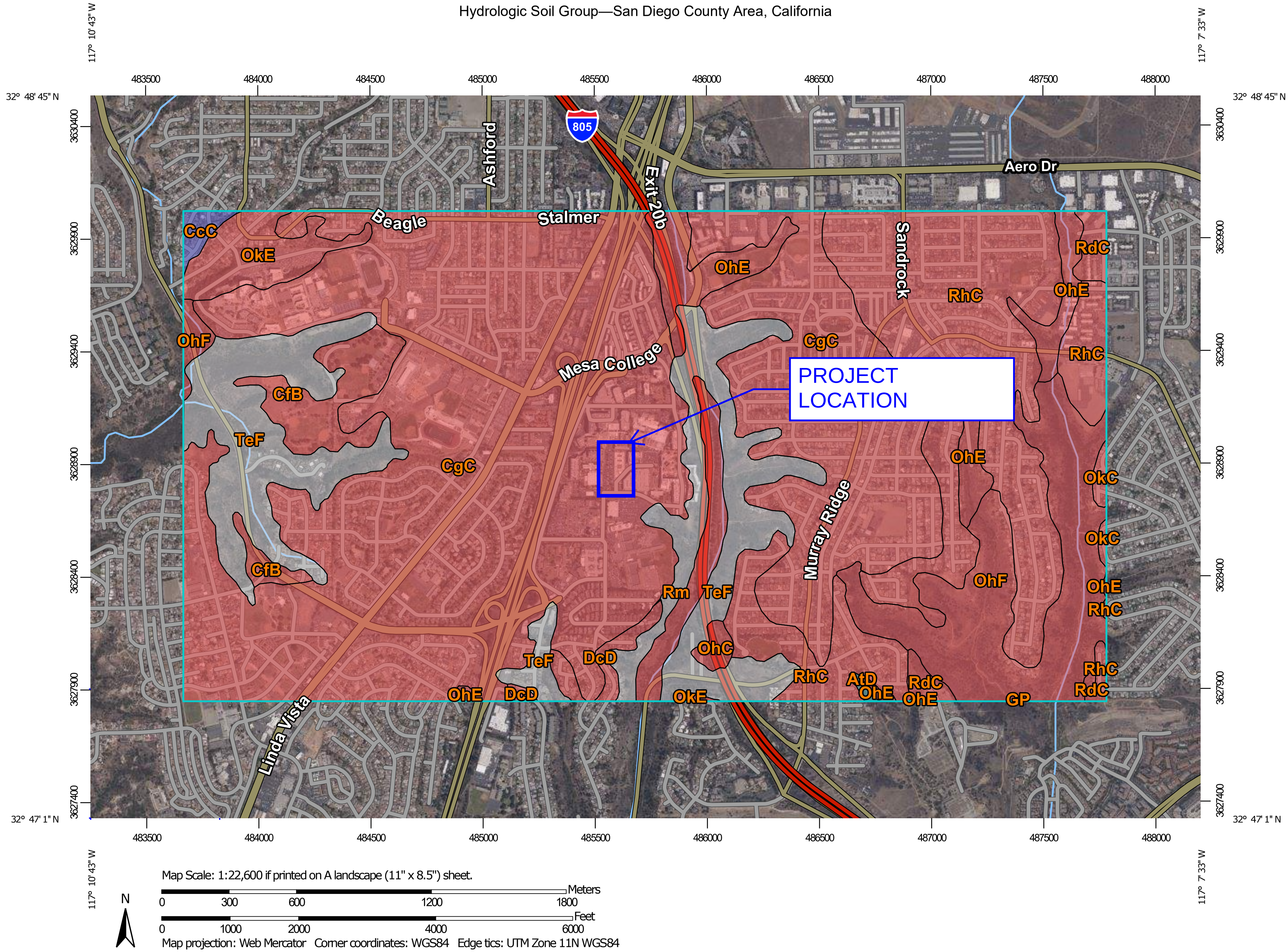
0.67 Acres

Project: Sharp MMC Pk 3A

BMP #4 (DMA #4.1, 4.2 & 4.3) (PC and HMP Control)

	Design Capture Volume	Worksheet B.2-1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.58	inches
2	Area tributary to BMP (s)	A=	0.67	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.710	unitless
4	Trees Credit Volume Note: In the SWQMP list the number of trees, size of each tree, amount of soil volume installed for each tree, contributing area to each tree and the inlet opening dimension for each tree.	TCV=	0	cubic-feet
5	Rain barrels Credit Volume Note: In the SWQMP list the number of rain barrels, size of each rain barrel and the use of the captured storm water runoff.	RCV=	0	cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	**DCV=**	**998**	cubic-feet

The City of SAN DIEGO	Project Name	Sharp MMC PK 3A	
	BMP ID	BMP #4 (DMA 4.1, 4.2, 4.3)	
Sizing Method for Pollutant Removal Criteria		**Worksheet B.5-1**	
1	Area draining to the BMP	29,098	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)	0.71	
3	85th percentile 24-hour rainfall depth	0.58	inches
4	Design capture volume [Line 1 x Line 2 x (Line 3/12)]	999	cu. ft.
BMP Parameters			
5	Surface ponding [6 inch minimum, 12 inch maximum]	12	inches
6	Media thickness [18 inches minimum], also add mulch layer and washed ASTM 33 fine aggregate sand thickness to this line for sizing calculations	18	inches
7	Aggregate storage (also add ASTM No 8 stone) above underdrain invert (12 inches typical) – use 0 inches if the aggregate is not over the entire bottom surface area	12	inches
8	Aggregate storage below underdrain invert (3 inches minimum) – use 0 inches if the aggregate is not over the entire bottom surface area	3	inches
9	Freely drained pore storage of the media	0.2	in/in
10	Porosity of aggregate storage	0.4	in/in
11	Media filtration rate to be used for sizing (maximum filtration rate of 5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate (includes infiltration into the soil and flow rate through the outlet structure) which will be less than 5 in/hr.)	0.05	in/hr.
Baseline Calculations			
12	Allowable routing time for sizing	6	hours
13	Depth filtered during storm [Line 11 x Line 12]	0.3	inches
14	Depth of Detention Storage [Line 5 + (Line 6 x Line 9) + (Line 7 x Line 10) + (Line 8 x Line 10)]	21.6	inches
15	Total Depth Treated [Line 13 + Line 14]	21.9	inches
Option 1 – Biofilter 1.5 times the DCV			
16	Required biofiltered volume [1.5 x Line 4]	1498	cu. ft.
17	Required Footprint [Line 16/ Line 15] x 12	821	sq. ft.
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
18	Required Storage (surface + pores) Volume [0.75 x Line 4]	749	cu. ft.
19	Required Footprint [Line 18/ Line 14] x 12	416	sq. ft.
Footprint of the BMP			
20	BMP Footprint Sizing Factor (Default 0.03 or an alternative minimum footprint sizing factor from Line 11 in Worksheet B.5-4)	0.03	
21	Minimum BMP Footprint [Line 1 x Line 2 x Line 20]	620	sq. ft.
22	Footprint of the BMP = Maximum(Minimum(Line 17, Line 19), Line 21)	620	sq. ft.
23	Provided BMP Footprint	1985	sq. ft.
24	Is Line 23 ≥ Line 22?	**Yes, Performance Standard is Met**	


117° 10' 43" W
117° 7' 33" W
32° 48' 45" N
32° 47' 1" N
483500
484000
484500
485000
485500
486000
486500
487000
487500
488000
3630400
3629900
3629400
3628900
3628400
3627900
3627400
805
Ashford
Exit 20b
Aero Dr
Beagle
Stalmer
Sandrock
Mesa College
Murray Ridge
Linda Vista
PROJECT LOCATION
CcC
OkE
OhE
RdC
RhC
OhF
CgC
CfB
TeF
OkC
Rm
OhC
DcD
OkE
AtD
GP
Map Scale: 1:22,600 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0
300
600
1200
1800
Feet
0
1000
2000
4000
6000
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 Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

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.

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 Diego County Area, California
Survey Area Data: Version 15, May 27, 2020

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

Date(s) aerial images were photographed: Aug 22, 2018—Aug 31, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AtD	Altamont clay, 9 to 15 percent slopes, warm MAAT, MLRA 20	C	1.5	0.1%
CcC	Carlsbad-Urban land complex, 2 to 9 percent slopes	B	7.4	0.3%
CfB	Chesterton fine sandy loam, 2 to 5 percent slopes	D	53.4	2.4%
CgC	Chesterton-Urban land complex, 2 to 9 percent slopes	D	1,168.5	52.6%
DcD	Diablo-Urban land complex, 5 to 15 percent slopes	D	14.5	0.7%
GP	Gravel pits		0.2	0.0%
OhC	Olivenhain cobbly loam, 2 to 9 percent slopes	D	6.3	0.3%
OhE	Olivenhain cobbly loam, 9 to 30 percent slopes	D	72.8	3.3%
OhF	Olivenhain cobbly loam, 30 to 50 percent slopes	D	171.5	7.7%
OkC	Olivenhain-Urban land complex, 2 to 9 percent slopes	D	5.0	0.2%
OkE	Olivenhain-Urban land complex, 9 to 30 percent slopes	D	44.5	2.0%
RdC	Redding gravelly loam, 2 to 9 percent slopes	D	17.5	0.8%
RhC	Redding-Urban land complex, 2 to 9 percent slopes	D	358.7	16.1%
Rm	Riverwash	D	31.7	1.4%
TeF	Terrace escarpments		268.3	12.1%
Totals for Area of Interest			**2,221.9**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

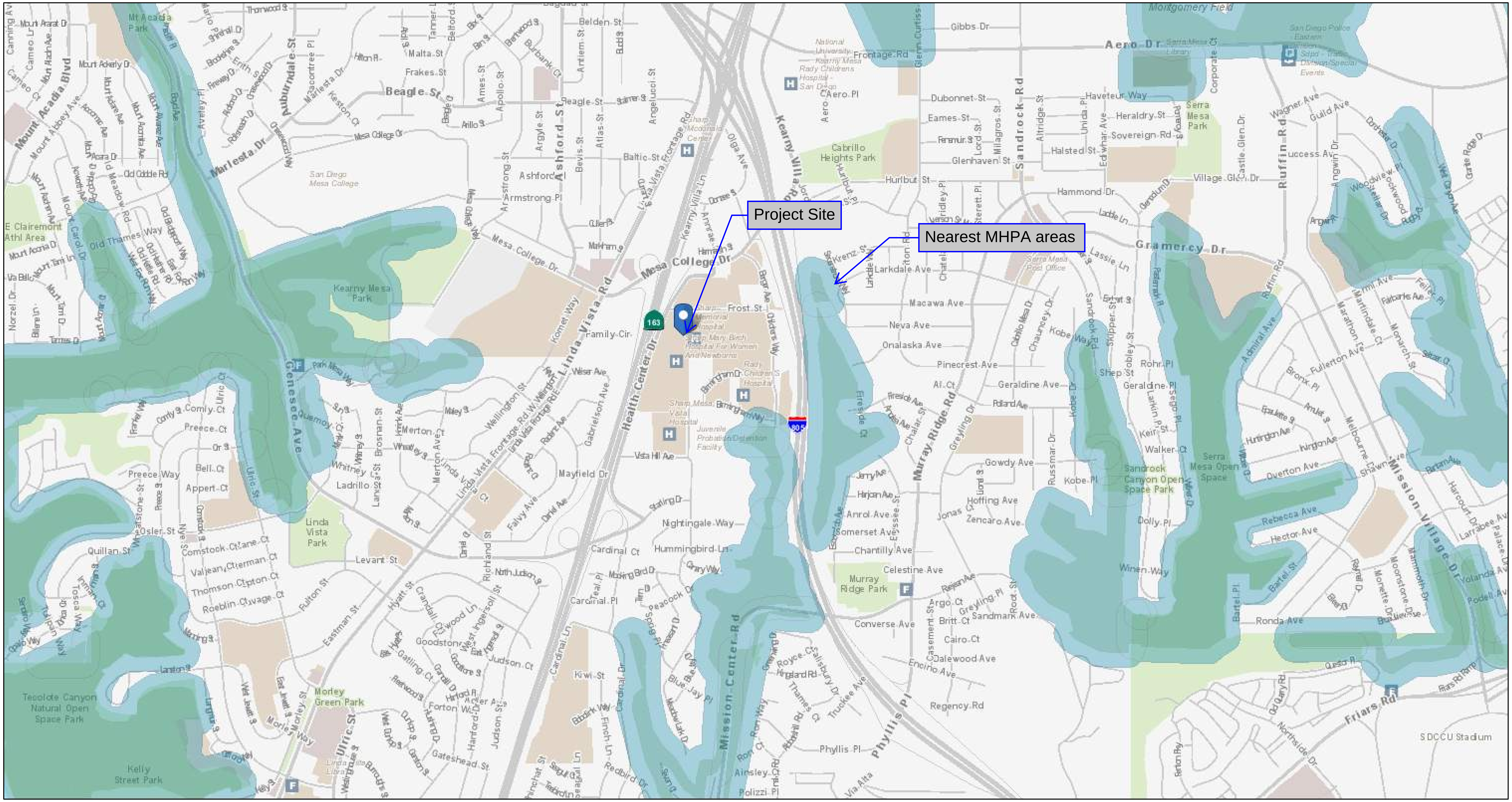
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Parcel Lookup Tool Map



July 2, 2021

- Regional Board ASBS Area
- Regional Board 303d polygons
- Regional Board 303d lines
- EPA Basin Plan Listed RARE
- SANGIS MHPA Areas
- MHPA

1:18,056

0 | 0.225 | 0.45 | 0.9 mi

0 | 0.35 | 0.7 | 1.4 km

SanGIS

Data Sources: SANDAG and SanGIS
SanGIS Legal Notice: http://www.sangis.org/Legal_Notice.htm

Attachment 2
Backup for PDP Hydromodification Control Measures

This is the cover sheet for Attachment 2.

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

Project Name: Sharp MMC - Package 3A (PK3A)

Indicate which Items are Included:

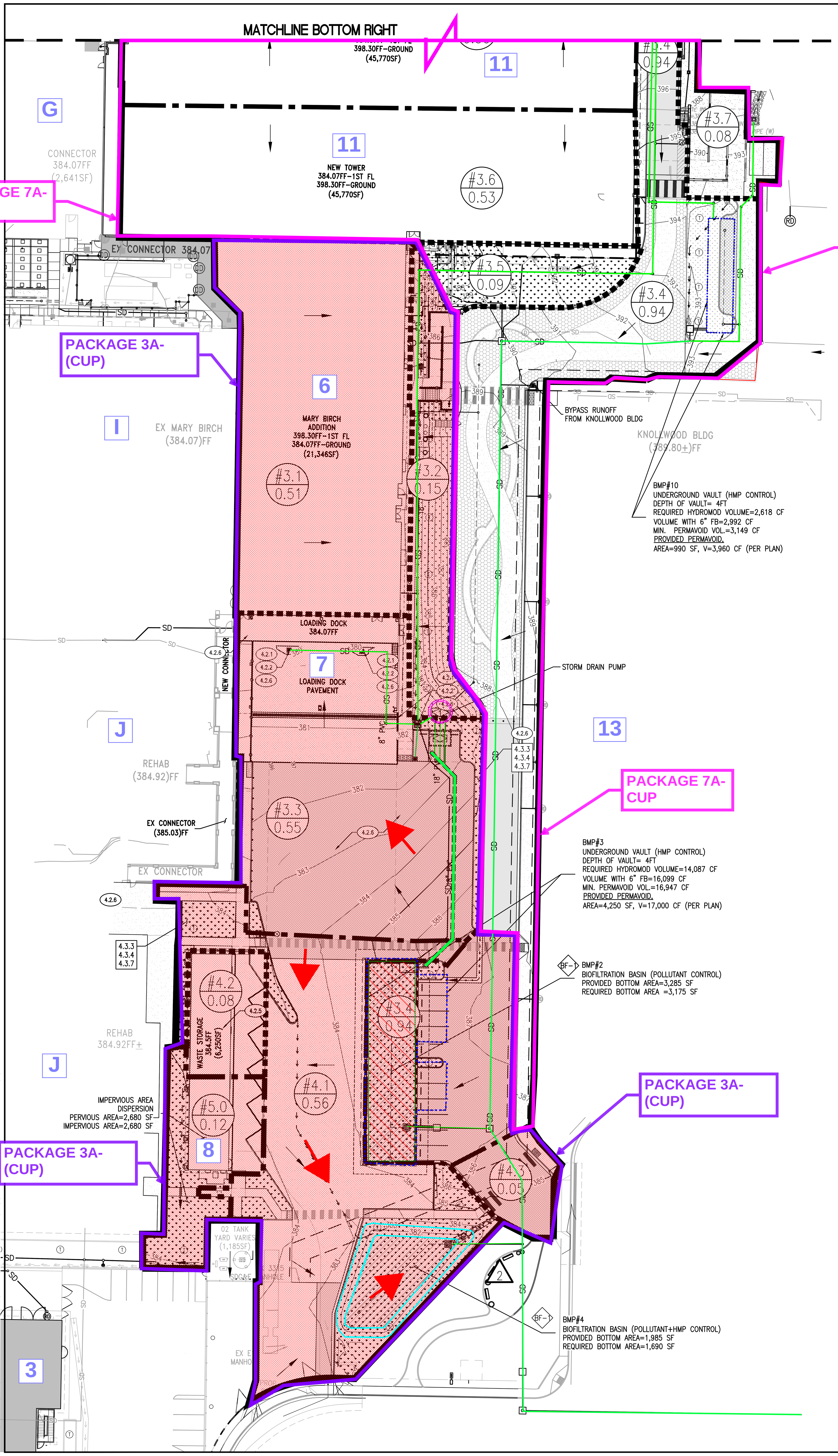
Attachment Sequence	Contents	Checklist
Attachment 2a	Hydromodification Management Exhibit (Required)	☑ Included See Hydromodification Management Exhibit Checklist.
Attachment 2b	Management of Critical Coarse Sediment Yield Areas (WMAA Exhibit is required, additional analyses are optional) See Section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

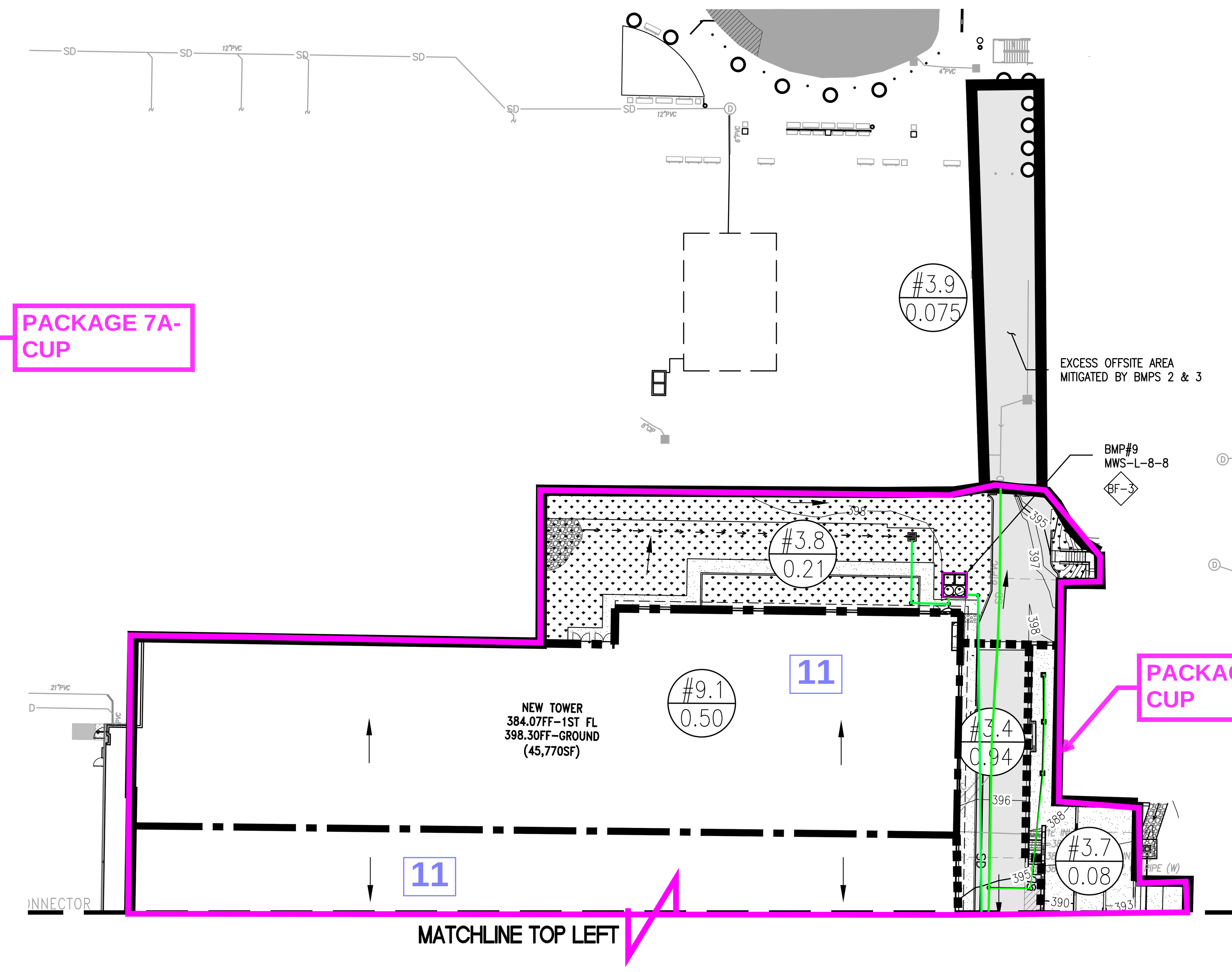
Use this checklist to ensure the required information has been included on the Hydromodification Management Exhibit:

The Hydromodification Management Exhibit must identify:

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

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING





LEGEND / SYMBOL

- OUTER DMA BOUNDARY
- MAJOR DMA BOUNDARY
- MINOR DMA BOUNDARY
- EXISTING STORM DRAIN
- NEW STORM DRAIN
- EXISTING CONTOUR
- NEW CONTOUR
- FLOW DIRECTION
- FLOW PATH
- POINT OF COMPLIANCE (POC)
- DRAINAGE MANAGEMENT AREA MARKER & AREA (AC) — B-X / X.XX
- CONCRETE PAVEMENT
- ASPHALT PAVEMENT
- LANDSCAPING
- BIOFILTRATION BMP
- BUILDING ROOF

SWQMP NOTES

1. THE SITE IS COMPRISED OF HYDROLOGIC SOIL TYPE D.
2. NO CRITICAL COARSE SEDIMENT YIELD AREAS ARE PRESENT ON SITE.
3. THERE ARE NO NATURAL HYDROLOGIC FEATURES PRESENT ON SITE.
4. DEPTH TO GROUNDWATER GREATER THAN 20 FT.
5. BMP #2 AND BMP #3 ARE ALSO DESIGNED TO MITIGATE RUNOFF FROM DMAS THAT ARE ASSOCIATED WITH IMPROVEMENTS IN PACKAGE 7A.

STRUCTURAL BMPS:

BF-1 BIOFILTRATION BMP

SOURCE CONTROL BMPS:

4.2.1 PREVENTION OF ILLICIT DISCHARGE INTO THE MS4

4.2.2 STORM DRAIN STENCILING OR SIGNAGE

4.2.5 PROTECT TRASH STORAGE AREAS FROM RAINFALL. RUN-ON, RUNOFF, AND WIND DISPERSAL

4.2.6 ADDITIONAL BMPS
- ONSITE STORM DRAIN INLETS
- INTERIOR FLOOR DRAINS AND ELEVATOR SHAFT SUMP PUMPS
- NEED FOR FUTURE INDOOR & STRUCTURAL PEST CONTROL
- LANDSCAPE/OUTDOOR PESTICIDE USE
- REFUSE AREAS
- LOADING DOCKS
- FIRE SPRINKLER TEST WATER
- MISCELLANEOUS DRAIN OR WASH WATER
- PLAZAS, SIDEWALKS, AND PARKING LOTS

SITE DESIGN BMPS:

4.3.3 MINIMIZE IMPERVIOUS AREA

4.3.4 MINIMIZE SOIL COMPACTION

4.3.5 IMPERVIOUS AREA DISPERSION

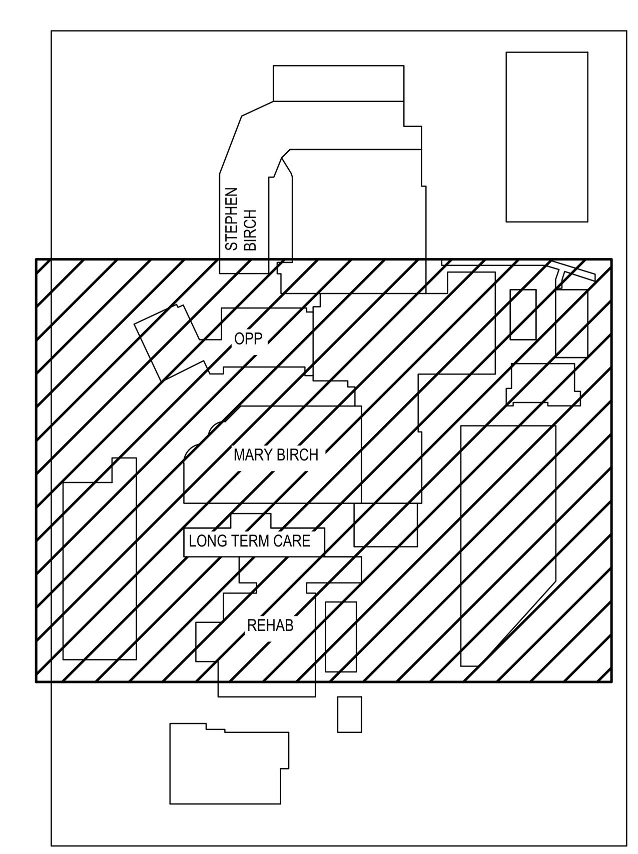
4.3.7 LANDSCAPING WITH NATIVE OR DROUGHT TOLERANT SPECIES

DMA-PACKAGE 3A
DMA-PACKAGE 7A
DMA-PACKAGE 8
BUILDING NO. — XX
SD FLOW DIRECTION — OR
UG-VAULT
STORM DRAIN

SCALE: 1"=30'

PACKAGE 3A - 7A DMA AREA DETAILS

DMA ID	TOTAL AREA (AC)	TOTAL AREA (SF)	PERVIOUS AREA (SF)	IMPERVIOUS AREA (SF)	IMPERVIOUS RATIO %	NOTES
3.1	0.51	22132	0	22132	100	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.2	0.15	6739	4607	2132	32	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.3	0.55	23812	993	22819	96	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.4	0.94	40664	5893	34771	85	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.5	0.09	4044	3393	651	16	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.6	0.53	23177	0	23089	100	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.7	0.08	3432	0	3432	100	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.8	0.21	9092	6267	2825	31	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.9	0.075	3287	0	3287	100	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
9.1	0.50	22013	0	22013	100	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
4.1	0.53	23285	6498	16787	72	POLLUTANT AND HMP CONTROL MITIGATED BY BMP #4
4.2	0.08	3495	420	3075	88	POLLUTANT AND HMP CONTROL MITIGATED BY BMP #4
4.3	0.05	2318	0	2318	100	POLLUTANT AND HMP CONTROL MITIGATED BY BMP #4
5.0	0.12	5360	2687	2673	50	SELF RETAINING DMA (1:1 DISPERSION)



KEY PLAN

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123
619.299.5550

SYM	DESCRIPTION	DATE	APPR

BENCHMARK:

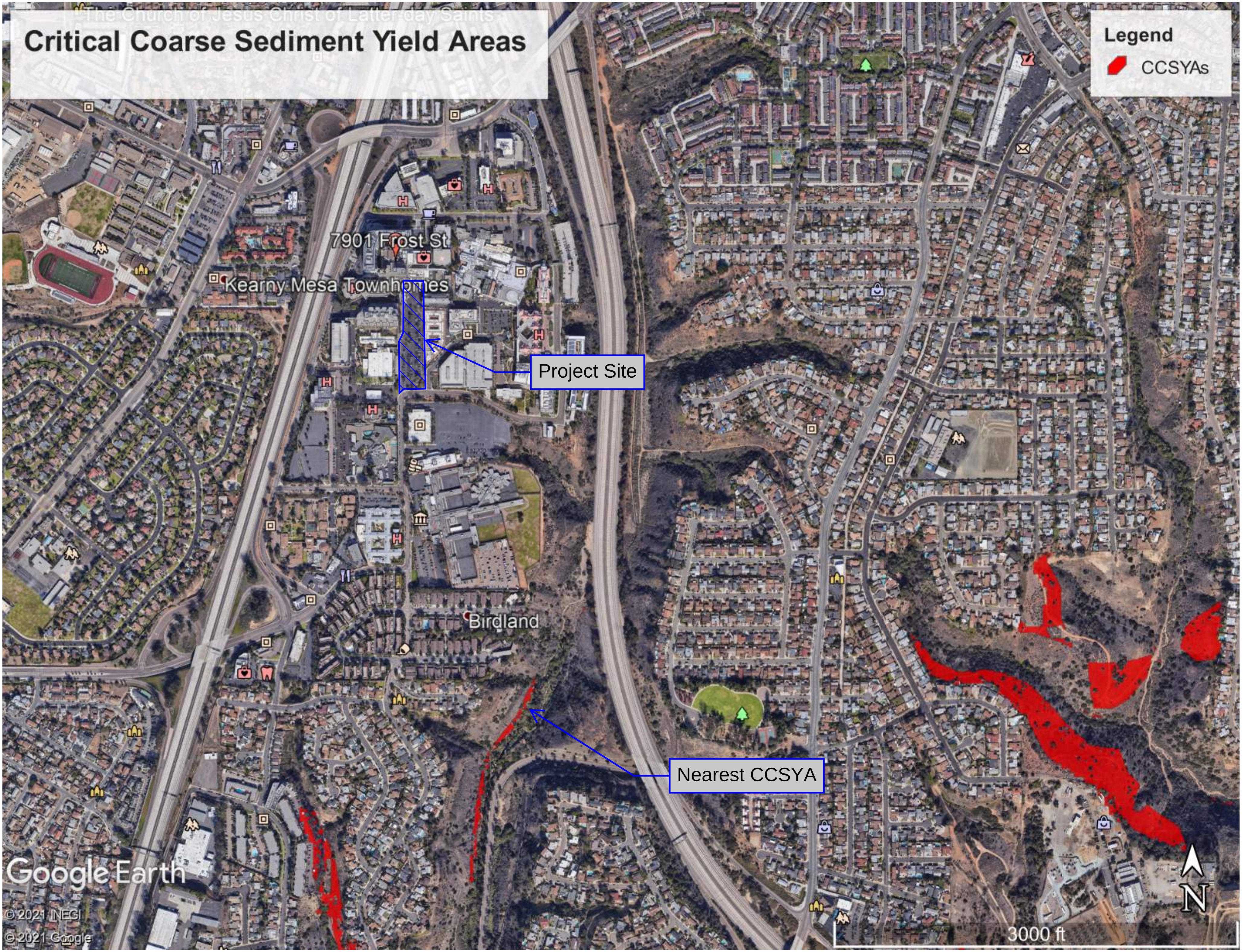
ISSUE DATE:	09/17/2021
DRAWN BY:	MDS
CHECKED BY:	MGC
B&W JOB NUMBER:	9545.10.00
CLIENT JOB NUMBER:	

PROJECT
SHARP MMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

SHEET TITLE
DMA EXHIBIT

SHEET 1 OF 2

PLOT: W:\PROJECTS\9500\9545\10.00 SHARP MMC\DWGS\EXHIBITS\SWQMP\PACKAGE 3A (CUP)\9545\10.00 PK 3A DMAS.DWG MH GC 10/6/2022 4:22 PM



Critical Coarse Sediment Yield Areas
Legend
CCSYAs
Project Site
Nearest CCSYA
7901 Frost St
Kearny Mesa Townhomes
Birdland
The Church of Jesus Christ of Latter-day Saints
N
3000 ft
Google Earth
© 2021 INEGI
© 2021 Google

BMP Sizing Spreadsheet V3.1

Project Name:	Sharp MMC- PK 3A & 7A
Project Applicant:	BWE Inc
Jurisdiction:	City of San Diego
Parcel (APN):	
Hydrologic Unit:	San Diego
Rain Gauge:	Oceanside
Total Project Area (sf):	136,874
Channel Susceptibility:	High

BMP Sizing Spreadsheet V3.1			
Project Name:	Sharp MMC- PK 3A & 7A	Hydrologic Unit:	San Diego
Project Applicant:	BWE Inc	Rain Gauge:	Oceanside
Jurisdiction:	City of San Diego	Total Project Area:	136,874
Parcel (APN):	0	Low Flow Threshold:	0.1Q2
BMP Name:	BMP #3	BMP Type:	Cistern
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	NA

Areas Draining to BMP						HMP Sizing Factors	Minimum BMP Size
DMA Name	Area (sf)	Pre Project Soil Type	Pre-Project Slope	Post Project Surface Type	Area Weighted Runoff Factor (Table G.2-1)[1]	Volume	Volume (CF)
3.1 & 3.6	45,309	D	Flat	Roofs	1.0	0.12	5437
3.2	4,607	D	Flat	Landscape	0.1	0.12	55
	2,132	D	Flat	Concrete	1.0	0.12	256
3.3	22,819	D	Flat	Concrete	1.0	0.12	2738
	993	D	Flat	Landscape	0.1	0.12	12
3.4	34,771	D	Flat	Concrete	1.0	0.12	4173
	5,893	D	Flat	Landscape	0.1	0.12	71
3.5	651	D	Flat	Concrete	1.0	0.12	78
	3,393	D	Flat	Landscape	0.1	0.12	41
3.7	3,432	D	Flat	Concrete	1.0	0.12	412
3.8	2,825	D	Flat	Concrete	1.0	0.12	339
	6,762	D	Flat	Landscape	0.1	0.12	81
3.9	3,287	D	Flat	Concrete	1.0	0.12	394
		D	Flat	Concrete	1.0	0.12	0
						0	0
BMP Tributary Area	136,874					Minimum BMP Size	14087
						Proposed BMP Size*	16100

* Assumes standard configuration

Standard Cistern Depth (Overflow Elevation)	3.5	ft
Provided Cistern Depth (Overflow Elevation)	3.5	ft
Minimum Required Cistern Footprint)	4025	CF

Notes:

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

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

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

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

BMP Sizing Spreadsheet V3.1

Project Name:	Sharp MMC- PK 3A & 7A	Hydrologic Unit:	San Diego
Project Applicant:	BWE Inc	Rain Gauge:	Oceanside
Jurisdiction:	City of San Diego	Total Project Area:	136,874
Parcel (APN):	0	Low Flow Threshold:	0.1Q2
BMP Name	BMP #3	BMP Type:	Cistern

DMA Name	Rain Gauge	Pre-developed Condition		Unit Runoff Ratio (cfs/ac)	DMA Area (ac)	Orifice Flow - %Q_2 (cfs)	Orifice Area (in^2)
		Soil Type	Slope				
3.1 & 3.6	Oceanside	D	Flat	0.571	1.040	0.059	**0.88**
3.2	Oceanside	D	Flat	0.571	0.106	0.006	**0.09**
3.3	Oceanside	D	Flat	0.571	0.524	0.030	**0.44**
3.4	Oceanside	D	Flat	0.571	0.798	0.046	**0.67**
3.5	Oceanside	D	Flat	0.571	0.015	0.001	**0.01**
3.7	Oceanside	D	Flat	0.571	0.079	0.004	**0.07**
3.8	Oceanside	D	Flat	0.571	0.065	0.004	**0.05**
3.9	Oceanside	D	Flat	0.571	0.075	0.004	**0.06**

3.50	**0.154**	**2.28**	**1.70**
Max Orifice Head (feet)	**Max Tot. Allowable Orifice Flow (cfs)**	**Max Tot. Allowable Orifice Area (in^2)**	**Max Orifice Diameter (in)**

Provide Hand Calc.	**0.154**	**2.27**	**1.700**
Average outflow during surface drawdown (cfs)	Max Orifice Outflow (cfs)	Actual Orifice Area (in^2)	Selected Orifice Diameter (in)

Drawdown (Hrs)	Provide Hand Calculation

Project Name:	Sharp MMC - Package 3A & 7A
Project Applicant:	BWE Inc.
BMP Name:	**BMP #3**

From HMP Analysis (hand calculation method)

Sizing calculations assuming 100% voids

Storage Depth, d (ft)	**4**	Per standard
HMP Volume Depth, d_{hmp} (ft) = d*7/8	**3.5**	
Required HMP Volume @ 3.5' depth, (CF) - V	**14,087**	From HMP Analysis
Void Ratio (100%)	1	
Required Surface area A, (sf) = V/d_{hmp}	**4,025**	
Required Volume @ 4' depth including 0.5' Freeboard	**16,099**	

Permavoid Sizing

Void ratio	0.95	Per Manufacturer
Required gross PV Volume for HMP Control @ 3.5' depth, V1 (cf) = V/0.95	14,828	
Required PV Surface area for HMP control @ 3.5' depth, A1 (sf)=	4,237	
Required gross volume at 4' depth (including 0.5' Freeboard), V2 (cf) = A1*d	**16,947**	
Volume of single unit (cf) = 2.32'*1.16'*0.49'	1.32	
Total units required =	12,851	
Permavoid Area per plan	**4,250**	
Net Vol. provided at 3.5' and 0.95 void ratio (cf)	**14,131**	
Gross Volume of Permavoid at 4' (cf)	**17,000**	

BMP Sizing Spreadsheet V3.1

Project Name:	Sharp MMC - PK 3A
Project Applicant:	BWE Inc
Jurisdiction:	City of San Diego
Parcel (APN):	
Hydrologic Unit:	San Diego
Rain Gauge:	Oceanside
Total Project Area (sf):	29,098
Channel Susceptibility:	High

BMP Sizing Spreadsheet V3.1			
Project Name:	Sharp MMC - PK 3A	Hydrologic Unit:	San Diego
Project Applicant:	BWE Inc	Rain Gauge:	Oceanside
Jurisdiction:	City of San Diego	Total Project Area:	29,098
Parcel (APN):	0	Low Flow Threshold:	0.1Q2
BMP Name:	BMP 4 - Package 3A and 7A	BMP Type:	Biofiltration
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	0.025

Areas Draining to BMP						HMP Sizing Factors	Minimum BMP Size	
DMA Name	Area (sf)	Pre Project Soil Type	Pre-Project Slope	Post Project Surface Type	Area Weighted Runoff Factor (Table G.2-1)[1]	Surface Area	Surface Area (SF)	
4.1	6,498	D	Flat	Landscape	0.1	0.07	45	
	16,787	D	Flat	Concrete	1.0	0.07	1175	
4.2	3,075	D	Flat	Roofs	1.0	0.07	215	
	420	D	Flat	Landscape	0.1	0.07	3	
4.3	2,318	D	Flat	Concrete	1.0	0.07	162	
						0	0	
						0	0	
						0	0	
						0	0	
						0	0	
						0	0	
						0	0	
						0	0	
						0	0	
						0	0	
BMP Tributary Area	29,098					Minimum BMP Size	1601	
						Proposed BMP Size*	1985	* Assumes standard configuration
				Surface Ponding Depth		12.00	in	
				Bioretention Soil Media Depth		18.00	in	
				Filter Coarse		6.00	in	
				Gravel Storage Layer Depth		12	in	
				Underdrain Offset		3.0	in	

Notes:

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

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

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

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

BMP Sizing Spreadsheet V3.1

Project Name:	Sharp MMC - PK 3A	Hydrologic Unit:	San Diego
Project Applicant:	BWE Inc	Rain Gauge:	Oceanside
Jurisdiction:	City of San Diego	Total Project Area:	29,098
Parcel (APN):	0	Low Flow Threshold:	0.1Q2
BMP Name	BMP 4 - Package 3A and 7A	BMP Type:	Biofiltration

DMA Name	Rain Gauge	Pre-developed Condition		Unit Runoff Ratio (cfs/ac)	DMA Area (ac)	Orifice Flow - %Q_2 (cfs)	Orifice Area (in^2)
		Soil Type	Slope				
4.1	Oceanside	D	Flat	0.571	0.149	0.009	**0.12**
4.2	Oceanside	D	Flat	0.571	0.071	0.004	**0.06**
4.3	Oceanside	D	Flat	0.571	0.053	0.003	**0.04**

3.75	**0.016**	**0.22**	**0.53**
Max Orifice Head (feet)	**Max Tot. Allowable Orifice Flow (cfs)**	**Max Tot. Allowable Orifice Area (in^2)**	**Max Orifice Diameter (in)**

0.013	**0.014**	**0.20**	**0.500**
Average outflow during surface drawdown (cfs)	Max Orifice Outflow (cfs)	Actual Orifice Area (in^2)	Selected Orifice Diameter (in)

Drawdown (Hrs)	43.0

Attachment 3
Structural BMP Maintenance Information

This is the cover sheet for Attachment 3.

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Indicate which Items are Included:

Attachment Sequence	Contents	Checklist
Attachment 3	Maintenance Agreement (Form DS-3247) (when applicable)	☑ Included ☐ Not applicable

THE CITY OF SAN DIEGO

RECORDING REQUESTED BY:
THE CITY OF SAN DIEGO
AND WHEN RECORDED MAIL TO:

____
____
____

(THIS SPACE IS FOR RECORDER'S USE ONLY)

STORM WATER MANAGEMENT AND DISCHARGE CONTROL MAINTENANCE AGREEMENT

APPROVAL NUMBER:	ASSESSOR'S PARCEL NUMBER:	PROJECT NUMBER:
____________________	____________________________	__________________

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

____;

the owner or duly authorized representative of the owner [Property Owner] of property located at

____
(PROPERTY ADDRESS)

and more particularly described as:

____
(LEGAL DESCRIPTION OF PROPERTY)

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

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

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

Continued on Page 2

NOW, THEREFORE, the parties agree as follows:

1. Property Owner shall have prepared, or if qualified, shall prepare an Operation and Maintenance Procedure [OMP] for Permanent Storm Water BMPs, satisfactory to the City, according to the attached exhibit(s), consistent with the Grading and/or Improvement Plan Drawing No(s), or Building Plan Project No(s): ______________________________.
2. Property Owner shall install, maintain, and repair or replace all Permanent Storm Water BMPs within the property, according to the OMP guidelines as described in the attached exhibit(s), the project's SWQMP, and Grading and/or Improvement Plan Drawing No(s), or Building Plan Project No(s) ______________________________.
3. Property Owner shall maintain operation and maintenance records for at least five (5) years. These records shall be made available to the City for inspection upon request at any time.

This Maintenance Agreement shall commence upon execution of this document by all parties named hereon, and shall run with the land.

Executed by the City of San Diego and by Property Owner in San Diego, California.

See Attached Exhibit(s): ______________________________

____
(PROPERTY OWNER SIGNATURE)

____
(PRINT NAME AND TITLE)

____
(COMPANY/ORGANIZATION NAME)

____
(DATE)

THE CITY OF SAN DIEGO

APPROVED:

____
(DEPUTY CITY ENGINEER SIGNATURE)

____
(PRINT NAME)

____
(DATE)

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

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

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

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

SITE DESIGN, SOURCE CONTROL AND POLLUTANT CONTROL BMP OPERATION + MAINTENANCE PROCEDURE

STORM WATER MANAGEMENT AND DISCHARGE CONTROL MAINTENANCE AGREEMENT APPROVAL NO.: TBD

O&M RESPONSIBLE PARTY DESIGNEE: TBD

BMP DESCRIPTION	*INSPECTION FREQUENCY*	*MAINTENANCE FREQUENCY*	*MAINTENANCE METHOD*	*QUANTITY*	*INCLUDED IN O&M MANUAL*		*SHEET NUMBER(S)*
SITE DESIGN ELEMENTS					YES	NO	
LANDSCAPING W/ NATIVE OR DROUGHT TOLERANT SPECIES (4.3.7)	SEMI-ANNUALLY	AS-NEEDED	RE-SEED, RE-PLANT VEGETATION IN ERODED AREAS	N/A			C-111 C-112
SOURCE CONTROL ELEMENTS					YES	NO	
PREVENTION OF ILLICIT DISCHARGES INTO THE MS4 (4.2.1)	N/A	AS NEEDED	ELIMINATE NON-STORM WATER DISCHARGE REPAIR/REPLACE IRRIGATION SYSTEM	N/A			C-111 C-112
ON-SITE STORM DRAIN INLETS (4.2.6)	AFTER RAIN EVENT	AS NEEDED	REMOVE ACCUMULATED SEDIMENT, TRASH, DEBRIS	5			C-111 C-112
PLAZAS, SIDEWALKS, AND PARKING LOTS (4.2.6)	BASED ON DIRT ACCUMULATION	AS NEEDED	REMOVE ACCUMULATED DIRT USING APPROPRIATE SWEEPING	N/A			C-111 C-112
POLLUTANT CONTROL BMP(S)					YES	NO	
BIOFILTRATION BASIN (BMP #2 AND BMP #4)	QUARTERLY	AS NEEDED	CLEAR ANY OBSTRUCTIONS FROM OUTLET CONTROL STRUCTURE/ORIFICE	2			C-111 C-112
HYDROMODIFICATION CONTROL BMP					YES	NO	
PERMAVOID UNDERGROUND VAULT (BMP #3)	QUARTERLY	AS NEEDED	CLEAR ANY OBSTRUCTIONS FROM OUTLET CONTROL STRUCTURE ORIFICE	1			C-111 C-112

Attachment 4
Copy of Plan Sheets Showing Permanent Storm Water BMPs

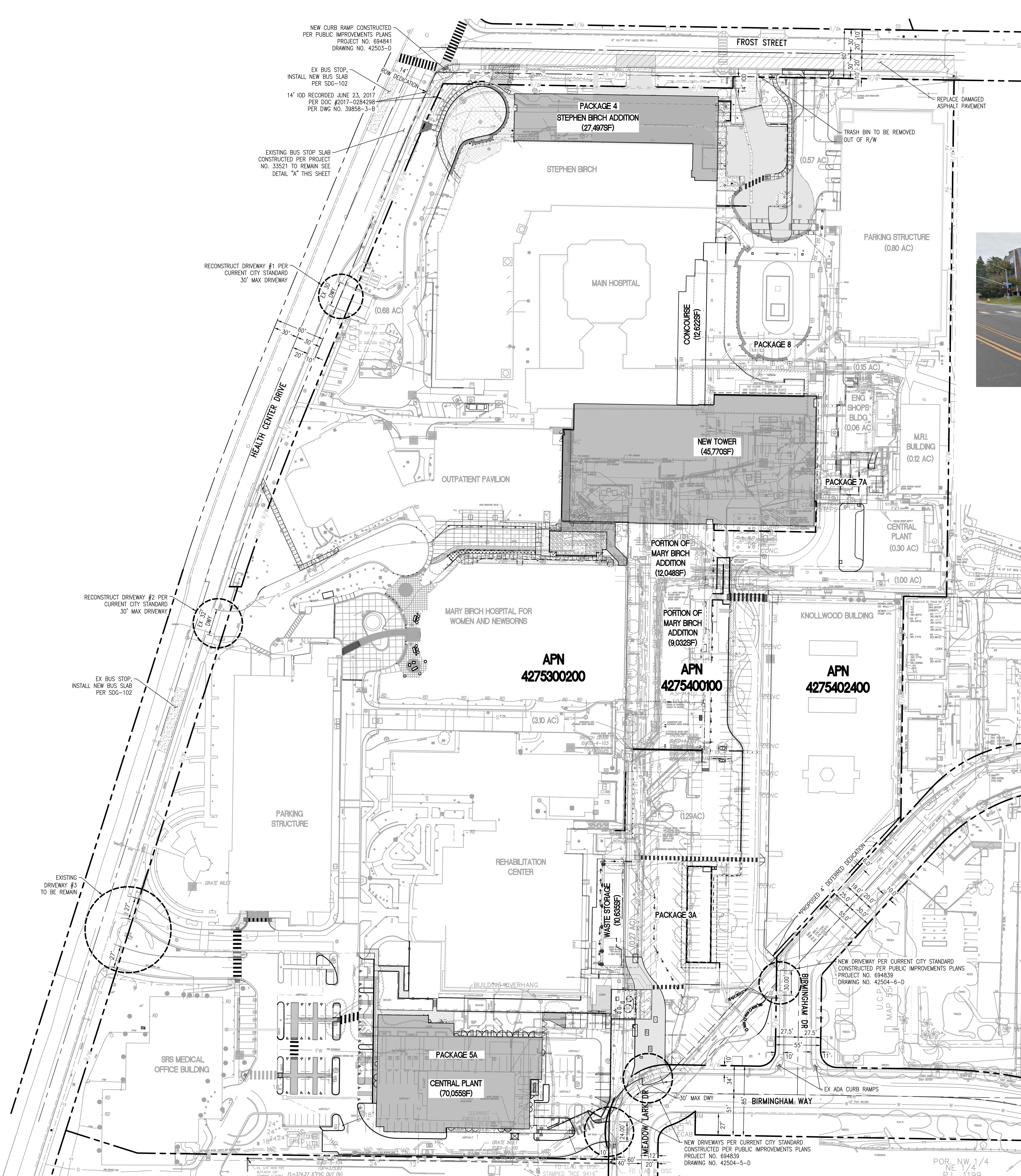
This is the cover sheet for Attachment 4.

Project Name: Sharp MMC - Package 3A (PK3A)

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

The plans must identify:

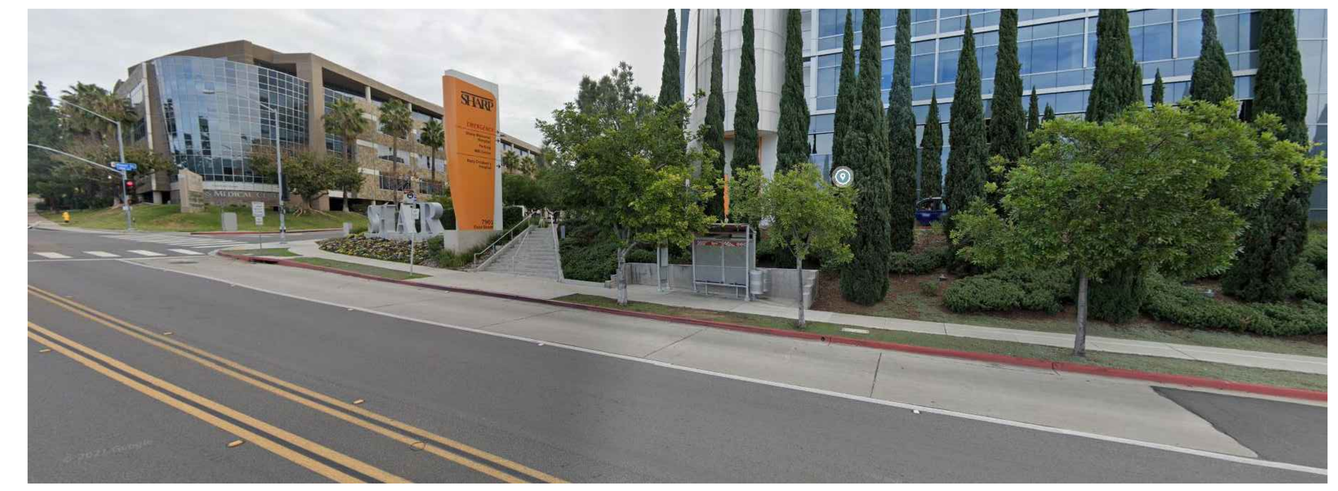
- [x] Structural BMP(s) with ID numbers matching Form I-6 Summary of PDP Structural BMPs
- [x] The grading and drainage design shown on the plans must be consistent with the delineation of DMAs shown on the DMA exhibit
- [x] Details and specifications for construction of structural BMP(s)
- [ ] Signage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



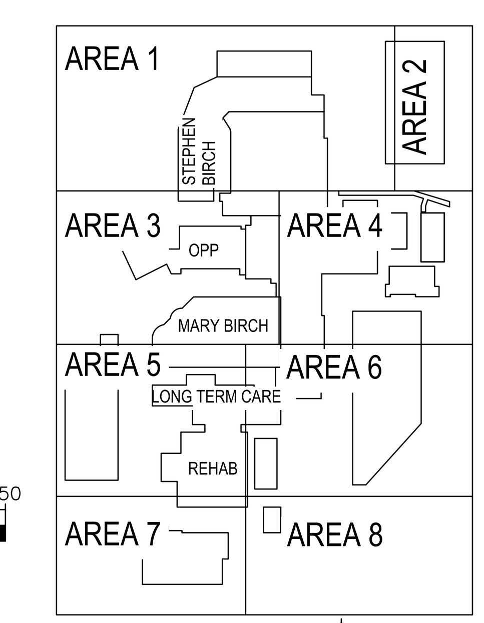
*PROPOSED 4' DEFERRED DEDICATION

PROPOSED 4' DEFERRED DEDICATION TO SHARP KNOLLWOOD BUILDING DEMOLITION ALONG BIRMINGHAM DRIVE FRONTAGE FOR CONSTRUCTION OF A 14-FEET PARKWAY WITH NON-CONTIGUOUS SIDEWALK

AT SUCH TIME THAT DEMOLITION OF THE SHARP KNOLLWOOD BUILDING AT 7944 BIRMINGHAM DRIVE BEGINS, THE OWNER/PERMITTEE SHALL ASSURE BY PERMIT AND BOND THE DEDICATION OF 4 FEET ALONG THE BIRMINGHAM DRIVE FRONTAGE FOR CONSTRUCTION OF A 14-FOOT PARKWAY WITH NON-CONTIGUOUS SIDEWALK, SATISFACTORY TO THE CITY ENGINEER



A HEALTH CENTER DRIVE STREET VIEW
NOT TO SCALE



KEY PLAN

SHARP
SMMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

McCARTHY
McCARTHY BUILDING COMPANIES, INC.
9275 SKY PARK COURT, SUITE 200
SAN DIEGO, CA 92123

HDR
HDR ARCHITECTURE, INC.
350 SOUTH GRAND AVENUE, SUITE 2900
LOS ANGELES, CA 90071-3406

TAYLOR design
17850 FITCH
IRVINE, CA 92614

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

CONDITIONAL USE PERMIT

Project Manager	Thomas Onnen
Project Designer	HDR/ Taylor Design
Project Architect	HDR/ Taylor Design
Landscape Architect	Schmidt Design Group
Civil Engineer	BWE Engineering
Structural Engineer	KPFF
Mechanical Engineer	TK1SC
Electrical Engineer	TK1SC
Plumbing Engineer	TK1SC
Interior Designer	HDR/ Taylor Design Group
Equipment Planner	Criterion

Sheet Reviewer: Author

MARK	DATE	DESCRIPTION
3	12/29/2022	CUP BACKCHECK #3

Current Print Description

Project Number: 10204365
Original Issue: 06/18/20

Agency Number: I210874-37-00
Agency Approval

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR

INIT DATE

Office of Statewide Health Planning and Development
FACILITIES DEVELOPMENT DIVISION

REGISTERED PROFESSIONAL ENGINEER MICHAEL A. C-79001 12-31-24 CIVIL STATE OF CALIFORNIA
NOT FOR CONSTRUCTION PLAN CHECK APPROVAL

Sheet Name
HEALTH CENTER DRIVE IMPROVEMENTS PLAN

Sheet Number
C-100

Project Status
CONDITIONAL USE PERMIT AMENDMENT

M:\Projects\9500\9545U.10.00 Sharp MMC\Dwg\Exhibits\2022-12-19 Health Center Drive\9545U.10.00 HEALTH CENTER DR. DRIVEWAY

SHARP

SMMC CAMPUS REDEVELOPMENT

7901 FROST STREET
SAN DIEGO, CA 92123

McCARTHY

MCCARTHY BUILDING COMPANIES, INC.
9275 SKY PARK COURT, SUITE 200
SAN DIEGO, CA 92123

HDR

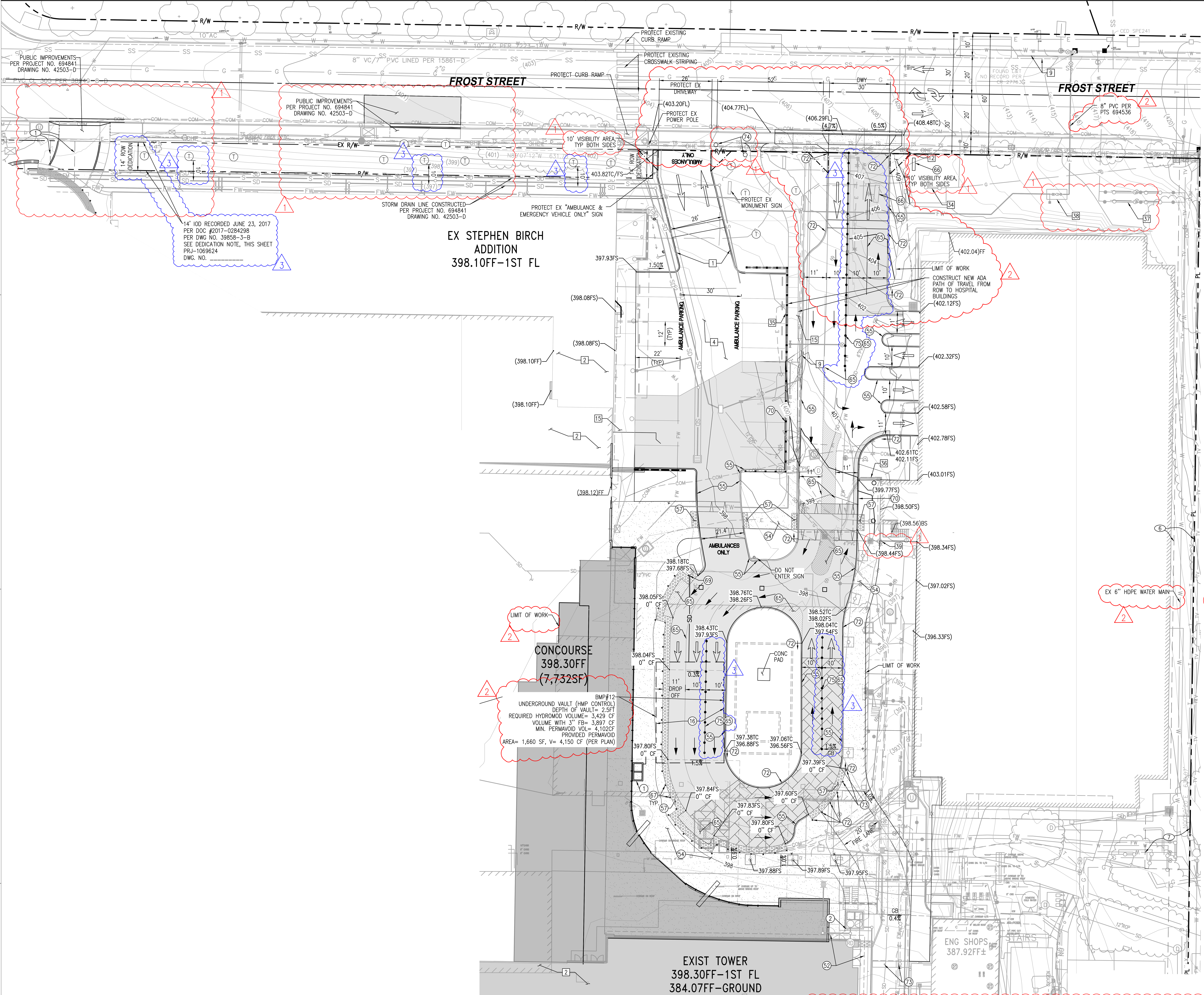
HDR ARCHITECTURE, INC.
350 SOUTH GRAND AVENUE, SUITE 2900
LOS ANGELES, CA 90071-3406

TAYLOR design

17850 FITCH
IRVINE, CA 92614

BWE

CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550



DEDICATION NOTE

14' IOD WAS ACCEPTED AS PUBLIC ROW BY CITY OF SAN DIEGO DATED __________ PER DOC #__________, DWG. NO. ________ (PRJ 1069624).

*SEE EMRA APPROVAL NO. 2570377 FOR PRIVATE ENCROACHMENTS

LEGEND

- PERVIOUS PAVEMENT
- ASPHALT PAVEMENT
- CONCRETE PAVEMENT
- STORM DRAIN
- ROAD ACCESS

PROTECTION KEYNOTES

1 PROTECT EX CURB
2 PROTECT EX BUILDING & FOUNDATION
3 PROTECT EX CONCRETE PAVEMENT
4 PROTECT EX ASPHALT PAVEMENT
9 PROTECT EX CURB & GUTTER
12 PROTECT EX FIRE HYDRANT
15 PROTECT EX WALKWAY
34 PROTECT EX GAS METER ASSEMBLY
35 PROTECT EX RETAINING WALL
36 PROTECT PORTION OF EX RETAINING WALL
37 PROTECT EX DUAL 6" FIRE WATER SERVICES TO 4" ABOVE GROUND METERS AND 6" BACKFLOWS
38 PROTECT EX 8" FIRE SERVICE BACKFLOW
39 PROTECT EX FIRE DEPARTMENT CONNECTION

CONSTRUCTION KEYNOTES

(1) CONSTRUCT MODULAR WETLAND MWS–L–4–8
(2) MODULAR WETLAND MWS–L–8–8 CONSTRUCTED PER NEW TOWER PERMIT
(16) CONSTRUCT 3,955 CF (MINIMUM) OF UNDERGROUND STORM WATER STORAGE FOR CONCOURSE
(52) FOUNDATION BELOW PER STRUCTURAL
(54) CONSTRUCT CONCRETE 4" WALKWAY
(55) CONSTRUCT 6" CURB PER SDG–150
(57) CONSTRUCT DETECTABLE WARNING TILES
(65) PAINT LINE STRIPING
(66) RELOCATE EX MONUMENT SIGN
(67) CONSTRUCT BOLLARDS
(69) CONNECT NEW SD TO EX SD
(70) CONSTRUCT RETAINING WALL
(72) RED CURB AREAS ON FIRE ACCESS ROAD
(73) CONSTRUCT REMOVABLE BOLLARD
(74) RELOCATE THE CONCRETE TRASH BIN
(75) INSTALL 36" HIGH SURFACE MOUNTED FLEXIBLE DELINEATORS AT 5' O.C.

EXISTING EASEMENT KEYNOTES

(1) EXISTING EASEMENT FOR WATER METER VAULT RECORDED 7–29–1958 AS DOC. # 121966 IN BOOK 7187, PAGE 465 O.R.
(6) WATER EASEMENT TO THE CITY SAN DIEGO RECORDED 4–21–2003. DOC. NO. 2003–0457839 OF OFFICIAL RECORDS
(7) EXISTING EASEMENT FOR WATER METER VAULT RECORDED 7–29–1958 AS DOC. # 121966 IN BOOK 7187, PAGE 465 O.R.

GENERAL NOTES

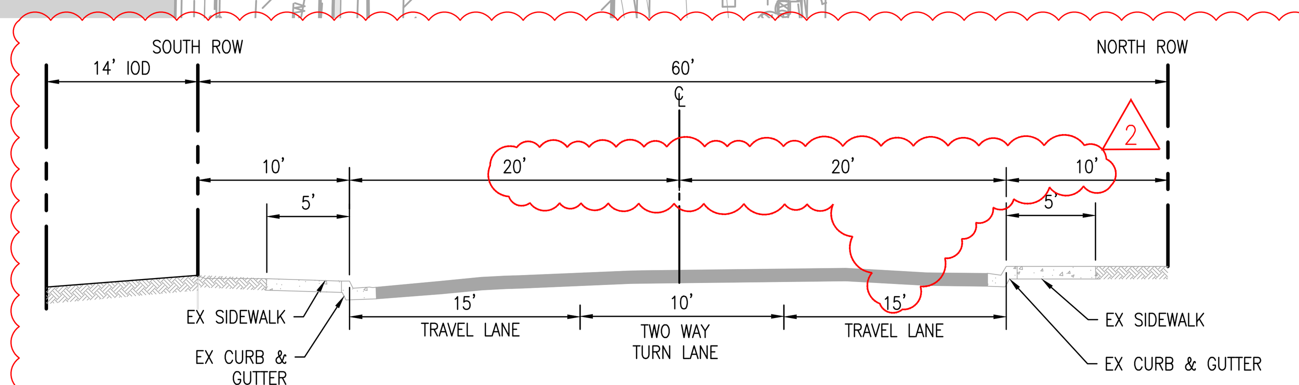
1. PRIOR TO THE ISSUANCE OF ANY CONSTRUCTION PERMIT, THE OWNER/PERMITTEE SHALL INCORPORATE ANY CONSTRUCTION BEST MANAGEMENT PRACTICES NECESSARY TO COMPLY WITH CHAPTER 14, ARTICLE 2, DIVISION 1 (GRADING REGULATIONS) OF THE SAN DIEGO MUNICIPAL CODE, INTO THE CONSTRUCTION PLANS OR SPECIFICATIONS.
2. THE PROPOSED PROJECT WILL COMPLY WITH ALL THE REQUIREMENTS OF THE CURRENT CITY OF SAN DIEGO STORM WATER STANDARDS MANUAL BEFORE A GRADING OR BUILDING PERMIT IS ISSUED. IT IS THE RESPONSIBILITY OF THE OWNER/DESIGNER/APPLICANT TO ENSURE THAT THE CURRENT STORM WATER PERMANENT BMP DESIGN STANDARDS ARE INCORPORATED INTO THE PROJECT.
3. NO TREES OR SHRUBS EXCEEDING THREE FEET IN HEIGHT AT MATURITY SHALL BE INSTALLED WITHIN TEN FEET OF ANY SEWER AND TEN FEET OF ANY WATER FACILITIES.

EARTHWORK

410 CY CUT
1,180 CY FILL
770 CY IMPORT

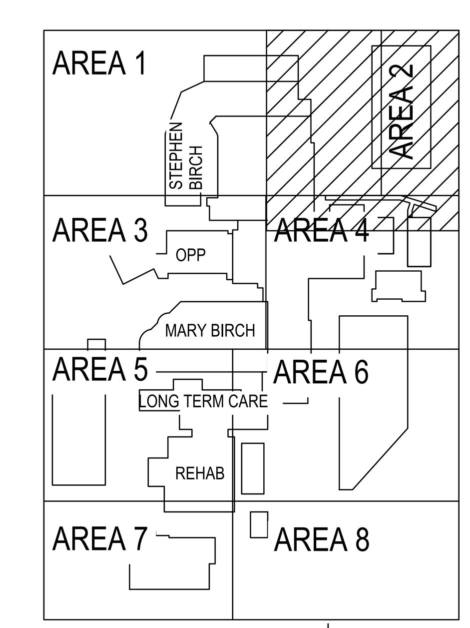
MAX CUT DEPTH: 2.5'
MAX FILL DEPTH: 12.5'

SCALE: 1"=20'



FROST STREET - TYPICAL SECTION

(SECTION LOOKING WEST)
NOT TO SCALE



KEY PLAN

CONCOURSE ADD

CONDITIONAL USE PERMIT

Project Manager	Thomas Onnen
Project Designer	HDR/ Taylor Design
Project Architect	HDR/ Taylor Design
Landscape Architect	Schimdt Design Group
Civil Engineer	BWE Engineering
Structural Engineer	KPFF
Mechanical Engineer	TK1SC
Electrical Engineer	TK1SC
Plumbing Engineer	TK1SC
Interior Designer	HDR/ Taylor Design Group
Equipment Planner	Criterion
Sheet Reviewer	Author

MARK	DATE	DESCRIPTION
1	06/02/2022	CUP BACKCHECK #1
2	10/07/2022	CUP BACKCHECK #2
3	12/29/2022	CUP BACKCHECK #3

Current Print Description

Project Number	10204365
Original Issue	06/18/20
Agency Number	I210874-37-00
Agency Approval	

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR

INIT DATE

Office of Statewide Health Planning and Development
FACILITIES DEVELOPMENT DIVISION

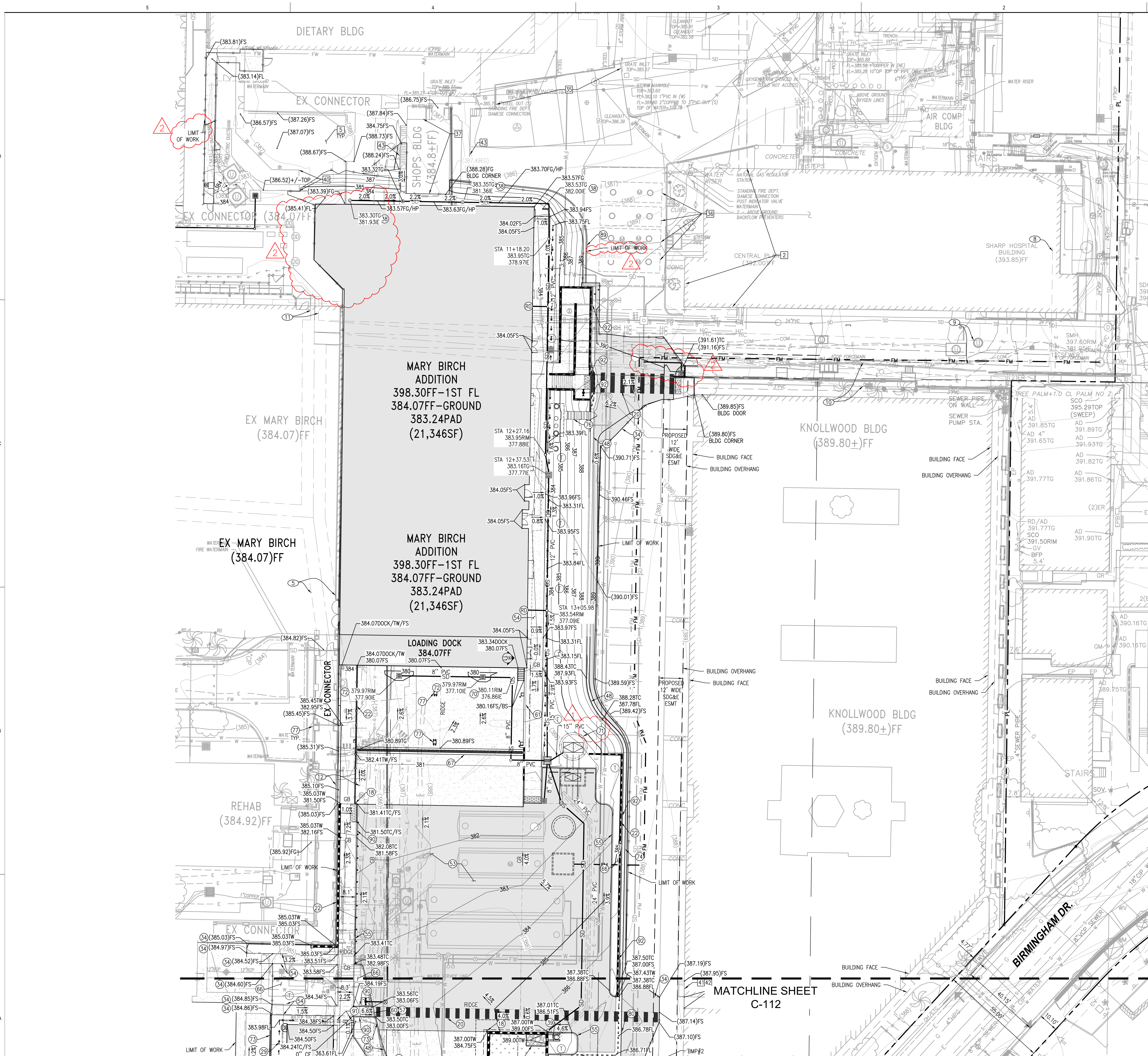
NOT FOR CONSTRUCTION PLAN CHECK APPROVAL

Sheet Name
GRADING AND DRAINAGE PLAN

Sheet Number
C-111

Project Status
CONDITIONAL USE PERMIT AMENDMENT

M:\Projects\9500\9545u.10.00 sharp mmc\Dwgs\sheet_dwgs\PX8 Concourse Add\9545U.10.00 PX8–03–GRAD – CUP.dwg



WORK TO BE DONE

THE PUBLIC IMPROVEMENTS SHOWN ON THESE PLANS SHALL BE CONSTRUCTED ACCORDING TO THE FOLLOWING STANDARD SPECIFICATIONS AND STANDARD DRAWINGS OF THE CITY OF SAN DIEGO.

STANDARD SPECIFICATIONS:

DOCUMENT NO.	DESCRIPTION
PWPI010119-01	STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (GREENBOOK), 2018 EDITION
PWPI010119-02	CITY OF SAN DIEGO STANDARD SPECIFICATIONS FOR PUBLICWORKS CONSTRUCTION (WHITEBOOK), 2018 EDITION
PWPI010119-04	CITYWIDE COMPUTER AIDED DESIGN AND DRAFTING (CADD) STANDARDS, 2018 EDITION
PWPI030119-08	CALIFORNIA DEPARTMENT OF TRANSPORTATION MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (REVISION 4), 2014 EDITION
PWPI030119-05	CALIFORNIA DEPARTMENT OF TRANSPORTATION U.S. CUSTOMARY STANDARD SPECIFICATIONS, 2018 EDITION

STANDARD DRAWINGS:

DOCUMENT NO.	DESCRIPTION
PWPI010119-03	CITY OF SAN DIEGO STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION, 2018 EDITION
PWPI030119-06	CALIFORNIA DEPARTMENT OF TRANSPORTATION U.S CUSTOMARY STANDARD PLANS, 2018 EDITION

LEGEND

PROPOSED IMPROVEMENTS

IMPROVEMENT	STANDARD DWGS.	SYMBOL
6" CURB & GUTTER	SDG-151	
36"x36" FLOW CONTROL STRUCTURE	D/C-004	
ATRIUM DRAIN	C/C-004	
6" CURB	SDG-150	
TREE	PER LANDSCAPE DWGS	
MODULAR WETLAND	C/C-003 & E/C-004	
RETAINING WALL	PER STRUCTURAL DWGS	
SIDEWALK CONCRETE PAVEMENT	B/C-003	
ASPHALT PAVEMENT	E/C-003	
GRIND AND OVERLAY		
TRUNCATED DOMES		
TRENCH RESURFACING	SDG-107 & SDG-117	
PERMEABLE PAVERS		
CHAIN LINK FENCE	PER LANDSCAPE DWGS	x
DOMESTIC WATER SERVICE	SIZE & TYPE PER PLAN	W
STORM DRAIN	SIZE & TYPE PER PLAN	SD
ELEC CONDUIT	PER ELECTRICAL DWGS	E
WATER GATE VALVE	SDW-104	
FIRE HYDRANT	SDW-150	
1" BACKFLOW PREVENTER		
STORM DRAIN CLEANOUT	SIZE & TYPE PER PLAN	

EXISTING IMPROVEMENTS

ITEM	SYMBOL
PROPERTY LINE / RIGHT OF WAY	
CENTER LINE	
EX UNDERGROUND ELECTRIC LINE	E
EX GAS VALVE	GV
EX STORM DRAIN MANHOLE	SDMH
EX DROP INLET	DI
EX STORM DRAIN LINE	SD
EX WATER METER	WM
EX WATER VALVE	
EX WATER LINE	W
EX SEWER MANHOLE	SMH
EX SEWER LINE	S
EX COMMUNICATION LINE	COM
EX FENCE	x
EX CURB & GUTTER	
EX ELECTRIC PULL BOX	EPB
EX ELECTRIC TRANSFORMER	ET
EX STREET LIGHT	ST
DECIDUOUS TREE WITH DIAMETER INDICATED	12"
EX FIRE HYDRANT	FH
EX SEWER CLEANOUT	SCO

PROTECTION KEYNOTES

2 PROTECT EX BUILDING & FOUNDATION

35 PROTECT EX LOADING DOCK TO REMAIN IN SERVICE DURING CONSTRUCTION OF PACKAGE 3A

36 PROTECT EX UNDERGROUND FUEL TANKS

37 PROTECT PORTION OF EX SHOPS BUILDING

EXISTING EASEMENT KEYNOTES

7 EXISTING EASEMENT FOR WATER METER VAULT RECORDED 7-29-1958 AS DOC. # 121966 IN BOOK 7187, PAGE 465 O.R.

8 EXISTING SDGE EASEMENT (NO WIDTH GIVEN) RECORDED 9-29-1954 AS DOC. #129840, BOOK 5379, PAGE 419 O.R.

9 EXISTING 12'-WIDE SDGE EASEMENT RECORDED 9-21-1962 IN F/P 163692, SERIES 3, BOOK 1962 O.R.

10 EXISTING 12'-WIDE SDGE EASEMENT RECORDED 1-4-1960, F/P 433, SERIES 1, BOOK 1960 O.R.

GENERAL NOTES

1. THE PROPOSED PROJECT WILL COMPLY WITH ALL THE REQUIREMENTS OF THE CURRENT CITY OF SAN DIEGO STORM WATER STANDARDS MANUAL BEFORE A GRADING OR BUILDING PERMIT IS ISSUED. IT IS THE RESPONSIBILITY OF THE OWNER/DESIGNER/APPLICANT TO ENSURE THAT THE CURRENT STORM WATER PERMANENT BMP DESIGN STANDARDS ARE INCORPORATED INTO THE PROJECT.
2. PRIOR TO THE ISSUANCE OF ANY CONSTRUCTION PERMIT, THE OWNER/PERMITTEE SHALL INCORPORATE ANY CONSTRUCTION BEST MANAGEMENT PRACTICES NECESSARY TO COMPLY WITH CHAPTER 14, ARTICLE 2, DIVISION 1 (GRADING REGULATIONS) OF THE SAN DIEGO MUNICIPAL CODE, INTO THE CONSTRUCTION PLANS OR SPECIFICATIONS.
3. NO TREES OR SHRUBS EXCEEDING THREE FEET IN HEIGHT AT MATURITY SHALL BE INSTALLED WITHIN TEN FEET OF ANY SEWER AND TEN FEET OF ANY WATER FACILITIES.

CONSTRUCTION KEYNOTES

RD ROOF DRAIN POINT OF CONNECTION 5' OUTSIDE OF BUILDING. CONTINUATION PER PLUMBING DRAWINGS

DD DAYLIGHT ROOF DRAIN TO GRADE PER PLUMBING DWGS

1 TREE PER LANDSCAPE DWGS

4 CONSTRUCT RIP RAP WITH A SILL WALL, 2 SIDES, 1/4 TON ROCK AND 30MIL IMPERMEABLE LINER ON THE BOTTOM OF SDRSD D-40 ENERGY DISSIPATER

18 INSTALL BOLLARD

20 PAINT CONTINENTAL CROSSWALK PER SDM-116

22 CONSTRUCT RETAINING WALL PER STRUCTURAL DWGS PER SEPARATE HCAI PERMIT

29 CONSTRUCT VEGETATED SWALE

34 MATCH EX PAVEMENT ELEVATIONS

38 ATRIUM DRAIN PER DETAIL G/20-D

39 CONSTRUCT MODIFIED WING HEADWALL & U HEADWALL PER SDRSD D-34

48 CONSTRUCT CURB & GUTTER PER SDG-151 (PVT)

53 CONSTRUCT AC PAVEMENT

54 CONSTRUCT CONCRETE WALKWAY

55 CONSTRUCT 6" CURB PER SDG-150 (PVT)

57 CONSTRUCT DETECTABLE WARNING TILES PER SDG-130

60 CONSTRUCT 0" CURB

61 CONSTRUCT BUILDING RETAINING WALL AND WATERPROOFING PER STRUCTURAL AND ARCH DWGS PER SEPARATE OSHPD PERMIT

66 CONSTRUCT NEW LANDSCAPING PER LANDSCAPE DWGS

67 CONSTRUCT 12" WIDE HEAVY DUTY TRENCH DRAIN

70 CONSTRUCT STORM DRAIN CLEANOUT

71 CONSTRUCT DUPLEX GRUNDFOS 10HP 2,250GPM STORM WATER PUMPS IN 10' DIA X 19H TANK. 383.50 RIM, 361.50BOTTOM

72 CONSTRUCT 18"X18" CATCH BASIN

73 CONSTRUCT CURB CUT

74 ADJUST TO GRADE

76 CONSTRUCT STAIRS PER ARCHITECTURAL DWGS

77 BUILDING COLUMN PER STRUCTURAL DWGS PER SEPARATE HCAI PERMIT

80 CONSTRUCT (PVT) RIBBON GUTTER

89 CONSTRUCT TYPE A AC DIKE PER SDRSD G-5

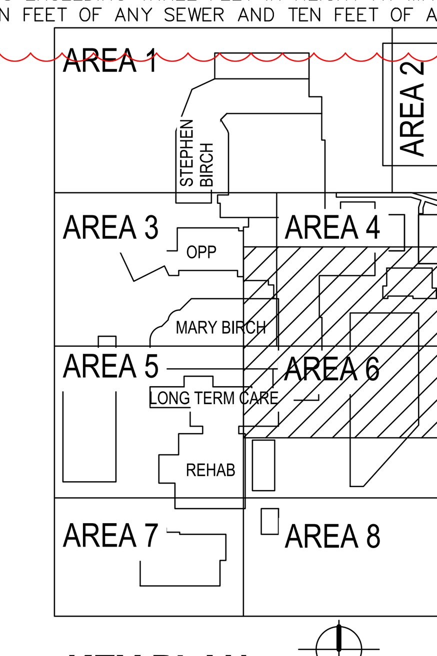
90 TRANSITION FROM 0" TO 6" CURB FACE

91 CONSTRUCT CURB-O-LET-THRU THE CURB

92 RED CURB AREAS ON FIRE ACCESS ROAD

MATCHLINE SHEET C-112

SCALE: 1"=20'



KEY PLAN

SMMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

MCCARTHY BUILDING COMPANIES, INC.
9275 SKY PARK COURT, SUITE 200
SAN DIEGO, CA 92123

HDR ARCHITECTURE, INC.
350 SOUTH GRAND AVENUE, SUITE 2900
LOS ANGELES, CA 90071-3406

TAYLOR design
17850 FITCH
IRVINE, CA 92614

BWE
CIVIL-STRUCTURAL-SURVEY-PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

MARY BIRCH EXP
CONDITIONAL USE PERMIT

Project Manager	Thomas Onnen
Project Designer	HDR/ Taylor Design
Project Architect	HDR/ Taylor Design
Landscape Architect	Schmidt Design Group
Civil Engineer	BWE Engineering
Structural Engineer	KPFF
Mechanical Engineer	TK1SC
Electrical Engineer	TK1SC
Plumbing Engineer	TK1SC
Interior Designer	HDR/ Taylor Design Group
Equipment Planner	Criterion
Sheet Reviewer	Author

MARK	DATE	DESCRIPTION
1	06/02/2022	CUP BACKCHECK #1
2	10/07/2022	CUP BACKCHECK #2
3	12/29/2022	CUP BACKCHECK #3

Current Print Description

Project Number	10204365
Original Issue	06/18/20
Agency Number	I210874-37-00
Agency Approval	

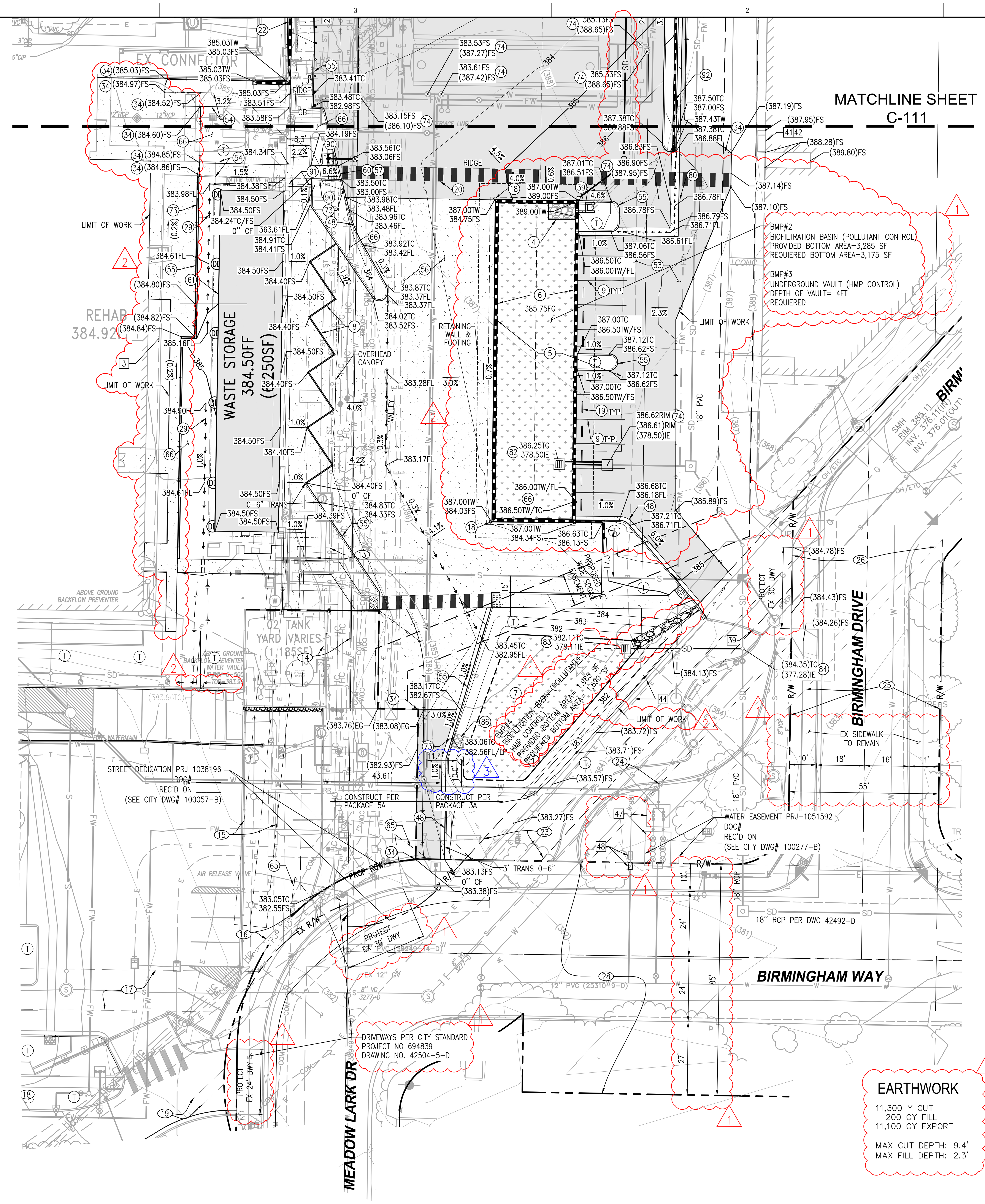
REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
INIT DATE
Office of Statewide Health Planning and Development
FACILITIES DEVELOPMENT DIVISION

NOT FOR CONSTRUCTION PLAN CHECK APPROVAL
REGISTERED PROFESSIONAL ENGINEER MICHAEL A. ... CIVIL STATE OF CALIFORNIA

Sheet Name
GRADING AND DRAINAGE PLAN

Sheet Number
C-111

Project Status
CONDITIONAL USE PERMIT AMENDMENT



CONSTRUCTION KEYNOTES

- (DD) DAYLIGHT ROOF DRAIN TO GRADE PER PLUMBING DWGS
- (4) CONSTRUCT RIP RAP WITH A SILL WALL, 2 SIDES, 1/4 TON ROCK AND 30MIL IMPERMEABLE LINER ON THE BOTTOM OF SDRSD D-40 ENERGY DISSIPATER
- (5) CONSTRUCT UNDERGROUND STORM WATER STORAGE 17,054 CF (MINIMUM) (BMP #3) PER DETAIL B/19-D 382.50 TOP, 378.50 BOTTOM.
- (6) CONSTRUCT BIOFILTRATION BASIN (BMP#2) WITH 3,332 SF BOTTOM AREA WITH 6" PONDING DEPTH
- (7) CONSTRUCT BIOFILTRATION BASIN (BMP #4) WITH 2,000 SF BOTTOM AREA FOR OXYGEN YARD, WASTE STORAGE, & NEW PAVEMENT
- (8) PAINT 4" WIDE YELLOW STRIPING
- (9) PAINT 4" WIDE WHITE STRIPE
- (18) INSTALL BOLLARD
- (19) CONSTRUCT WHEEL STOP
- (20) PAINT CONTINENTAL CROSSWALK PER SDM-116
- (22) CONSTRUCT RETAINING WALL PER STRUCTURAL DWGS PER SEPARATE HCAI PERMIT
- (29) CONSTRUCT VEGETATED SWALE
- (34) MATCH EX PAVEMENT ELEVATIONS
- (39) CONSTRUCT MODIFIED WING HEADWALL & U HEADWALL PER SDRSD D-34
- (48) CONSTRUCT CURB & GUTTER PER SDG-151 (PVT)
- (53) CONSTRUCT AC PAVEMENT
- (54) CONSTRUCT CONCRETE WALKWAY
- (55) CONSTRUCT 6" CURB PER SDG-150 (PVT)
- (56) CONSTRUCT CONCRETE PAVEMENT
- (57) CONSTRUCT DETECTABLE WARNING TILES PER SDG-130
- (60) CONSTRUCT 0" CURB
- (61) CONSTRUCT BUILDING PER STRUCTURAL AND ARCH DWGS PER SEPARATE HCAI PERMIT
- (65) SIGHT VISIBILITY TRIANGLES
- (66) CONSTRUCT NEW LANDSCAPING PER LANDSCAPE DWGS
- (73) CONSTRUCT CURB CUT
- (74) ADJUST TO GRADE
- (80) CONSTRUCT (PVT) RIBBON GUTTER
- (82) CONSTRUCT OVERFLOW STRUCTURE
- (83) CONSTRUCT OVERFLOW STRUCTURE
- (84) CONNECT 15" STORM DRAIN TO EX 18" STUB
- (86) CONSTRUCT COBBLE/RIP RAP
- (90) TRANSITION FROM 0" TO 6" CURB FACE
- (91) CONSTRUCT CURB-O-LET-THRU THE CURB
- (92) RED CURB AREAS ON FIRE ACCESS ROAD

PROTECTION KEYNOTES

- [3] PROTECT EX CONCRETE PAVEMENT
- [39] PROTECT EX BERM
- [41] PROTECT EX DOOR
- [42] PROTECT EX STAIRS
- [44] PROTECT EX DRAINAGE CHANNEL
- [47] PROTECT EX DUAL 6" ABOVE GROUND METERS AND 6" BACKFLOWS
- [48] PROTECT EX 2" IRRIGATION METER AND 2" BACKFLOW

EXISTING EASEMENT KEYNOTES

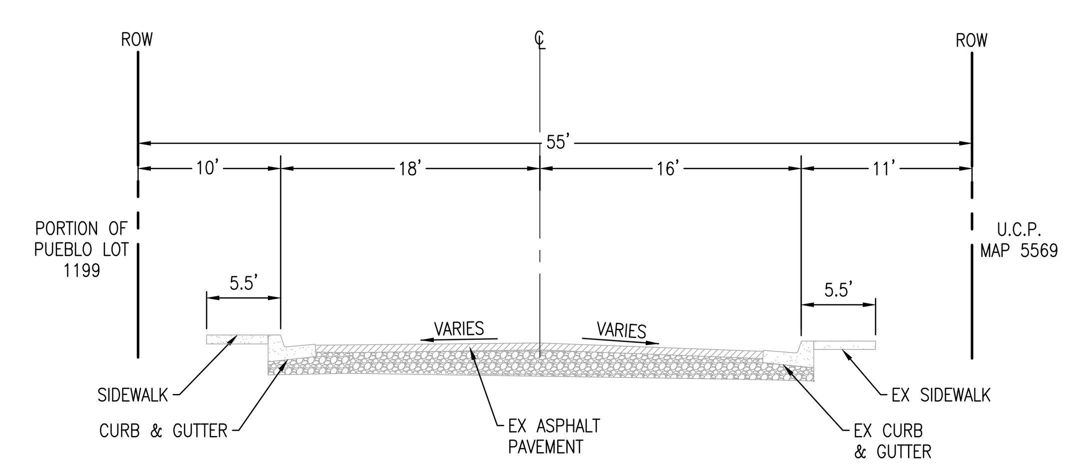
- (13) EXISTING 4'-WIDE PACIFIC TEL. CO. EASEMENT RECORDED 3-29-1963, F/P 54459, SERIES 4, BOOK 1963 O.R.
- (14) EXISTING 10'-WIDE CITY OF SAN DIEGO ELECTRICAL EASEMENT RECORDED 6-23-1976, F/P 76-195720 O.R.
- (15) EXISTING 12'-WIDE SDGE EASEMENT RECORDED 9-21-1962 IN F/P 163692, SERIES 3, BOOK 1962 O.R.
- (16) EXISTING 12'-WIDE SDGE EASEMENT RECORDED 5-22-1961 IN F/P 87927, SERIES 2, BOOK 1961 O.R.
- (17) EXISTING 15'-WIDE SEWER EASEMENT GRANTED PER MAP NO. 7664
- (18) EXISTING 10'-WIDE SEWER EASEMENT RECORDED 1-24-1962, F/P 13865, SERIES 3, BOOK 1962 O.R.
- (19) EXISTING 4'-WIDE PACIFIC TEL. CO. EASEMENT RECORDED 3-29-1963, F/P 54459, SERIES 4, BOOK 1963 O.R.
- (23) EXISTING 21'-WIDE GENEREAL UTILITY EASEMENT RESERVED PER RESOLUTION NO. 312198
- (24) EXISTING 20'-WIDE SEWER EASEMENT GRANTED TO THE CITY OF SAN DIEGO PER DOC. REC. 5-14-2019
- (25) EXISTING EASEMENT FOR BIRMINGHAM DRIVE DEDICATED PER DOC. REC 5-14-2019 AS DOC. #2019-0181711, O.R.
- (26) EXISTING EASEMENT FOR BIRMINGHAM DR. DEDICATED PER DOC. REC. 3-25-1932 IN BK 96, PG 347, O.R.
- (28) EXISTING EASEMENT FOR BIRMINGHAM WAY DEDICATED PER RESOLUTION NUMBER 279144, RECORDED 12-31-1991 AS DOCUMENT NO. 1991-0685748, O.R.

EARTHWORK

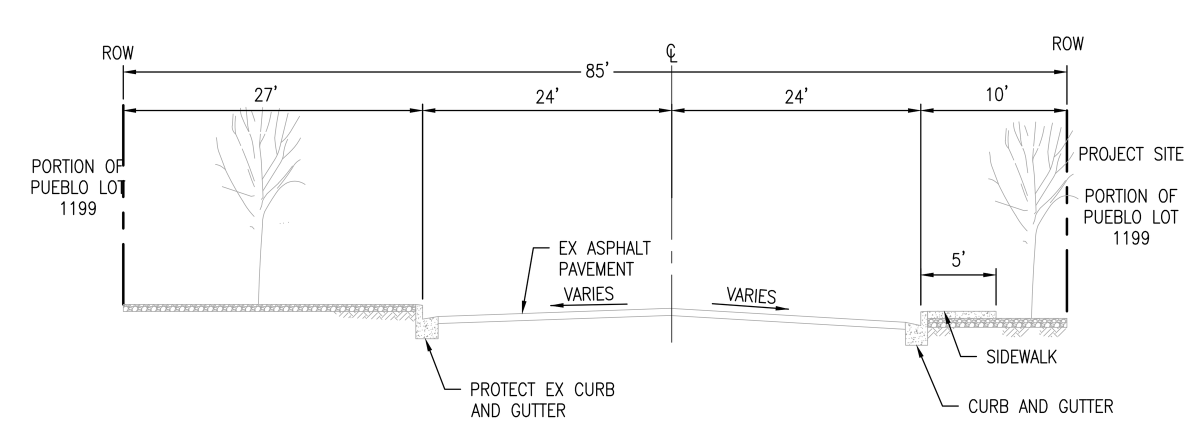
11,300 Y CUT
200 CY FILL
11,100 CY EXPORT

MAX CUT DEPTH: 9.4'
MAX FILL DEPTH: 2.3'

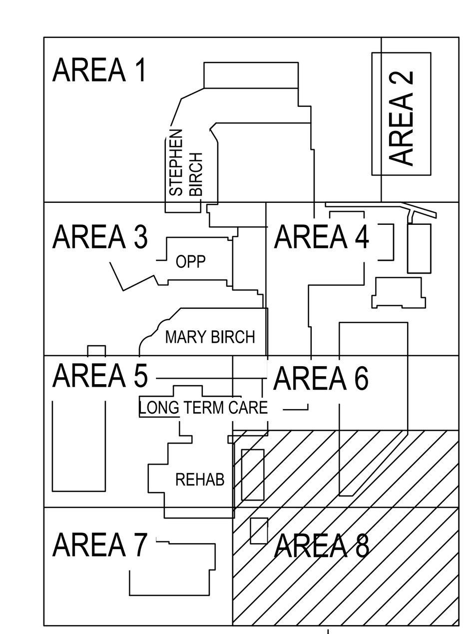
SCALE: 1"=20'



BIRMINGHAM DRIVE SECTION
(SECTION LOOKING NORTH)
NOT TO SCALE



BIRMINGHAM WAY SECTION
(SECTION LOOKING WEST)
NOT TO SCALE



KEY PLAN

SHARP
SMMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

McCARTHY
McCARTHY BUILDING COMPANIES, INC.
9275 SKY PARK COURT, SUITE 200
SAN DIEGO, CA 92123

HDR
HDR ARCHITECTURE, INC.
350 SOUTH GRAND AVENUE, SUITE 2900
LOS ANGELES, CA 90071-3406

TAYLOR design
17850 FITCH
IRVINE, CA 92614

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

MARY BIRCH EXP
CONDITIONAL USE PERMIT

Project Manager	Thomas Onnen
Project Designer	HDR/ Taylor Design
Project Architect	HDR/ Taylor Design
Landscape Architect	Schimdt Design Group
Civil Engineer	BWE Engineering
Structural Engineer	KPFF
Mechanical Engineer	TK1SC
Electrical Engineer	TK1SC
Plumbing Engineer	TK1SC
Interior Designer	HDR/ Taylor Design Group
Equipment Planner	Criterion
Sheet Reviewer	Author

MARK	DATE	DESCRIPTION
1	06/02/2022	CUP BACKCHECK #1
2	10/07/2022	CUP BACKCHECK #2
3	12/29/2022	CUP BACKCHECK #3

Current Print Description

Project Number	10204365
Original Issue	06/18/20
Agency Number	I210874-37-00
Agency Approval	

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
INIT DATE
Office of Statewide Health Planning and Development
FACILITIES DEVELOPMENT DIVISION

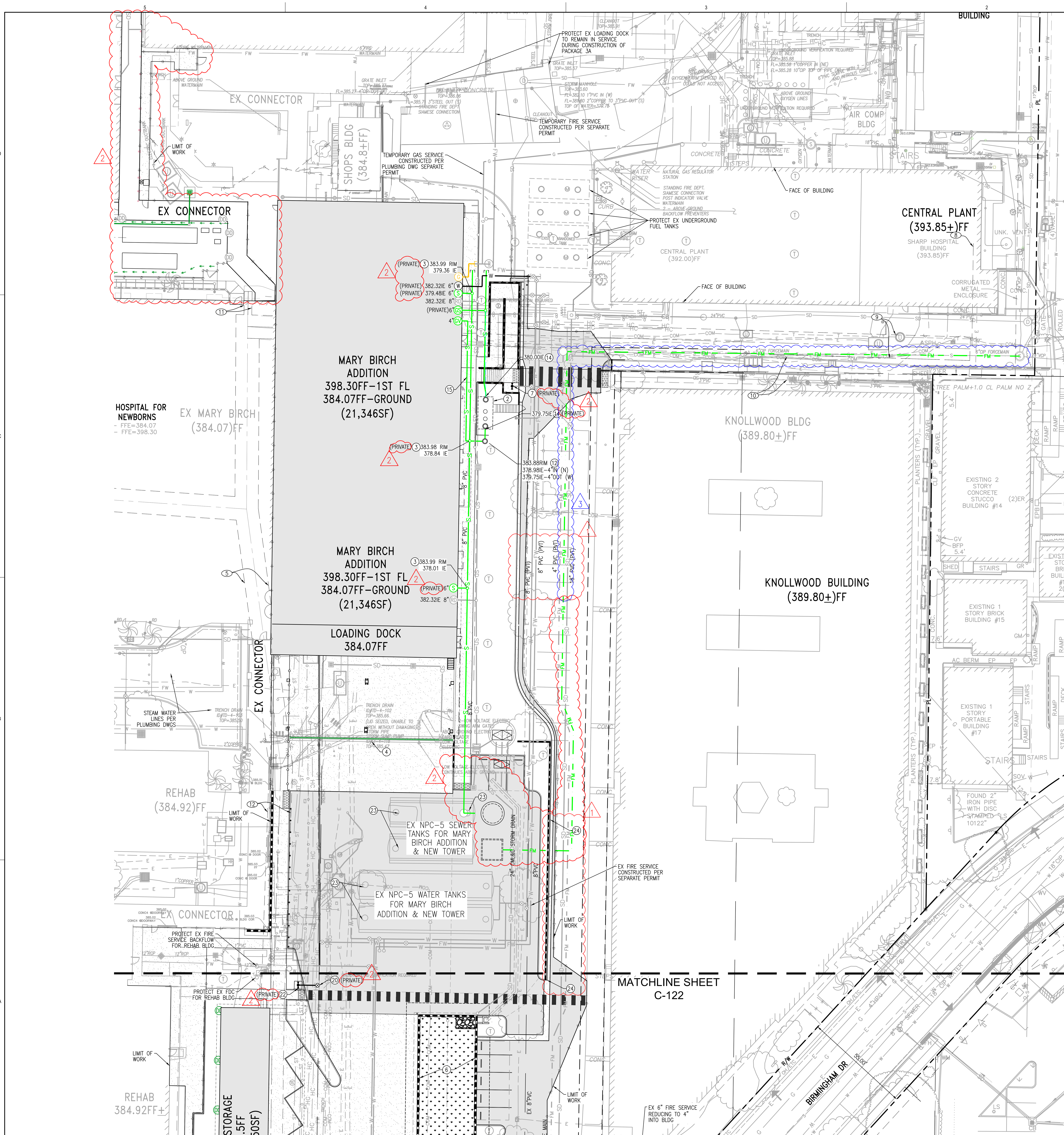
REGISTERED PROFESSIONAL ENGINEER MICHAEL A. S... CIVIL STATE OF CALIFORNIA
NOT FOR CONSTRUCTION PLAN CHECK APPROVAL

Sheet Name
GRADING AND DRAINAGE PLAN

Sheet Number
C-112

Project Status
CONDITIONAL USE PERMIT AMENDMENT

m:\Projects\95003\9545u.10.00 sharp mmc\Dwgs\sheet_dwgs\PK3A Mary Birch\9545U.10.00 PK3A-03-GRAD - CUP.dwg



UTILITY LEGEND

- GAS PIPE PER SEPARATE PERMIT
- SEWER PIPE PER SEPARATE PERMIT
- FIRE WATER PIPE PER SEPARATE PERMIT
- DOMESTIC WATER PIPE PER SEPARATE PERMIT
- STEAM WATER PIPE PER SEPARATE PERMIT
- STORM DRAIN PIPE PER SEPARATE PERMIT
- CHILLED WATER PIPE PER SEPARATE PERMIT
- ELECTRIC TRENCH PER SEPARATE PERMIT
- GAS PIPE PER THIS PACKAGE
- SEWER PIPE PER THIS PACKAGE
- DOMESTIC WATER PIPE PER THIS PACKAGE
- FIRE WATER PIPE PER THIS PACKAGE
- STORM DRAIN PIPE PER THIS PACKAGE. SEE GRADING AND DRAINAGE PLAN

UTILITY NOTES:

1. THE PROPOSED ELECTRIC, GAS, CHILLED WATER, AND STEAM LINES SHOWN ON THIS SHEET ARE FOR REFERENCE ONLY. CONSTRUCT PER SEPARATE MEP DRAWINGS.
2. ALL PROPOSED ONSITE WATER AND SEWER IS PRIVATE AND WILL CONNECT TO EXISTING ONSITE PRIVATE WATER AND SEWER.

CONSTRUCTION KEYNOTES

(2) CONSTRUCT 5,000 GAL GREASE INTERCEPTOR PER PLUMBING DWGS
(3) CONSTRUCT SEWER CLEANOUT PER DETAIL (PRIVATE)
(4) CONSTRUCT 12" HEAVY DUTY TRENCH DRAIN PER GRADING PLAN PER SEPARATE CITY PERMIT
(6) CONSTRUCT BIOFILTRATION BASIN PER GRADING PLAN PER SEPARATE CITY PERMIT
(7) CONSTRUCT FIRE HYDRANT PER DETAIIL A, THIS SHEET, CONNECT TO EX 6" FIRE SERVICE (PRIVATE)
(11) CONNECT NEW 8" PVC SEWER TO EX 8" PVC SEWER AT EX CLEANOUT (PRIVATE)
(12) CONSTRUCT GRASE INTERCEPTOR SAMPLE BOX PER PLUMBING DWGS
(14) CONNECT 6" SEWER TO GREASE INTERCEPTOR (PRIVATE)
(15) CONSTRUCT 4" VENT PIPE PER PLUMBING PLAN
(20) CONNECT NEW 6" FIRE SERVICE TO EX 8" FIRE SERVICE, FIELD VERIFY SIZE & LOCATION (PRIVATE)
(22) CONSTRUCT FIRE HYDRANT PER SDW–104 (PRIVATE)
(23) ADJUST TO FINISH GRADE, SEE UTILITY NOTE 6.
(24) RED CURB AREAS ON FIRE ACCESS ROAD

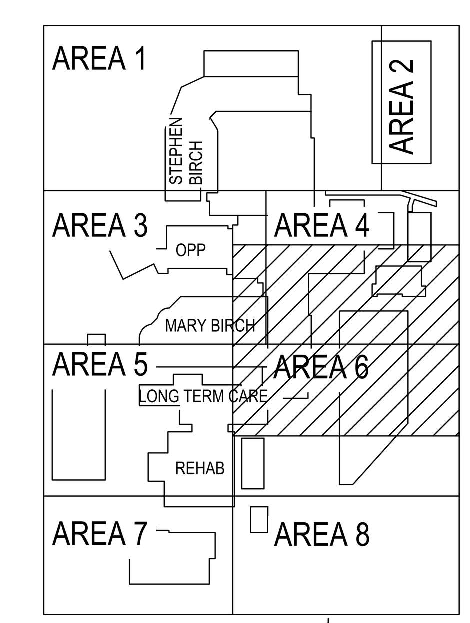
EXISTING EASEMENT KEYNOTES

(7) EXISTING EASEMENT FOR WATER METER VAULT RECORDED 7–29–1958 AS DOC. # 121966 IN BOOK 7187, PAGE 465 O.R.
(8) EXISTING SDGE EASEMENT (NO WIDTH GIVEN) RECORDED 9–29–1954 AS DOC. #129840, BOOK 5379, PAGE 419 O.R.
(9) EXISTING 12'–WIDE SDGE EASEMENT RECORDED 9–21–1962 IN F/P 163692, SERIES 3, BOOK 1962 O.R.
(10) EXISTING 12'–WIDE SDGE EASEMENT RECORDED 1–4–1960, F/P 433, SERIES 1, BOOK 1960 O.R.

GENERAL NOTES

NO TREES OR SHRUBS EXCEEDING THREE FEET IN HEIGHT AT MATURITY SHALL BE INSTALLED WITHIN TEN FEET OF ANY SEWER AND TEN FEET OF ANY WATER FACILITIES

SCALE: 1"=20'



KEY PLAN

SHARP

SMMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

McCARTHY

MCCARTHY BUILDING COMPANIES, INC.
9275 SKY PARK COURT, SUITE 200
SAN DIEGO, CA 92123

HDR ARCHITECTURE, INC.
350 SOUTH GRAND AVENUE, SUITE 2900
LOS ANGELES, CA 90071-3406

TAYLOR design
17850 FITCH
IRVINE, CA 92614

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

MARY BIRCH EXP

CONDITIONAL USE PERMIT

Project Manager	Thomas Onnen
Project Designer	HDR/ Taylor Design
Project Architect	HDR/ Taylor Design
Landscape Architect	Schmidt Design Group
Civil Engineer	BWE Engineering
Structural Engineer	KPFF
Mechanical Engineer	TK1SC
Electrical Engineer	TK1SC
Plumbing Engineer	TK1SC
Interior Designer	HDR/ Taylor Design Group
Equipment Planner	Criterion
Sheet Reviewer	Author

MARK	DATE	DESCRIPTION
1	06/02/2022	CUP BACKCHECK #1
2	10/07/2022	CUP BACKCHECK #2
3	12/29/2022	CUP BACKCHECK #3

Current Print Description

Project Number	10204365
Original Issue	06/18/20
Agency Number	I210874-37-00
Agency Approval	

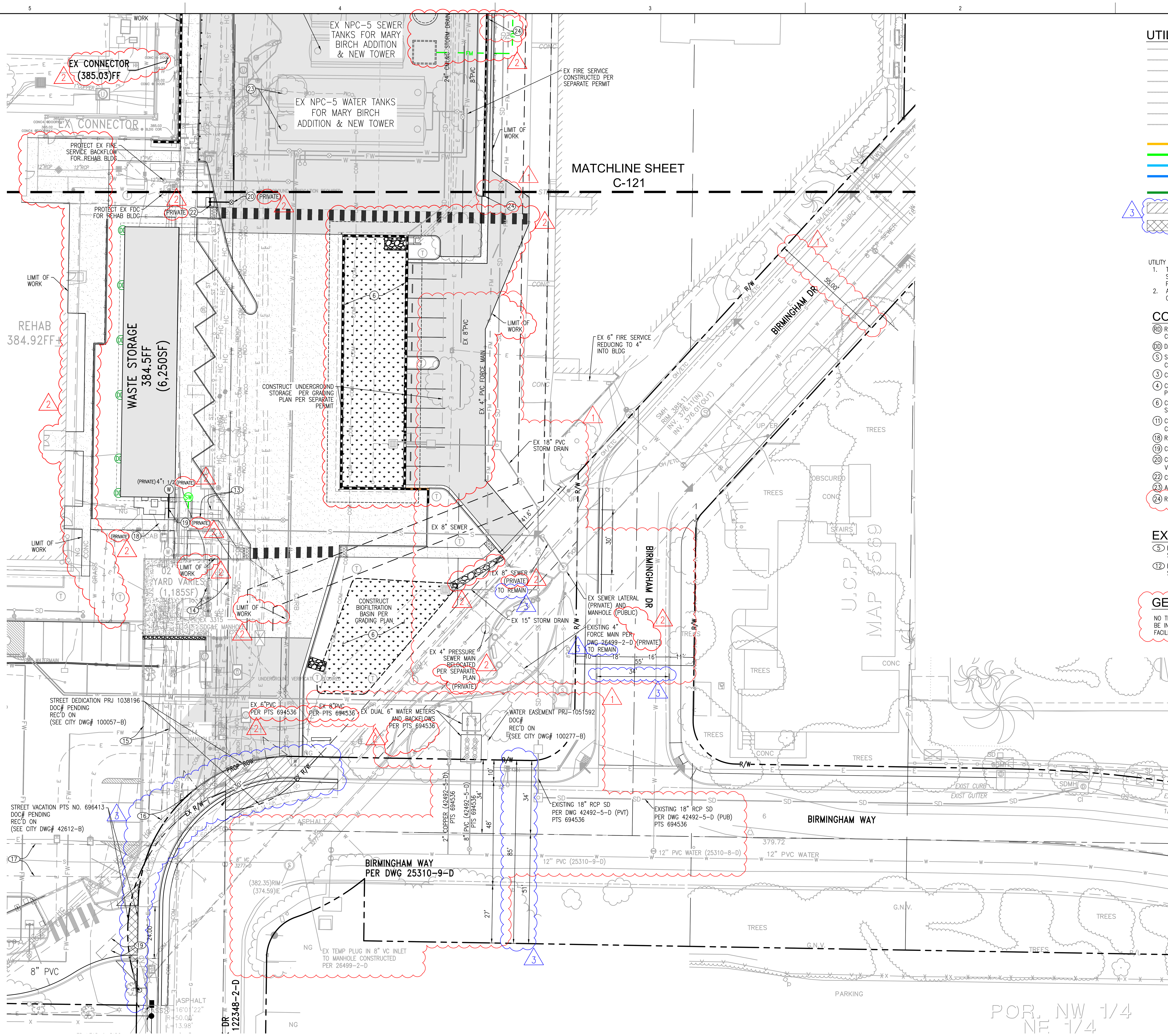
REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
INIT DATE
Office of Statewide Health Planning and Development FACILITIES DEVELOPMENT DIVISION

REGISTERED PROFESSIONAL ENGINEER MICHAEL A. ... CIVIL 12-31-24 STATE OF CALIFORNIA
NOT FOR CONSTRUCTION PLAN CHECK APPROVAL

Sheet Name
UTILITY PLAN

Sheet Number
C-121

Project Status
CONDITIONAL USE PERMIT AMENDMENT



SCALE: 1"=20'

UTILITY LEGEND

- GAS PIPE PER SEPARATE PERMIT
- SEWER PIPE PER SEPARATE PERMIT
- FIRE WATER PIPE PER SEPARATE PERMIT
- DOMESTIC WATER PIPE PER SEPARATE PERMIT
- STEAM WATER PIPE PER SEPARATE PERMIT
- STORM DRAIN PIPE PER SEPARATE PERMIT
- CHILLED WATER PIPE PER SEPARATE PERMIT
- ELECTRIC TRENCH PER SEPARATE PERMIT
- GAS PIPE PER THIS PACKAGE
- SEWER PIPE PER THIS PACKAGE
- DOMESTIC WATER PIPE PER THIS PACKAGE
- FIRE WATER PIPE PER THIS PACKAGE
- STORM DRAIN PIPE PER THIS PACKAGE. SEE GRADING AND DRAINAGE PLAN
- DEDICATION LIMITS
- VACATION LIMITS

UTILITY NOTES:
1. THE PROPOSED ELECTRIC, GAS, CHILLED WATER, AND STEAM LINES SHOWN ON THIS SHEET ARE FOR REFERENCE ONLY. CONSTRUCT PER SEPARATE MEP DRAWINGS.
2. ALL PROPOSED ONSITE WATER AND SEWER IS PRIVATE AND WILL CONNECT TO EXISTING ONSITE PRIVATE WATER AND SEWER.

CONSTRUCTION KEYNOTES

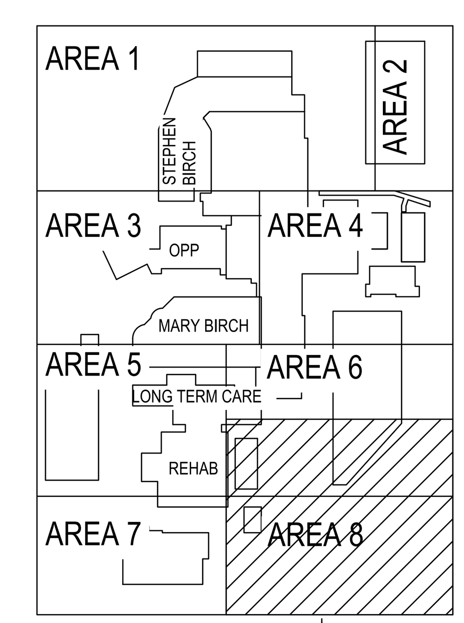
- RD ROOF DRAIN POINT OF CONNECTION 5' OUTSIDE OF BUILDING. CONTINUATION PER PLUMBING DRAWINGS
- DD DAYLIGHT ROOF DRAIN TO GRADE PER PLUMBING DWGS
- 5 SEWER POINT OF CONNECTION 5' OUTSIDE OF BUILDING. CONTINUATION PER PLUMBING DRAWINGS (PRIVATE)
- 3 CONSTRUCT SEWER CLEANOUT (PRIVATE)
- 4 CONSTRUCT 12" HEAVY DUTY TRENCH DRAIN PER GRADING PLAN PER SEPARATE CITY PERMIT
- 6 CONSTRUCT BIOFILTRATION BASIN PER GRADING PLAN PER SEPARATE CITY PERMIT
- 11 CONNECT NEW 8" PVC SEWER TO EX 8" PVC SEWER AT EX CLEANOUT (PRIVATE)
- 18 REMOVE EX CAP & CONNECT NEW 4" SEWER TO EX 4" SEWER (PRIVATE)
- 19 CONNECT NEW 1.5" WATER TO EX 1.5" WATER (PRIVATE)
- 20 CONNECT NEW 6" FIRE SERVICE TO EX 8" FIRE SERVICE, FIELD VERIFY SIZE & LOCATION (PRIVATE)
- 22 CONSTRUCT FIRE HYDRANT PER SDW-104 (PRIVATE)
- 23 ADJUST TO FINISH GRADE, SEE UTILITY NOTE 6.
- 24 RED CURB AREAS ON FIRE ACCESS ROAD

EXISTING EASEMENT KEYNOTES

- 5 EXISTING 12'-WIDE SDGE EASEMENT RECORDED 1-4-1960, F/P 433, SERIES 1, BOOK 1960 O.R.
- 12 EXISTING 12'-WIDE SDGE EASEMENT RECORDED 5-22-1961 IN F/P 87927, SERIES 2, BOOK 1961 O.R.

GENERAL NOTES

NO TREES OR SHRUBS EXCEEDING THREE FEET IN HEIGHT AT MATURITY SHALL BE INSTALLED WITHIN TEN FEET OF ANY SEWER AND TEN FEET OF ANY WATER FACILITIES



KEY PLAN

SHARP
SMMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

McCARTHY
McCARTHY BUILDING COMPANIES, INC.
9275 SKY PARK COURT, SUITE 200
SAN DIEGO, CA 92123

HDR
HDR ARCHITECTURE, INC.
350 SOUTH GRAND AVENUE, SUITE 2900
LOS ANGELES, CA 90071-3406

TAYLOR design
17850 FITCH
IRVINE, CA 92614

BWE
CIVIL • STRUCTURAL • SURVEY • PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

MARY BIRCH EXP
CONDITIONAL USE PERMIT

Project Manager	Thomas Onnen
Project Designer	HDR/ Taylor Design
Project Architect	HDR/ Taylor Design
Landscape Architect	Schmidt Design Group
Civil Engineer	BWE Engineering
Structural Engineer	KPFF
Mechanical Engineer	TK1SC
Electrical Engineer	TK1SC
Plumbing Engineer	TK1SC
Interior Designer	HDR/ Taylor Design Group
Equipment Planner	Criterion

Sheet Reviewer: Author

MARK	DATE	DESCRIPTION
1	06/02/2022	CUP BACKCHECK #1
2	10/07/2022	CUP BACKCHECK #2
3	12/29/2022	CUP BACKCHECK #3

Current Print Description

Project Number: 10204365
Original Issue: 06/18/20

Agency Number: I210874-37-00
Agency Approval

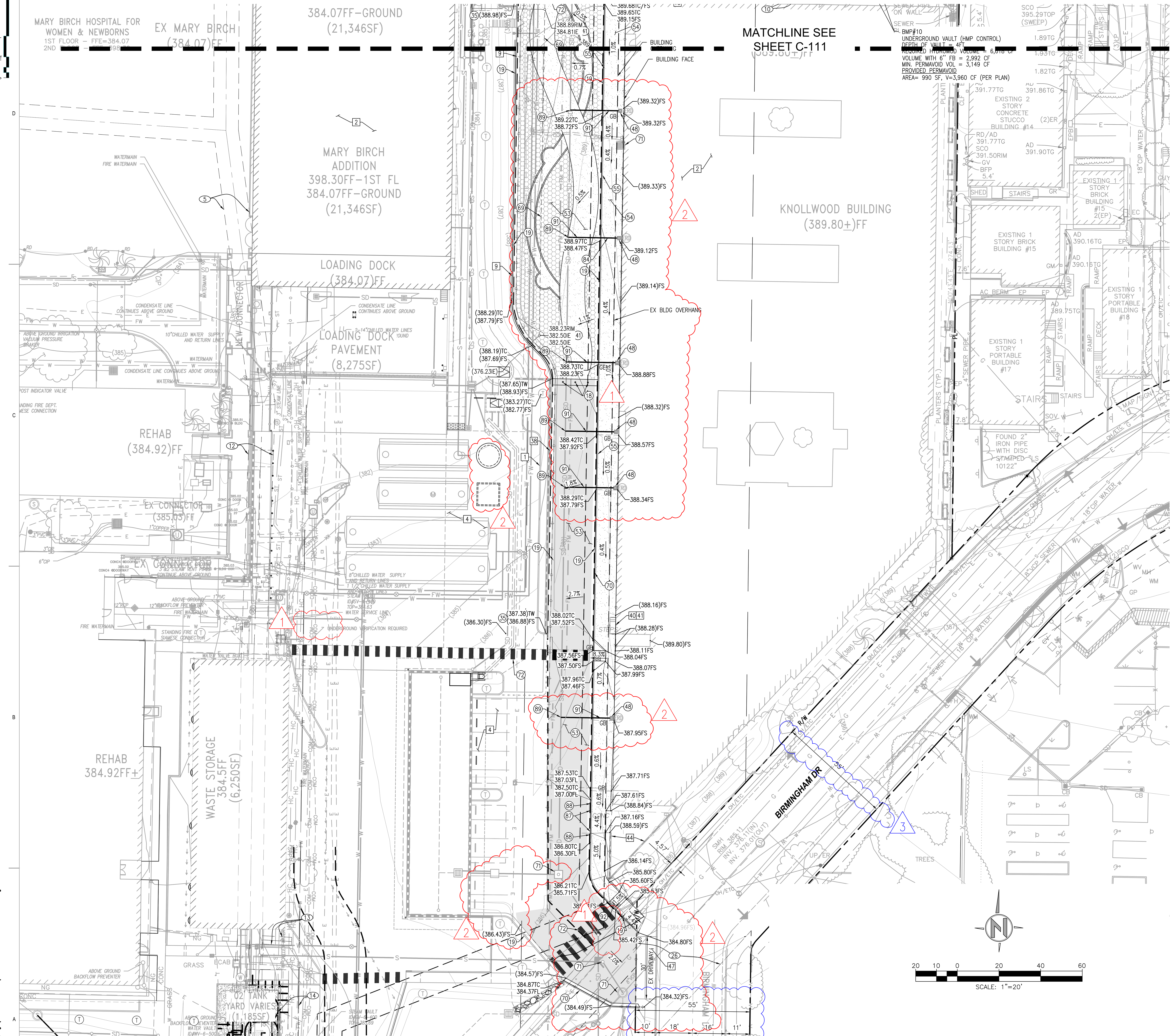
REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
INIT DATE
Office of Statewide Health Planning and Development
FACILITIES DEVELOPMENT DIVISION

REGISTERED PROFESSIONAL ENGINEER MICHAEL A. ... CIVIL STATE OF CALIFORNIA
NOT FOR CONSTRUCTION PLAN CHECK APPROVAL

Sheet Name: UTILITY PLAN

Sheet Number: C-122

Project Status: CONDITIONAL USE PERMIT AMENDMENT



GRADING NOTES

1. PRELIMINARY EARTHWORK QUANTITIES FOR PHASES 0 THROUGH 6 COMBINED ARE 20,080CY CUT AND 4850CY FILL FOR A TOTAL OF 15,230CY OF EXPORT. CALCULATIONS ASSUME 12" THICK PAVEMENT SECTIONS, 6' BUILDING SLABS, AND 4" SIDEWALK THICKNESSES. QUANTITIES HAVE NOT YET BEEN BROKEN OUT INTO SEPARATE PHASES.
2. FOR PROPOSED UTILITY REPLACEMENT AND RELOCATION REFER TO THE PACKAGE 1A

GENERAL NOTES

1. THE PROPOSED PROJECT WILL COMPLY WITH ALL THE REQUIREMENTS OF THE CURRENT CITY OF SAN DIEGO STORM WATER STANDARDS MANUAL BEFORE A GRADING OR BUILDING PERMIT IS ISSUED. IT IS THE RESPONSIBILITY OF THE OWNER/DESIGNER/APPLICANT TO ENSURE THAT THE CURRENT STORM WATER PERMANENT BMP DESIGN STANDARDS ARE INCORPORATED INTO THE PROJECT.

PROTECTION KEYNOTES

1 PROTECT EX CURB
2 PROTECT EX BUILDING & FOUNDATION
4 PROTECT EX ASPHALT PAVEMENT
9 PROTECT EX CURB & GUTTER
10 PROTECT EX WALL & FOOTING
38 PROTECT EX RETAINING WALL
40 PROTECT EX STAIRS
41 PROTECT EX DOOR
44 PROTECT EX WALL
47 PROTECT EX DRIVEWAY

CONSTRUCTION KEYNOTES

ERD PROTECT EX ROOF DRAIN
18 CONSTRUCT REMOVABLE BOLLARD
19 RED CURB AREAS ON FIRE ACCESS ROAD
35 MATCH EX TC/FS ELEVATIONS
41 CONSTRUCT STORM DRAIN CLEANOUT
48 CONSTRUCT 12"X12" CATCH BASIN
53 CONSTRUCT AC PAVEMENT
54 CONSTRUCT CONCRETE 4" WALKWAY
55 CONSTRUCT 6" CURB PER SDG–150 (PVT)
69 CONSTRUCT 6" PERFORATED STORM DRAIN PIPE
70 CONSTRUCT 6" CURB AND GUTTER PER SDG–151 (PVT)
71 ADJUST UTILITY TO GRADE
72 PAINT CONTINENTAL CROSSWALK PER SDM–116
84 CONSTRUCT SIDEWALK UNDERDRAIN PER SDRSD D–27 (PVT)
87 CONSTRUCT ROLLED CURB
88 CONSTRUCT ROLLED CURB TRANSITION
89 CONNECT NEW PVC STORM DRAIN TO EX STORM DRAIN
91 CONSTRUCT 6" PVC STORM DRAIN
92 CONSTRUCT TRUNCATED DOMES

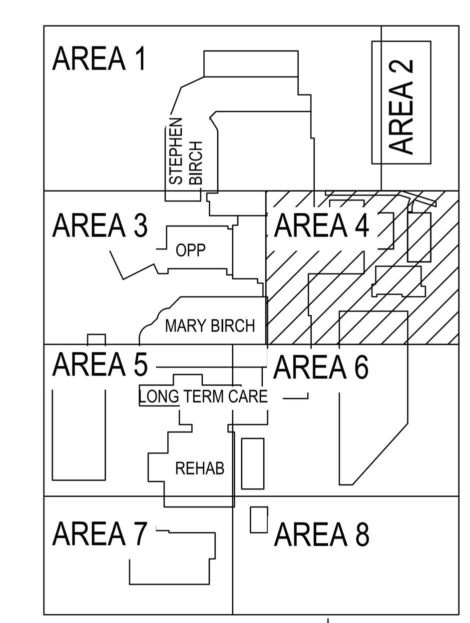
EXISTING EASEMENT KEYNOTES

5 EXISTING 12'–WIDE SDGE EASEMENT RECORDED 1–4–1960, F/P 433, SERIES 1, BOOK 1960 O.R.
12 EXISTING 12'–WIDE SDGE EASEMENT RECORDED 5–22–1961 IN F/P 87927, SERIES 2, BOOK 1961 O.R.

EARTHWORK

5,940 CY CUT
1,080 CY FILL
4,860 CY EXPORT

MAX CUT DEPTH 8.7'
MAX FILL DEPTH 6.5'



KEY PLAN

SHARP

SMMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

McCARTHY
McCARTHY BUILDING COMPANIES, INC.
9275 SKY PARK COURT, SUITE 200
SAN DIEGO, CA 92123

HDR
HDR ARCHITECTURE, INC.
350 SOUTH GRAND AVENUE, SUITE 2900
LOS ANGELES, CA 90071-3406

TAYLOR design
17850 FITCH
IRVINE, CA 92614

BWE
CIVIL • STRUCTURAL • SURVEY • PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

NEW TOWER

CONDITIONAL USE PERMIT

Project Manager	Thomas Onnen
Project Designer	HDR/ Taylor Design
Project Architect	HDR/ Taylor Design
Landscape Architect	Schimdt Design Group
Civil Engineer	BWE Engineering
Structural Engineer	KPFF
Mechanical Engineer	TK1SC
Electrical Engineer	TK1SC
Plumbing Engineer	TK1SC
Interior Designer	HDR/ Taylor Design Group
Equipment Planner	Criterion
Sheet Reviewer	Author

MARK	DATE	DESCRIPTION
1	06/02/2022	CUP BACKCHECK #1
2	10/07/2022	CUP BACKCHECK #2
3	12/29/2022	CUP BACKCHECK #3

Current Print Description

Project Number 10204365
Original Issue 06/18/20

Agency Number I210874-37-00
Agency Approval

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR

INIT DATE

Office of Statewide Health Planning and Development
FACILITIES DEVELOPMENT DIVISION

NOT FOR CONSTRUCTION
PLAN CHECK APPROVAL

Sheet Name
GRADING AND DRAINAGE PLAN

Sheet Number
C-112

Project Status
CONDITIONAL USE PERMIT AMENDMENT

M:\Projects\9500\9545L10.00 sharp mmc\Dwgs\sheet_dwgs\PK7A New Tower\9545L10.00 PK7A-03-GRAD CUP.dwg

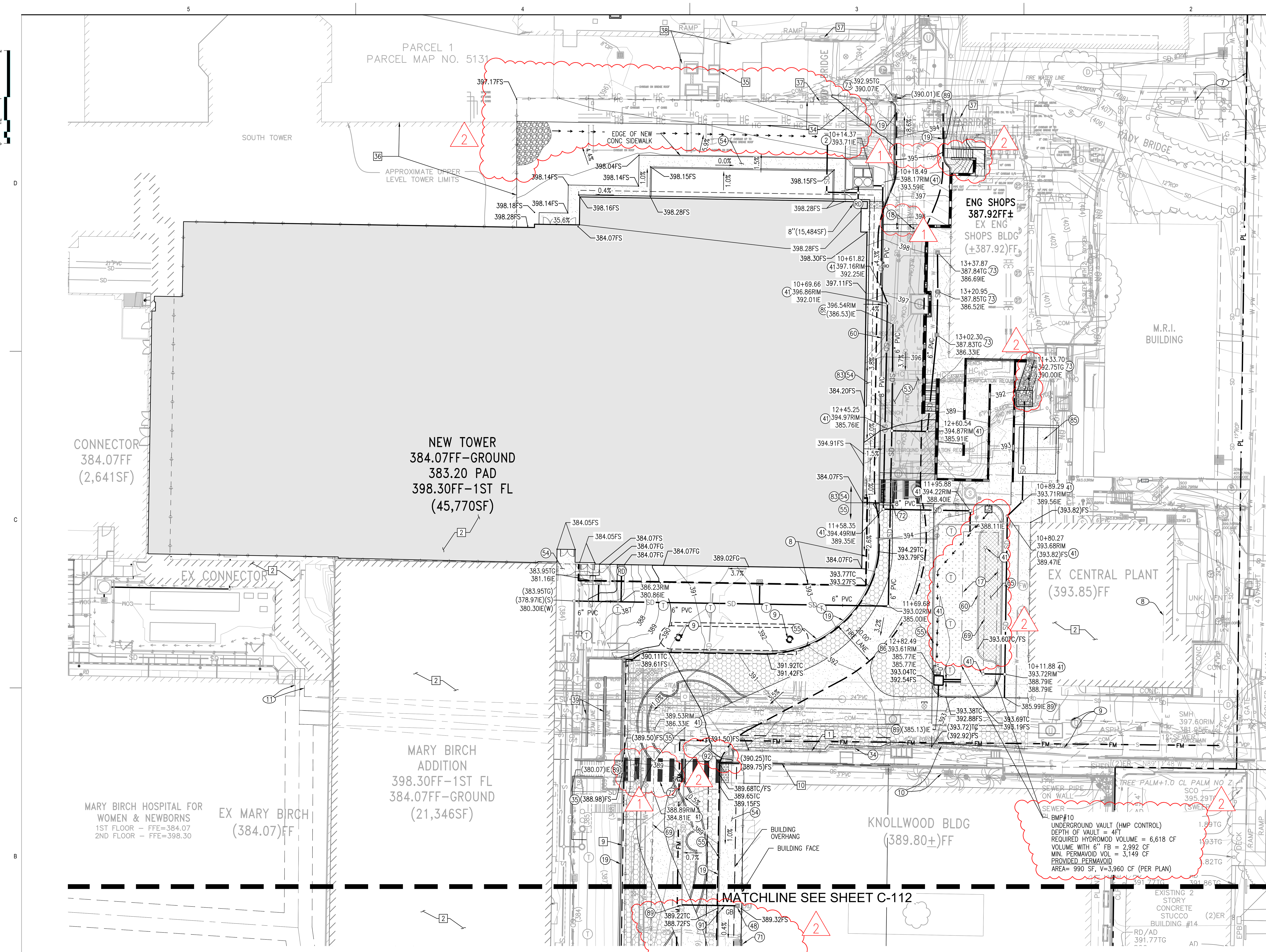
SHARP
SMMC CAMPUS
REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

McCARTHY
McCARTHY BUILDING COMPANIES, INC.
9275 SKY PARK COURT, SUITE 200
SAN DIEGO, CA 92123

HDR
HDR ARCHITECTURE, INC.
350 SOUTH GRAND AVENUE, SUITE 2900
LOS ANGELES, CA 90071-3406

TAYLOR design
17850 FITCH
IRVINE, CA 92614

BWE
CIVIL • STRUCTURAL • SURVEY • PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550



WORK TO BE DONE

THE PUBLIC IMPROVEMENTS SHOWN ON THESE PLANS SHALL BE CONSTRUCTED ACCORDING TO THE FOLLOWING STANDARD SPECIFICATIONS AND STANDARD DRAWINGS OF THE CITY OF SAN DIEGO.

STANDARD SPECIFICATIONS:

DOCUMENT NO.	DESCRIPTION
PWPI010119-01	STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (GREENBOOK), 2018 EDITION
PWPI010119-02	CITY OF SAN DIEGO STANDARD SPECIFICATIONS FOR PUBLICWORKS CONSTRUCTION (WHITEBOOK), 2018 EDITION
PWPI010119-04	CITYWIDE COMPUTER AIDED DESIGN AND DRAFTING (CADD) STANDARDS, 2018 EDITION
PWPI030119-08	CALIFORNIA DEPARTMENT OF TRANSPORTATION MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (REVISION 4), 2014 EDITION
PWPI030119-05	CALIFORNIA DEPARTMENT OF TRANSPORTATION U.S. CUSTOMARY STANDARD SPECIFICATIONS, 2018 EDITION

STANDARD DRAWINGS:

DOCUMENT NO.	DESCRIPTION
PWPI010119-03	CITY OF SAN DIEGO STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION, 2018 EDITION
PWPI030119-06	CALIFORNIA DEPARTMENT OF TRANSPORTATION U.S CUSTOMARY STANDARD PLANS, 2018 EDITION

UTILITY NOTES

PROPOSED IMPROVEMENTS

IMPROVEMENT	STANDARD DWGS.	SYMBOL
6" CURB & GUTTER	SDG-151	
36"x36" FLOW CONTROL STRUCTURE		
ATRIUM DRAIN		
6" CURB	SDG-150	
TREE	PER LANDSCAPE DWGS	T
MODULAR WETLAND		
RETAINING WALL	PER STRUCTURAL DWGS	
SIDEWALK CONCRETE PAVEMENT		
ASPHALT PAVEMENT		
GRIND AND OVERLAY		
TRUNCATED DOMES		
TRENCH RESURFACING	SDG-107 & SDG-117	
PERMEABLE PAVERS		
CHAIN LINK FENCE	PER LANDSCAPE DWGS	x
DOMESTIC WATER SERVICE	SIZE & TYPE PER PLAN	W
STORM DRAIN	SIZE & TYPE PER PLAN	SD
ELEC CONDUIT	PER ELECTRICAL DWGS	E
WATER GATE VALVE		
FIRE HYDRANT	SDW-104	
1" BACKFLOW PREVENTER	SDW-150	
STORM DRAIN CLEANOUT	SIZE & TYPE PER PLAN	

EXISTING IMPROVEMENTS

ITEM	SYMBOL
PROPERTY LINE / RIGHT OF WAY	
CENTER LINE	
EX UNDERGROUND ELECTRIC LINE	E
EX GAS VALVE	GV
EX STORM DRAIN MANHOLE	D SDMH
EX DROP INLET	DI
EX STORM DRAIN LINE	SD
EX WATER METER	WM
EX WATER VALVE	
EX WATER LINE	W
EX SEWER MANHOLE	S SMH
EX SEWER LINE	S
EX COMMUNICATION LINE	COM
EX FENCE	X
EX CURB & GUTTER	
EX ELECTRIC PULL BOX	EPB
EX ELECTRIC TRANSFORMER	ET
EX STREET LIGHT	ST
DECIDUOUS TREE WITH DIAMETER INDICATED	12"
EX FIRE HYDRANT	FH
EX SEWER CLEANOUT	SCO

1

GENERAL NOTES

1. THE PROPOSED PROJECT WILL COMPLY WITH ALL THE REQUIREMENTS OF THE CURRENT CITY OF SAN DIEGO STORM WATER STANDARDS MANUAL BEFORE A GRADING OR BUILDING PERMIT IS ISSUED. IT IS THE RESPONSIBILITY OF THE OWNER/DESIGNER/APPLICANT TO ENSURE THAT THE CURRENT STORM WATER PERMANENT BMP DESIGN STANDARDS ARE INCORPORATED INTO THE PROJECT.
2. PRIOR THE ISSUANCE OF ANY CONSTRUCTION PERMIT, THE OWNER/PERMITEE SHALL INCORPORATE ANY BEST MANAGEMENT PRACTICES NECESSARY TO COMPLY WITH CHAPTER 14, ARTICLE 2, DIVISION 1 (GRADING REGULATIONS) OF THE SAN DIEGO MUNICIPAL CODE, INTO THE CONSTRUCTION PLANS OR SPECIFICATIONS.
3. NO TREES OR SHRUBS EXCEEDING THREE FEET IN HEIGHT AT MATURITY SHALL BE INSTALLED WITHIN TEN FEET OF ANY SEWER AND TEN FEET OF ANY WATER FACILITIES.

EXISTING EASEMENT KEYNOTES

7 EXISTING EASEMENT FOR WATER METER VAULT RECORDED 7-29-1958 AS DOC. # 121966 IN BOOK 7187, PAGE 465 O.R.
8 EXISTING SDGE EASEMENT (NO WIDTH GIVEN) RECORDED 9-29-1954 AS DOC. #129840, BOOK 5379, PAGE 419 O.R.
9 EXISTING 12'-WIDE SDGE EASEMENT RECORDED 9-21-1962 IN F/P 163692, SERIES 3, BOOK 1962 O.R.
10 EXISTING 12'-WIDE SDGE EASEMENT RECORDED 1-4-1960, F/P 433, SERIES 1, BOOK 1960 O.R.

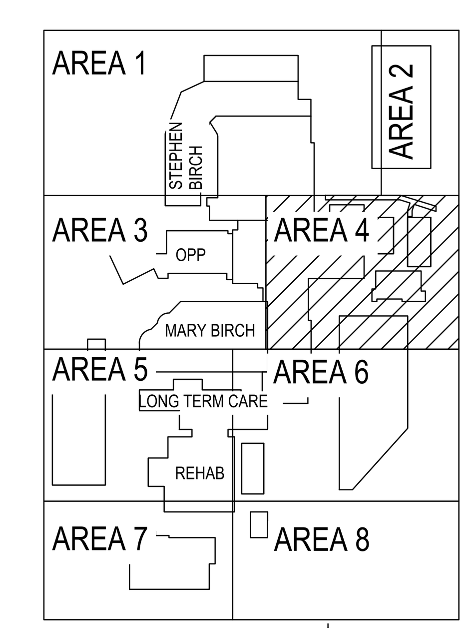
PROTECTION KEYNOTES

1 PROTECT EX CURB
2 PROTECT EX BUILDING & FOUNDATION
9 PROTECT EX CURB & GUTTER
10 PROTECT EX WALL & FOOTING
34 PROTECT EX RADY BRIDGE STRUCTURE & FOOTING
35 PROTECT EX ELECTRICAL STRUCTURE
36 PROTECT EX TOWER BUILDING
37 PROTECT EX BRIDGE COLUMN
38 PROTECT EX RETAINING WALL
39 PROTECT EX RAMP & WALLS CONSTRUCTED PER PACKAGE 3A

CONSTRUCTION KEYNOTES

RD ROOF DRAIN POINT OF CONNECTION 5' OUTSIDE OF BUILDING. CONTINUATION PER PLUMBING DRAWINGS
2 CONSTRUCT MODULAR WETLAND MWS-L-8-8
8 BUILDING OVERHANG PER ARCHITECTURAL DWGS
9 FIRE TANK ACCESS PORTS
17 CONSTRUCT 3,767 CF (MINIMUM) OF UNDERGROUND STORM WATER STORAGE FOR NEW TOWER
18 CONSTRUCT REMOVABLE BOLLARD
19 RED CURB AREAS ON FIRE ACCESS ROAD
1
~~34 MATCH EX PAVEMENT ELEVATIONS~~
35 MATCH EX TC/FS ELEVATIONS
41 CONSTRUCT STORM DRAIN CLEANOUT
48 CONSTRUCT 12"X12" CATCH BASIN
53 CONSTRUCT AC PAVEMENT
54 CONSTRUCT CONCRETE 4" WALKWAY
55 CONSTRUCT 6" CURB PER SDG-150 (PVT)
60 CONSTRUCT 0" CURB
65 TURF BLOCK PER LANDSCAPE DWGS
69 CONSTRUCT 6" PERFORATED STORM DRAIN PIPE
71 ADJUST UTILITY TO GRADE
72 PAINT CONTINENTAL CROSSWALK PER SDM-116
73 CONSTRUCT 18"X18" CATCH BASIN
83 CONSTRUCT THICKENED PAVEMENT EDGE
85 SET EMERGENCY RESPONSE STORAGE CONTAINERS ON AC PVMT PER ARCHITECTURAL DWGS
86 CONSTRUCT OUTLET CONTROL STRUCTURE
89 CONNECT NEW PVC STORM DRAIN TO EX STORM DRAIN
91 CONSTRUCT 6" PVC STORM DRAIN
92 CONSTRUCT TRUNCATED DOMES
2

SCALE: 1"=20'



KEY PLAN

NEW TOWER

CONDITIONAL USE PERMIT

Project Manager	Thomas Onnen
Project Designer	HDR/ Taylor Design
Project Architect	HDR/ Taylor Design
Landscape Architect	Schimdt Design Group
Civil Engineer	BWE Engineering
Structural Engineer	KPFF
Mechanical Engineer	TK1SC
Electrical Engineer	TK1SC
Plumbing Engineer	TK1SC
Interior Designer	HDR/ Taylor Design Group
Equipment Planner	Criterion
Sheet Reviewer	Author

MARK	DATE	DESCRIPTION
1	06/02/2022	CUP BACKCHECK #1
2	10/07/2022	CUP BACKCHECK #2
3	12/29/2022	CUP BACKCHECK #3

Current Print Description

Project Number	10204365
Original Issue	06/18/20
Agency Number	I210874-37-00
Agency Approval	

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR

INIT DATE

Office of Statewide Health Planning and Development
FACILITIES DEVELOPMENT DIVISION

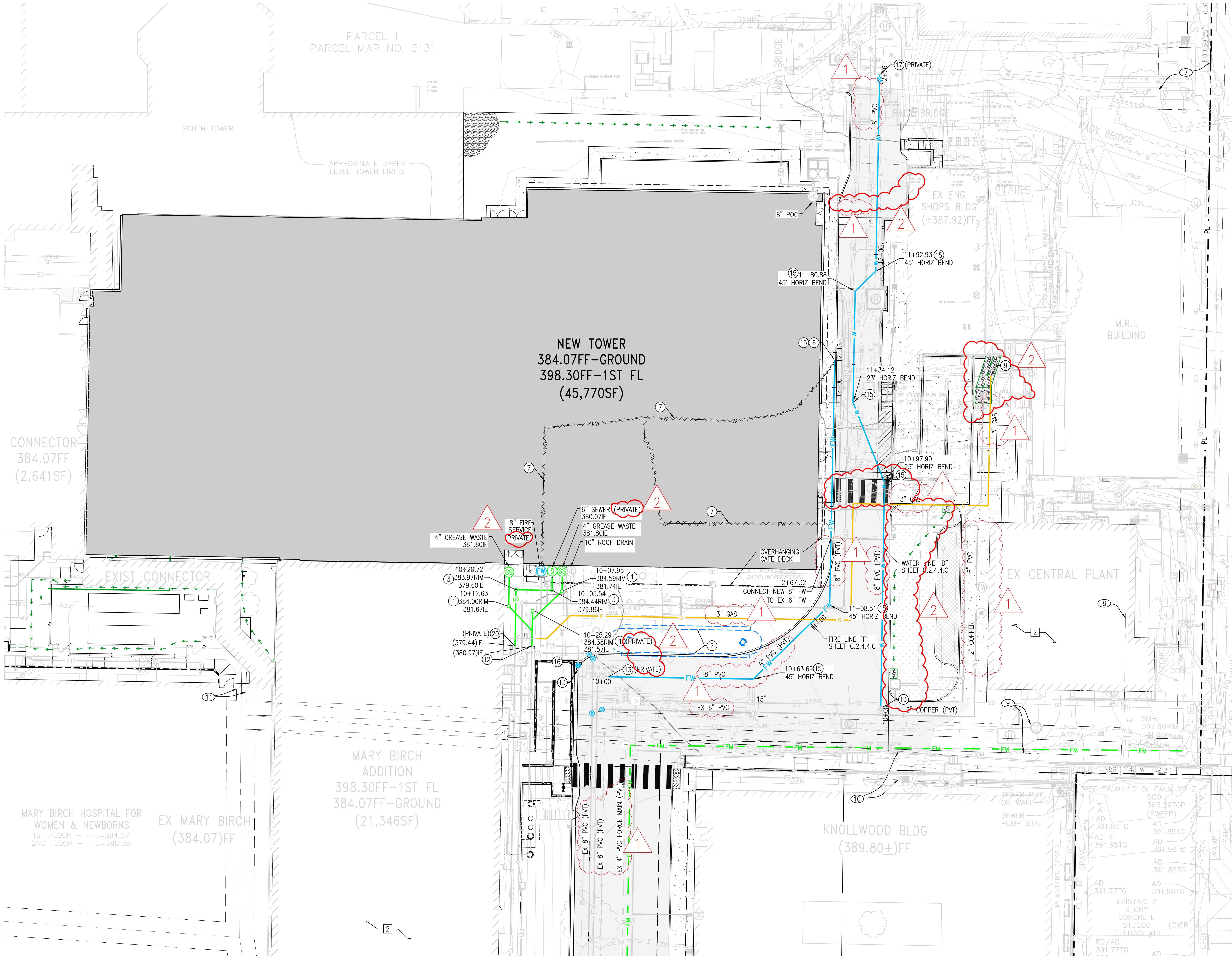
NOT FOR CONSTRUCTION
PLAN CHECK APPROVAL

Sheet Name
GRADING AND DRAINAGE PLAN

Sheet Number
C-111

Project Status
CONDITIONAL USE PERMIT AMENDMENT

M:\Projects\9500\9545\10.00 sharp mmc\Dwgs\sheet_dwgs\PK7A New Tower\9545.10.00 PK7A-03-GRAD CUP.dwg



UTILITY LEGEND

G	GAS PIPE PER SEPARATE PERMIT
S	SEWER PIPE PER SEPARATE PERMIT
FW	FIRE WATER PIPE SEPARATE PERMIT
W	DOMESTIC WATER PIPE PER SEPARATE PERMIT
ST	STEAM WATER PIPE PER SEPARATE PERMIT
SD	STORM DRAIN PIPE PER SEPARATE PERMIT
CW	CHILLED WATER PIPE PER SEPARATE PERMIT
E	ELECTRIC TRENCH PER SEPARATE PERMIT
G	GAS PIPE PER THIS PACKAGE
S	SEWER PIPE PER THIS PACKAGE
W	DOMESTIC WATER PIPE PER THIS PACKAGE
FW	FIRE WATER PIPE PER THIS PACKAGE
SD	STORM DRAIN PIPE PER THIS PACKAGE. SEE GRADING AND DRAINAGE PLAN

UTILITY NOTES:
1. THE PROPOSED ELECTRIC, GAS, CHILLED WATER, AND STEAM LINES SHOWN ON THIS SHEET ARE FOR REFERENCE ONLY. CONSTRUCT PER SEPARATE MEP DRAWINGS.
2. ALL PROPOSED ONSITE WATER AND SEWER IS PRIVATE AND WILL CONNECT TO EXISTING ONSITE PRIVATE WATER AND SEWER.

CONSTRUCTION KEYNOTES

- RD ROOF DRAIN POINT OF CONNECTION 5' OUTSIDE OF BUILDING. CONTINUATION PER PLUMBING DRAWINGS
- 1 GREASE WASTE CLEANOUT
- 2 CONSTRUCT FIRE WATER TANK (PRIVATE)
- 3 SEWER CLEANOUT (PRIVATE)
- 6 CONNECT NEW 8" PVC FIRE SERVICE TO EX 8" FIRE SERVICE (PRIVATE)
- 7 DEMOLISH & REMOVE PORTION OF EX 8" FIRE SERVICE
- 9 CONNECT NEW 3" GAS TO EX PER PLUMBING DWGS
- 12 REMOVE EX PIPE CAP & CONNECT NEW 4" PVC GREASE WASTE TO EX
- 13 REMOVE BLIND FLANGE AND CONNECT NEW 8" PVC WATER/FIRE SERVICE TO EX (PRIVATE)
- 15 CONSTRUCT WATERLINE WITH MECHANICAL RESTRAINED JOINTS FULL LENGTH (PRIVATE)
- 16 CONSTRUCT PIV (PRIVATE)
- 17 CONNECT NEW 8" PVC WATER SERVICE TO EX 6" WATER PIPE (PRIVATE)
- 20 REMOVE EX PIPE CAP & CONNECT NEW 6" PVC SEWER TO EX (PRIVATE)

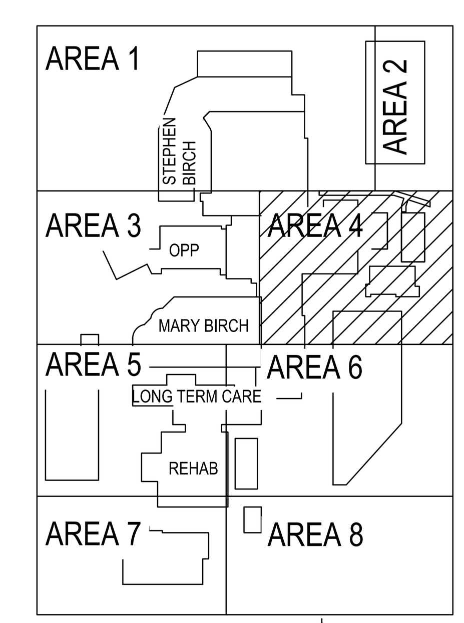
EXISTING EASEMENT KEYNOTES

- 7 EXISTING EASEMENT FOR WATER METER VAULT RECORDED 7-29-1958 AS DOC. # 121966 IN BOOK 7187, PAGE 465 O.R.
- 8 EXISTING SDGE EASEMENT (NO WIDTH GIVEN) RECORDED 9-29-1954 AS DOC. #129840, BOOK 5379, PAGE 419 O.R.
- 9 EXISTING 12'-WIDE SDGE EASEMENT RECORDED 9-21-1962 IN F/P 163692, SERIES 3, BOOK 1962 O.R.
- 10 EXISTING 12'-WIDE SDGE EASEMENT RECORDED 1-4-1960, F/P 433, SERIES 1, BOOK 1960 O.R.

GENERAL NOTES

NO TREES OR SHRUBS EXCEEDING THREE FEET IN HEIGHT AT MATURITY SHALL BE INSTALLED WITHIN TEN FEET OF ANY SEWER AND TEN FEET OF ANY WATER FACILITIES

SCALE: 1"=20'



KEY PLAN

SHARP

SMMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

McCARTHY
McCARTHY BUILDING COMPANIES, INC.
9275 SKY PARK COURT, SUITE 200
SAN DIEGO, CA 92123

HDR
HDR ARCHITECTURE, INC.
350 SOUTH GRAND AVENUE, SUITE 2900
LOS ANGELES, CA 90071-3406

TAYLOR design
17850 FITCH
IRVINE, CA 92614

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

NEW TOWER

CONDITIONAL USE PERMIT

Project Manager	Thomas Onnen
Project Designer	HDR/ Taylor Design
Project Architect	HDR/ Taylor Design
Landscape Architect	Schmidt Design Group
Civil Engineer	BWE Engineering
Structural Engineer	KPFF
Mechanical Engineer	TK1SC
Electrical Engineer	TK1SC
Plumbing Engineer	TK1SC
Interior Designer	HDR/ Taylor Design Group
Equipment Planner	Criterion

Sheet Reviewer: Author

MARK	DATE	DESCRIPTION
1	06/02/2022	CUP BACKCHECK #1
2	10/07/2022	CUP BACKCHECK #2
3	12/29/2022	CUP BACKCHECK #3

Current Print Description

Project Number: 10204365
Original Issue: 06/18/20

Agency Number: I210874-37-00
Agency Approval

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
INIT DATE
Office of Statewide Health Planning and Development
FACILITIES DEVELOPMENT DIVISION

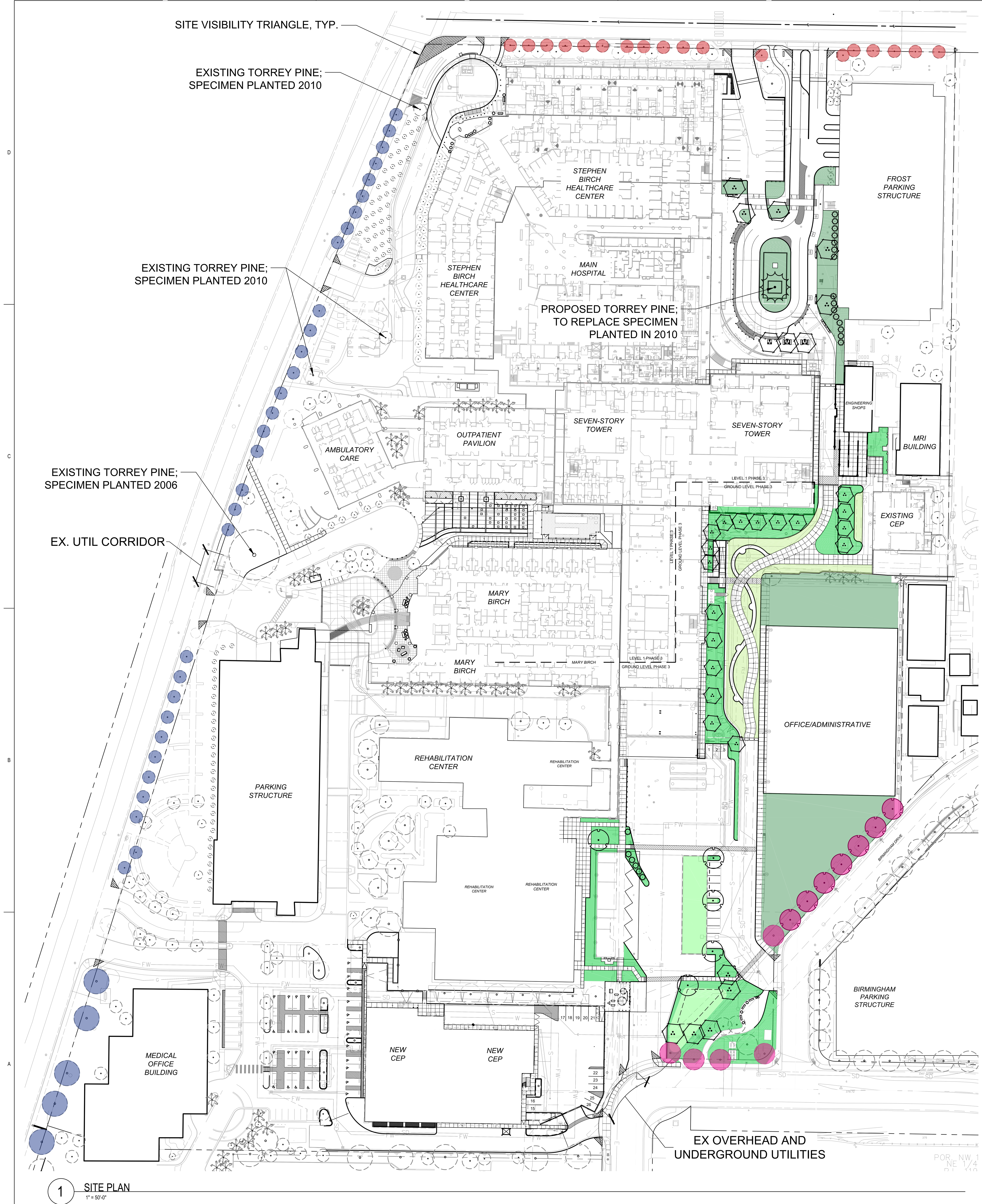
NOT FOR CONSTRUCTION
PLAN CHECK APPROVAL
REGISTERED PROFESSIONAL ENGINEER
MICHAEL A. ...
CIVIL
STATE OF CALIFORNIA

Sheet Name
UTILITY PLAN

Sheet Number
C-121

Project Status
CONDITIONAL USE PERMIT AMENDMENT

M:\Projects\9500\9545\10.00 sharp mmc\Dwgs\sheet_dwgs\PK7A New Tower\9545U.10.00 PK7A-04-UTIL CUP.dwg



1 SITE PLAN
1" = 50'-0"

TREE PLANTING SCHEDULE

SHADE/STREET TREES SUCH AS: (100% 36" BOX)
CUPANIOPSIS ANACARDIOIDES / CARROT WOOD - 25' H
LAGERSTROEMIA INDICA 'PURPUREA' / CRAPE MYRTLE - 20' H

FLOWERING ACCENT TREES SUCH AS: (100% 36" BOX)
CASSIA LEPTOPHYLLA / GOLD MEDALLION TREE - 25' H
CERCIS OCCIDENTALIS / WESTERN REDBUD - 15' H
TABEBUIA IMPETIGINOSA / PINK TRUMPET TREE - 25' H

UPRIGHT SPECIMEN TREES SUCH AS:
CUPRESSUS SEMPERVIRENS / ITALIAN CYPRESS - 20' H (36" BOX)
PINUS TORREYANA / TORREY PINE - 25' H (96" BOX)

EXISTING TREES TO REMAIN
SPECIES VARY

SHRUB & GROUNDCOVER PLANTING SCHEDULE

FOUNDATION SHRUBS AND GROUNDCOVER SUCH AS: (40% 5 GAL, 60% 1 GAL)
CISTUS X PULVERULENTUS 'SUNSET' / MAGENTA ROCK ROSE - 2' H/4' O.C.
DIETES GRANDIFLORA / FORTNIGHT LILY - 3' H/ 2' O.C.
PHORMIUM TENAX 'GUARDSMAN' / NEW ZEALAND FLAX - 4' H/4' O.C.
PITTOSPORUM TOBIRA 'VARIEGATA' / VARIEGATED JAPANESE PITTOSPORUM - 4' H/4' O.C.
TECOMA X 'ORANGE JUBILEE' / ORANGE JUBILEE TRUMPET FLOWER - 6' H/6' O.C.
TRACHELOSPERMUM JASMINOIDES / CHINESE STAR JASMINE - 18" H/18" O.C.

ENHANCED ENTRY SHRUBS AND GROUNDCOVER SUCH AS: (40% 5 GAL, 60% 1 GAL)
AEONIUM SPP. / AEONIUM - 2' H/18" O.C.
AGAVE X 'BLUE FLAME' / BLUE FLAME AGAVE - 2' H/3' O.C.
BORONIA CRENULATA 'SHARK BAY' / SHARK BAY BORONIA - 3' H/ 3' O.C.
CISTUS X PULVERULENTUS 'SUNSET' / MAGENTA ROCK ROSE - 2' H/4' O.C.
DYMONDIA MARGARETAE / DYMONDIA - 4" H/4" O.C.
MISCANTHUS SINENSIS 'ADAGIO' / ADAGIO EULALIA GRASS - 2' H/2' O.C.
ROSA 'ICEBERG' / ICEBERG ROSE - 4' H/3' O.C.
ROSMARINUS OFFICINALIS 'ROMAN BEAUTY' / ROMAN BEAUTY ROSEMARY - 2' H/2' O.C.

BIO-RETENTION SHRUBS AND GROUNDCOVER SUCH AS: (20% 5 GAL, 80% 1 GAL)
CAREX PANSA / SANDDUNE SEDGE - 8" H/1' O.C.
CAREX PRAEGRACILIS / CALIFORNIA FIELD SEDGE - 8" H/ 1' O.C.
FESTUCA RUBRA 'MOLATE' / MOLATE FESCUE - 6" H/18" O.C.
IRIS DOUGLASIANA / DOUGLAS IRIS - 18" H/3' O.C.
JUNCUS EFFUSUS / SOFT RUSH - 2' H/3' O.C.
JUNCUS PATENS / CALIFORNIA GRAY RUSH - 18" H/18" O.C.
LEYMUS CONDENSATUS 'CANYON PRINCE' / NATIVE BLUE RYE - 2' H/3' O.C.
SOLIDAGO CALIFORNICA / CALIFORNIA GOLDENROD - 2' H/3' O.C.

TURF BLOCK GROUNDCOVER SUCH AS: (100% 1 GAL)
CAREX PANSA / SANDDUNE SEDGE - 8" H/1' O.C.
CAREX PRAEGRACILIS / CALIFORNIA FIELD SEDGE - 8" H/ 1' O.C.
DYMONDIA MARGARETAE / DYMONDIA - 4" H/4" O.C.

IRRIGATION NOTES:

A. ALL PLANTING AREAS WILL BE IRRIGATED ACCORDING TO HYDROZONES, PLANT TYPE, AND ENVIRONMENTAL EXPOSURE AND WILL RECEIVE 100% COVERAGE BY MEANS OF AUTOMATICALLY CONTROLLED, ELECTRONICALLY OR SATELLITE OPERATED, UNDERGROUND PIPE PERMANENT SYSTEM.
B. ALL LANDSCAPE AND IRRIGATION SHALL CONFORM TO THE CITY OF SAN DIEGO LANDSCAPE ORDINANCE AND CITY OF SAN DIEGO LAND DEVELOPMENT MANUAL LANDSCAPE STANDARDS AND ALL REGIONAL STANDARDS FOR LANDSCAPE INSTALLATION AND MAINTENANCE.
C. AN IRRIGATION SYSTEM SHALL BE PROVIDED AS REQUIRED FOR PROPER IRRIGATION DEVELOPMENT AND MAINTENANCE OF THE VEGETATION. THE DESIGN OF THE SYSTEM SHALL PROVIDE ADEQUATE SUPPORT FOR THE VEGETATION SELECTED.

MINIMUM TREE SEPARATION DISTANCES:

TRAFFIC SIGNALS / STOP SIGNS - 20 FEET
UNDERGROUND UTILITY LINES - 5 FEET (10 FEET FOR SEWER)
ABOVE GROUND UTILITY STRUCTURES - 10 FEET
DRIVEWAY (ENTRIES) - 10 FEET
INTERSECTIONS (INTERSECTING CURB LINES OF TWO STREETS) - 10 FEET`

RELEVANT PLANTING & IRRIGATION DETAILS (PER CITY OF SD 2018 STD DWGS)

SDI-103, SDI-104, SDI-105, SDI-106, SDI-107
SDI-114, SDI-115, SDI-127, SDI-128, SDI-129
SDL-101, SDL-102, SDL-106

STREET	FRONTAGE LENGTH	TREES REQUIRED	TREES PROVIDED
Frost Street	484 Feet	16 Specimen	18 Specimen
Health Center Drive	1,088 Feet	36 Specimen	36 Specimen
Birmingham Way/Drive	424 Feet	14 Specimen	12 Specimen

SHARP®
SMMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

McCARTHY
McCARTHY BUILDING COMPANIES, INC.
9275 SKY PARK COURT, SUITE 200
SAN DIEGO, CA 92123

HDR
HDR Architecture
350 S. Grand Avenue, Suite 2900

TAYLOR design
17850 FITCH
IRVINE, CA 92614

SCHMIDT DESIGN GROUP
1310 Rosecrans St., Suite G, San Diego, CA 92106
619.236.1462
LIC. CA 2138 | NV 219 | AZ 34139
SCHMIDTDESIGN.COM

SITE PLAN

CONDITIONAL USE PERMIT

Project Manager	Thomas Onnen
Project Designer	HDR/ Taylor Design
Project Architect	HDR/ Taylor Design
Landscape Architect	Schimdt Design Group
Civil Engineer	BWE Engineering
Structural Engineer	KPFF
Mechanical Engineer	TK1SC
Electrical Engineer	TK1SC
Plumbing Engineer	TK1SC
Interior Designer	HDR / Taylor Design Group
Equipment Planner	Criterion

Sheet Reviewer: Author

MARK	DATE	DESCRIPTION

Project Number: 10204365
Original Issue: 07/16/21

Agency Number
Agency Approval

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
INIT DATE
Office of Statewide Health Planning and Development
FACILITIES DEVELOPMENT DIVISION

LICENSED LANDSCAPE ARCHITECT
JEFF A. JUSTUS No. 4028
SIGNATURE
05-31-23
RENEWAL DATE
DATE
STATE OF CALIFORNIA

Sheet Name
LANDSCAPE PLAN

Sheet Number
LP-1.1

Attachment 5
Drainage Report

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

MASTER DRAINAGE STUDY
for

SHARP MMC CAMPUS REDEVELOPMENT

PACKAGE 1A UTILITY RE-ROUTE
PACKAGE 3A MARY BIRCH EXPANSION
PACKAGE 4 ED EXPANSION
PACKAGE 5A NEW CEP
PACKAGE 7A NEW TOWER
PACKAGE 8 CONCOURSE ADDITION

Prepared By:

BWE

STRUCTURAL ENGINEERING • CIVIL ENGINEERING • SURVEYING • LAND PLANNING

9449 Balboa Avenue, Suite 270
San Diego, CA 92123
BWE Project: 9545U.10.00

APPROVED

E. Landeros
Development Services Department
8-25-22

Date: July, 2022

PROJECT NAME	PKG #	ADDRESS	LEGAL DESCRIPTION	PROJECT NO.	DWG NO..
ED EXPANSION	4	7901 FROST STREET SAN DIEGO, CA-92123	PARCEL 1 OF PARCEL MAP NO. 5131 IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, FILLED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, SEPTEMBER 24, 1976.	694841	42503
NEW CEP	5A	7901 FROST STREET SAN DIEGO, CA-92123	PARCEL 1 OF PARCEL MAP NO. 5131 IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, FILLED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, SEPTEMBER 24, 1976. AND A PORTION OF PUEBLO LOT 1199 OF MISCELLENOUS MAP NO. 36 FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY NOVEMBER 14,1921.	694839	42504
UTILITY RE-REOUTE	1	7901 FROST STREET SAN DIEGO, CA-92123	PARCEL 1 OF PARCEL MAP NO. 5131 IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, FILLED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, SEPTEMBER 24, 1976	N/A	N/A

PROJECT NAME	PKG #	ADDRESS	LEGAL DESCRIPTION	PROJECT NO.	DWG NO..
MARY BIRCH EXPANSION	3A	7901 FROST STREET SAN DIEGO, CA-92123	PARCEL 1 OF PARCEL MAP NO. 5131 IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, FILLED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, SEPTEMBER 24, 1976. AND A PORTION OF PUEBLO LOT 1199 OF MISCELLENOUS MAP NO. 36 FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY NOVEMBER 14,1921.		
NEW TOWER	7A	7901 FROST STREET SAN DIEGO, CA-92123	PARCEL 1 OF PARCEL MAP NO. 5131 IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, FILLED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, SEPTEMBER 24, 1976.		
CONCOURSE ADDITION	8	7901 FROST STREET SAN DIEGO, CA-92123	PARCEL 1 OF PARCEL MAP NO. 5131 IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, FILLED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, SEPTEMBER 24, 1976.		

DECLARATION OF RESPONSIBLE CHARGE

I, HEREBY DECLARE THAT I AM THE CIVIL ENGINEER OF WORK FOR THIS PROJECT, THAT I HAVE EXERCISED RESPONSIBLE CHARGE OVER THE DESIGN OF THE PROJECT AS DEFINED IN SECTION 6703 OF THE BUSINESS AND PROFESSIONS CODE, AND THAT THE DESIGN IS CONSISTENT WITH CURRENT DESIGN.

I UNDERSTAND THAT THE CHECK OF PROJECT DRAWING AND SPECIFICATIONS BY THE COUNTY OF SAN DIEGO IS CONFINED TO A REVIEW ONLY AND DOES NOT RELIEVE ME, AS ENGINEER OF WORK, OF MY RESPONSIBILITIES FOR PROJECT DESIGN.

July 20, 2022

MICHAEL A. SLAWSON DATE:
R.C.E. # 56127
EXP. 12/31/2022

Table of Contents

Appendices

1. Purpose

The purpose of this drainage study is to analyze the existing and proposed drainage patterns, and peak flow rates for the Sharp MMC Campus redevelopment site in the City of San Diego, California. This study also provides recommendation(s) to mitigate drainage impacts due to the redevelopment. Post development peak flow rates are mitigated to their predevelopment condition level for this purpose.

To determine the drainage impacts of the proposed redevelopment on the existing drainage patterns, the pre- and post-peak flow rates are analyzed and compared for the 100-year storm event using the Rational Method. 50-year storm event is also analyzed to perform the hydraulic analysis of the proposed storm drain system within the public Right of Way. This report has been prepared in accordance with the requirements of the City of San Diego Hydrology Manual.

2. Project Background

This multi-phased development project will be constructed in a series of "Packages" corresponding to similarly named grading plan submittals.

This study covers Package 4 Stephen Birch/Emergency Department Expansion, which in addition to Package 5A New Central Plant, have been submitted and been reviewed by the City under SCR project number 677608 for CUP 11504/PDP 11505-88-0253/88-1297.

Package 3A Mary Birch Addition, Package 7A New Tower, and Package 8 Concourse Area, which have been submitted and reviewed as a Conditional Use Permit (CUP) and Planned Development Permit (PDP) amendment.

This report's Proposed Condition calculations analyze the ultimate built-out condition of all Packages.

The Federal Emergency Management Agency (FEMA) categorizes the project site as Zone X, where Zone X is area determined to be outside the 500-year floodplain. Appendix E illustrates the FEMA floodplain mapping within the vicinity of the project site.

The site does not consist of, nor will this project disturb any Waters of the United States. Therefore, the site is not subject to the Regional Water Quality Control Board requirements under the Federal Clean Water Act Section 401 or 404.

3. Existing Condition

The existing site is located at the southeast corner of the intersection of Health Center Drive and Frost Street in the City of San Diego, CA 92123 in San Diego, California. See Appendix A for Vicinity and Imagery Maps.

Most of the site area is already developed and covered mainly by buildings, pavements, walkways and landscaping. Site topography is relatively flat and generally slopes from east to west and north to south. Northerly portion of the site drains to northwest corner of the site via an existing storm drain system prior to discharging offsite. Majority of the southerly portion of the site surface flows to Birmingham Way via an existing curb outlet. The runoff from the proposed central plant site discharges west via an existing storm drain system.

The hydrology of the site area can be analyzed at five distinct Discharge Points as described in the following paragraphs.

Discharge Point #1 is the confluence point for runoff from the central part of the site. The existing Central Energy Plant (CEP), existing tower, and loading dock areas contribute to this point. An existing 24" storm drain system collects runoff from this area and discharges west in the current condition, and ultimately to Mission Bay via Tecalote Creek. However, historical topographic maps indicate that this area used to surface flow south to Birmingham Way and the San Diego River.

Discharge Point #2 is located the intersection of Birmingham Way and Meadow Lark Drive. This location currently receives runoff from the asphalt roadway and adjacent buildings south of the existing loading dock, as well as the existing surface parking lot west of the Sharp Knollwood Building. There are currently two minor discharge points at this location – one at Meadow Lark Drive and one at Birmingham Way. However, based on the historic drainage pattern these two minor discharge points are analyzed as a single discharge point in Birmingham Way. Drainage Basin "A" is associated with Discharge Point 2.

Discharge point #2 is further divided into 3 different discharge points for analysis purposes. These discharge points are designated as 2.1, 2.2 and 2.3. Discharge point 2.1 is located at the existing curb outlet whereas, discharge points 2.2 and 2.3 are located at the existing driveways.

Discharge Point #3 is analyzed near the intersection of Frost Street and Health Center Drive. The existing Stephen Birch building, parking structure south of Frost Street, emergency drop-off, and ambulance parking areas contribute runoff to this discharge point. Drainage Basin "C" is associated with Discharge Point 3.

Discharge Point #4 receives runoff from the existing Emergency Room Building roof and flows towards Health Center Drive via an existing storm drain. Drainage Basin "D" is associated with Discharge Point 4.

Discharge Point #5 is located in the asphalt parking lot southwest of the Sharp Rehabilitation Center. This area receives runoff from the portable building south of the Rehabilitation Center, and surrounding asphalt parking lot. Drainage Basin "E" is associated with Discharge Point 5.

See Appendix B for Existing Condition Hydrology Map.

4. Proposed Improvements

The major redevelopment activities include, but are not limited to, clearing and grubbing vegetation, demolition, construction of new buildings (Stephen Birch Addition, Mary Birch Addition, New Tower, Concourse Addition, Central Plant), paved parking, walkways, streets, and landscaping. The demolition activities include mainly the removal existing building and the concrete/asphalt pavements.

The associated improvements will also include drainage improvements, and construction of Best Management Practices (BMPs). BMPs such as biofiltration, and detention basins are proposed to control pollutant and hydromodification impacts respectively. Detention is proposed because the site must comply with the requirements of hydromodification management and mitigate the peak flow rates. Runoff from the site does not discharge to an exempt system for hydromodification management.

The site is designed to maintain the historical on-site drainage pattern. The runoff from the site will continue to discharge to the existing discharge locations, with the exception of Discharge Point #1 which is diverted to Discharge Point #2 to match historical patterns.

Because the peak flow rate from the site is mitigated in the proposed condition, the redevelopment will not create drainage impacts to the existing receiving storm drain system.

Discharge Point #1 is eliminated in the proposed condition. The runoff that was contributing to this point in the existing condition is directed south to Birmingham Way via the proposed storm drain system.

Discharge Point #2 is the confluence point for site runoff for the area situated south of the new tower and existing parking structure near Frost Street. The runoff from existing central plant building, proposed new tower, Mary Birch addition, associated surface parking, and new loading dock areas contribute to this point. Runoff from the new tower, loading dock, and adjacent asphalt roadway collect near the loading dock and are pumped to a Biofiltration BMP which discharges to a proposed 18" storm drain. The storm drain flows south and connects to an existing curb inlet in Birmingham Way. Drainage Basin "A" is associated with Discharge Point #2.

Discharge point #2 is further divided into 2 different discharge points for analysis purposes. These discharge points are designated as 2, and 2.1. Discharge point 2.1 is located at the existing curb outlet whereas, discharge points 2 is located at the storm drain cleanout at node 107. In the ultimate condition, the existing curb outlet is not utilized for conveyance of onsite flow. Majority of the site runoff is directed to the BMPs. Therefore, only the runoff due to direct precipitation over the area of existing ditch (A=0.006 ac) situated upstream is conveyed via this outlet.

Discharge Point #3 continues to receive stormwater from the northwest portion of the site, as in the existing condition. The existing Stephen Birch building, new Stephen Birch building addition, parking structure south of Frost Street, emergency drop-off, and ambulance parking areas contribute runoff to this discharge point. Two proposed storm drains run west along Frost Street, one connected directly to the existing storm drain system at health center drive, and one which is routed though BMPs for pollutant and hydromodification control. Discharge Point #3 is associated with Grading Package 4.

Discharge Point #4 receives runoff from the proposed concourse area and is piped west towards Health Center Drive via an existing and proposed storm drain system. Drainage Basin "D" is associated with Discharge Point #4 and Grading Package 8.

Discharge Point #5 receives runoff from the proposed Central Energy Plant and surrounding asphalt parking lot. A Modular Wetland Biofiltration BMP and underground vault pollutant and hydromodification mitigation for this area. Drainage Basin "E" and Grading Package 5A are associated with Discharge Point #5.

See Appendix C for Proposed Conditions Hydrology Map.

5. Soil Characteristics

Hydrologic analysis is performed by utilizing soil type D. Soil type D has higher runoff potential.

See Appendix D for soil map.

6. Methodology

Rational Method: A rational method analysis was utilized to perform hydrologic calculations in this study.

Rational Equation: $Q = C * I * A$

Where;
Q = Peak discharge, cfs
C = Rational method runoff coefficient
I = Rainfall intensity, inch/hour
A = Drainage area, acre

A computer model CivilD is used to automate the hydrology analysis process. This computer version of the rational method analysis allows user to develop a node-link model of the watershed. CivilD computer program has the capability of performing calculations utilizing mathematical functions. These functions are assigned code numbers, which appear in the printed results. The code numbers and their corresponding functions are described below;

Sub area Hydrologic Processes;

Code 1 - INITIAL subarea input, top of stream
Code 2 - STREET flow through subarea, includes subarea runoff
Code 3 - ADDITION of runoff from subarea to stream
Code 4 - STREET INLET + parallel street & pipe flow + area
Code 5 - PIPEFLOW travel time (program estimated pipe size)**
Code 6 - PIPEFLOW travel time (user specified pipe size)
Code 7 - IMPROVED channel travel time (open or box)**
Code 8 - IRREGULAR channel travel time**
Code 9 - USER specified entry of data at a point
Code 10 - CONFLUENCE at downstream point in current stream
Code 11 - CONFLUENCE of mainstreams
**NOTE: These options do not include subarea runoff
**NOTE: (#) - Required pipe size determined by the hydrology program

7. Calculations

a. Impervious and Pervious Areas

The impervious and pervious areas are calculated for both the existing and proposed site conditions. A summary is shown in Table 7-1.

Table 7-1 Summary of Areas

Discharge Point #1 & 2

	Area (Acres)			Percent Impervious Area	Percent Pervious Area
	Total	**Impervious (Ai)**	**Pervious (Ap)**		
Existing	5.54	5.00	0.54	90.3%	9.7%
Proposed	5.35	4.32	1.03	80.7%	19.3%
Percentage Change		**-13.6%**	**90.7%**		

Discharge Point #3

	Area (Acres)			Percent Impervious Area	Percent Pervious Area
	Total	Impervious (Ai)	Pervious (Ap)		
Existing	2.50	2.00	0.50	80.0%	20.0%
Proposed	2.40	1.93	0.47	80.4%	19.6%
Percentage Change		**-3.5%**	**19.6%**		

Discharge Point #4

	Area (Acres)			Percent Impervious Area	Percent Pervious Area
	Total	Impervious (Ai)	Pervious (Ap)		
Existing	0.46	0.41	0.05	89.1%	10.9%
Proposed	0.95	0.72	0.23	75.8%	24.2%
Percentage Change		**75.6%**	**360.0%**		

The increase in impervious area in proposed condition is due to a minor diversion of additional impervious area to Discharge Point #4 in proposed condition.

Discharge Point #5

	Area (Acres)			Percent Impervious Area	Percent Pervious Area
	Total	Impervious (Ai)	Pervious (Ap)		
Existing	2.00	1.60	0.40	80.0%	20.0%
Proposed	2.00	1.68	0.32	84.0%	16%
Percentage Change		**5.0%**	**-20.0%**		

b. Runoff Coefficient

The coefficients of runoff for the site are determined by utilizing Table A-1 of the City of San Diego Drainage Design Manual by assuming commercial type land use and soil type D. Similar assumptions are made for both the existing and proposed conditions. Following equation is used to determine the revised C value.

The "Revised C" value = $\dfrac{\text{(Actual Percentage of Impervious Area)}}{(80\%)} \times (0.85)$

Example:

Actual Imperviousness = 77%

Tabulated Imperviousness = 80%

Revised C =	(77 /80)*0.85
C =	0.82

Table 7-2 Existing and Proposed Runoff Coefficient Value Summary

	Runoff Coefficient	
Discharge Point(s) #	**Existing Condition**	**Proposed Condition**
1	0.96	0.86
2	0.96	0.86
3	0.85	0.85
4	0.95	0.81
5	0.85	0.89

See Appendices B and C for the runoff coefficient calculations.

c. Peak Flow Rates

The rational method is used to perform the hydrologic analysis. The CivilD computer program, which utilizes the rational method of analysis, is used to determine peak flow rates in this study.

The peak flow rates for the 100-year storm event are calculated for both existing and proposed conditions and results are summarized in Table 7-3 for comparison purpose. The existing and proposed condition results (CivilD results) are located in Appendices B and C respectively.

Table 7-3 Existing and Proposed Conditions Peak Flow Rates Summary

Discharge Points #1 & 2

	Drainage Area (acres)		**100 Yr Flow (cfs)**		
Discharge Point(s) #	**Existing Condition**	**Proposed Condition**	**Existing Condition**	**Proposed Condition (Unmitigated)**	**% Change from Existing Condition**
1	3.34	-	17.45	-	**-**
2	2.20	5.35	8.37	24.36	**-**
Total	5.54	5.35	25.82	24.36	**-5.65%**

In the proposed condition the unmitigated peak flow rate due to the 100-year storm event can be expected to decrease by 1.46 cfs.

Discharge Point #3

Drainage Area (acres)		100 Yr Flow (cfs)		
Existing Condition	**Proposed Condition**	**Existing Condition**	**Proposed Condition (Unmitigated)**	**% Change from Existing Condition**
2.50	2.46	11.10	11.21	**0.99%**

In the proposed condition the unmitigated peak flow rate due to the 100-year storm event can be expected to increase by 0.11 cfs.

Discharge Point #4

Drainage Area (acres)		100 Yr Flow (cfs)		
Existing Condition	**Proposed Condition**	**Existing Condition**	**Proposed Condition (Unmitigated)**	**% Change from Existing Condition**
0.46	0.95	2.88	5.32	**84.72%**

In the proposed condition the unmitigated peak flow rate due to the 100-year storm event can be expected to increase by 2.44 cfs.

Discharge Point #5

Drainage Area (acres)		100 Yr Flow (cfs)		
Existing Condition	**Proposed Condition**	**Existing Condition**	**Proposed Condition (Unmitigated)**	**% Change from Existing Condition**
2.00	2.00	9.85	10.02	**1.73%**

In the proposed condition the unmitigated peak flow rate due to the 100-year storm event can be expected to increase by 0.17 cfs.

A slight increase in peak flow rate for most discharge points in the proposed conditions is primarily due to the increase in impervious area.

Discharge and velocity are calculated at each discharge/outlet location. Results are tabulated below for discharge point 2 only. Refer to existing and proposed condition hydrology exhibits for discharge & velocity for other outlet locations.

Discharge Point 2 (Existing Condition): In the existing condition discharge point #2 is further divided into 3 distinct discharge points 2.1, 2.2, and 2.3. Discharges and velocities are tabulated below.

			100 Yr Storm	
Discharge Point(s) #	**Outlet Description**	**Area (ac)**	**Discharge (cfs)**	**Velocity (fps)**
2.1	Existing Curb-Outlet	0.48	1.40	3.33
2.2	Existing Driveway	0.87	2.52	1.75
2.3	Existing Driveway	0.85	2.78	3.41

Discharge Point 2 (Proposed Condition): In the proposed condition discharge point #2 is further divided into 2 distinct discharge points 2, and 2.1. Discharges and velocities are tabulated below.

			100 Yr Storm	
Discharge Point(s) #	**Outlet Description**	**Area (ac)**	**Discharge (cfs)**	**Velocity (fps)**
2	Proposed Cleanout	5.35	8.13	7.51
2.1	Existing Curb-Outlet	0.006	0.03	0.50

d. Detention & Mitigated Flow Rates

The peak flow rate will be mitigated by routing the flow through underground detention basins. Detention basins are proposed to control hydromodification impacts due to redevelopment. These detention basins will also be utilized to rout and mitigate the peak flow rate for the 100-yr storm event and are summarized in Table 7-4.

Table 7-4 Detention Summary Table

		100-yr Detention Flow Rate (cfs)			Approx. 100-yr Detention Volume Required (cf)	Detention Volume Provided (cf)
		Inflow	Outflow	Detained		
Discharge Location 2	**BMP #3**	11.80	1.48	10.32	16,448	16,910
Discharge Location 2	**BMP #4**	3.74	2.09	1.65	3,404	5,453
Discharge Location 2	**BMP #10**	3.00	0.34	2.66	3,131	3,496
Discharge Location 3	**BMP #5**	5.10	0.36	4.74	5,050	5,667
Discharge Location 4	**BMP #12**	5.30	2.12	3.18	4,634	4,679
Discharge Location 5	**BMP #8**	9.72	4.44	5.28	9,802	10,013
	Total	38.66	10.82	27.84	42,469	46,218

The peak flow rates for the 100 year storm event are calculated for mitigated conditions with detention are summarized in Table 7-5 for comparison purpose. Results are presented separately for discharge points #1/#2 and #4.

Table 7-5 Existing and Proposed Conditions Peak Flow Rates Summary

Discharge Points #1 & 2

	100 Yr Flow (cfs)			
Discharge Point(s) #	**Existing Condition**	**Proposed Condition (Unmitigated)**	**Proposed Condition (Mitigated)**	**% Change from Existing Condition**
1	17.45	-	-	**-**
2	8.37	24.36	9.73	**-**
Total	25.82	24.36	9.73	**-62.32%**

In the proposed condition the mitigated peak flow rate due to the 100-year storm event and detention provided BMPs #3,#4 and 10 can be expected to decrease by 16.09 cfs.

Discharge Point #3

100 Yr Flow (cfs)			
Existing Condition	**Proposed Condition (Unmitigated)**	**Proposed Condition (Mitigated)**	**% Change from Existing Condition**
11.10	11.21	6.74	**-39.28%**

In the proposed condition the mitigated peak flow rate due to the 100-year storm event and detention provided BMP #5 can be expected to decrease by 4.36 cfs.

Discharge Point #4

100 Yr Flow (cfs)			
Existing Condition	**Proposed Condition (Unmitigated)**	**Proposed Condition (Mitigated)**	**% Change from Existing Condition**
2.88	5.32	2.12	**-26.39%**

In the proposed condition the mitigated peak flow rate due to the 100-year storm event and detention provided BMP #12 can be expected to decrease by 0.68 cfs.

Discharge Point #5

100 Yr Flow (cfs)			
Existing Condition	**Proposed Condition (Unmitigated)**	**Proposed Condition (Mitigated)**	**% Change from Existing Condition**
9.85	10.02	4.74	**-51.88%**

In the proposed condition the mitigated peak flow rate due to the 100-year storm event and detention provided BMP #8 can be expected to decrease by 5.11 cfs.

Hydraulic Analysis of 18” System: There are no existing storm drain system in the proximity of discharge point #2 where proposed underground detention structures/vaults can be connected utilizing gravity system. Therefore site runoff from discharge point #2 is connected to a first curb inlet situated within RoW of Birmingham Way approximately 285 feet south of the site. Approximately, 5.52 acres of site area is tributary to this system.

18” storm drain system is proposed at this point because of two reasons, 1) it is situated within the public right of way of Birmingham Way, a minimum pipe size and material within public RoW is 18” RCP, 2) the receiving storm drain system is 18” and larger system cannot be utilized upstream of smaller storm drain system.

The 100-yr peak flow rate for mitigated condition for Discharge Location #2 is 9.73. The 100-yr mitigated peak flow rate can be conveyed through the 18” pipe.

See appendix C for calculations.

8. Downstream Drainage Impact Analysis

The onsite drainage pattern will change in the proposed condition. The runoff will continue flowing in the same general direction as in the existing condition. New storm drain system is proposed to capture and convey runoff into detention basin for peak flow rate control and facilitate site drainage in the proposed condition.

All discharge points are designed with peak 100-year flow rates smaller than the existing peak flow rates. Detention basins are proposed to mitigate the peak flow rates. Therefore, negative downstream drainage impacts are not anticipated due to the redevelopment.

9. Conclusion

Storm water runoff from the site is collected and conveyed by a system of roof downspouts, inlets, conduits, and swales. The site is designed to mitigate the stormwater quantity (peak flow rate) impacts due to the redevelopment. New storm drain system will be designed to convey the runoff from the site. The proposed detention basins are designed to mitigate and the peak flow rate due to 100-year storm event.

Total peak 100 year flow rates in the existing and proposed conditions are 49.65 cfs and 50.91 cfs respectively. But, the mitigated condition peak flow rate from the site is 23.33 cfs.

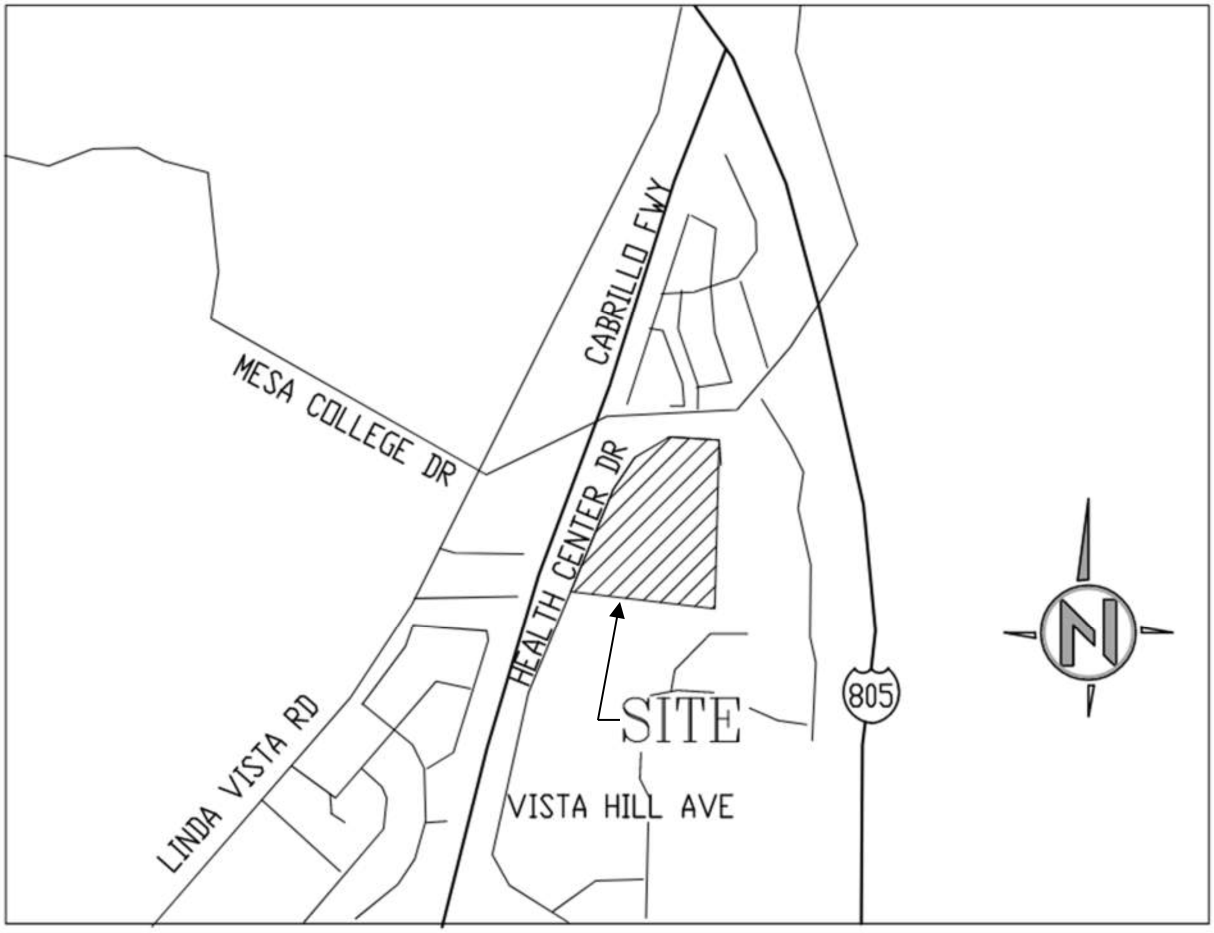
The existing drainage pattern changed slightly but runoff discharge points are maintained in the proposed condition. Since the redevelopment of the site creates slightly more impervious area as compared to existing condition the net increase in peak flow rate is minimal and adverse downstream impacts are not anticipated. Detention basins are proposed to control peak flow rates at each discharge location.

10. References

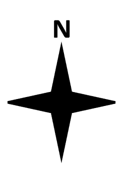
- City of San Diego, Drainage Design Manual, 2017

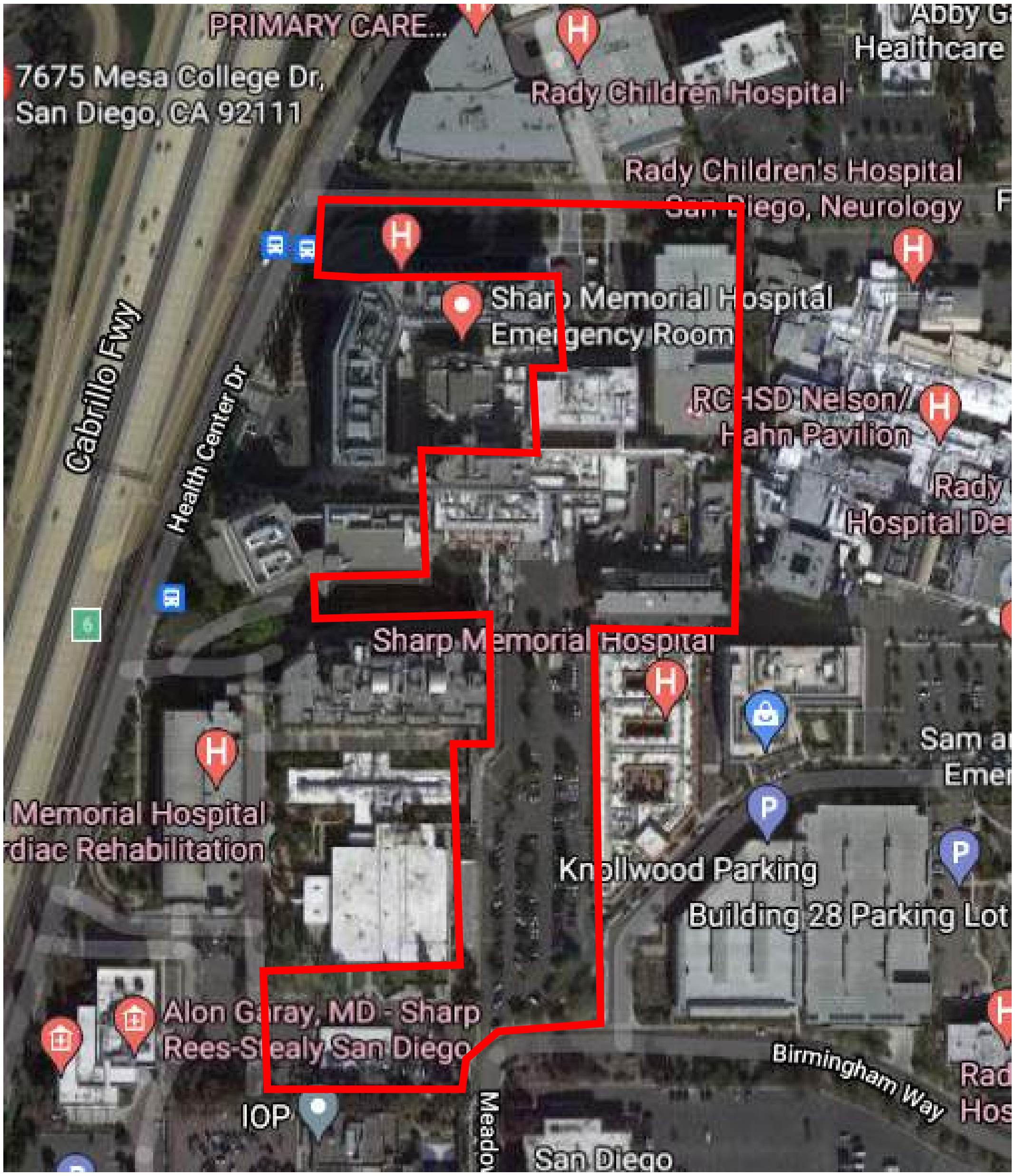
APPENDIX A:

Site Vicinity/Imagery Maps



VICINITY MAP





N

IMAGERY MAP

APPENDIX B:

Existing Condition Runoff Coefficient Calculations
Existing Condition Hydrology Calculations
Existing Condition Hydrology Map

Runoff Coefficient Calculation (Existing Condition)

Project: Sharp MMC Redevelopment

Similar to commercial development

C = 0.85 (Per Table A-1, Soil Class D, Drainage Design Manual)

% imperviousness= 80%

Revised C= (Actual % Imp./Tabulated % Imp.)*0.85

Discharge Point #	Area (Acres) Total Area	Area (Acres) Imp. Area (Ai)	Actual % Imperviousness	Calculated Revised Runoff Coeff. (C)	Used Runoff Coef. (C)
1 & 2	5.54	5.00	90%	0.96	0.96
3	2.50	2.00	80%	0.85	0.85
4	0.46	0.41	89%	0.95	0.95
5	2.00	1.60	80%	0.85	0.85

*C value for commercial development shall not be less than = 0.5

Example:

Actual Imperviousness = 77% (per plan)

Tabulated Imperviousness = 80% (Commercial Land Use Per table A-1)

Revised C = (77/80)*0.85

C = 0.82

CUP PACKAGES 3A, & 7 ANALYSIS

```
                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2005 Version 6.5

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 12/22/21
------------------------------------------------------------------------
EXISTING CONDITION HYDROLOGY ANALYSIS
ANALYSIS POINT 1
100 yr Storm Event
City of San Diego
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

------------------------------------------------------------------------


Program License Serial Number 6116

------------------------------------------------------------------------
Rational hydrology study storm event year is   100.0
English (in-lb) input data Units used
English (in) rainfall data used

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      100.000 to Point/Station      101.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
User specified 'C' value of 0.960 given for subarea
Initial subarea flow distance  =   54.000(Ft.)
Highest elevation =  421.000(Ft.)
Lowest elevation =  413.000(Ft.)
Elevation difference =    8.000(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     0.75 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.9600)*(  54.000^.5)/(  14.815^(1/3)]=   0.75
Setting time of concentration to 5 minutes
Rainfall intensity (I) =      4.389(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.960
```

```
Subarea runoff =      0.548(CFS)
Total initial stream area =       0.130(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      101.000 to Point/Station      102.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
______________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.948(CFS)
Depth of flow =   0.422(Ft.), Average velocity =   5.323(Ft/s)
        ******* Irregular Channel Data ***********
-----------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              0.50
        2              0.50              0.00
        3              1.00              0.50
Manning's 'N' friction factor =   0.013
-----------------------------------------------------------------
Sub-Channel flow  =      0.948(CFS)
  '     '        flow top width =      0.844(Ft.)
  '     '    velocity=    5.323(Ft/s)
  '     '        area =      0.178(Sq.Ft)
  '     '        Froude number =     2.042

Upstream point elevation =   413.000(Ft.)
Downstream point elevation =   409.000(Ft.)
Flow length =   146.000(Ft.)
Travel time  =    0.46 min.
Time of concentration =    5.46 min.
Depth of flow =   0.422(Ft.)
Average velocity =   5.323(Ft/s)
Total irregular channel flow =     0.948(CFS)
Irregular channel normal depth above invert elev. =   0.422(Ft.)
Average velocity of channel(s) =   5.323(Ft/s)

Sub-Channel No. 1 Critical depth =      0.555(Ft.)
  '     '       '     Critical flow top width =      1.000(Ft.)
  '     '       '     Critical flow velocity=    3.111(Ft/s)
  '     '       '     Critical flow area =      0.305(Sq.Ft)

 Adding area flow to channel
User specified 'C' value of 0.960 given for subarea
Rainfall intensity =      4.236(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.960
Subarea runoff =      0.773(CFS) for    0.190(Ac.)
Total runoff =      1.320(CFS)  Total area =       0.32(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

```
Process from Point/Station      102.000 to Point/Station      103.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   406.000(Ft.)
Downstream point/station elevation =   393.000(Ft.)
Pipe length  =   255.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.320(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     1.320(CFS)
Normal flow depth in pipe =    3.70(In.)
Flow top width inside pipe =    8.86(In.)
Critical Depth =    6.35(In.)
Pipe flow velocity =      7.73(Ft/s)
Travel time through pipe =    0.55 min.
Time of concentration (TC) =     6.01 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      103.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.960 given for subarea
Time of concentration =     6.01 min.
Rainfall intensity =      4.079(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.960
Subarea runoff =      1.292(CFS) for    0.330(Ac.)
Total runoff =      2.613(CFS)  Total area =       0.65(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      104.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   393.000(Ft.)
Downstream point/station elevation =   386.370(Ft.)
Pipe length  =    89.50(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.613(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     2.613(CFS)
Normal flow depth in pipe =    4.92(In.)
Flow top width inside pipe =    8.96(In.)
Critical Depth =    8.40(In.)
Pipe flow velocity =     10.57(Ft/s)
Travel time through pipe =    0.14 min.
Time of concentration (TC) =     6.15 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      104.000 to Point/Station      104.000
**** SUBAREA FLOW ADDITION ****
```

```
________________________________________________________________________
User specified 'C' value of 0.960 given for subarea
Time of concentration =     6.15 min.
Rainfall intensity =      4.042(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.960
Subarea runoff =      0.698(CFS) for    0.180(Ac.)
Total runoff =      3.311(CFS)  Total area =       0.83(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      104.000 to Point/Station      105.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =   386.250(Ft.)
Downstream point/station elevation =   384.390(Ft.)
Pipe length  =   218.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.311(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     3.311(CFS)
Normal flow depth in pipe =    7.98(In.)
Flow top width inside pipe =   14.97(In.)
Critical Depth =    8.80(In.)
Pipe flow velocity =      4.99(Ft/s)
Travel time through pipe =    0.73 min.
Time of concentration (TC) =     6.88 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      105.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
User specified 'C' value of 0.960 given for subarea
Time of concentration =     6.88 min.
Rainfall intensity =      3.872(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.960
Subarea runoff =      0.818(CFS) for    0.220(Ac.)
Total runoff =      4.129(CFS)  Total area =       1.05(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      105.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
User specified 'C' value of 0.960 given for subarea
Time of concentration =     6.88 min.
Rainfall intensity =      3.872(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.960
Subarea runoff =      3.606(CFS) for    0.970(Ac.)
Total runoff =      7.735(CFS)  Total area =       2.02(Ac.)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      106.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.960 given for subarea
Time of concentration =     6.88 min.
Rainfall intensity =      3.872(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.960
Subarea runoff =      4.907(CFS) for    1.320(Ac.)
Total runoff =     12.642(CFS)  Total area =        3.34(Ac.)
End of computations, total study area =           3.340 (Ac.)
```

```
                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2005 Version 6.5

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 12/22/21
------------------------------------------------------------------------
EXISTING CONDITION HYDROLOGY ANALYSIS
ANALYSIS  POINT 2
100 yr Storm Event
City of San Diego
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

------------------------------------------------------------------------



Program License Serial Number 6116

------------------------------------------------------------------------
Rational hydrology study storm event year is   100.0
English (in-lb) input data Units used
English (in) rainfall data used

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      200.000 to Point/Station      201.000
**** INITIAL AREA EVALUATION ****

User specified 'C' value of 0.850 given for subarea
Initial subarea flow distance  =   77.000(Ft.)
Highest elevation =  390.000(Ft.)
Lowest elevation =  389.000(Ft.)
Elevation difference =    1.000(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     3.62 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.8500)*(  77.000^.5)/(   1.299^(1/3)]=   3.62
Setting time of concentration to 5 minutes
Rainfall intensity (I) =      4.389(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.850
```

```
Subarea runoff =      0.448(CFS)
Total initial stream area =       0.120(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      201.000 to Point/Station      202.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
______________________________________________________________________
Estimated mean flow rate at midpoint of channel =      1.157(CFS)
Depth of flow =   0.137(Ft.), Average velocity =   2.468(Ft/s)
        ******* Irregular Channel Data ***********
-----------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              0.50
        2              0.12              0.00
        3             10.00              0.20
Manning's 'N' friction factor =   0.016
-----------------------------------------------------------------
Sub-Channel flow  =      1.157(CFS)
  '     '        flow top width =      6.821(Ft.)
  '     '    velocity=    2.468(Ft/s)
  '     '        area =      0.469(Sq.Ft)
  '     '        Froude number =     1.660

Upstream point elevation =   389.000(Ft.)
Downstream point elevation =   385.000(Ft.)
Flow length =   156.000(Ft.)
Travel time  =    1.05 min.
Time of concentration =    6.05 min.
Depth of flow =   0.137(Ft.)
Average velocity =   2.468(Ft/s)
Total irregular channel flow =     1.157(CFS)
Irregular channel normal depth above invert elev. =   0.137(Ft.)
Average velocity of channel(s) =   2.468(Ft/s)

Sub-Channel No. 1 Critical depth =      0.168(Ft.)
  '     '       '     Critical flow top width =      8.338(Ft.)
  '     '       '     Critical flow velocity=    1.652(Ft/s)
  '     '       '     Critical flow area =      0.700(Sq.Ft)

 Adding area flow to channel
User specified 'C' value of 0.850 given for subarea
Rainfall intensity =      4.067(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =      1.313(CFS) for    0.380(Ac.)
Total runoff =      1.761(CFS)  Total area =       0.50(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

```
Process from Point/Station      202.000 to Point/Station      203.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
______________________________________________________________________
Estimated mean flow rate at midpoint of channel =      2.378(CFS)
Depth of flow =   0.233(Ft.), Average velocity =   1.797(Ft/s)
        ******* Irregular Channel Data ***********
-----------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              0.50
        2              0.12              0.00
        3             10.00              0.20
Manning's 'N' friction factor =   0.016
-----------------------------------------------------------------
Sub-Channel flow  =      2.378(CFS)
  '     '        flow top width =      9.936(Ft.)
  '     '    velocity=    1.797(Ft/s)
  '     '        area =      1.323(Sq.Ft)
  '     '        Froude number =     0.868

Upstream point elevation =   385.000(Ft.)
Downstream point elevation =   382.800(Ft.)
Flow length =   390.000(Ft.)
Travel time  =    3.62 min.
Time of concentration =    9.67 min.
Depth of flow =   0.233(Ft.)
Average velocity =   1.797(Ft/s)
Total irregular channel flow =     2.378(CFS)
Irregular channel normal depth above invert elev. =   0.233(Ft.)
Average velocity of channel(s) =   1.797(Ft/s)

Sub-Channel No. 1 Critical depth =      0.221(Ft.)
  '     '       '     Critical flow top width =      9.933(Ft.)
  '     '       '     Critical flow velocity=    1.984(Ft/s)
  '     '       '     Critical flow area =      1.198(Sq.Ft)

 Adding area flow to channel
User specified 'C' value of 0.850 given for subarea
Rainfall intensity =      3.415(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =      1.016(CFS) for    0.350(Ac.)
Total runoff =      2.777(CFS)  Total area =       0.85(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      203.000 to Point/Station      203.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.850 given for subarea
Time of concentration =     9.67 min.
```

```
Rainfall intensity =      3.415(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =      3.919(CFS) for    1.350(Ac.)
Total runoff =      6.696(CFS)  Total area =        2.20(Ac.)
End of computations, total study area =           2.200 (Ac.)
```

CUP PACKAGE 8 ANALYSIS

```
                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2005 Version 6.5

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 12/22/21
------------------------------------------------------------------------
EXISTING CONDITION HYDROLOGY ANALYSIS
ANALYSIS POINT 4
100 yr Storm Event
City of San Diego
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

------------------------------------------------------------------------


Program License Serial Number 6116

------------------------------------------------------------------------
Rational hydrology study storm event year is   100.0
English (in-lb) input data Units used
English (in) rainfall data used

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      400.000 to Point/Station      401.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
User specified 'C' value of 0.950 given for subarea
Initial subarea flow distance  =   92.000(Ft.)
Highest elevation =  399.840(Ft.)
Lowest elevation =  398.000(Ft.)
Elevation difference =    1.840(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     2.06 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.9500)*(  92.000^.5)/(   2.000^(1/3)]=   2.06
Setting time of concentration to 5 minutes
Rainfall intensity (I) =      4.389(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.950
```

```
Subarea runoff =      1.918(CFS)
Total initial stream area =        0.460(Ac.)
End of computations, total study area =           0.460 (Ac.)
```

PACKAGE 4 (STEPHEN BIRCH ADDITION) ANALYSIS

```
                 San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2005 Version 6.5

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 12/22/21
------------------------------------------------------------------------
Existing Condition Hydrology Analysis
Analysis Point 3
100 yr Storm Event
City of San Diego
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

------------------------------------------------------------------------


Program License Serial Number 6116

------------------------------------------------------------------------
Rational hydrology study storm event year is   100.0
English (in-lb) input data Units used
English (in) rainfall data used

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      300.000 to Point/Station      301.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
User specified 'C' value of 0.850 given for subarea
Initial subarea flow distance  =   58.000(Ft.)
Highest elevation =  407.240(Ft.)
Lowest elevation =  402.000(Ft.)
Elevation difference =    5.240(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     1.65 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.8500)*(  58.000^.5)/(   9.034^(1/3)]=   1.65
Setting time of concentration to 5 minutes
Rainfall intensity (I) =      4.389(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.850
```

```
Subarea runoff =      0.149(CFS)
Total initial stream area =       0.040(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      301.000 to Point/Station      302.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
______________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.895(CFS)
Depth of flow =   0.098(Ft.), Average velocity =   2.255(Ft/s)
        ******* Irregular Channel Data ***********
-----------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              0.50
        2              0.12              0.00
        3             20.00              0.24
Manning's 'N' friction factor =   0.016
-----------------------------------------------------------------
Sub-Channel flow  =      0.895(CFS)
  '     '        flow top width =      8.122(Ft.)
  '     '    velocity=    2.255(Ft/s)
  '     '        area =      0.397(Sq.Ft)
  '     '        Froude number =     1.797

Upstream point elevation =   402.000(Ft.)
Downstream point elevation =   396.790(Ft.)
Flow length =   156.000(Ft.)
Travel time  =    1.15 min.
Time of concentration =    6.15 min.
Depth of flow =   0.098(Ft.)
Average velocity =   2.255(Ft/s)
Total irregular channel flow =     0.895(CFS)
Irregular channel normal depth above invert elev. =   0.098(Ft.)
Average velocity of channel(s) =   2.255(Ft/s)

Sub-Channel No. 1 Critical depth =      0.124(Ft.)
  '     '       '     Critical flow top width =     10.303(Ft.)
  '     '       '     Critical flow velocity=    1.401(Ft/s)
  '     '       '     Critical flow area =      0.639(Sq.Ft)

 Adding area flow to channel
User specified 'C' value of 0.850 given for subarea
Rainfall intensity =      4.041(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =      1.374(CFS) for    0.400(Ac.)
Total runoff =      1.523(CFS)  Total area =       0.44(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

```
Process from Point/Station      302.000 to Point/Station      302.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.850 given for subarea
Time of concentration =     6.15 min.
Rainfall intensity =      4.041(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =      1.202(CFS) for    0.350(Ac.)
Total runoff =      2.725(CFS)  Total area =       0.79(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      302.000 to Point/Station      302.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.850 given for subarea
Time of concentration =     6.15 min.
Rainfall intensity =      4.041(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =      1.992(CFS) for    0.580(Ac.)
Total runoff =      4.717(CFS)  Total area =       1.37(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      302.000 to Point/Station      303.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   396.790(Ft.)
Downstream point/station elevation =   393.400(Ft.)
Pipe length  =    65.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     4.717(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     4.717(CFS)
Normal flow depth in pipe =    6.56(In.)
Flow top width inside pipe =   11.95(In.)
Critical Depth =   10.81(In.)
Pipe flow velocity =     10.74(Ft/s)
Travel time through pipe =    0.10 min.
Time of concentration (TC) =     6.25 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      303.000 to Point/Station      303.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.850 given for subarea
Time of concentration =     6.25 min.
Rainfall intensity =      4.015(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =      0.956(CFS) for    0.280(Ac.)
```

```
Total runoff =      5.673(CFS)  Total area =       1.65(Ac.)


+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      303.000 to Point/Station      304.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   393.400(Ft.)
Downstream point/station elevation =   392.300(Ft.)
Pipe length  =   137.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.673(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     5.673(CFS)
Normal flow depth in pipe =   12.02(In.)
Flow top width inside pipe =   11.96(In.)
Critical Depth =   11.57(In.)
Pipe flow velocity =      5.38(Ft/s)
Travel time through pipe =    0.42 min.
Time of concentration (TC) =     6.68 min.


+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      304.000 to Point/Station      304.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.850 given for subarea
Time of concentration =     6.68 min.
Rainfall intensity =      3.915(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =      0.666(CFS) for    0.200(Ac.)
Total runoff =      6.339(CFS)  Total area =       1.85(Ac.)


+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      304.000 to Point/Station      305.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   392.300(Ft.)
Downstream point/station elevation =   390.840(Ft.)
Pipe length  =   175.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     6.339(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     6.339(CFS)
Normal flow depth in pipe =   10.69(In.)
Flow top width inside pipe =   17.68(In.)
Critical Depth =   11.69(In.)
Pipe flow velocity =      5.80(Ft/s)
Travel time through pipe =    0.50 min.
Time of concentration (TC) =     7.18 min.
```

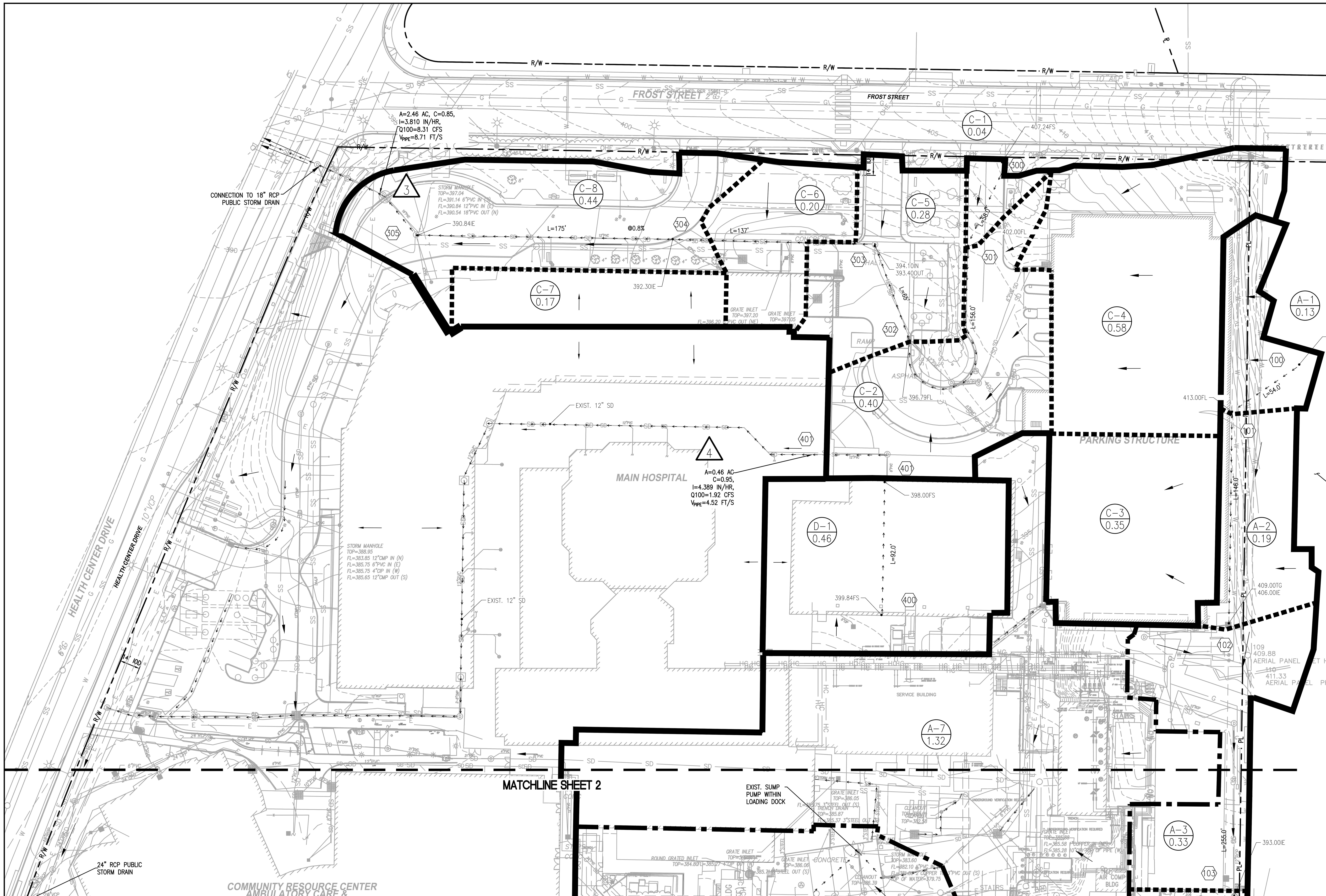
```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      305.000 to Point/Station      305.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.850 given for subarea
Time of concentration =     7.18 min.
Rainfall intensity =      3.810(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =      0.550(CFS) for    0.170(Ac.)
Total runoff =      6.889(CFS)  Total area =        2.02(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      305.000 to Point/Station      305.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.850 given for subarea
Time of concentration =     7.18 min.
Rainfall intensity =      3.810(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =      1.425(CFS) for    0.440(Ac.)
Total runoff =      8.314(CFS)  Total area =        2.46(Ac.)
End of computations, total study area =           2.460 (Ac.)
```

PACKAGE 5A (CEP) ANALYSIS

```
                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2005 Version 6.5

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 12/22/21
------------------------------------------------------------------------
Existing Condition Hydrology Analysis
Analysis Point 5
100 yr Storm Event
City of San Diego
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

------------------------------------------------------------------------


Program License Serial Number 6116

------------------------------------------------------------------------
Rational hydrology study storm event year is   100.0
English (in-lb) input data Units used
English (in) rainfall data used

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      500.000 to Point/Station      501.000
**** INITIAL AREA EVALUATION ****

User specified 'C' value of 0.850 given for subarea
Initial subarea flow distance  =  200.000(Ft.)
Highest elevation =  382.500(Ft.)
Lowest elevation =  377.920(Ft.)
Elevation difference =    4.580(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     4.83 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.8500)*( 200.000^.5)/(   2.290^(1/3)]=   4.83
Setting time of concentration to 5 minutes
Rainfall intensity (I) =      4.389(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.850
```

```
Subarea runoff =      1.828(CFS)
Total initial stream area =       0.490(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      501.000 to Point/Station      502.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   376.520(Ft.)
Downstream point/station elevation =   373.000(Ft.)
Pipe length  =   235.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.828(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     1.828(CFS)
Normal flow depth in pipe =    6.69(In.)
Flow top width inside pipe =    7.86(In.)
Critical Depth =    7.42(In.)
Pipe flow velocity =      5.19(Ft/s)
Travel time through pipe =    0.75 min.
Time of concentration (TC) =     5.75 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      502.000 to Point/Station      502.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.850 given for subarea
Time of concentration =     5.75 min.
Rainfall intensity =      4.148(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =      3.279(CFS) for    0.930(Ac.)
Total runoff =      5.107(CFS)  Total area =       1.42(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      502.000 to Point/Station      503.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   373.000(Ft.)
Downstream point/station elevation =   371.490(Ft.)
Pipe length  =   163.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.107(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     5.107(CFS)
Normal flow depth in pipe =   10.35(In.)
Flow top width inside pipe =   13.88(In.)
Critical Depth =   10.99(In.)
Pipe flow velocity =      5.65(Ft/s)
Travel time through pipe =    0.48 min.
Time of concentration (TC) =     6.24 min.
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      503.000 to Point/Station      503.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.850 given for subarea
Time of concentration =     6.24 min.
Rainfall intensity =      4.020(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =      1.982(CFS) for    0.580(Ac.)
Total runoff =      7.089(CFS)  Total area =       2.00(Ac.)
End of computations, total study area =           2.000 (Ac.)
```



LEGEND / SYMBOL

- OUTER BASIN BOUNDARY
- MAJOR BASIN BOUNDARY
- MINOR BASIN BOUNDARY
- EXISTING STORM DRAIN
- EXISTING CONTOUR
- FLOW DIRECTION
- FLOW PATH
- FLOW LENGTH — L=XXX.X'
- NODE/CONTOUR ELEVATION — 306.43TC / 301.33IE
- HYDROLOGY NODE — 200
- ANALYSIS/DISCHARGE POINT
- DRAINAGE BASIN MARKER & AREA (AC) — A-3 / X.XX

NOTES:
1) 5 MAJOR POINT OF COMPLIANCES (POCs) HAVE BEEN IDENTIFIED BASED ON THE EXISTING DRAINAGE PATTERN OF THE SITE.
2) PEAK FLOW RATES ARE CALCULATED UTILIZING 100-YEAR DESIGN STORM EVENT AND CITY OF SAN DIEGO NOMOGRAPH METHOD.

ASSESSOR'S PARCEL NUMBER

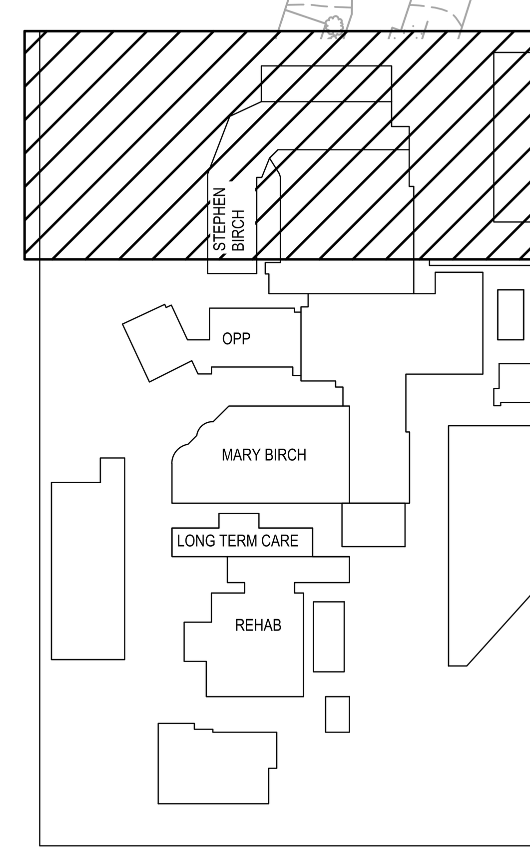
427-530-02

BRIEF LEGAL DESCRIPTION

PARCEL 1 OF PARCEL MAP 5131 IN THE CITY OF SAN DIEGO, STATE OF CALIFORNIA, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY SEPTEMBER 24, 1976.

DRAINAGE BASIN DETAILS

DRAINAGE BASIN	BASIN AREA (AC)	BASIN RUNOFF COEFFICIENT	BASIN RAINFALL INTENSITY (IN/HR)	BASIN Q100 PEAK FLOW RATE (CFS)
A-1	0.13	0.96	4.389	0.55
A-2	0.19	0.96	4.236	0.77
A-7	1.32	0.96	4.907	4.91
C-1	0.04	0.85	4.389	0.15
C-2	0.40	0.85	4.041	1.37
C-3	0.35	0.85	4.041	1.20
C-4	0.58	0.85	4.041	1.99
C-5	0.28	0.85	4.015	0.95
C-6	0.20	0.85	3.915	0.67
C-7	0.17	0.85	3.810	0.55
C-8	0.44	0.85	3.810	1.43
D-1	0.46	0.95	4.389	1.92



KEY PLAN

BWE
CIVIL • STRUCTURAL • SURVEY • PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123
619.299.5550

BENCHMARK:

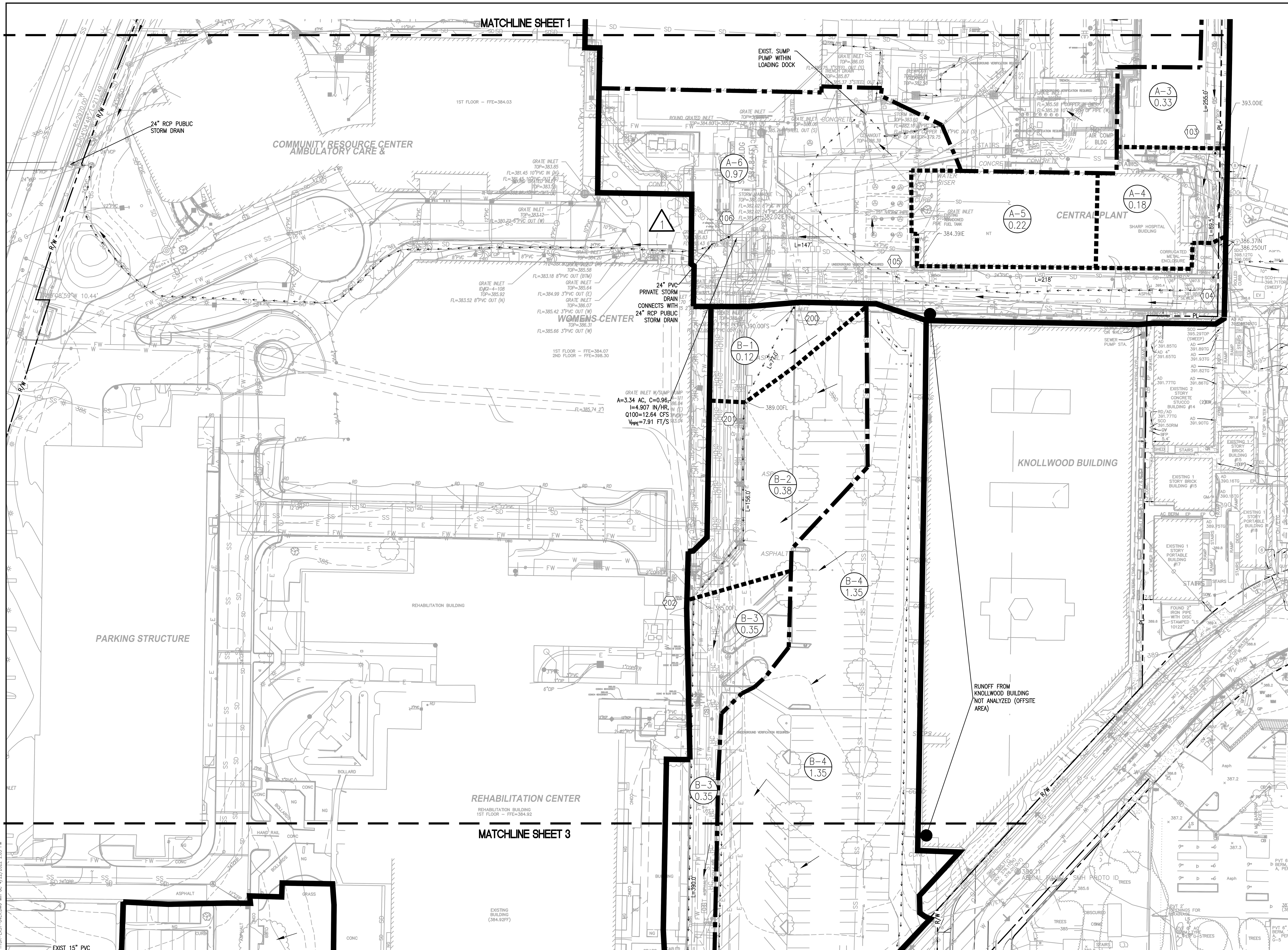
ISSUE DATE: 09/17/2021
DRAWN BY: MDS
CHECKED BY: MGC
B&W JOB NUMBER: 9545.10.00
CLIENT JOB NUMBER:

PROJECT: SHARP MMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

SHEET TITLE: EXISTING CONDITION HYDOLOGY EXHIBIT

SHEET 1 OF 3

PLOT: W:\PROJECTS\9500\9545\10.00 SHARP MMC\DWGS\EXHIBITS\DRAINAGE\954510.00 HYDR-EXST-OVER.DWG MH: GC 4/22/2022 2:03 PM



LEGEND

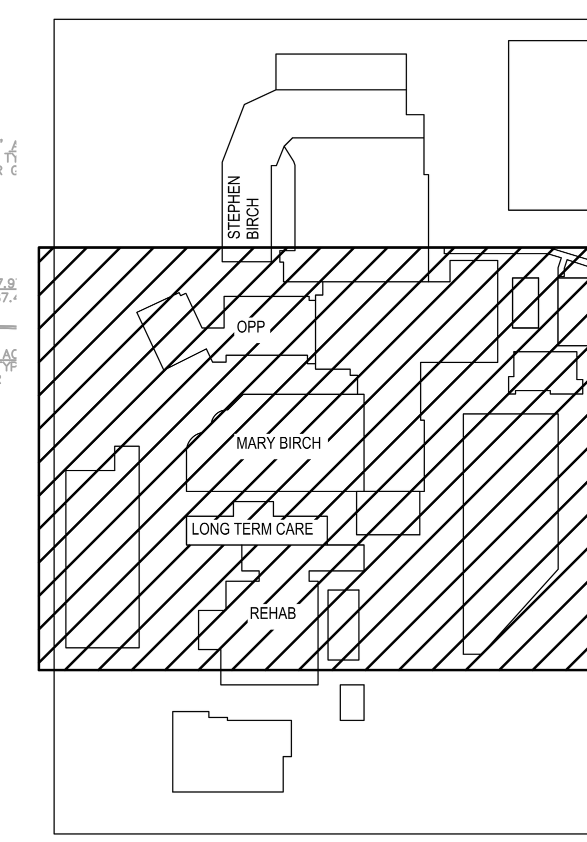
LEGEND	SYMBOL
OUTER BASIN BOUNDARY	
MAJOR BASIN BOUNDARY	
MINOR BASIN BOUNDARY	
EXISTING STORM DRAIN	SD
EXISTING CONTOUR	XXX
FLOW DIRECTION	
FLOW PATH	
FLOW LENGTH	L=XXX.X'
NODE/CONTOUR ELEVATION	306.43TG 301.33IE
HYDROLOGY NODE	200
ANALYSIS/DISCHARGE POINT	1
DRAINAGE BASIN MARKER & AREA (AC)	A-3 X.XX

DRAINAGE BASIN DETAILS

DRAINAGE BASIN	BASIN AREA (AC)	BASIN RUNOFF COEFFICIENT	BASIN RAINFALL INTENSITY (IN/HR)	BASIN Q100 PEAK FLOW RATE (CFS)
A-3	0.33	0.96	4.079	1.29
A-4	0.18	0.96	4.042	0.70
A-5	0.22	0.96	3.872	0.82
A-6	0.97	0.96	3.872	3.61
B-1	0.40	0.85	4.389	0.45
B-2	0.35	0.85	4.067	1.31

DRAINAGE BASIN DETAILS

DRAINAGE BASIN	BASIN AREA (AC)	BASIN RUNOFF COEFFICIENT	BASIN RAINFALL INTENSITY (IN/HR)	BASIN Q100 PEAK FLOW RATE (CFS)
B-3	0.35	0.85	3.415	1.02
B-4	1.35	0.85	3.415	3.92



KEY PLAN

BWE
CIVIL·STRUCTURAL·SURVEY·PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123
619.299.5550

SYM	DESCRIPTION	DATE	APPR

BENCHMARK:

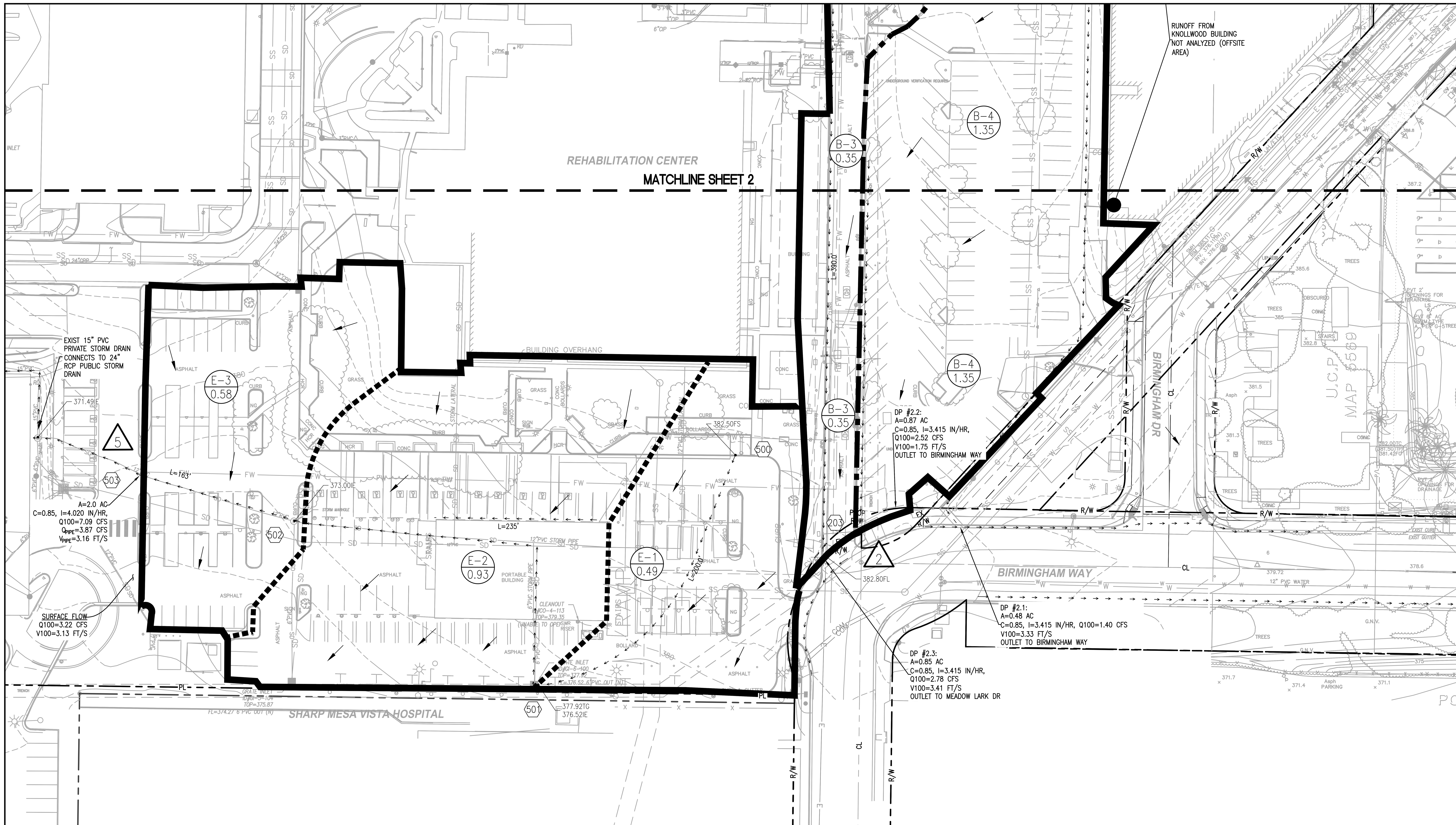
ISSUE DATE:	09/17/2021
DRAWN BY:	MDS
CHECKED BY:	MGC
B&W JOB NUMBER:	9545.10.00
CLIENT JOB NUMBER:	

PROJECT
SHARP MMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

SHEET TITLE
EXISTING CONDITION HYDROLOGY EXHIBIT

SHEET 2 OF 3

PLOT: W:\PROJECTS\9500\9545\10.00 SHARP MMC\DWGS\EXHIBITS\DRAINAGE\954510.00 HYDR-EXST-OVER.DWG MH OC 4/22/2022 2:03 PM



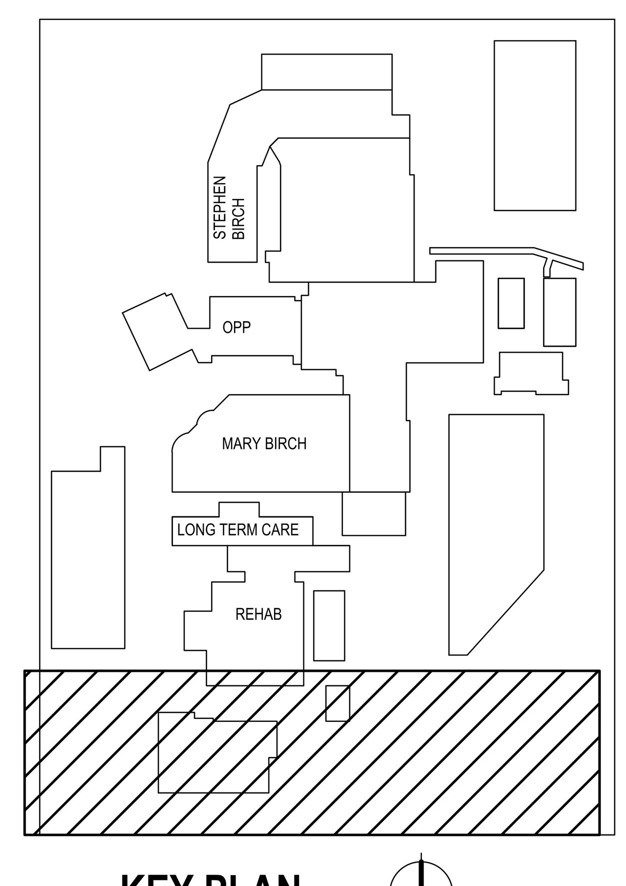
LEGEND | **SYMBOL**

- OUTER BASIN BOUNDARY
- MAJOR BASIN BOUNDARY
- MINOR BASIN BOUNDARY
- EXISTING STORM DRAIN — SD —
- EXISTING CONTOUR — XXX —
- FLOW DIRECTION
- FLOW PATH
- FLOW LENGTH L=XXX.X'
- NODE/CONTOUR ELEVATION 306.43TG / 301.33IE
- HYDROLOGY NODE 200
- ANALYSIS/DISCHARGE POINT
- DRAINAGE BASIN MARKER & AREA (AC) A-3 / X.XX

DRAINAGE BASIN DETAILS

DRAINAGE BASIN	BASIN AREA (AC)	BASIN RUNOFF COEFFICIENT	BASIN RAINFALL INTENSITY (IN/HR)	BASIN Q100 PEAK FLOW RATE (CFS)
E-1	0.49	0.85	4.389	1.83
E-2	0.93	0.85	4.148	3.28
E-3	0.58	0.85	4.020	1.98

SCALE: 1"=30'



KEY PLAN

BWE
CIVIL • STRUCTURAL • SURVEY • PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123
619.299.5550

SYM	DESCRIPTION	DATE	APPR

BENCHMARK:

ISSUE DATE:	09/17/2021
DRAWN BY:	MDS
CHECKED BY:	MGC
B&W JOB NUMBER:	9545.10.00
CLIENT JOB NUMBER:	

PROJECT

SHARP MMC CAMPUS REDEVELOPMENT

7901 FROST STREET
SAN DIEGO, CA 92123

SHEET TITLE

EXISTING CONDITION HYDROLOGY EXHIBIT

SHEET 3 OF 3

APPENDIX C:

Proposed Condition Runoff Coefficient Calculations
Proposed Condition Hydrology Calculations
Proposed Condition Hydraulics Calculations
Proposed Condition Hydrology Map

CUP PACKAGES 3A, & 7 ANALYSIS

```
                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2005 Version 6.5

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 12/22/21
------------------------------------------------------------------------
Proposed Condition Hydrology Analysis
Analysis Point 1
100 yr Storm Event
City of San Diego
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

------------------------------------------------------------------------


Program License Serial Number 6116

------------------------------------------------------------------------
Rational hydrology study storm event year is   100.0
English (in-lb) input data Units used
English (in) rainfall data used

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      100.000 to Point/Station      101.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
User specified 'C' value of 0.860 given for subarea
Initial subarea flow distance  =   82.000(Ft.)
Highest elevation =  385.700(Ft.)
Lowest elevation =  384.000(Ft.)
Elevation difference =    1.700(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     3.07 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.8600)*(  82.000^.5)/(   2.073^(1/3)]=   3.07
Setting time of concentration to 5 minutes
Rainfall intensity (I) =      4.389(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.860
```

```
Subarea runoff =      2.001(CFS)
Total initial stream area =       0.530(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      101.000 to Point/Station      102.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   393.710(Ft.)
Downstream point/station elevation =   388.130(Ft.)
Pipe length  =   167.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.001(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     2.001(CFS)
Normal flow depth in pipe =    5.34(In.)
Flow top width inside pipe =    8.84(In.)
Critical Depth =    7.71(In.)
Pipe flow velocity =      7.31(Ft/s)
Travel time through pipe =    0.38 min.
Time of concentration (TC) =     5.38 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      103.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   388.130(Ft.)
Downstream point/station elevation =   385.130(Ft.)
Pipe length  =    67.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.001(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     2.001(CFS)
Normal flow depth in pipe =    4.88(In.)
Flow top width inside pipe =    8.97(In.)
Critical Depth =    7.71(In.)
Pipe flow velocity =      8.19(Ft/s)
Travel time through pipe =    0.14 min.
Time of concentration (TC) =     5.52 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      103.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.860 given for subarea
Time of concentration =     5.52 min.
Rainfall intensity =      4.218(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.860
Subarea runoff =      4.063(CFS) for    1.120(Ac.)
Total runoff =      6.063(CFS)  Total area =       1.65(Ac.)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      104.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   385.130(Ft.)
Downstream point/station elevation =   382.410(Ft.)
Pipe length  =    98.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     6.063(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     6.063(CFS)
Normal flow depth in pipe =    8.06(In.)
Flow top width inside pipe =   14.96(In.)
Critical Depth =   11.94(In.)
Pipe flow velocity =      9.03(Ft/s)
Travel time through pipe =    0.18 min.
Time of concentration (TC) =     5.70 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      104.000 to Point/Station      105.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   382.410(Ft.)
Downstream point/station elevation =   378.740(Ft.)
Pipe length  =   454.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     6.063(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     6.063(CFS)
Normal flow depth in pipe =   10.49(In.)
Flow top width inside pipe =   17.75(In.)
Critical Depth =   11.40(In.)
Pipe flow velocity =      5.67(Ft/s)
Travel time through pipe =    1.33 min.
Time of concentration (TC) =     7.03 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      105.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.860 given for subarea
Time of concentration =     7.03 min.
Rainfall intensity =      3.840(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.860
Subarea runoff =      3.434(CFS) for    1.040(Ac.)
Total runoff =      9.498(CFS)  Total area =       2.69(Ac.)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      105.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.860 given for subarea
Time of concentration =     7.03 min.
Rainfall intensity =      3.840(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.860
Subarea runoff =      4.128(CFS) for    1.250(Ac.)
Total runoff =     13.626(CFS)  Total area =       3.94(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      105.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.860 given for subarea
Time of concentration =     7.03 min.
Rainfall intensity =      3.840(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.860
Subarea runoff =      1.783(CFS) for    0.540(Ac.)
Total runoff =     15.409(CFS)  Total area =       4.48(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      106.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   378.740(Ft.)
Downstream point/station elevation =   377.380(Ft.)
Pipe length  =    34.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    15.409(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    15.409(CFS)
Normal flow depth in pipe =   11.45(In.)
Flow top width inside pipe =   17.32(In.)
Critical Depth =   16.97(In.)
Pipe flow velocity =     12.99(Ft/s)
Travel time through pipe =    0.04 min.
Time of concentration (TC) =     7.07 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      106.000 to Point/Station      107.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   377.380(Ft.)
Downstream point/station elevation =   377.000(Ft.)
Pipe length  =    38.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    15.409(CFS)
```

```
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    15.409(CFS)
Normal flow depth in pipe =   16.71(In.)
Flow top width inside pipe =   16.93(In.)
Critical Depth =   17.42(In.)
Pipe flow velocity =      7.51(Ft/s)
Travel time through pipe =    0.08 min.
Time of concentration (TC) =     7.16 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      107.000 to Point/Station      107.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.860 given for subarea
Time of concentration =     7.16 min.
Rainfall intensity =      3.814(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.860
Subarea runoff =      2.854(CFS) for    0.870(Ac.)
Total runoff =     18.262(CFS)  Total area =       5.35(Ac.)
End of computations, total study area =          5.350 (Ac.)
```

CUP PACKAGE 8 ANALYSIS

```
                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2005 Version 6.5

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 12/22/21
------------------------------------------------------------------------
PROPOSED CONDITION HYDROLOGY ANALYSIS
ANALYSIS POINT 4
100 yr Storm Event
City of San Diego
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

------------------------------------------------------------------------


Program License Serial Number 6116

------------------------------------------------------------------------
Rational hydrology study storm event year is   100.0
English (in-lb) input data Units used
English (in) rainfall data used

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      400.000 to Point/Station      401.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
User specified 'C' value of 0.850 given for subarea
Initial subarea flow distance  =   44.000(Ft.)
Highest elevation =  385.700(Ft.)
Lowest elevation =  384.820(Ft.)
Elevation difference =    0.880(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     2.37 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.8500)*(  44.000^.5)/(   2.000^(1/3)]=   2.37
Setting time of concentration to 5 minutes
Rainfall intensity (I) =      4.389(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.850
```

```
Subarea runoff =      0.672(CFS)
Total initial stream area =       0.180(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      401.000 to Point/Station      402.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.850 given for subarea
Time of concentration =     5.00 min.
Rainfall intensity =      4.389(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =      2.873(CFS) for    0.770(Ac.)
Total runoff =      3.544(CFS)  Total area =       0.95(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      402.000 to Point/Station      403.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   393.300(Ft.)
Downstream point/station elevation =   393.130(Ft.)
Pipe length  =    42.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.544(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     3.544(CFS)
Normal flow depth in pipe =   10.75(In.)
Flow top width inside pipe =   13.52(In.)
Critical Depth =    9.12(In.)
Pipe flow velocity =      3.77(Ft/s)
Travel time through pipe =    0.19 min.
Time of concentration (TC) =     5.19 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      403.000 to Point/Station      404.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   393.130(Ft.)
Downstream point/station elevation =   393.000(Ft.)
Pipe length  =    77.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.544(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     3.544(CFS)
Normal flow depth in pipe =   12.42(In.)
Flow top width inside pipe =   16.65(In.)
Critical Depth =    8.62(In.)
Pipe flow velocity =      2.73(Ft/s)
Travel time through pipe =    0.47 min.
Time of concentration (TC) =     5.66 min.
```

End of computations, total study area =   0.950 (Ac.)

PACKAGE 4 (STEPHEN BIRCH ADDITION) ANALYSIS

```
                  San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2005 Version 6.5

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 12/22/21
------------------------------------------------------------------------
Proposed Condition Hydrology Analysis
Analysis Point 3
100 yr Storm Event
City of San Diego
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

------------------------------------------------------------------------


Program License Serial Number 6116

------------------------------------------------------------------------
Rational hydrology study storm event year is   100.0
English (in-lb) input data Units used
English (in) rainfall data used

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      300.000 to Point/Station      301.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
User specified 'C' value of 0.850 given for subarea
Initial subarea flow distance  =  144.000(Ft.)
Highest elevation =  403.840(Ft.)
Lowest elevation =  397.730(Ft.)
Elevation difference =    6.110(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     3.34 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.8500)*( 144.000^.5)/(   4.243^(1/3)]=   3.34
Setting time of concentration to 5 minutes
Rainfall intensity (I) =      4.389(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.850
```

```
Subarea runoff =      1.492(CFS)
Total initial stream area =       0.400(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      301.000 to Point/Station      302.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   395.140(Ft.)
Downstream point/station elevation =   394.420(Ft.)
Pipe length  =   138.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.492(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     1.492(CFS)
Normal flow depth in pipe =    6.56(In.)
Flow top width inside pipe =   11.95(In.)
Critical Depth =    6.22(In.)
Pipe flow velocity =      3.40(Ft/s)
Travel time through pipe =    0.68 min.
Time of concentration (TC) =     5.68 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      302.000 to Point/Station      303.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   394.420(Ft.)
Downstream point/station elevation =   393.360(Ft.)
Pipe length  =   203.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.492(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     1.492(CFS)
Normal flow depth in pipe =    6.56(In.)
Flow top width inside pipe =   11.95(In.)
Critical Depth =    6.22(In.)
Pipe flow velocity =      3.40(Ft/s)
Travel time through pipe =    1.00 min.
Time of concentration (TC) =     6.67 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      303.000 to Point/Station      303.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.850 given for subarea
Time of concentration =     6.67 min.
Rainfall intensity =      3.917(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =      1.731(CFS) for    0.520(Ac.)
Total runoff =      3.224(CFS)  Total area =       0.92(Ac.)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      303.000 to Point/Station      304.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   393.360(Ft.)
Downstream point/station elevation =   392.820(Ft.)
Pipe length  =    92.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.224(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     3.224(CFS)
Normal flow depth in pipe =    8.82(In.)
Flow top width inside pipe =   14.76(In.)
Critical Depth =    8.68(In.)
Pipe flow velocity =      4.30(Ft/s)
Travel time through pipe =    0.36 min.
Time of concentration (TC) =     7.03 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      304.000 to Point/Station      309.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.850 given for subarea
Time of concentration =     7.03 min.
Rainfall intensity =      3.840(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =      0.653(CFS) for    0.200(Ac.)
Total runoff =      3.876(CFS)  Total area =       1.12(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      309.000 to Point/Station      309.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      1.120(Ac.)
Runoff from this stream =      3.876(CFS)
Time of concentration =    7.03 min.
Rainfall intensity =     3.840(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      305.000 to Point/Station      306.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
User specified 'C' value of 0.850 given for subarea
Initial subarea flow distance  =   58.000(Ft.)
Highest elevation =  407.240(Ft.)
```

```
Lowest elevation =  402.000(Ft.)
Elevation difference =    5.240(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     1.65 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.8500)*(  58.000^.5)/(   9.034^(1/3)]=   1.65
Setting time of concentration to 5 minutes
Rainfall intensity (I) =      4.389(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.850
Subarea runoff =      0.187(CFS)
Total initial stream area =        0.050(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      306.000 to Point/Station      307.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
______________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.466(CFS)
Depth of flow =   0.094(Ft.), Average velocity =   2.118(Ft/s)
        ******* Irregular Channel Data ***********
-----------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              0.50
        2              0.12              0.00
        3             10.00              0.20
Manning's 'N' friction factor =   0.016
-----------------------------------------------------------------
Sub-Channel flow  =      0.466(CFS)
  '     '        flow top width =      4.675(Ft.)
  '     '    velocity=    2.118(Ft/s)
  '     '        area =      0.220(Sq.Ft)
  '     '        Froude number =     1.720

Upstream point elevation =   402.000(Ft.)
Downstream point elevation =   400.500(Ft.)
Flow length =    48.000(Ft.)
Travel time  =    0.38 min.
Time of concentration =    5.38 min.
Depth of flow =   0.094(Ft.)
Average velocity =   2.118(Ft/s)
Total irregular channel flow =     0.466(CFS)
Irregular channel normal depth above invert elev. =   0.094(Ft.)
Average velocity of channel(s) =   2.118(Ft/s)

Sub-Channel No. 1 Critical depth =      0.117(Ft.)
  '     '       '     Critical flow top width =      5.817(Ft.)
  '     '       '     Critical flow velocity=    1.368(Ft/s)
  '     '       '     Critical flow area =      0.341(Sq.Ft)
```

```
 Adding area flow to channel
User specified 'C' value of 0.850 given for subarea
Rainfall intensity =      4.261(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =      0.543(CFS) for    0.150(Ac.)
Total runoff =      0.730(CFS)  Total area =       0.20(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      307.000 to Point/Station      308.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   397.000(Ft.)
Downstream point/station elevation =   394.450(Ft.)
Pipe length  =    39.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.730(CFS)
Nearest computed pipe diameter  =      6.00(In.)
Calculated individual pipe flow  =     0.730(CFS)
Normal flow depth in pipe =    3.03(In.)
Flow top width inside pipe =    6.00(In.)
Critical Depth =    5.15(In.)
Pipe flow velocity =      7.34(Ft/s)
Travel time through pipe =    0.09 min.
Time of concentration (TC) =     5.47 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      308.000 to Point/Station      308.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.850 given for subarea
Time of concentration =     5.47 min.
Rainfall intensity =      4.234(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =      1.259(CFS) for    0.350(Ac.)
Total runoff =      1.989(CFS)  Total area =       0.55(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      308.000 to Point/Station      308.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.850 given for subarea
Time of concentration =     5.47 min.
Rainfall intensity =      4.234(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =      2.087(CFS) for    0.580(Ac.)
Total runoff =      4.077(CFS)  Total area =       1.13(Ac.)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      308.000 to Point/Station      309.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   394.450(Ft.)
Downstream point/station elevation =   390.250(Ft.)
Pipe length  =   445.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     4.077(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     4.077(CFS)
Normal flow depth in pipe =    8.80(In.)
Flow top width inside pipe =   14.77(In.)
Critical Depth =    9.81(In.)
Pipe flow velocity =      5.44(Ft/s)
Travel time through pipe =    1.36 min.
Time of concentration (TC) =     6.83 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      309.000 to Point/Station      309.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.850 given for subarea
Time of concentration =     6.83 min.
Rainfall intensity =      3.882(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =      0.693(CFS) for    0.210(Ac.)
Total runoff =      4.770(CFS)  Total area =       1.34(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      309.000 to Point/Station      310.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      1.340(Ac.)
Runoff from this stream =      4.770(CFS)
Time of concentration =    6.83 min.
Rainfall intensity =     3.882(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1        3.876      7.03                 3.840
2        4.770      6.83                 3.882
Qmax(1) =
           1.000 *    1.000 *     3.876) +
           0.989 *    1.000 *     4.770) + =       8.594
```

```
Qmax(2) =
           1.000 *    0.971 *     3.876) +
           1.000 *    1.000 *     4.770) + =       8.535

Total of 2 streams to confluence:
Flow rates before confluence point:
       3.876      4.770
Maximum flow rates at confluence using above data:
        8.594       8.535
Area of streams before confluence:
        1.120       1.340
Results of confluence:
Total flow rate =      8.594(CFS)
Time of concentration =     7.029 min.
Effective stream area after confluence =      2.460(Ac.)
End of computations, total study area =           2.460 (Ac.)
```

PACKAGE 5A (CEP) ANALYSIS

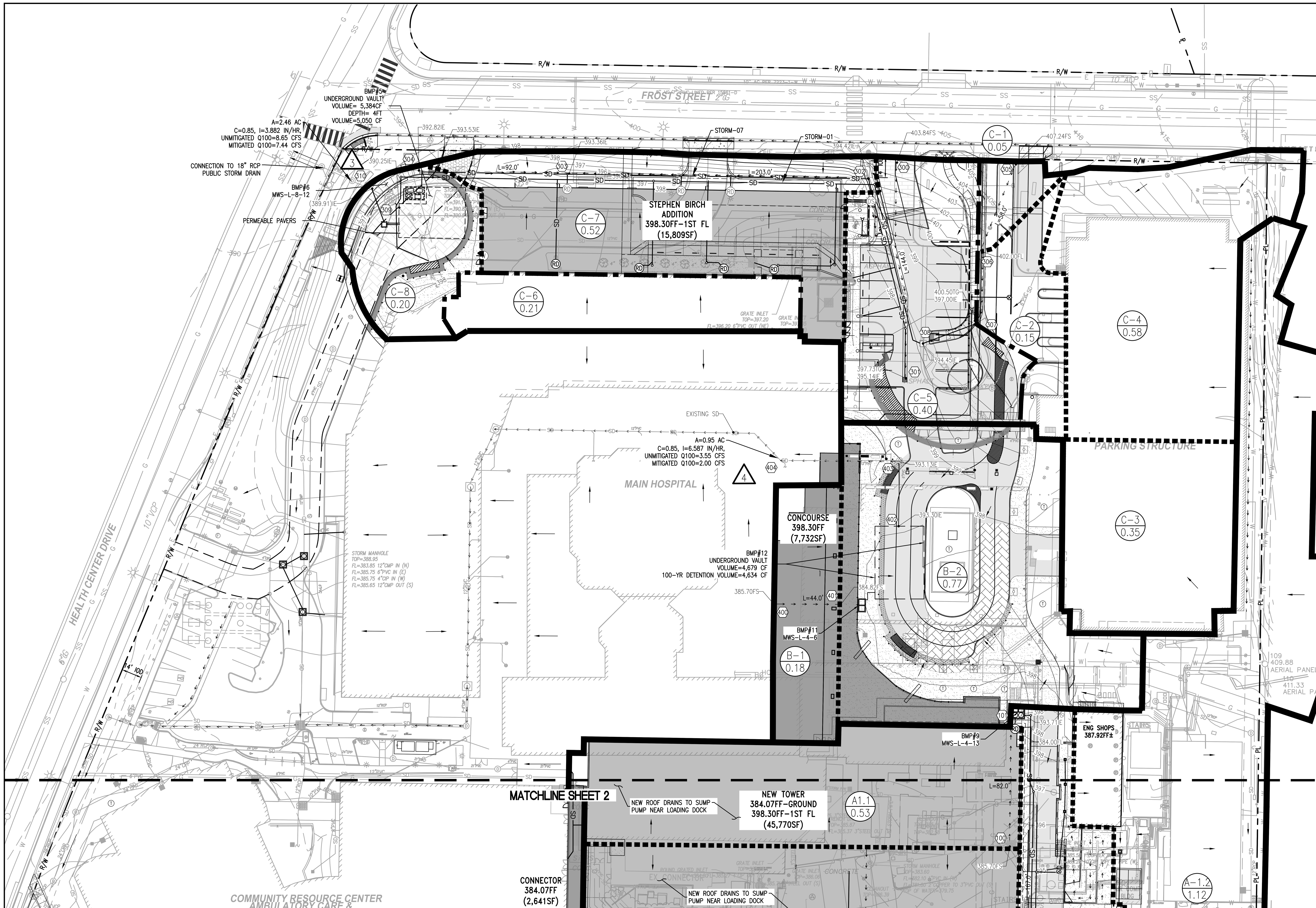
```
                San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2005 Version 6.5

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 12/29/21
------------------------------------------------------------------------
Proposed Condition Hydrology analysis
Analysis Point 5
100 yr Storm Event
City of San Diego
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

------------------------------------------------------------------------


Program License Serial Number 6116

------------------------------------------------------------------------
Rational hydrology study storm event year is   100.0
English (in-lb) input data Units used
English (in) rainfall data used

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      500.000 to Point/Station      501.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
User specified 'C' value of 0.890 given for subarea
Initial subarea flow distance  =  139.000(Ft.)
Highest elevation =  383.900(Ft.)
Lowest elevation =  379.800(Ft.)
Elevation difference =    4.100(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     3.11 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.8900)*( 139.000^.5)/(   2.950^(1/3)]=   3.11
Setting time of concentration to 5 minutes
Rainfall intensity (I) =      4.389(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.890
```

```
Subarea runoff =      0.977(CFS)
Total initial stream area =       0.250(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      501.000 to Point/Station      502.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   377.800(Ft.)
Downstream point/station elevation =   376.520(Ft.)
Pipe length  =   100.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.977(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     0.977(CFS)
Normal flow depth in pipe =    4.62(In.)
Flow top width inside pipe =    9.00(In.)
Critical Depth =    5.44(In.)
Pipe flow velocity =      4.28(Ft/s)
Travel time through pipe =    0.39 min.
Time of concentration (TC) =     5.39 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      502.000 to Point/Station      502.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.890 given for subarea
Time of concentration =     5.39 min.
Rainfall intensity =      4.258(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.890
Subarea runoff =      0.531(CFS) for    0.140(Ac.)
Total runoff =      1.507(CFS)  Total area =       0.39(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      502.000 to Point/Station      503.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   376.520(Ft.)
Downstream point/station elevation =   374.000(Ft.)
Pipe length  =   177.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.507(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     1.507(CFS)
Normal flow depth in pipe =    5.89(In.)
Flow top width inside pipe =    8.56(In.)
Critical Depth =    6.79(In.)
Pipe flow velocity =      4.92(Ft/s)
Travel time through pipe =    0.60 min.
Time of concentration (TC) =     5.99 min.
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      503.000 to Point/Station      503.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.890 given for subarea
Time of concentration =     5.99 min.
Rainfall intensity =      4.084(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.890
Subarea runoff =      0.582(CFS) for    0.160(Ac.)
Total runoff =      2.089(CFS)  Total area =       0.55(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      503.000 to Point/Station      504.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   375.500(Ft.)
Downstream point/station elevation =   375.290(Ft.)
Pipe length  =    42.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.089(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     2.089(CFS)
Normal flow depth in pipe =    8.33(In.)
Flow top width inside pipe =   11.06(In.)
Critical Depth =    7.41(In.)
Pipe flow velocity =      3.59(Ft/s)
Travel time through pipe =    0.20 min.
Time of concentration (TC) =     6.18 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      504.000 to Point/Station      504.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.890 given for subarea
Time of concentration =     6.18 min.
Rainfall intensity =      4.033(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.890
Subarea runoff =      1.256(CFS) for    0.350(Ac.)
Total runoff =      3.345(CFS)  Total area =       0.90(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      504.000 to Point/Station      505.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   375.290(Ft.)
Downstream point/station elevation =   374.850(Ft.)
```

```
Pipe length  =    86.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.345(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     3.345(CFS)
Normal flow depth in pipe =    9.46(In.)
Flow top width inside pipe =   14.48(In.)
Critical Depth =    8.85(In.)
Pipe flow velocity =      4.10(Ft/s)
Travel time through pipe =    0.35 min.
Time of concentration (TC) =     6.53 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      505.000 to Point/Station      505.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.890 given for subarea
Time of concentration =     6.53 min.
Rainfall intensity =      3.949(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.890
Subarea runoff =      1.933(CFS) for    0.550(Ac.)
Total runoff =      5.278(CFS)  Total area =       1.45(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      505.000 to Point/Station      505.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.890 given for subarea
Time of concentration =     6.53 min.
Rainfall intensity =      3.949(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.890
Subarea runoff =      0.492(CFS) for    0.140(Ac.)
Total runoff =      5.770(CFS)  Total area =       1.59(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      505.000 to Point/Station      505.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.890 given for subarea
Time of concentration =     6.53 min.
Rainfall intensity =      3.949(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.890
Subarea runoff =      0.668(CFS) for    0.190(Ac.)
Total runoff =      6.437(CFS)  Total area =       1.78(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      506.000 to Point/Station      506.000
```

```
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.890 given for subarea
Time of concentration =     6.53 min.
Rainfall intensity =      3.949(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.890
Subarea runoff =      0.562(CFS) for    0.160(Ac.)
Total runoff =      7.000(CFS)  Total area =       1.94(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      506.000 to Point/Station      506.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.890 given for subarea
Time of concentration =     6.53 min.
Rainfall intensity =      3.949(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.890
Subarea runoff =      0.211(CFS) for    0.060(Ac.)
Total runoff =      7.210(CFS)  Total area =       2.00(Ac.)
End of computations, total study area =          2.000 (Ac.)
```



LEGEND

	SYMBOL
OUTER BASIN BOUNDARY	
MAJOR BASIN BOUNDARY	
MINOR BASIN BOUNDARY	
EXISTING STORM DRAIN	SD
NEW STORM DRAIN	SD
EXISTING CONTOUR	XXX
NEW CONTOUR	XXX
FLOW DIRECTION	
FLOW PATH	
FLOW LENGTH	L=XXX.X'
NODE/CONTOUR ELEVATION	307.85FL 304.35IE
HYDROLOGY NODE	200
ANALYSIS/EXIT POINT	1
DRAINAGE BASIN MARKER & AREA (AC)	B-X X.XX

NOTES:
1) PEAK FLOW RATES ARE CALCULATED UTILIZING CITY OF SD DRAINAGE DESIGN MANUAL. THE CITY OF SAN DIEGO NOMOGRAPH METHOD WAS USED TO CALCULATED FLOW RATES.
2) DRAINAGE AREA DIVERSION IS ANTICIPATED IN THE PROPOSED CONDITION BASED ON THE EXISTING CONDITION DRAINAGE PATTERN. BUT, HISTORIC DRAINAGE PATTERN IS MAINTAINED TO THE MAXIMUM EXTENT TECHNICALLY FEASIBLE.
3) STORM DRAIN SYSTEM IS DESIGNED TO CONVEY RUNOFF DUE TO 50-YR STORM EVENT.
4) AN ONSITE OVERLAND RELEASE WILL BE PROVIDED TO CONVEY EXCESS RUNOFF DUE TO 50 YEAR OR LARGER FREQUENCY STORM EVENTS.
5) PUMP IS REQUIRED TO DISCHARGE RUNOFF FROM LOADING DOCK AREA.
6) RUNOFF ORIGINATING FROM THE ADJACENT KNOOLWOOD BUILDING ROOF NEEDS TO BYPASS THE PROPOSED BMPS.

DRAINAGE BASIN DETAILS

DRAINAGE BASIN	BASIN AREA (AC)	BASIN RUNOFF COEFFICIENT	BASIN RAINFALL INTENSITY (IN/HR)	BASIN UNMITIGATED Q100 PEAK FLOW RATE (CFS)
B-1	0.18	0.85	4.389	0.67
B-2	0.77	0.85	4.389	2.87
C-1	0.05	0.85	4.389	0.19
C-2	0.15	0.85	4.261	0.55
C-3	0.35	0.85	4.234	1.26
C-4	0.58	0.85	4.234	2.09
C-5	0.40	0.85	4.389	1.49
C-6	0.21	0.85	4.770	0.69
C-7	0.52	0.85	3.917	1.73
C-8	0.20	0.85	3.840	0.65

ASSESSOR'S PARCEL NUMBER

427-530-02

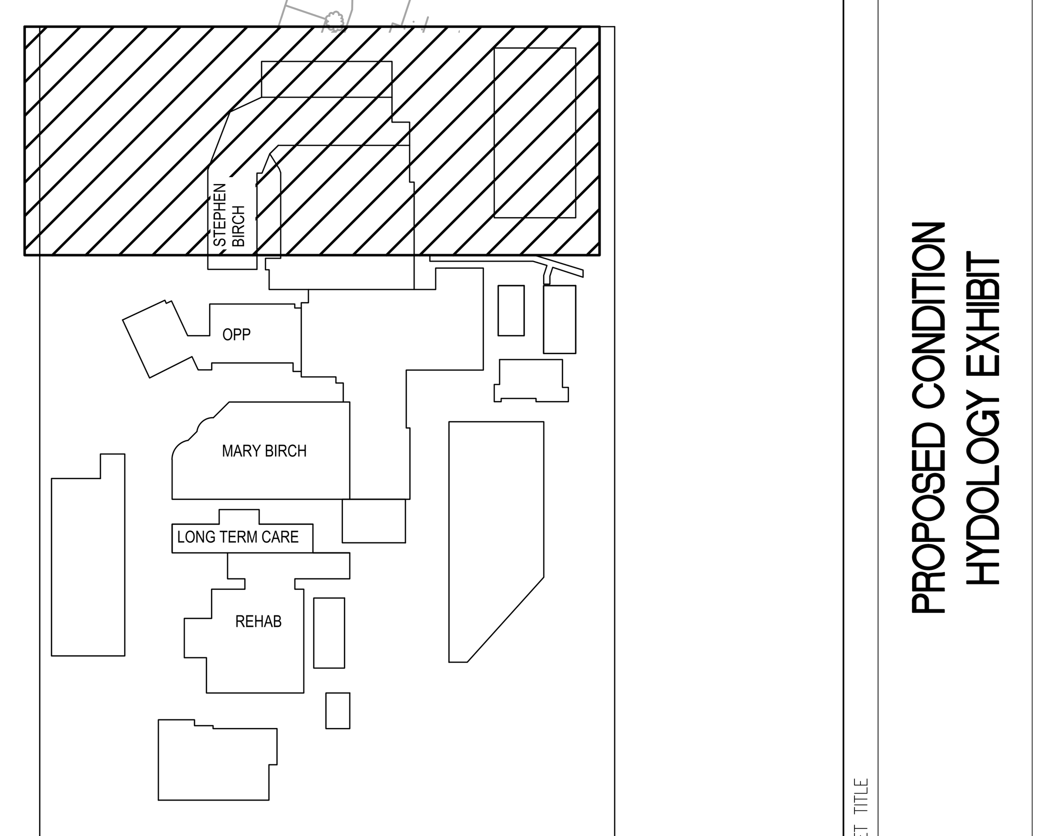
BRIEF LEGAL DESCRIPTION

PARCEL 1 OF PARCEL MAP 5131 IN THE CITY OF SAN DIEGO, STATE OF CALIFORNIA, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY SEPTEMBER 24, 1976.

Q AND V AT DISCHARGE POINTS

Discharge Point #	Type of Discharge	Discharge Location	Proposed Unmitigated Q (cfs)	Proposed Unmitigated V (ft/s)	Proposed Mitigated Q (cfs)	Proposed Mitigated V (ft/s)
3	Pipe	18" PIPE @2.08%	8.65	8.84	7.44	8.38
4	Pipe	12" PIPE @1.00%	3.55	5.14	2	4.6

SCALE: 1"=30'



KEY PLAN

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123
619.299.5550

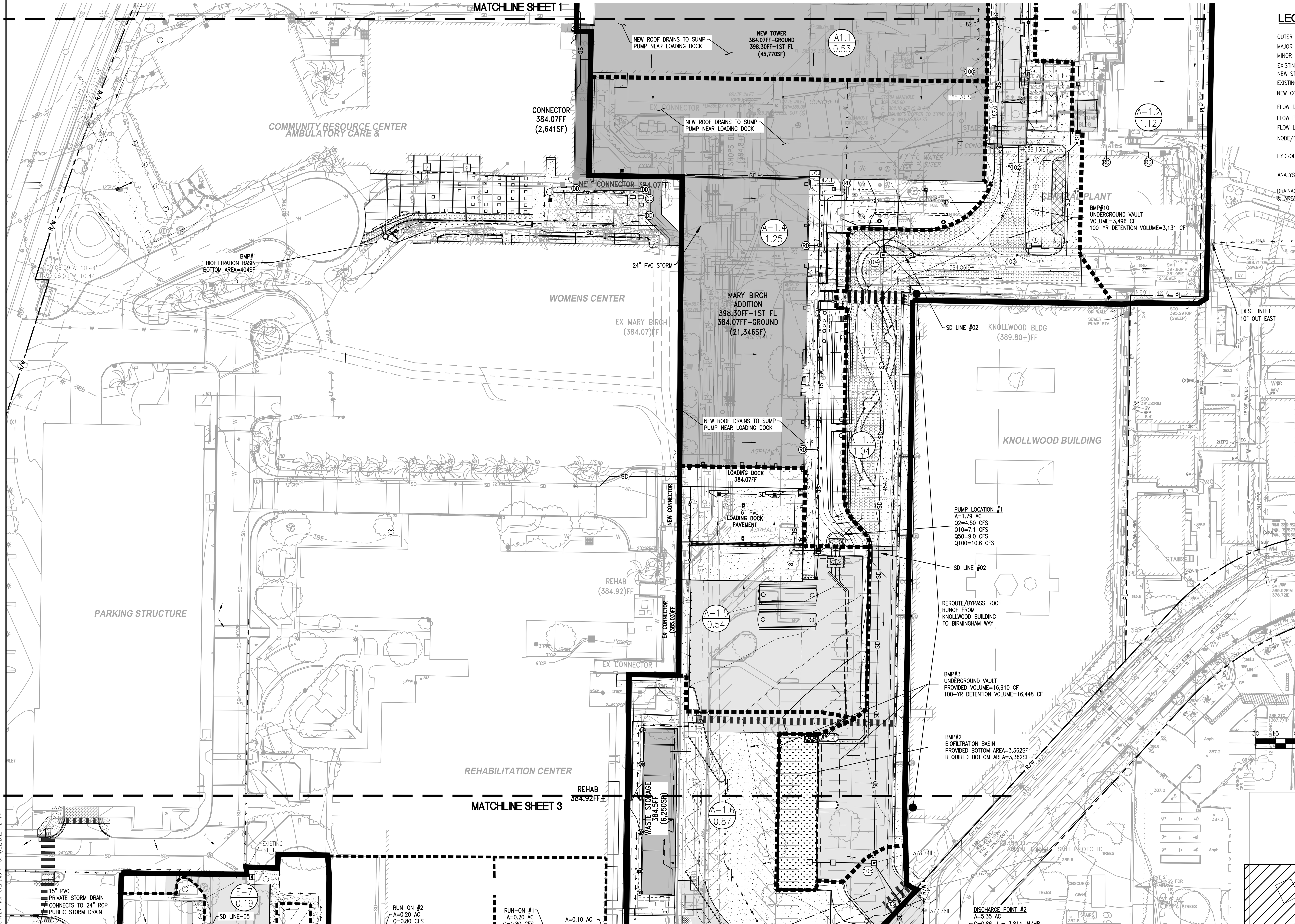
SYM	DESCRIPTION	DATE	APPR

BENCHMARK:	
ISSUE DATE:	09/17/2021
DRAWN BY:	MDS
CHECKED BY:	MGC
B&W JOB NUMBER:	9545.10.00
CLIENT JOB NUMBER:	

PROJECT
SHARP MMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

SHEET TITLE
PROPOSED CONDITION HYDROLOGY EXHIBIT

SHEET 1 OF 3

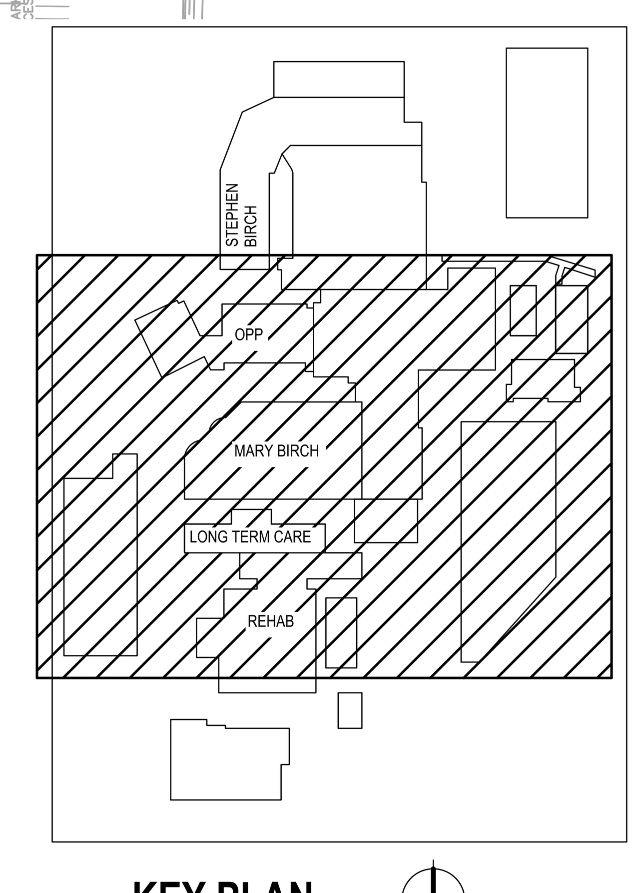


LEGEND

LEGEND	SYMBOL
OUTER BASIN BOUNDARY	
MAJOR BASIN BOUNDARY	
MINOR BASIN BOUNDARY	
EXISTING STORM DRAIN	SD
NEW STORM DRAIN	SD
EXISTING CONTOUR	XXX
NEW CONTOUR	XXX
FLOW DIRECTION	
FLOW PATH	
FLOW LENGTH	L=XXX.X'
NODE/CONTOUR ELEVATION	307.85FL 304.35IE
HYDROLOGY NODE	200
ANALYSIS/EXIT POINT	1
DRAINAGE BASIN MARKER & AREA (AC)	B-X X.XX

DRAINAGE BASIN DETAILS

DRAINAGE BASIN	BASIN AREA (AC)	BASIN RUNOFF COEFFICIENT	BASIN RAINFALL INTENSITY (IN/HR)	BASIN UNMITIGATED Q100 PEAK FLOW RATE (CFS)
A-1.1	0.53	0.86	4.389	2.00
A-1.2	1.12	0.86	4.218	4.06
A-1.3	1.04	0.86	3.840	3.43
A-1.4	1.25	0.86	3.840	4.13
A-1.5	0.54	0.86	3.840	1.78



KEY PLAN

BW E
CIVIL·STRUCTURAL·SURVEY·PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123
619.299.5550

SYM	DESCRIPTION	DATE	APPR

BENCHMARK:

ISSUE DATE:	09/17/2021
DRAWN BY:	MDS
CHECKED BY:	MGC
B&W JOB NUMBER:	9545.10.00
CLIENT JOB NUMBER:	

PROJECT

SHARP MMC CAMPUS REDEVELOPMENT

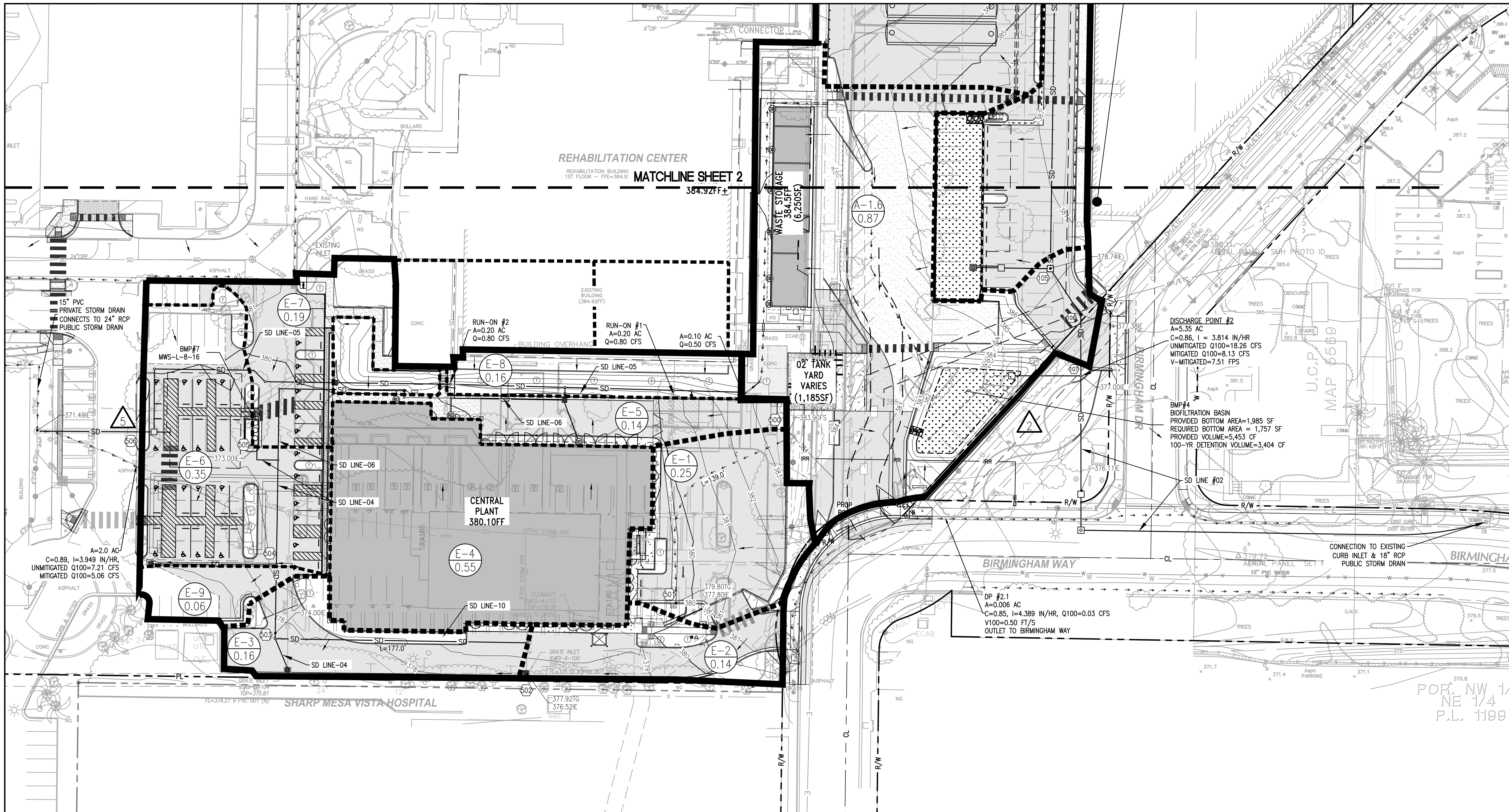
7901 FROST STREET
SAN DIEGO, CA 92123

SHEET TITLE

PROPOSED CONDITION HYDROLOGY EXHIBIT

SHEET 2 OF 3

PLOT: W:\PROJECTS\9500\9545\10.00 SHARP MMC\DWGS\EXHIBITS\DRAINAGE\9545\10.00 HYDR-PROP-OVER.DWG MH GC 4/22/2022 3:21 PM



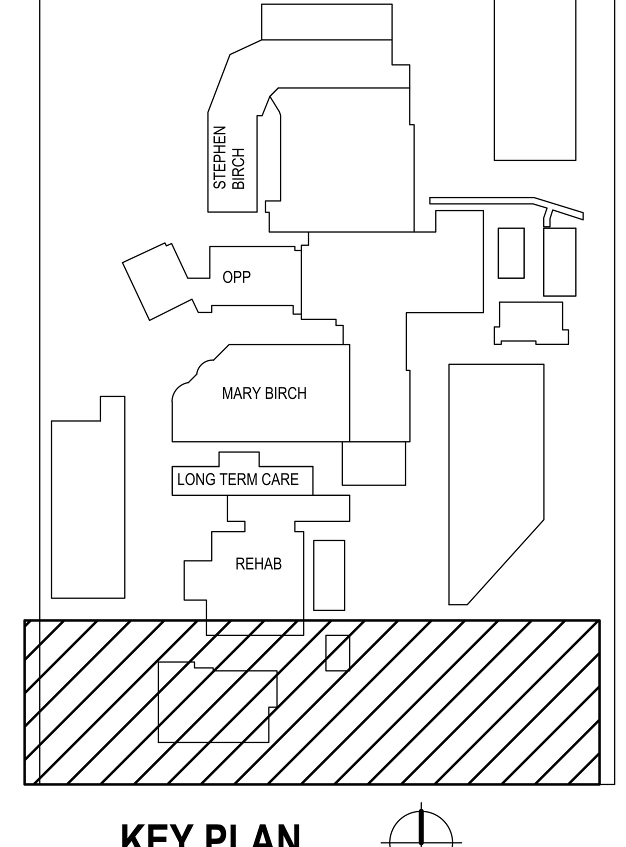
LEGEND

LEGEND	SYMBOL
OUTER BASIN BOUNDARY	
MAJOR BASIN BOUNDARY	
MINOR BASIN BOUNDARY	
EXISTING STORM DRAIN	SD
NEW STORM DRAIN	SD
EXISTING CONTOUR	XXX
NEW CONTOUR	XXX
FLOW DIRECTION	
FLOW PATH	
FLOW LENGTH	L=XXX.X'
NODE/CONTOUR ELEVATION	307.85FL 304.35IE
HYDROLOGY NODE	200
ANALYSIS/EXIT POINT	1
DRAINAGE BASIN MARKER & AREA (AC)	B-X X.XX

DRAINAGE BASIN DETAILS

DRAINAGE BASIN	BASIN AREA (AC)	BASIN RUNOFF COEFFICIENT	BASIN RAINFALL INTENSITY (IN/HR)	BASIN UNMITIGATED Q100 PEAK FLOW RATE (CFS)
A-1.6	0.87	0.86	3.814	2.85
E-1	0.25	0.89	4.389	0.98
E-2	0.14	0.89	4.258	0.53
E-3	0.16	0.89	4.084	0.58
E-4	0.55	0.89	3.949	1.93
E-5	0.14	0.89	3.949	0.49
E-6	0.35	0.89	4.033	1.26
E-7	0.19	0.89	3.949	0.69
E-8	0.16	0.89	3.949	0.56
E-9	0.06	0.89	3.949	0.21

30 15 0 30 60 90
SCALE: 1"=30'



KEY PLAN

BWE
CIVIL-STRUCTURAL-SURVEY-PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

SYM	DESCRIPTION	DATE	APPR

BENCHMARK:
ISSUE DATE: 09/17/2021
DRAWN BY: MDS
CHECKED BY: MGC
B&W JOB NUMBER: 9545.10.00
CLIENT JOB NUMBER:

PROJECT
SHARP MMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

SHEET TITLE
PROPOSED CONDITION
HYDROLOGY EXHIBIT

SHEET 3 OF 3

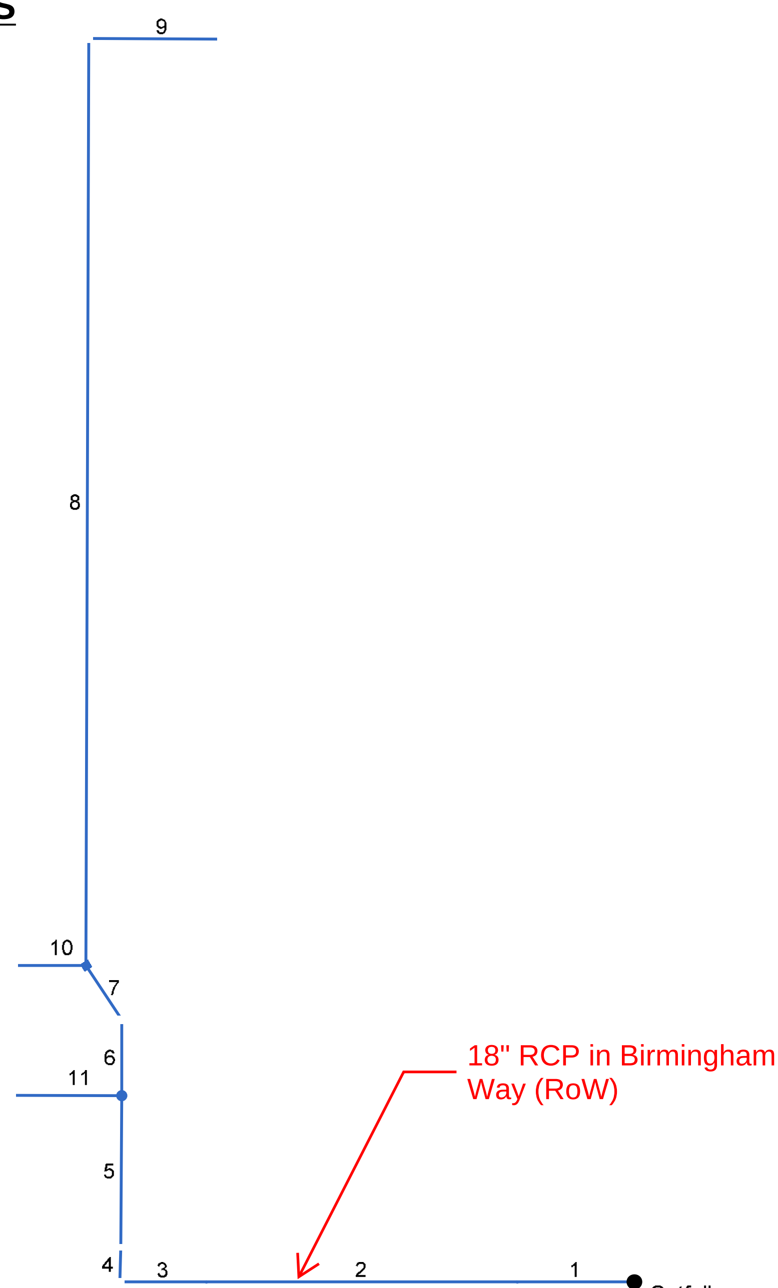
PLOT: W:\PROJECTS\9500\9545U.10.00 SHARP MMC\DWGS\EXHIBITS\DRAINAGE\9545U.10.00 HYDR-PROP-OVER.DWG MH GC 8/17/2022 4:00 PM

HYDRAULIC ANALYSIS

CUP PACKAGE (PACAKAGES 3A, 7, & 8) STORM DRAIN SYSTEM

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan

MITIGATED CONDITION ANALYSIS



Project File: SD Line-02 South-100yrMitigated.stm	Number of lines: 11	Date: 10/15/2021

Hydraulic Grade Line Computations

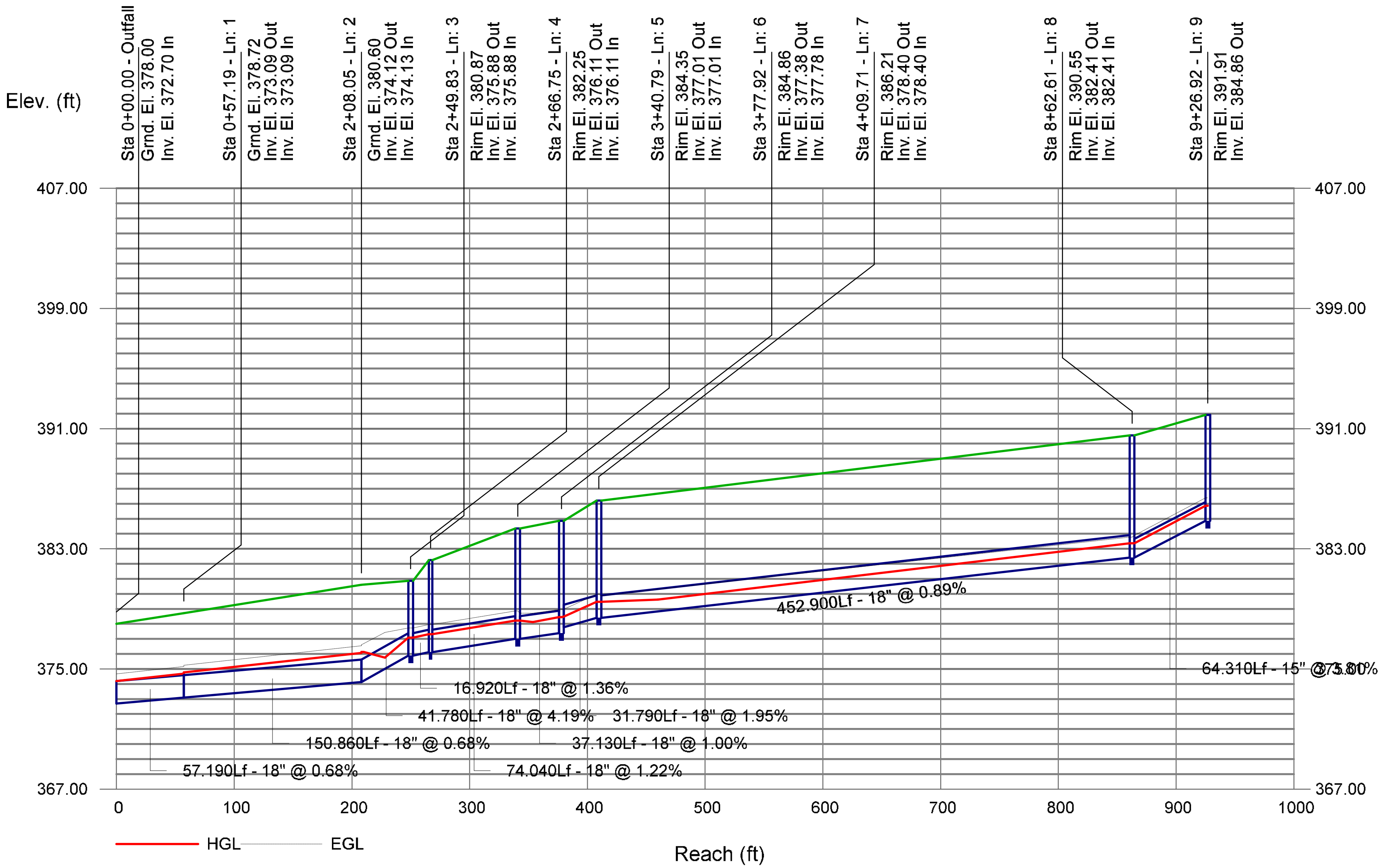
Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
11	15	2.10	377.01	378.21	1.20	0.55	1.73	0.22	378.44	0.000	52.240	378.11	378.69 j	0.58**	0.55	3.79	0.22	378.91	0.000	0.000	n/a	1.00	0.22
10	15	1.50	378.17	379.47	1.25	1.23	1.22	0.02	379.49	0.039	34.319	378.50	379.47	0.97	1.03	1.46	0.03	379.51	0.043	0.041	0.014	1.00	0.03
9	15	6.15	382.41	383.37	0.96	1.01	6.10	0.53	383.90	0.000	64.310	384.86	385.86	1.00**	1.05	5.84	0.53	386.39	0.000	0.000	n/a	1.00	0.53
8	18	6.15	378.40	379.47	1.07	1.19	4.56	0.41	379.89	0.000	452.900	382.41	383.37 j	0.96**	1.19	5.17	0.41	383.78	0.000	0.000	n/a	1.00	0.41
7	18	7.65	377.78	378.48	0.70*	0.81	9.50	0.50	378.98	0.000	31.790	378.40	379.47	1.07**	1.35	5.67	0.50	379.97	0.000	0.000	n/a	0.86	0.43
6	18	7.65	377.01	378.21	1.20	1.35	5.03	0.50	378.71	0.000	37.130	377.38	378.45 j	1.07**	1.35	5.67	0.50	378.95	0.000	0.000	n/a	0.62	0.31
5	18	9.75	376.11	377.31	1.20*	1.52	6.41	0.64	377.95	0.000	74.040	377.01	378.21	1.20**	1.52	6.41	0.64	378.85	0.000	0.000	n/a	1.00	0.64
4	18	9.75	375.88	377.08	1.20*	1.52	6.41	0.64	377.72	0.000	16.920	376.11	377.31	1.20**	1.52	6.41	0.64	377.95	0.000	0.000	n/a	0.50	0.32
3	18	9.75	374.13	376.14	1.50	1.52	5.52	0.47	376.61	0.862	41.780	375.88	377.08 j	1.20**	1.52	6.41	0.64	377.72	0.896	0.879	n/a	1.00	0.64
2	18	9.75	373.09	374.76	1.50	1.77	5.52	0.47	375.24	0.862	150.860	374.12	376.07	1.50	1.77	5.52	0.47	376.54	0.862	0.862	1.301	0.15	0.07
1	18	9.75	372.70	374.20	1.50	1.77	5.52	0.47	374.67	0.862	57.190	373.09	374.69	1.50	1.77	5.52	0.47	375.17	0.862	0.862	0.493	0.15	0.07

Project File: SD Line-02 South-100yrMitigated.stm | Number of lines: 11 | Run Date: 10/15/2021

Notes: * Normal depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

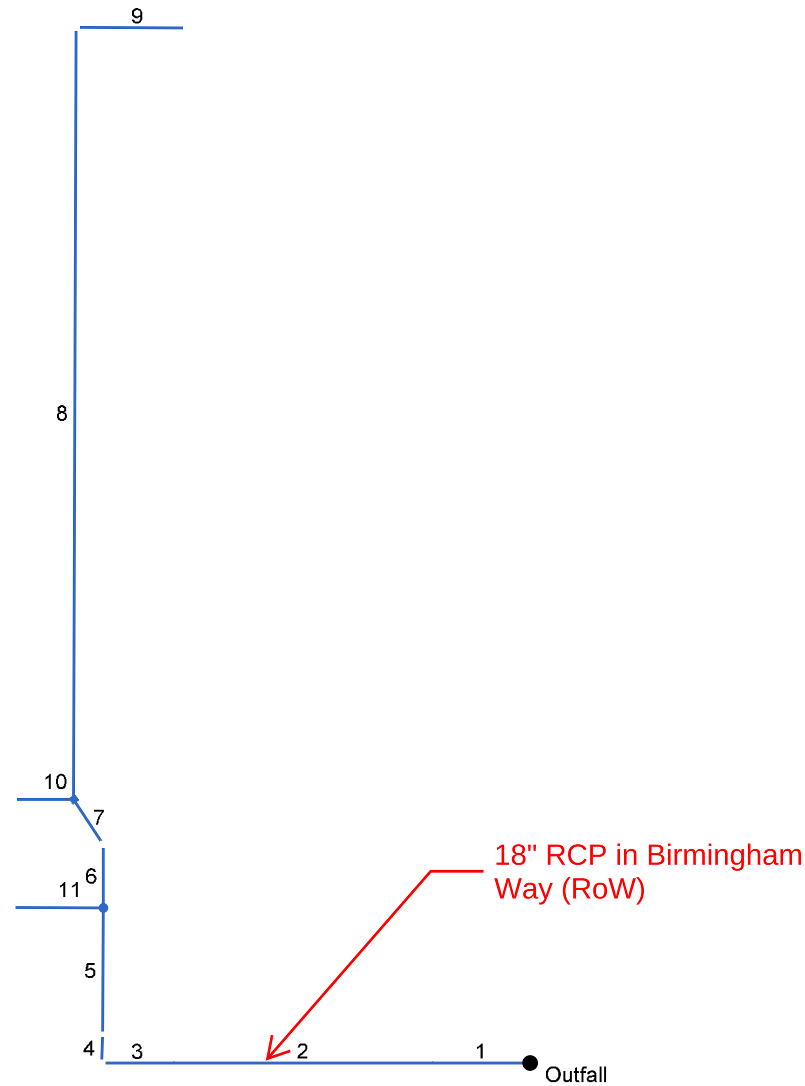
Storm Sewer Profile

Proj. file: SD Line-02 South-100yrMitigated.stm



Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan

UNMITIGATED CONDITION ANALYSIS



Project File: SD Line-02 South-100yrFull.stm	Number of lines: 11	Date: 10/15/2021

Hydraulic Grade Line Computations

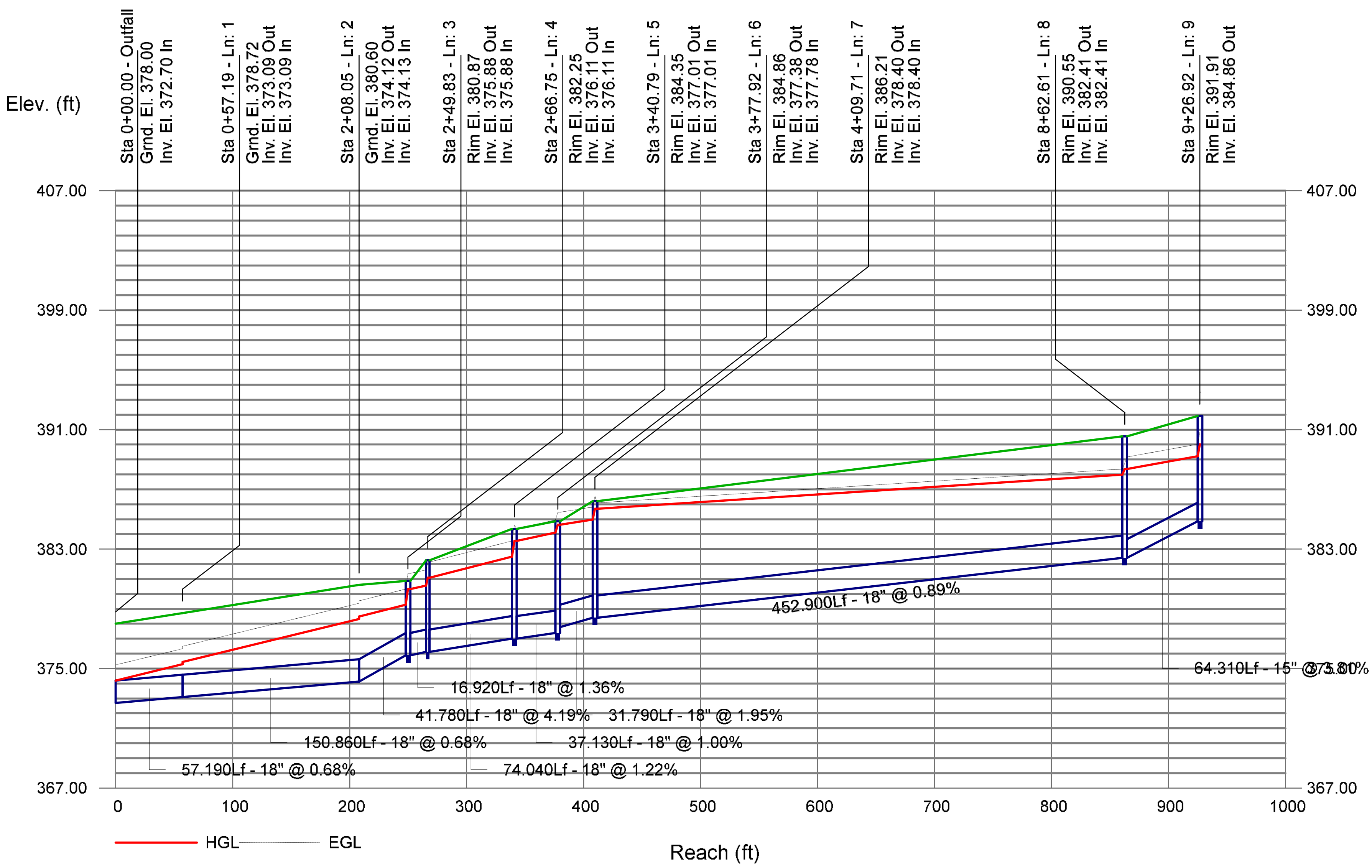
Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
	(in)	(cfs)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	(ft)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)	(K)	(ft)
11	15	1.50	377.01	383.54	1.25	1.23	1.22	0.02	383.56	0.039	52.240	378.11	383.56	1.25	1.23	1.22	0.02	383.58	0.039	0.039	0.020	1.00	0.02
10	15	4.20	378.17	385.70	1.25	1.23	3.42	0.18	385.89	0.303	34.319	378.50	385.81	1.25	1.23	3.42	0.18	385.99	0.303	0.303	0.104	1.00	0.18
9	15	8.80	382.41	388.37	1.25	1.23	7.17	0.80	389.17	1.330	64.310	384.86	389.22	1.25	1.23	7.17	0.80	390.02	1.330	1.330	0.855	1.00	0.80
8	18	8.80	378.40	385.70	1.50	1.77	4.98	0.39	386.09	0.503	452.900	382.41	387.98	1.50	1.77	4.98	0.39	388.37	0.503	0.503	2.278	1.00	0.39
7	18	13.00	377.78	384.63	1.50	1.77	7.36	0.84	385.47	1.098	31.790	378.40	384.98	1.50	1.77	7.36	0.84	385.82	1.097	1.098	0.349	0.86	0.72
6	18	13.00	377.01	383.54	1.50	1.77	7.36	0.84	384.38	1.533	37.130	377.38	384.11	1.50	1.77	7.36	0.84	384.95	1.533	1.533	0.569	0.62	0.52
5	18	14.50	376.11	381.08	1.50	1.77	8.21	1.05	382.13	1.907	74.040	377.01	382.49	1.50	1.77	8.21	1.05	383.54	1.907	1.907	1.412	1.00	1.05
4	18	14.50	375.88	380.33	1.50	1.77	8.21	1.05	381.37	1.366	16.920	376.11	380.56	1.50	1.77	8.21	1.05	381.60	1.365	1.365	0.231	0.50	0.52
3	18	14.50	374.13	378.48	1.50	1.77	8.21	1.05	379.53	1.907	41.780	375.88	379.28	1.50	1.77	8.21	1.05	380.33	1.907	1.907	0.797	1.00	1.05
2	18	14.50	373.09	375.45	1.50	1.77	8.21	1.05	376.50	1.907	150.860	374.12	378.33	1.50	1.77	8.21	1.05	379.37	1.907	1.907	2.877	0.15	0.16
1	18	14.50	372.70	374.20	1.50	1.77	8.21	1.05	375.25	1.907	57.190	373.09	375.29	1.50	1.77	8.21	1.05	376.34	1.907	1.907	1.091	0.15	0.16

Project File: SD Line-02 South-100yrFull.stm | Number of lines: 11 | Run Date: 10/15/2021

; c = cir e = ellip b = box

Storm Sewer Profile

Proj. file: SD Line-02 South-100yrFull.stm



Storm Sewers

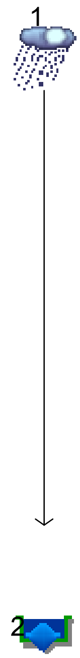
RATIONAL METHOD HYDROGRAPH PROGRAM

RUN DATE 12/23/2021
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 7 MIN.
6 HOUR RAINFALL 2.5 INCHES
BASIN AREA 2.83 ACRES
RUNOFF COEFFICIENT 0.86
PEAK DISCHARGE 9.4 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 7	DISCHARGE (CFS) = 0.4
TIME (MIN) = 14	DISCHARGE (CFS) = 0.4
TIME (MIN) = 21	DISCHARGE (CFS) = 0.4
TIME (MIN) = 28	DISCHARGE (CFS) = 0.4
TIME (MIN) = 35	DISCHARGE (CFS) = 0.4
TIME (MIN) = 42	DISCHARGE (CFS) = 0.4
TIME (MIN) = 49	DISCHARGE (CFS) = 0.4
TIME (MIN) = 56	DISCHARGE (CFS) = 0.4
TIME (MIN) = 63	DISCHARGE (CFS) = 0.4
TIME (MIN) = 70	DISCHARGE (CFS) = 0.4
TIME (MIN) = 77	DISCHARGE (CFS) = 0.5
TIME (MIN) = 84	DISCHARGE (CFS) = 0.5
TIME (MIN) = 91	DISCHARGE (CFS) = 0.5
TIME (MIN) = 98	DISCHARGE (CFS) = 0.5
TIME (MIN) = 105	DISCHARGE (CFS) = 0.5
TIME (MIN) = 112	DISCHARGE (CFS) = 0.5
TIME (MIN) = 119	DISCHARGE (CFS) = 0.6
TIME (MIN) = 126	DISCHARGE (CFS) = 0.6
TIME (MIN) = 133	DISCHARGE (CFS) = 0.6
TIME (MIN) = 140	DISCHARGE (CFS) = 0.6
TIME (MIN) = 147	DISCHARGE (CFS) = 0.7
TIME (MIN) = 154	DISCHARGE (CFS) = 0.7
TIME (MIN) = 161	DISCHARGE (CFS) = 0.7
TIME (MIN) = 168	DISCHARGE (CFS) = 0.8
TIME (MIN) = 175	DISCHARGE (CFS) = 0.8
TIME (MIN) = 182	DISCHARGE (CFS) = 0.9
TIME (MIN) = 189	DISCHARGE (CFS) = 0.9
TIME (MIN) = 196	DISCHARGE (CFS) = 1
TIME (MIN) = 203	DISCHARGE (CFS) = 1.2
TIME (MIN) = 210	DISCHARGE (CFS) = 1.2
TIME (MIN) = 217	DISCHARGE (CFS) = 1.5
TIME (MIN) = 224	DISCHARGE (CFS) = 1.7
TIME (MIN) = 231	DISCHARGE (CFS) = 2.6
TIME (MIN) = 238	DISCHARGE (CFS) = 7.1
TIME (MIN) = 245	DISCHARGE (CFS) = 9.4
TIME (MIN) = 252	DISCHARGE (CFS) = 2
TIME (MIN) = 259	DISCHARGE (CFS) = 1.4
TIME (MIN) = 266	DISCHARGE (CFS) = 1.1
TIME (MIN) = 273	DISCHARGE (CFS) = 0.9
TIME (MIN) = 280	DISCHARGE (CFS) = 0.8
TIME (MIN) = 287	DISCHARGE (CFS) = 0.7
TIME (MIN) = 294	DISCHARGE (CFS) = 0.6
TIME (MIN) = 301	DISCHARGE (CFS) = 0.6
TIME (MIN) = 308	DISCHARGE (CFS) = 0.5
TIME (MIN) = 315	DISCHARGE (CFS) = 0.5
TIME (MIN) = 322	DISCHARGE (CFS) = 0.5
TIME (MIN) = 329	DISCHARGE (CFS) = 0.5
TIME (MIN) = 336	DISCHARGE (CFS) = 0.4
TIME (MIN) = 343	DISCHARGE (CFS) = 0.4
TIME (MIN) = 350	DISCHARGE (CFS) = 0.4
TIME (MIN) = 357	DISCHARGE (CFS) = 0.4
TIME (MIN) = 364	DISCHARGE (CFS) = 0

Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022



Legend

Hyd.	Origin	Description
1	Manual	hydrograph 1
2	Reservoir	Detention 1

Project: Det-CUP pk3A BMP 3_Calcs yr100.gpw

Thursday, 12 / 23 / 2021

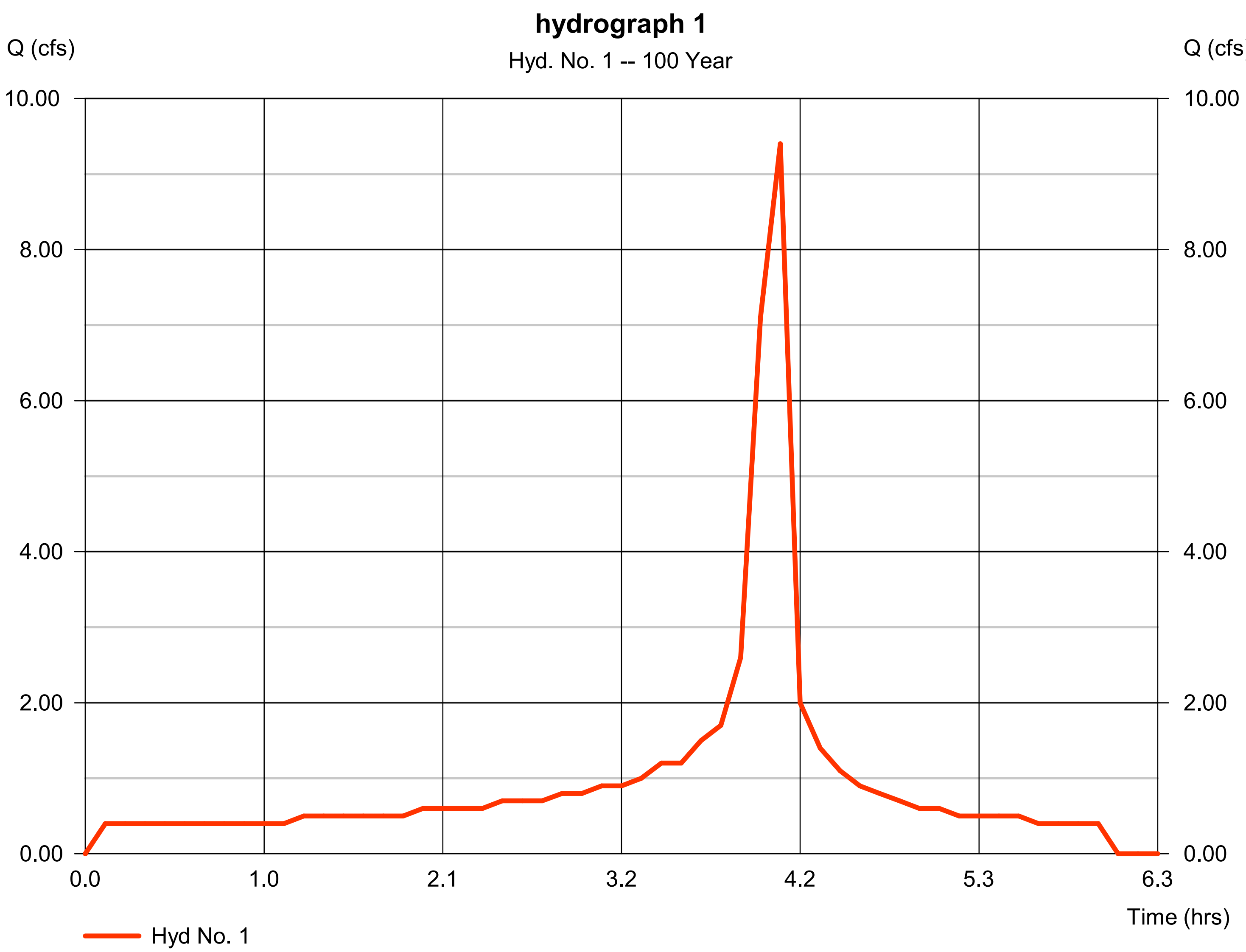
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Thursday, 12 / 23 / 2021

Hyd. No. 1

hydrograph 1

Hydrograph type	= Manual	Peak discharge	= 9.400 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.08 hrs
Time interval	= 7 min	Hyd. volume	= 21,966 cuft



Hydrograph Report

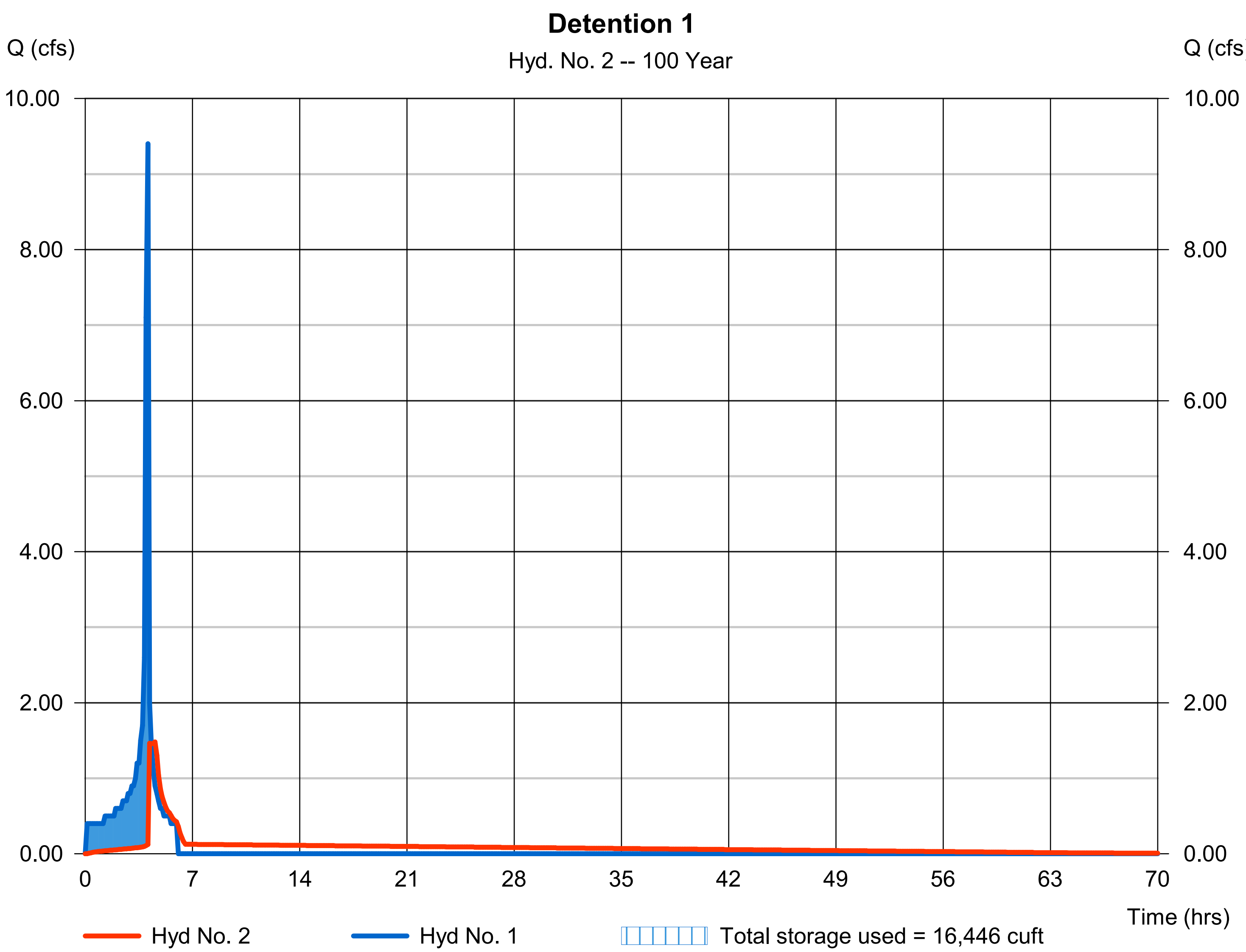
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Thursday, 12 / 23 / 2021

Hyd. No. 2

Detention 1

Hydrograph type	= Reservoir	Peak discharge	= 1.481 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.55 hrs
Time interval	= 7 min	Hyd. volume	= 21,932 cuft
Inflow hyd. No.	= 1 - hydrograph 1	Max. Elevation	= 103.80 ft
Reservoir name	= Det-CUP pk7-BMP #3	Max. Storage	= 16,446 cuft

Storage Indication method used.



Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Thursday, 12 / 23 / 2021

Pond No. 1 - Det-CUP pk7-BMP #3

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 100.00 ft. Voids = 95.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	4,450	0	0
1.00	101.00	4,450	4,228	4,228
2.00	102.00	4,450	4,228	8,455
3.00	103.00	4,450	4,228	12,683
4.00	104.00	4,450	4,228	16,910

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 18.00	1.62	Inactive	Inactive
Span (in)	= 18.00	1.62	0.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 100.00	100.00	0.00	0.00
Length (ft)	= 10.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.30	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 2.50	Inactive	Inactive	Inactive
Crest El. (ft)	= 103.50	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= 1	Rect	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	100.00	0.00	0.00	---	---	0.00	---	---	---	---	---	0.000
1.00	4,228	101.00	0.07 ic	0.07 ic	---	---	0.00	---	---	---	---	---	0.065
2.00	8,455	102.00	0.10 ic	0.09 ic	---	---	0.00	---	---	---	---	---	0.094
3.00	12,683	103.00	0.12 ic	0.12 ic	---	---	0.00	---	---	---	---	---	0.116
4.00	16,910	104.00	1.62 oc	0.13 ic	---	---	1.49 ic	---	---	---	---	---	1.610

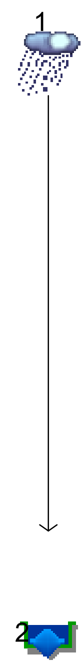
RATIONAL METHOD HYDROGRAPH PROGRAM

RUN DATE 12/23/2021
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 7 MIN.
6 HOUR RAINFALL 2.5 INCHES
BASIN AREA 0.87 ACRES
RUNOFF COEFFICIENT 0.86
PEAK DISCHARGE 2.85 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 7	DISCHARGE (CFS) = 0.1
TIME (MIN) = 14	DISCHARGE (CFS) = 0.1
TIME (MIN) = 21	DISCHARGE (CFS) = 0.1
TIME (MIN) = 28	DISCHARGE (CFS) = 0.1
TIME (MIN) = 35	DISCHARGE (CFS) = 0.1
TIME (MIN) = 42	DISCHARGE (CFS) = 0.1
TIME (MIN) = 49	DISCHARGE (CFS) = 0.1
TIME (MIN) = 56	DISCHARGE (CFS) = 0.1
TIME (MIN) = 63	DISCHARGE (CFS) = 0.1
TIME (MIN) = 70	DISCHARGE (CFS) = 0.1
TIME (MIN) = 77	DISCHARGE (CFS) = 0.1
TIME (MIN) = 84	DISCHARGE (CFS) = 0.1
TIME (MIN) = 91	DISCHARGE (CFS) = 0.1
TIME (MIN) = 98	DISCHARGE (CFS) = 0.2
TIME (MIN) = 105	DISCHARGE (CFS) = 0.2
TIME (MIN) = 112	DISCHARGE (CFS) = 0.2
TIME (MIN) = 119	DISCHARGE (CFS) = 0.2
TIME (MIN) = 126	DISCHARGE (CFS) = 0.2
TIME (MIN) = 133	DISCHARGE (CFS) = 0.2
TIME (MIN) = 140	DISCHARGE (CFS) = 0.2
TIME (MIN) = 147	DISCHARGE (CFS) = 0.2
TIME (MIN) = 154	DISCHARGE (CFS) = 0.2
TIME (MIN) = 161	DISCHARGE (CFS) = 0.2
TIME (MIN) = 168	DISCHARGE (CFS) = 0.2
TIME (MIN) = 175	DISCHARGE (CFS) = 0.3
TIME (MIN) = 182	DISCHARGE (CFS) = 0.3
TIME (MIN) = 189	DISCHARGE (CFS) = 0.3
TIME (MIN) = 196	DISCHARGE (CFS) = 0.3
TIME (MIN) = 203	DISCHARGE (CFS) = 0.4
TIME (MIN) = 210	DISCHARGE (CFS) = 0.4
TIME (MIN) = 217	DISCHARGE (CFS) = 0.5
TIME (MIN) = 224	DISCHARGE (CFS) = 0.5
TIME (MIN) = 231	DISCHARGE (CFS) = 0.8
TIME (MIN) = 238	DISCHARGE (CFS) = 2.2
TIME (MIN) = 245	DISCHARGE (CFS) = 2.85
TIME (MIN) = 252	DISCHARGE (CFS) = 0.6
TIME (MIN) = 259	DISCHARGE (CFS) = 0.4
TIME (MIN) = 266	DISCHARGE (CFS) = 0.3
TIME (MIN) = 273	DISCHARGE (CFS) = 0.3
TIME (MIN) = 280	DISCHARGE (CFS) = 0.2
TIME (MIN) = 287	DISCHARGE (CFS) = 0.2
TIME (MIN) = 294	DISCHARGE (CFS) = 0.2
TIME (MIN) = 301	DISCHARGE (CFS) = 0.2
TIME (MIN) = 308	DISCHARGE (CFS) = 0.2
TIME (MIN) = 315	DISCHARGE (CFS) = 0.2
TIME (MIN) = 322	DISCHARGE (CFS) = 0.1
TIME (MIN) = 329	DISCHARGE (CFS) = 0.1
TIME (MIN) = 336	DISCHARGE (CFS) = 0.1
TIME (MIN) = 343	DISCHARGE (CFS) = 0.1
TIME (MIN) = 350	DISCHARGE (CFS) = 0.1
TIME (MIN) = 357	DISCHARGE (CFS) = 0.1
TIME (MIN) = 364	DISCHARGE (CFS) = 0

Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022



Legend

Hyd.	Origin	Description
1	Manual	hydrograph 1
2	Reservoir	Detention 1

Project: Det-CUP pk3A BMP 4_Calcs yr100.gpw

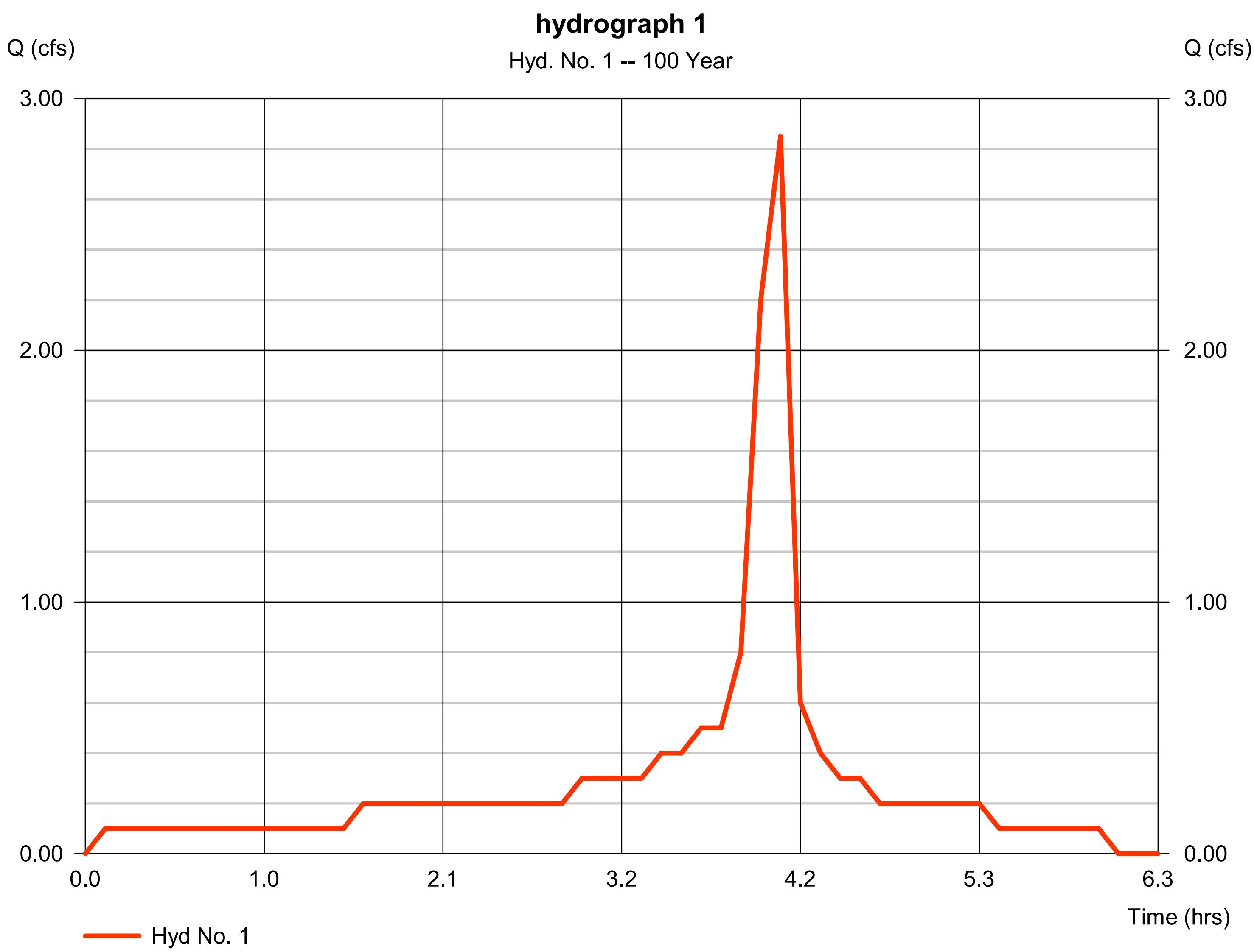
Thursday, 12 / 23 / 2021

Hydrograph Report

Hyd. No. 1

hydrograph 1

Hydrograph type	= Manual	Peak discharge	= 2.850 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.08 hrs
Time interval	= 7 min	Hyd. volume	= 6,615 cuft



Hydrograph Report

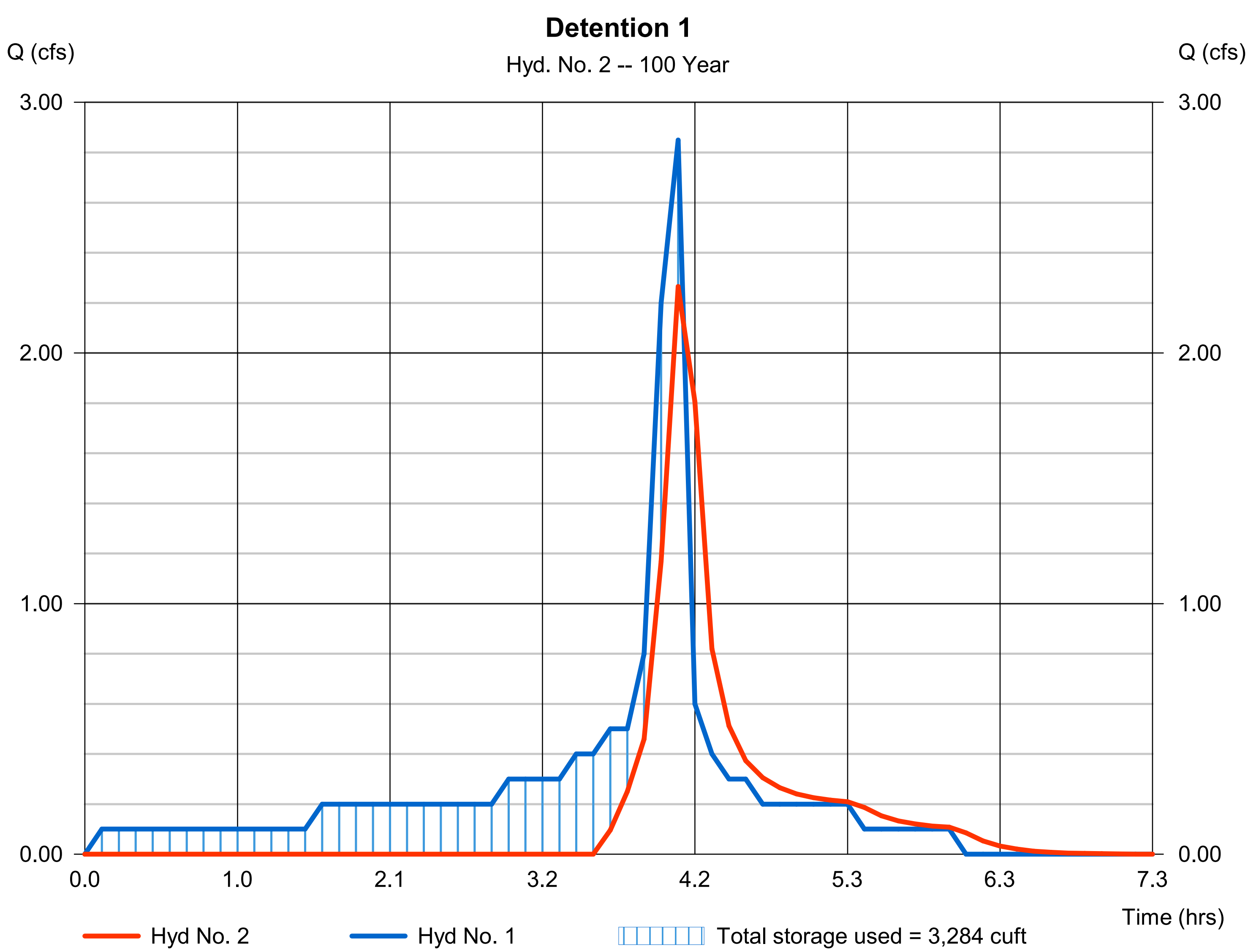
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Thursday, 12 / 23 / 2021

Hyd. No. 2

Detention 1

Hydrograph type	= Reservoir	Peak discharge	= 2.265 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.08 hrs
Time interval	= 7 min	Hyd. volume	= 4,305 cuft
Inflow hyd. No.	= 1 - hydrograph 1	Max. Elevation	= 382.44 ft
Reservoir name	= Det-CUP Pk3A-BMP #4	Max. Storage	= 3,284 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - Det-CUP Pk3A-BMP #4

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 381.11 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	381.11	1,985	0	0
0.89	382.00	2,555	2,020	2,020
1.89	383.00	3,220	2,887	4,908

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 15.00	Inactive	Inactive	Inactive
Span (in)	= 15.00	0.00	0.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 100.00	100.00	0.00	0.00
Length (ft)	= 10.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.30	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 3.60	Inactive	Inactive	Inactive
Crest El. (ft)	= 382.11	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= 1	Rect	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	381.11	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.89	2,020	382.00	98.95 ic	---	---	---	0.00	---	---	---	---	---	0.000
1.89	4,908	383.00	98.95 ic	---	---	---	4.11 ic	---	---	---	---	---	4.109

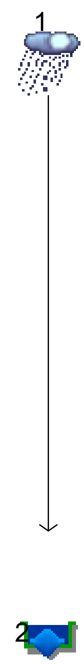
RATIONAL METHOD HYDROGRAPH PROGRAM

RUN DATE 12/23/2021
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 6 MIN.
6 HOUR RAINFALL 2.5 INCHES
BASIN AREA 0.53 ACRES
RUNOFF COEFFICIENT 0.86
PEAK DISCHARGE 2 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 6	DISCHARGE (CFS) = 0.1
TIME (MIN) = 12	DISCHARGE (CFS) = 0.1
TIME (MIN) = 18	DISCHARGE (CFS) = 0.1
TIME (MIN) = 24	DISCHARGE (CFS) = 0.1
TIME (MIN) = 30	DISCHARGE (CFS) = 0.1
TIME (MIN) = 36	DISCHARGE (CFS) = 0.1
TIME (MIN) = 42	DISCHARGE (CFS) = 0.1
TIME (MIN) = 48	DISCHARGE (CFS) = 0.1
TIME (MIN) = 54	DISCHARGE (CFS) = 0.1
TIME (MIN) = 60	DISCHARGE (CFS) = 0.1
TIME (MIN) = 66	DISCHARGE (CFS) = 0.1
TIME (MIN) = 72	DISCHARGE (CFS) = 0.1
TIME (MIN) = 78	DISCHARGE (CFS) = 0.1
TIME (MIN) = 84	DISCHARGE (CFS) = 0.1
TIME (MIN) = 90	DISCHARGE (CFS) = 0.1
TIME (MIN) = 96	DISCHARGE (CFS) = 0.1
TIME (MIN) = 102	DISCHARGE (CFS) = 0.1
TIME (MIN) = 108	DISCHARGE (CFS) = 0.1
TIME (MIN) = 114	DISCHARGE (CFS) = 0.1
TIME (MIN) = 120	DISCHARGE (CFS) = 0.1
TIME (MIN) = 126	DISCHARGE (CFS) = 0.1
TIME (MIN) = 132	DISCHARGE (CFS) = 0.1
TIME (MIN) = 138	DISCHARGE (CFS) = 0.1
TIME (MIN) = 144	DISCHARGE (CFS) = 0.1
TIME (MIN) = 150	DISCHARGE (CFS) = 0.1
TIME (MIN) = 156	DISCHARGE (CFS) = 0.1
TIME (MIN) = 162	DISCHARGE (CFS) = 0.1
TIME (MIN) = 168	DISCHARGE (CFS) = 0.1
TIME (MIN) = 174	DISCHARGE (CFS) = 0.1
TIME (MIN) = 180	DISCHARGE (CFS) = 0.2
TIME (MIN) = 186	DISCHARGE (CFS) = 0.2
TIME (MIN) = 192	DISCHARGE (CFS) = 0.2
TIME (MIN) = 198	DISCHARGE (CFS) = 0.2
TIME (MIN) = 204	DISCHARGE (CFS) = 0.2
TIME (MIN) = 210	DISCHARGE (CFS) = 0.2
TIME (MIN) = 216	DISCHARGE (CFS) = 0.3
TIME (MIN) = 222	DISCHARGE (CFS) = 0.3
TIME (MIN) = 228	DISCHARGE (CFS) = 0.4
TIME (MIN) = 234	DISCHARGE (CFS) = 0.5
TIME (MIN) = 240	DISCHARGE (CFS) = 1.4
TIME (MIN) = 246	DISCHARGE (CFS) = 2
TIME (MIN) = 252	DISCHARGE (CFS) = 0.4
TIME (MIN) = 258	DISCHARGE (CFS) = 0.3
TIME (MIN) = 264	DISCHARGE (CFS) = 0.2
TIME (MIN) = 270	DISCHARGE (CFS) = 0.2
TIME (MIN) = 276	DISCHARGE (CFS) = 0.2
TIME (MIN) = 282	DISCHARGE (CFS) = 0.1
TIME (MIN) = 288	DISCHARGE (CFS) = 0.1
TIME (MIN) = 294	DISCHARGE (CFS) = 0.1
TIME (MIN) = 300	DISCHARGE (CFS) = 0.1
TIME (MIN) = 306	DISCHARGE (CFS) = 0.1
TIME (MIN) = 312	DISCHARGE (CFS) = 0.1
TIME (MIN) = 318	DISCHARGE (CFS) = 0.1
TIME (MIN) = 324	DISCHARGE (CFS) = 0.1
TIME (MIN) = 330	DISCHARGE (CFS) = 0.1
TIME (MIN) = 336	DISCHARGE (CFS) = 0.1
TIME (MIN) = 342	DISCHARGE (CFS) = 0.1
TIME (MIN) = 348	DISCHARGE (CFS) = 0.1
TIME (MIN) = 354	DISCHARGE (CFS) = 0.1
TIME (MIN) = 360	DISCHARGE (CFS) = 0.1
TIME (MIN) = 366	DISCHARGE (CFS) = 0

Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022



Legend

Hyd.	Origin	Description
1	Manual	hydrograph 1
2	Reservoir	Detention 1

Project: Det-CUP pk7A BMP 10_Calcs yr100.gpw	Thursday, 12 / 23 / 2021

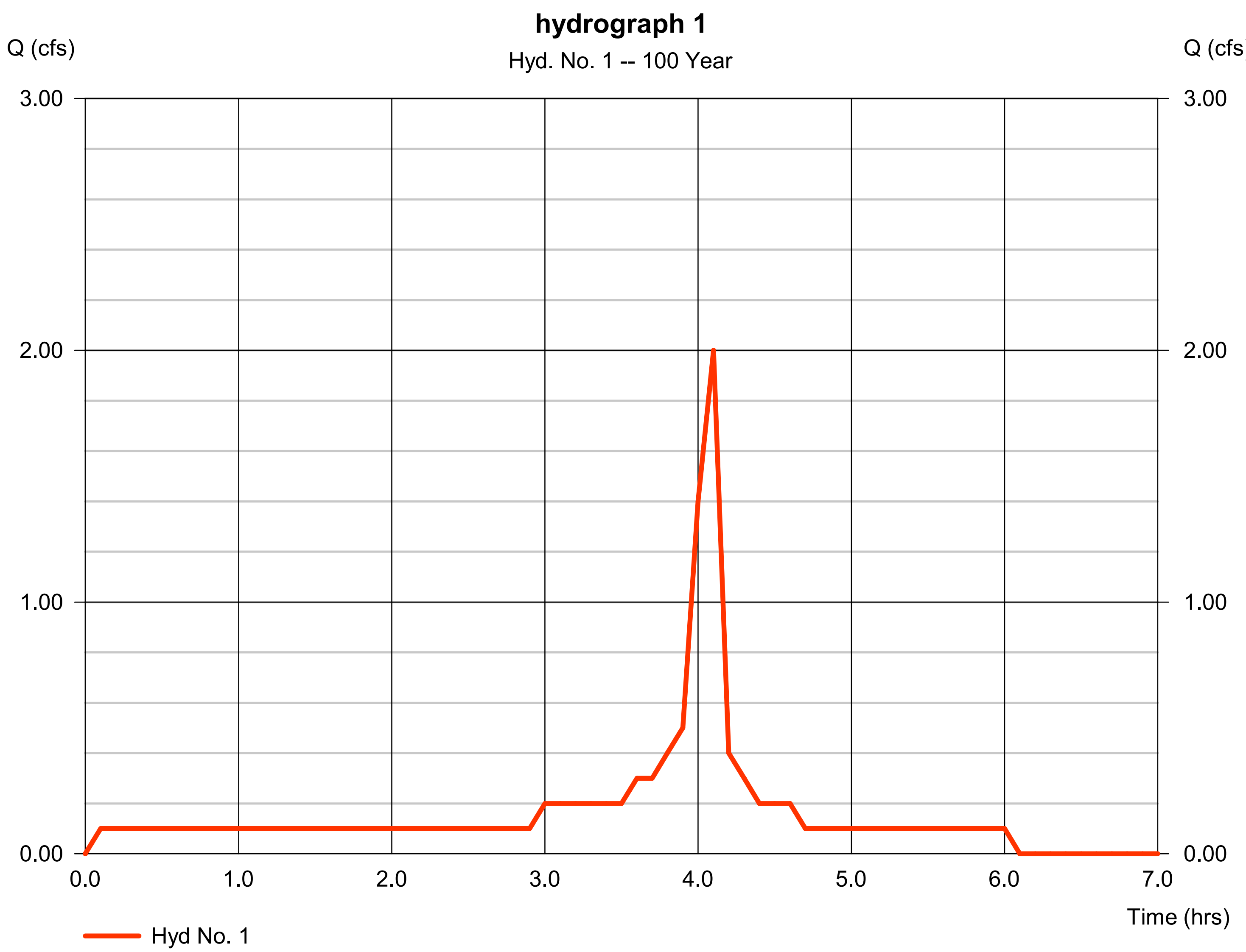
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Thursday, 12 / 23 / 2021

Hyd. No. 1

hydrograph 1

Hydrograph type	= Manual	Peak discharge	= 2.000 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.10 hrs
Time interval	= 6 min	Hyd. volume	= 4,212 cuft



Hydrograph Report

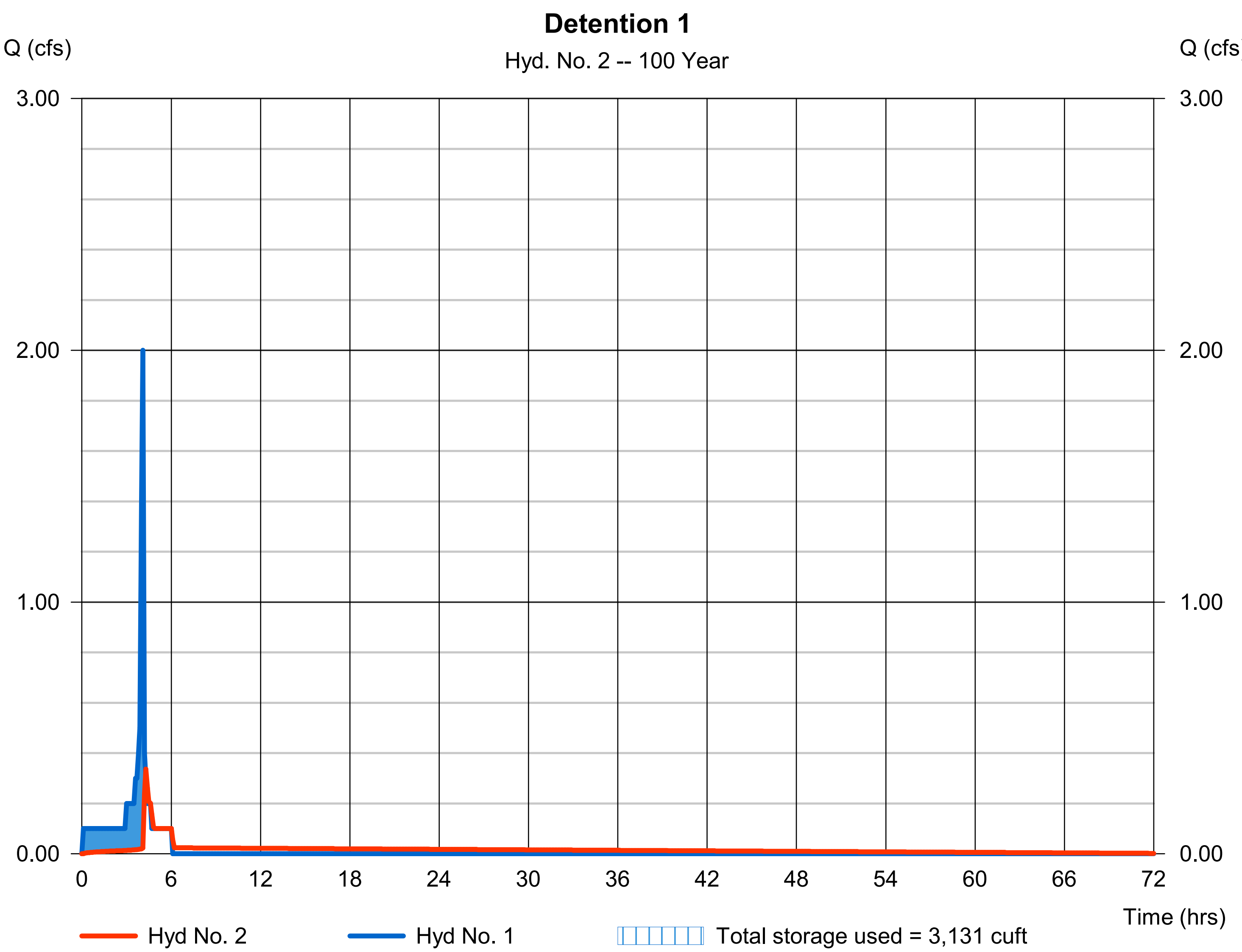
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Thursday, 12 / 23 / 2021

Hyd. No. 2

Detention 1

Hydrograph type	= Reservoir	Peak discharge	= 0.336 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.30 hrs
Time interval	= 6 min	Hyd. volume	= 4,186 cuft
Inflow hyd. No.	= 1 - hydrograph 1	Max. Elevation	= 103.58 ft
Reservoir name	= Det-CUP Pk7A-BMP 10	Max. Storage	= 3,131 cuft

Storage Indication method used.



Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Thursday, 12 / 23 / 2021

Pond No. 1 - Det-CUP Pk7A-BMP 10

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 100.00 ft. Voids = 95.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	920	0	0
1.00	101.00	920	874	874
2.00	102.00	920	874	1,748
3.00	103.00	920	874	2,622
4.00	104.00	920	874	3,496

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	0.70	Inactive	Inactive
Span (in)	= 12.00	0.70	0.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 100.00	100.00	0.00	0.00
Length (ft)	= 10.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.30	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 3.60	Inactive	Inactive	Inactive
Crest El. (ft)	= 103.50	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= 1	Rect	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	100.00	0.00	0.00	---	---	0.00	---	---	---	---	---	0.000
1.00	874	101.00	0.01 ic	0.01 ic	---	---	0.00	---	---	---	---	---	0.013
2.00	1,748	102.00	0.02 ic	0.02 ic	---	---	0.00	---	---	---	---	---	0.018
3.00	2,622	103.00	0.02 ic	0.02 ic	---	---	0.00	---	---	---	---	---	0.022
4.00	3,496	104.00	3.10 oc	0.02 ic	---	---	3.08 ic	---	---	---	---	---	3.101

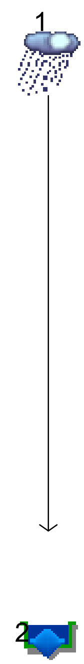
RATIONAL METHOD HYDROGRAPH PROGRAM

RUN DATE 12/23/2021
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 5 MIN.
6 HOUR RAINFALL 2.5 INCHES
BASIN AREA 0.95 ACRES
RUNOFF COEFFICIENT 0.85
PEAK DISCHARGE 3.55 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 5	DISCHARGE (CFS) = 0.1
TIME (MIN) = 10	DISCHARGE (CFS) = 0.1
TIME (MIN) = 15	DISCHARGE (CFS) = 0.1
TIME (MIN) = 20	DISCHARGE (CFS) = 0.1
TIME (MIN) = 25	DISCHARGE (CFS) = 0.1
TIME (MIN) = 30	DISCHARGE (CFS) = 0.1
TIME (MIN) = 35	DISCHARGE (CFS) = 0.1
TIME (MIN) = 40	DISCHARGE (CFS) = 0.1
TIME (MIN) = 45	DISCHARGE (CFS) = 0.1
TIME (MIN) = 50	DISCHARGE (CFS) = 0.1
TIME (MIN) = 55	DISCHARGE (CFS) = 0.1
TIME (MIN) = 60	DISCHARGE (CFS) = 0.1
TIME (MIN) = 65	DISCHARGE (CFS) = 0.1
TIME (MIN) = 70	DISCHARGE (CFS) = 0.1
TIME (MIN) = 75	DISCHARGE (CFS) = 0.2
TIME (MIN) = 80	DISCHARGE (CFS) = 0.2
TIME (MIN) = 85	DISCHARGE (CFS) = 0.2
TIME (MIN) = 90	DISCHARGE (CFS) = 0.2
TIME (MIN) = 95	DISCHARGE (CFS) = 0.2
TIME (MIN) = 100	DISCHARGE (CFS) = 0.2
TIME (MIN) = 105	DISCHARGE (CFS) = 0.2
TIME (MIN) = 110	DISCHARGE (CFS) = 0.2
TIME (MIN) = 115	DISCHARGE (CFS) = 0.2
TIME (MIN) = 120	DISCHARGE (CFS) = 0.2
TIME (MIN) = 125	DISCHARGE (CFS) = 0.2
TIME (MIN) = 130	DISCHARGE (CFS) = 0.2
TIME (MIN) = 135	DISCHARGE (CFS) = 0.2
TIME (MIN) = 140	DISCHARGE (CFS) = 0.2
TIME (MIN) = 145	DISCHARGE (CFS) = 0.2
TIME (MIN) = 150	DISCHARGE (CFS) = 0.2
TIME (MIN) = 155	DISCHARGE (CFS) = 0.2
TIME (MIN) = 160	DISCHARGE (CFS) = 0.2
TIME (MIN) = 165	DISCHARGE (CFS) = 0.2
TIME (MIN) = 170	DISCHARGE (CFS) = 0.3
TIME (MIN) = 175	DISCHARGE (CFS) = 0.3
TIME (MIN) = 180	DISCHARGE (CFS) = 0.3
TIME (MIN) = 185	DISCHARGE (CFS) = 0.3
TIME (MIN) = 190	DISCHARGE (CFS) = 0.3
TIME (MIN) = 195	DISCHARGE (CFS) = 0.3
TIME (MIN) = 200	DISCHARGE (CFS) = 0.4
TIME (MIN) = 205	DISCHARGE (CFS) = 0.4
TIME (MIN) = 210	DISCHARGE (CFS) = 0.4
TIME (MIN) = 215	DISCHARGE (CFS) = 0.5
TIME (MIN) = 220	DISCHARGE (CFS) = 0.5
TIME (MIN) = 225	DISCHARGE (CFS) = 0.6
TIME (MIN) = 230	DISCHARGE (CFS) = 0.7
TIME (MIN) = 235	DISCHARGE (CFS) = 1.1
TIME (MIN) = 240	DISCHARGE (CFS) = 3.3
TIME (MIN) = 245	DISCHARGE (CFS) = 3.55
TIME (MIN) = 250	DISCHARGE (CFS) = 0.8
TIME (MIN) = 255	DISCHARGE (CFS) = 0.6
TIME (MIN) = 260	DISCHARGE (CFS) = 0.4
TIME (MIN) = 265	DISCHARGE (CFS) = 0.4
TIME (MIN) = 270	DISCHARGE (CFS) = 0.3
TIME (MIN) = 275	DISCHARGE (CFS) = 0.3
TIME (MIN) = 280	DISCHARGE (CFS) = 0.3
TIME (MIN) = 285	DISCHARGE (CFS) = 0.2
TIME (MIN) = 290	DISCHARGE (CFS) = 0.2
TIME (MIN) = 295	DISCHARGE (CFS) = 0.2
TIME (MIN) = 300	DISCHARGE (CFS) = 0.2
TIME (MIN) = 305	DISCHARGE (CFS) = 0.2
TIME (MIN) = 310	DISCHARGE (CFS) = 0.2
TIME (MIN) = 315	DISCHARGE (CFS) = 0.2
TIME (MIN) = 320	DISCHARGE (CFS) = 0.2
TIME (MIN) = 325	DISCHARGE (CFS) = 0.2
TIME (MIN) = 330	DISCHARGE (CFS) = 0.1
TIME (MIN) = 335	DISCHARGE (CFS) = 0.1
TIME (MIN) = 340	DISCHARGE (CFS) = 0.1
TIME (MIN) = 345	DISCHARGE (CFS) = 0.1
TIME (MIN) = 350	DISCHARGE (CFS) = 0.1
TIME (MIN) = 355	DISCHARGE (CFS) = 0.1
TIME (MIN) = 360	DISCHARGE (CFS) = 0.1
TIME (MIN) = 365	DISCHARGE (CFS) = 0

Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022



Legend

Hyd.	**Origin**	**Description**
1	Manual	hydrograph 1
2	Reservoir	Detention 1

Project: Det-PK 8 BMP 12_Calcs yr100.gpw	Thursday, 12 / 23 / 2021

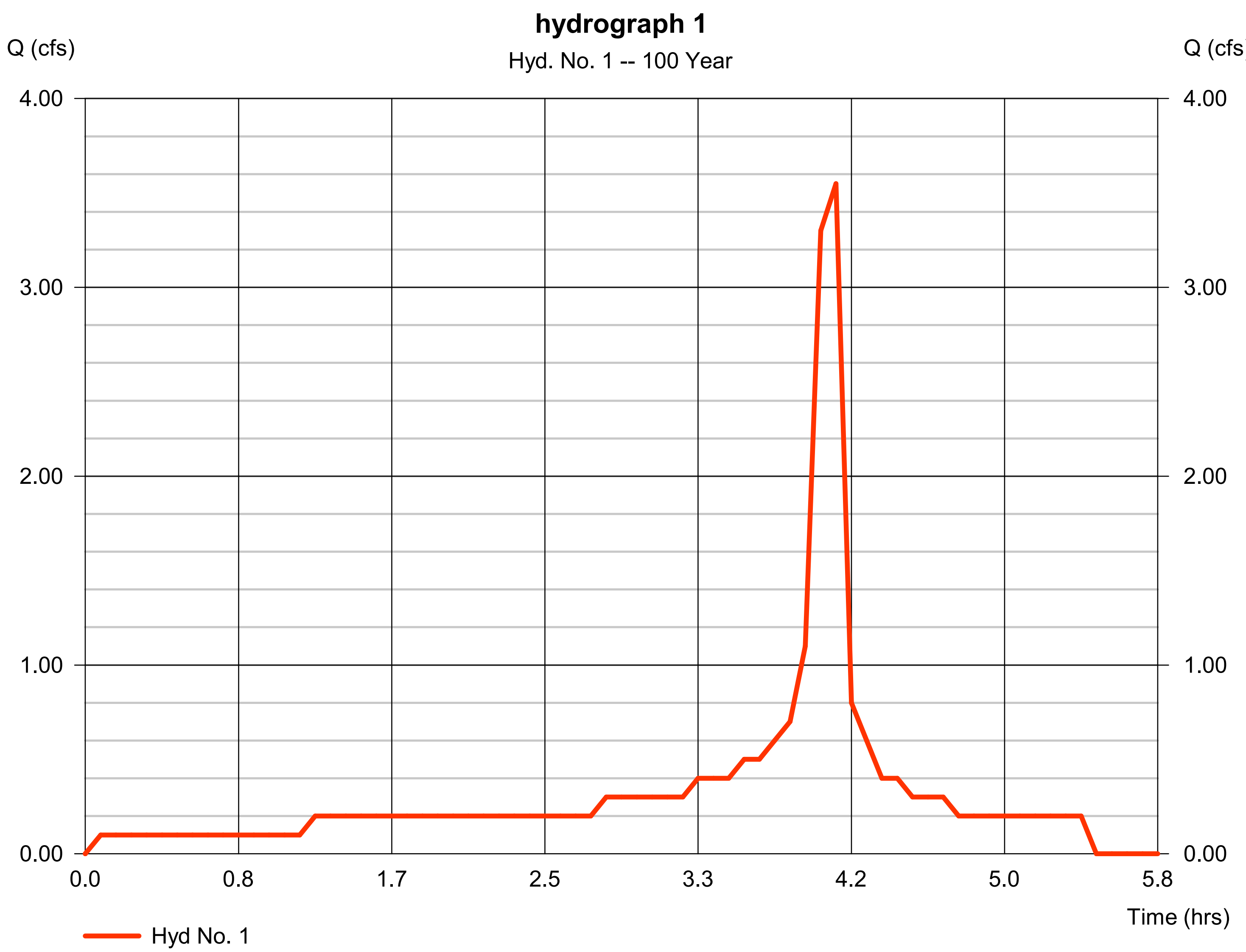
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Thursday, 12 / 23 / 2021

Hyd. No. 1

hydrograph 1

Hydrograph type	= Manual	Peak discharge	= 3.550 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.08 hrs
Time interval	= 5 min	Hyd. volume	= 7,005 cuft



Hydrograph Report

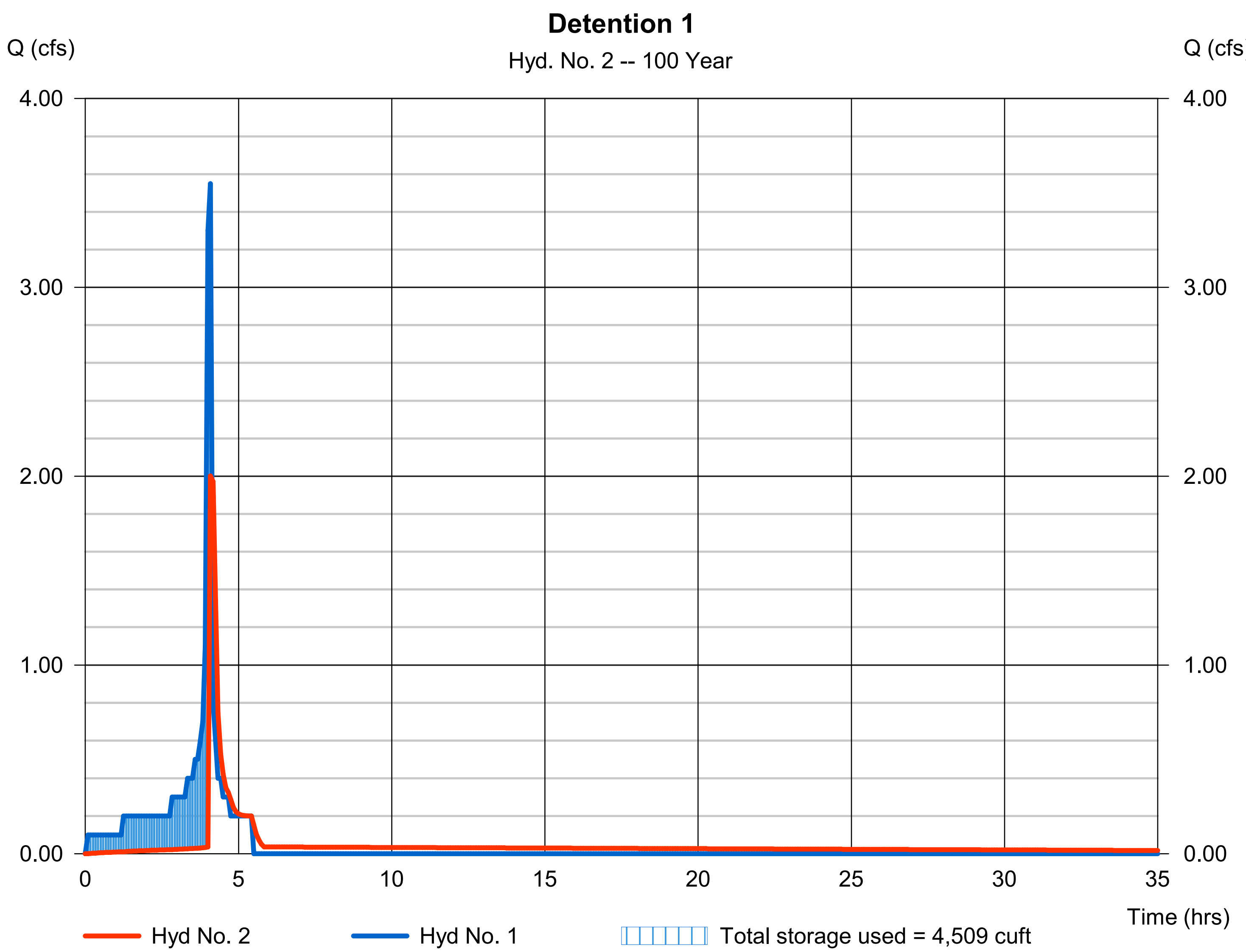
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Thursday, 12 / 23 / 2021

Hyd. No. 2

Detention 1

Hydrograph type	= Reservoir	Peak discharge	= 2.001 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.08 hrs
Time interval	= 5 min	Hyd. volume	= 6,976 cuft
Inflow hyd. No.	= 1 - hydrograph 1	Max. Elevation	= 102.34 ft
Reservoir name	= Detention Basin-BMP #12	Max. Storage	= 4,509 cuft

Storage Indication method used.



Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Thursday, 12 / 23 / 2021

Pond No. 1 - Detention Basin-BMP #12

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 100.00 ft. Voids = 95.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	1,970	0	0
1.00	101.00	1,970	1,872	1,872
2.00	102.00	1,970	1,872	3,743
2.50	102.50	1,970	936	4,679

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	1.00	Inactive	Inactive
Span (in)	= 12.00	1.00	0.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 100.00	100.00	0.00	0.00
Length (ft)	= 10.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.30	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 3.00	Inactive	Inactive	Inactive
Crest El. (ft)	= 102.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= 1	Rect	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

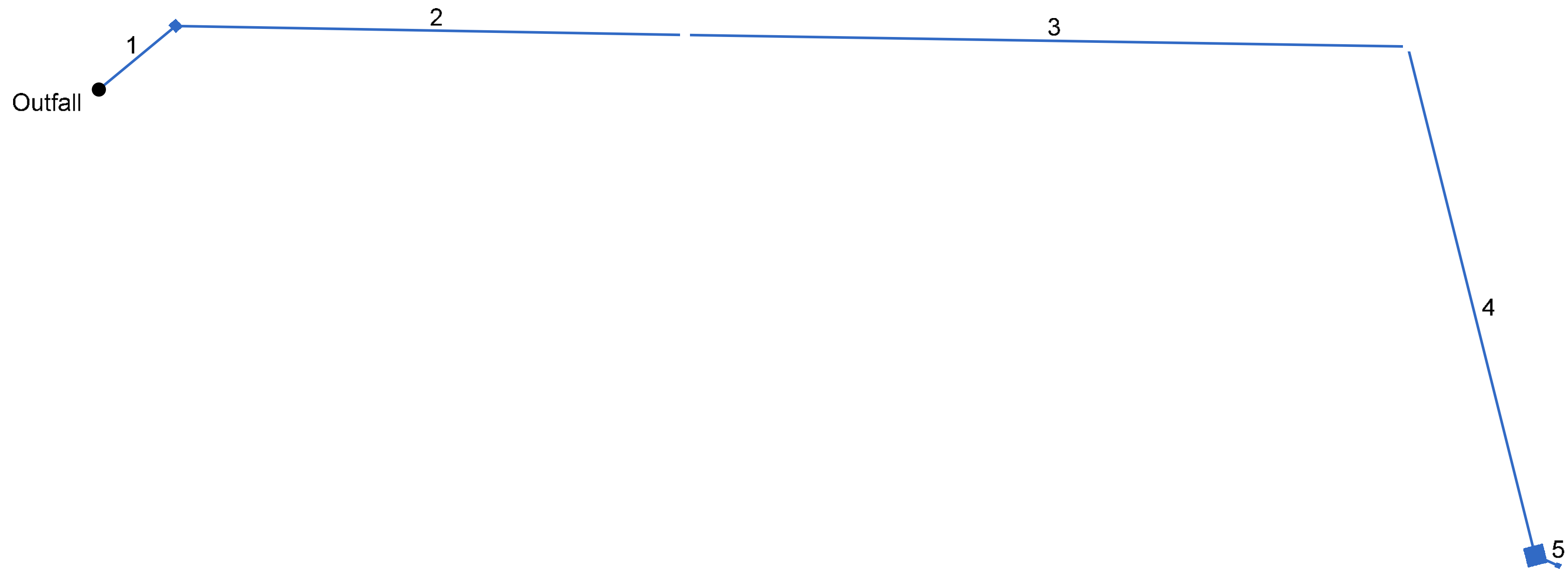
Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	100.00	0.00	0.00	---	---	0.00	---	---	---	---	---	0.000
1.00	1,872	101.00	0.03 ic	0.03 ic	---	---	0.00	---	---	---	---	---	0.025
2.00	3,743	102.00	0.04 ic	0.04 ic	---	---	0.00	---	---	---	---	---	0.036
2.50	4,679	102.50	2.17 oc	0.03 ic	---	---	2.14 ic	---	---	---	---	---	2.169

PACKAGE 4 (STEPHEN BIRCH ADDITION) STORM DRAIN SYSTEM

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan

BYPASS SYSTEM ANALYSIS



Project File: SD Line-01 North-100yr.stm	Number of lines: 5	Date: 12/28/2021

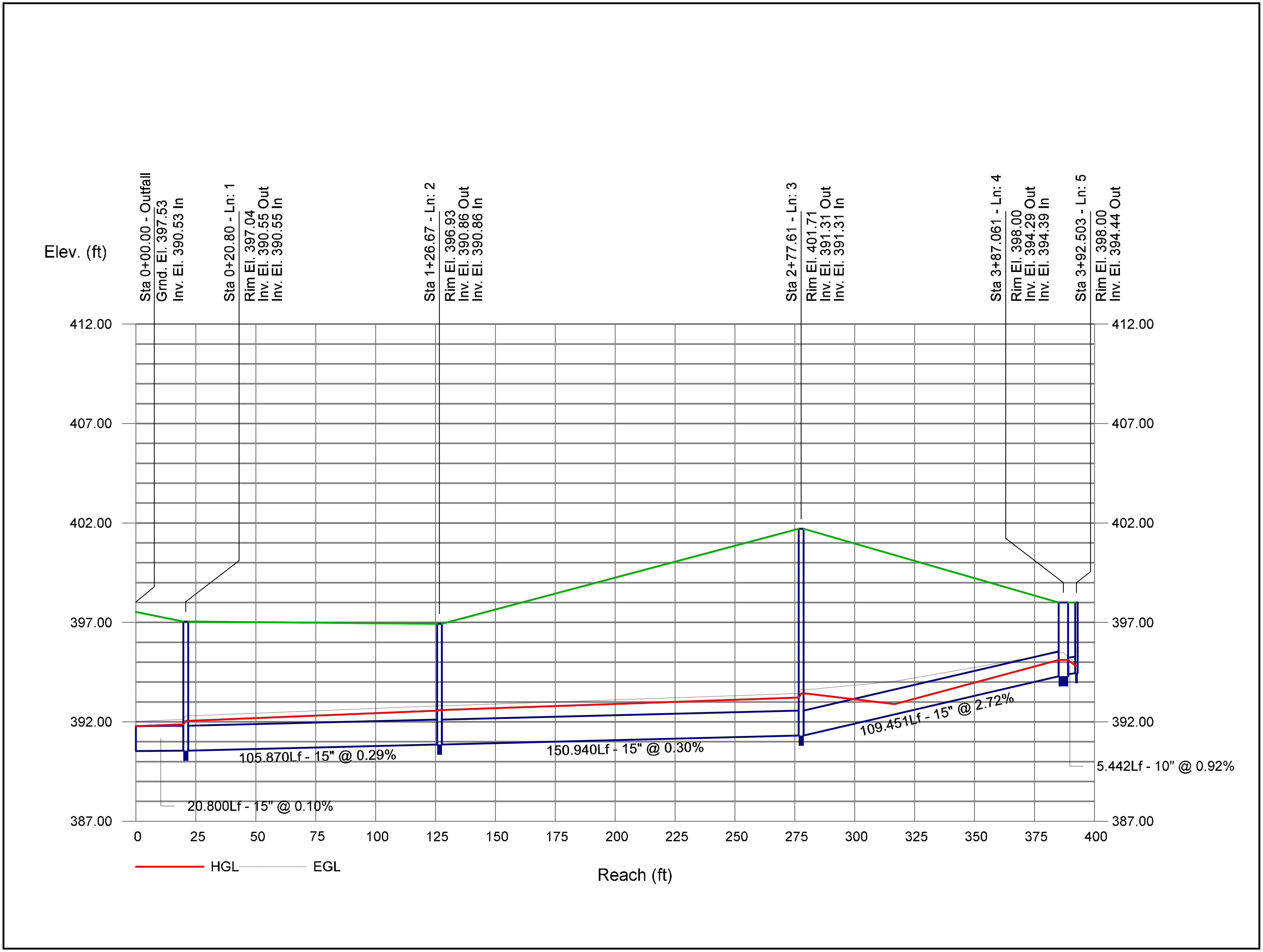
Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
	(in)	(cfs)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	(ft)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)	(K)	(ft)
5	10	0.75	394.39	395.11	0.72	0.24	1.49	0.15	395.26	0.000	5.442	394.44	394.82	0.38**	0.24	3.08	0.15	394.97	0.000	0.000	n/a	1.00	n/a
4	15	4.15	391.31	393.42	1.25	0.86	3.38	0.18	393.60	0.352	109.451	394.29	395.11 j	0.82**	0.86	4.84	0.36	395.48	0.591	0.471	n/a	0.83	n/a
3	15	4.50	390.86	392.60	1.25	1.23	3.67	0.21	392.80	0.414	150.940	391.31	393.22	1.25	1.23	3.67	0.21	393.43	0.414	0.414	0.625	0.97	0.20
2	15	4.85	390.55	392.05	1.25	1.23	3.95	0.24	392.29	0.481	105.870	390.86	392.56	1.25	1.23	3.95	0.24	392.80	0.481	0.481	0.509	0.15	0.04
1	15	4.85	390.53	391.78	1.25	1.23	3.95	0.24	392.02	0.481	20.800	390.55	391.88	1.25	1.23	3.95	0.24	392.12	0.481	0.481	0.100	0.70	0.17

Project File: SD Line-01 North-100yr.stm | Number of lines: 5 | Run Date: 12/28/2021

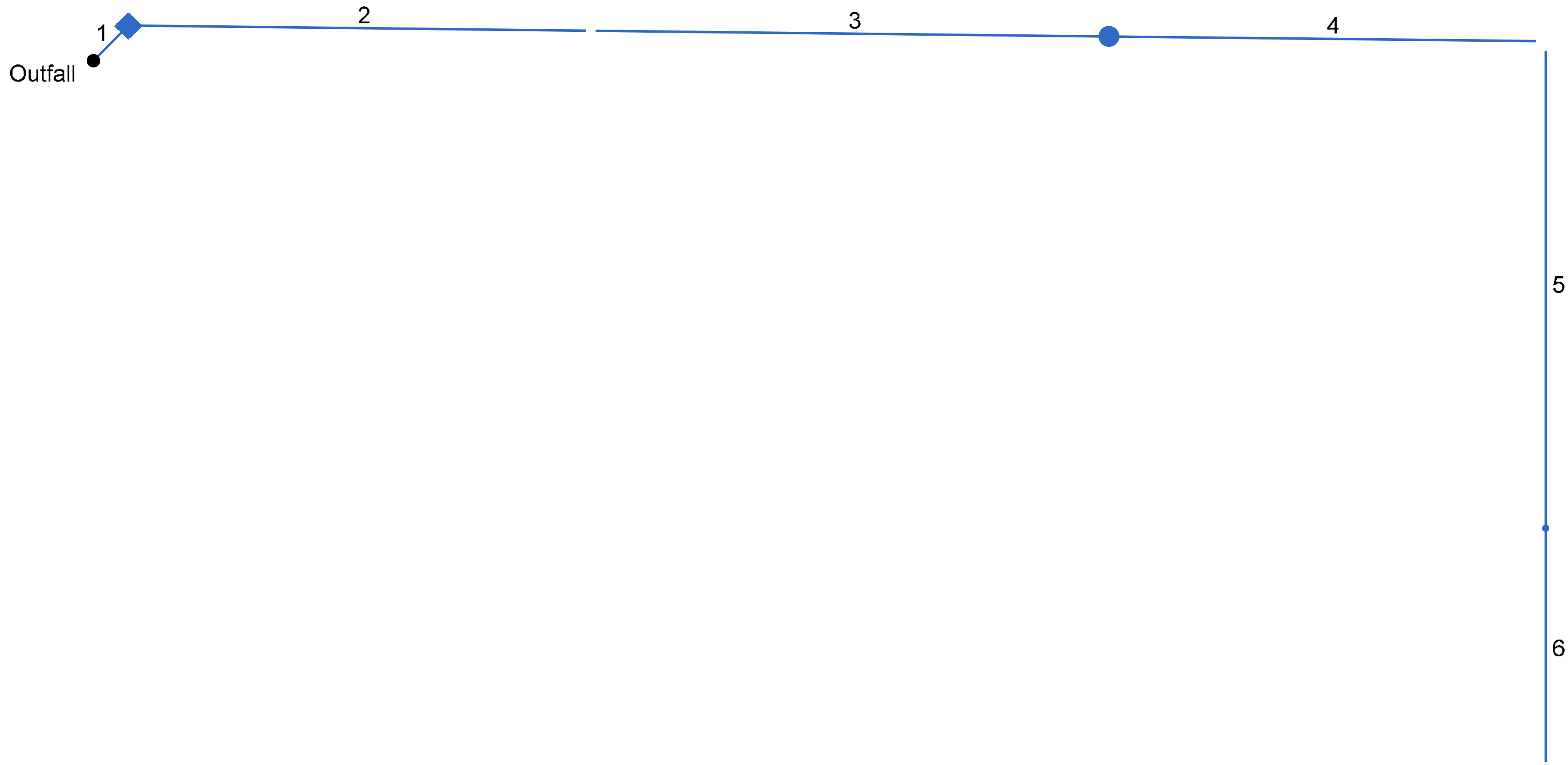
Notes: ; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

Storm Sewer Profile



Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan

MAIN SD ANALYSIS



Project File: SD Line-07 North-100yr.stm	Number of lines: 6	Date: 12/28/2021

Hydraulic Grade Line Computations

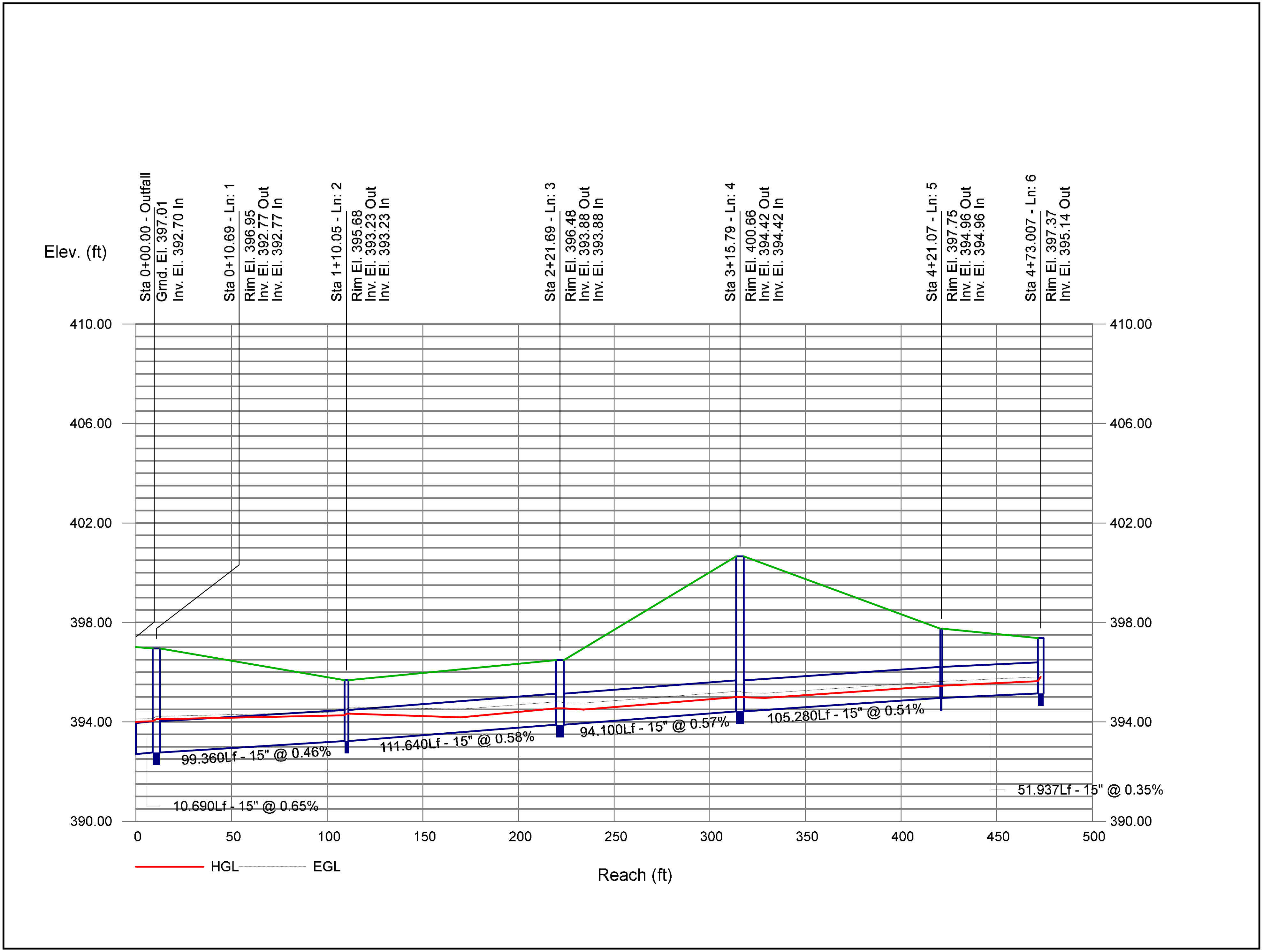
Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
	(in)	(cfs)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	(ft)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)	(K)	(ft)
6	15	1.50	394.96	395.46	0.50*	0.46	3.29	0.17	395.63	0.346	51.937	395.14	395.64	0.50	0.45	3.30	0.17	395.81	0.349	0.348	0.180	1.00	0.17
5	15	1.50	394.42	395.00	0.58	0.44	2.71	0.18	395.18	0.000	105.280	394.96	395.44 j	0.48**	0.44	3.41	0.18	395.63	0.000	0.000	n/a	0.15	0.03
4	15	2.10	393.88	394.54	0.66	0.55	3.20	0.22	394.76	0.000	94.100	394.42	395.00 j	0.58**	0.55	3.79	0.22	395.22	0.000	0.000	n/a	1.00	0.22
3	15	2.70	393.23	394.33	1.10	0.66	2.36	0.26	394.59	0.000	111.640	393.88	394.54 j	0.66**	0.66	4.12	0.26	394.80	0.000	0.000	n/a	0.15	0.04
2	15	3.30	392.77	394.11	1.25	1.23	2.69	0.11	394.22	0.187	99.360	393.23	394.26	1.03	1.08	3.06	0.15	394.40	0.186	0.186	0.185	0.50	0.07
1	15	3.30	392.70	394.00	1.25	1.23	2.69	0.11	394.11	0.187	10.690	392.77	394.02	1.25	1.23	2.69	0.11	394.13	0.186	0.186	0.020	0.76	0.09

Project File: SD Line-07 North-100yr.stm | Number of lines: 6 | Run Date: 12/28/2021

Notes: * depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

Storm Sewer Profile

Proj. file: SD Line-07 North-100yr.stm



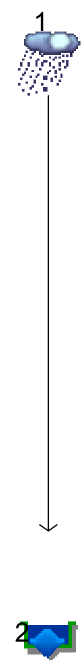
RATIONAL METHOD HYDROGRAPH PROGRAM

RUN DATE 12/23/2021
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 7 MIN.
6 HOUR RAINFALL 2.5 INCHES
BASIN AREA 1.12 ACRES
RUNOFF COEFFICIENT 0.85
PEAK DISCHARGE 3.88 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 7	DISCHARGE (CFS) = 0.1
TIME (MIN) = 14	DISCHARGE (CFS) = 0.1
TIME (MIN) = 21	DISCHARGE (CFS) = 0.1
TIME (MIN) = 28	DISCHARGE (CFS) = 0.2
TIME (MIN) = 35	DISCHARGE (CFS) = 0.2
TIME (MIN) = 42	DISCHARGE (CFS) = 0.2
TIME (MIN) = 49	DISCHARGE (CFS) = 0.2
TIME (MIN) = 56	DISCHARGE (CFS) = 0.2
TIME (MIN) = 63	DISCHARGE (CFS) = 0.2
TIME (MIN) = 70	DISCHARGE (CFS) = 0.2
TIME (MIN) = 77	DISCHARGE (CFS) = 0.2
TIME (MIN) = 84	DISCHARGE (CFS) = 0.2
TIME (MIN) = 91	DISCHARGE (CFS) = 0.2
TIME (MIN) = 98	DISCHARGE (CFS) = 0.2
TIME (MIN) = 105	DISCHARGE (CFS) = 0.2
TIME (MIN) = 112	DISCHARGE (CFS) = 0.2
TIME (MIN) = 119	DISCHARGE (CFS) = 0.2
TIME (MIN) = 126	DISCHARGE (CFS) = 0.2
TIME (MIN) = 133	DISCHARGE (CFS) = 0.2
TIME (MIN) = 140	DISCHARGE (CFS) = 0.2
TIME (MIN) = 147	DISCHARGE (CFS) = 0.3
TIME (MIN) = 154	DISCHARGE (CFS) = 0.3
TIME (MIN) = 161	DISCHARGE (CFS) = 0.3
TIME (MIN) = 168	DISCHARGE (CFS) = 0.3
TIME (MIN) = 175	DISCHARGE (CFS) = 0.3
TIME (MIN) = 182	DISCHARGE (CFS) = 0.3
TIME (MIN) = 189	DISCHARGE (CFS) = 0.4
TIME (MIN) = 196	DISCHARGE (CFS) = 0.4
TIME (MIN) = 203	DISCHARGE (CFS) = 0.5
TIME (MIN) = 210	DISCHARGE (CFS) = 0.5
TIME (MIN) = 217	DISCHARGE (CFS) = 0.6
TIME (MIN) = 224	DISCHARGE (CFS) = 0.7
TIME (MIN) = 231	DISCHARGE (CFS) = 1
TIME (MIN) = 238	DISCHARGE (CFS) = 2.6
TIME (MIN) = 245	DISCHARGE (CFS) = 3.88
TIME (MIN) = 252	DISCHARGE (CFS) = 0.8
TIME (MIN) = 259	DISCHARGE (CFS) = 0.5
TIME (MIN) = 266	DISCHARGE (CFS) = 0.4
TIME (MIN) = 273	DISCHARGE (CFS) = 0.4
TIME (MIN) = 280	DISCHARGE (CFS) = 0.3
TIME (MIN) = 287	DISCHARGE (CFS) = 0.3
TIME (MIN) = 294	DISCHARGE (CFS) = 0.2
TIME (MIN) = 301	DISCHARGE (CFS) = 0.2
TIME (MIN) = 308	DISCHARGE (CFS) = 0.2
TIME (MIN) = 315	DISCHARGE (CFS) = 0.2
TIME (MIN) = 322	DISCHARGE (CFS) = 0.2
TIME (MIN) = 329	DISCHARGE (CFS) = 0.2
TIME (MIN) = 336	DISCHARGE (CFS) = 0.2
TIME (MIN) = 343	DISCHARGE (CFS) = 0.2
TIME (MIN) = 350	DISCHARGE (CFS) = 0.2
TIME (MIN) = 357	DISCHARGE (CFS) = 0.1
TIME (MIN) = 364	DISCHARGE (CFS) = 0

Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022



Legend

Hyd.	Origin	Description
1	Manual	hydrograph 1
2	Reservoir	Detention 1

Project: Det-PK 4 BMP 5_Calcs yr100.gpw

Thursday, 12 / 23 / 2021

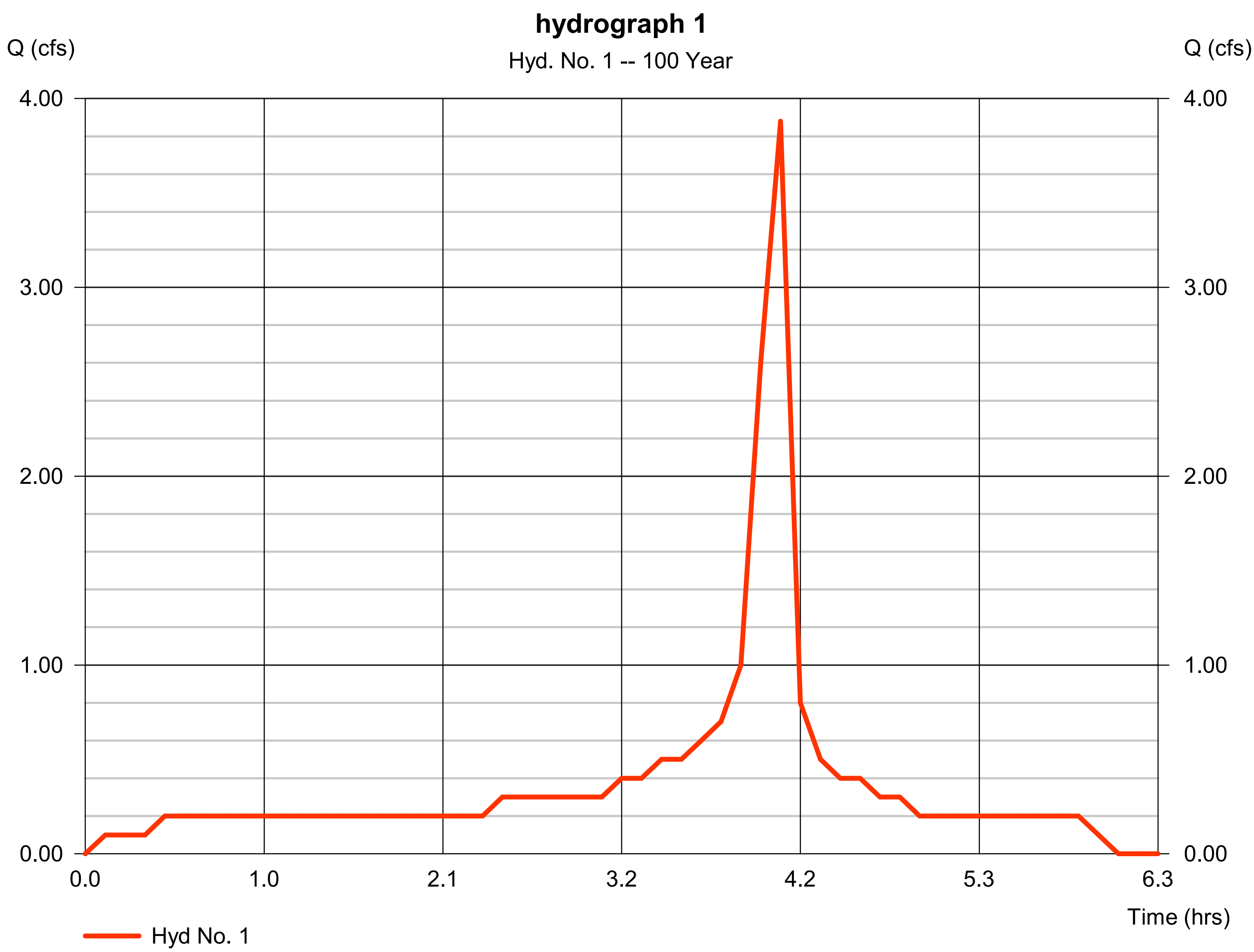
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 | Thursday, 12 / 23 / 2021

Hyd. No. 1

hydrograph 1

Hydrograph type	= Manual	Peak discharge	= 3.880 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.08 hrs
Time interval	= 7 min	Hyd. volume	= 8,686 cuft



Hydrograph Report

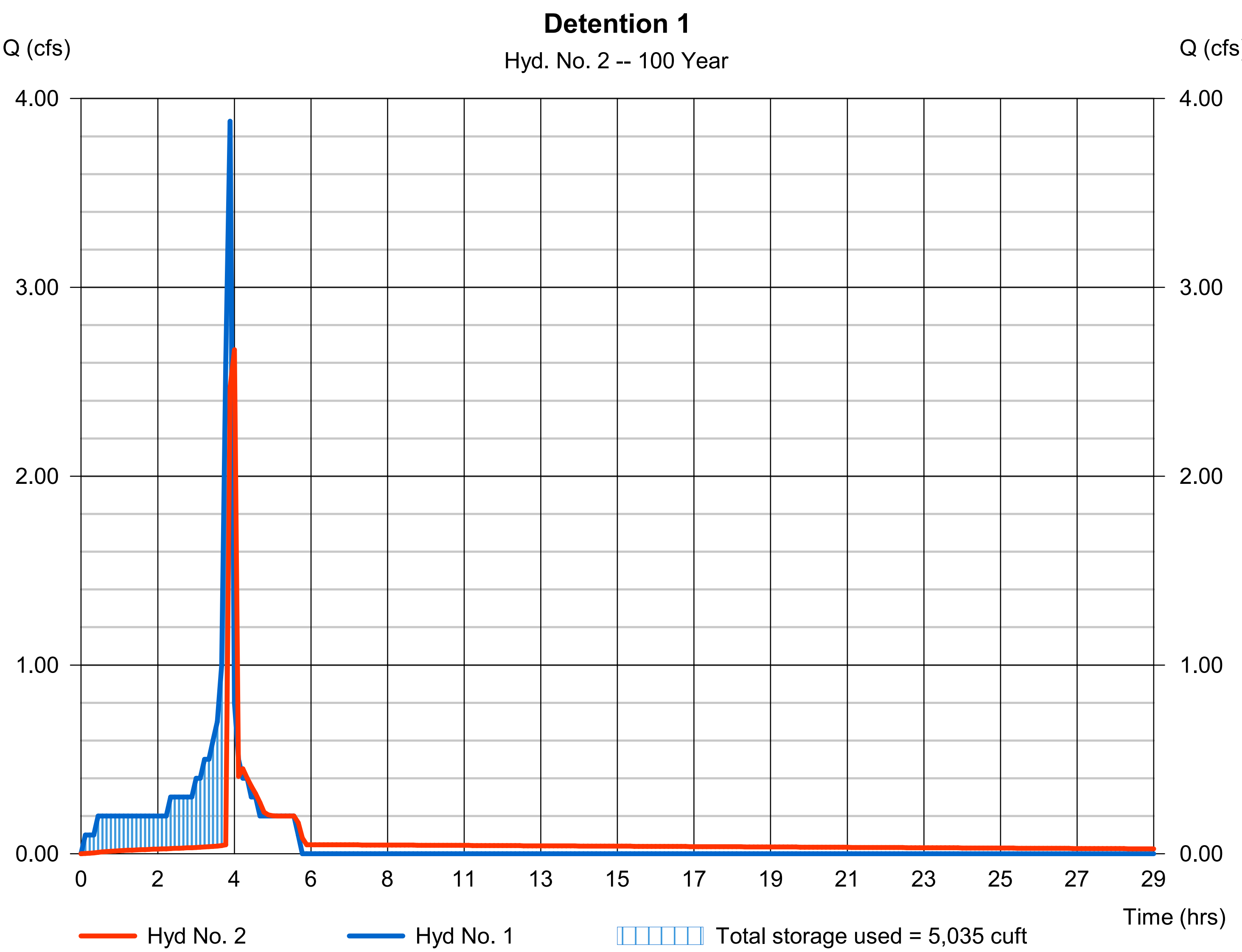
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Thursday, 12 / 23 / 2021

Hyd. No. 2

Detention 1

Hydrograph type	= Reservoir	Peak discharge	= 2.670 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.20 hrs
Time interval	= 7 min	Hyd. volume	= 8,665 cuft
Inflow hyd. No.	= 1 - hydrograph 1	Max. Elevation	= 103.90 ft
Reservoir name	= Det-SBA pk4-BMP 5	Max. Storage	= 5,035 cuft

Storage Indication method used.



Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Thursday, 12 / 23 / 2021

Pond No. 1 - Det-SBA pk4-BMP 5

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 100.00 ft. Voids = 95.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	1,345	0	0
1.00	101.00	1,345	1,278	1,278
2.00	102.00	1,345	1,278	2,556
3.00	103.00	1,345	1,278	3,833
4.00	104.00	1,345	1,278	5,111

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 18.00	1.00	Inactive	Inactive
Span (in)	= 18.00	1.00	0.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 100.00	100.00	0.00	0.00
Length (ft)	= 10.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.30	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 3.14	Inactive	Inactive	Inactive
Crest El. (ft)	= 103.50	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= 1	Rect	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

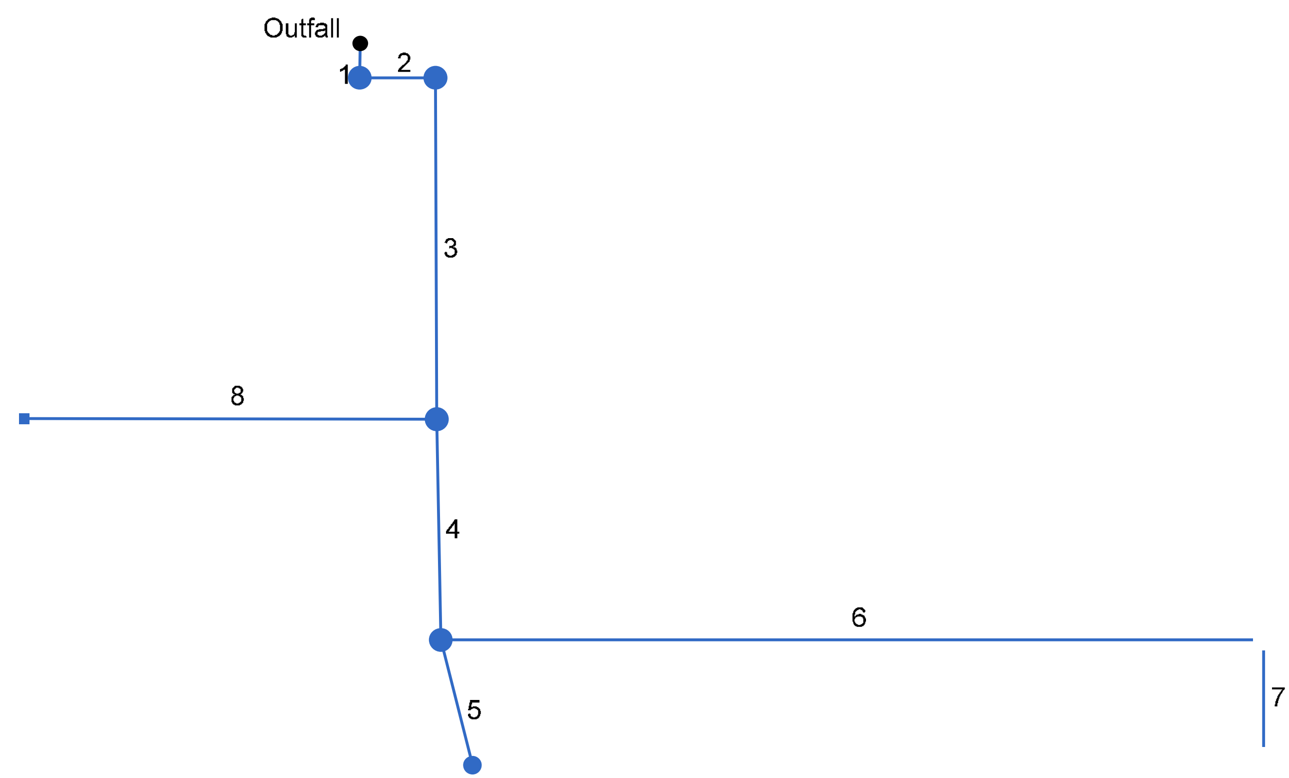
Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	100.00	0.00	0.00	---	---	0.00	---	---	---	---	---	0.000
1.00	1,278	101.00	0.03 ic	0.03 ic	---	---	0.00	---	---	---	---	---	0.025
2.00	2,556	102.00	0.04 ic	0.04 ic	---	---	0.00	---	---	---	---	---	0.036
3.00	3,833	103.00	0.05 ic	0.04 ic	---	---	0.00	---	---	---	---	---	0.045
4.00	5,111	104.00	2.64 oc	0.05 ic	---	---	2.34 ic	---	---	---	---	---	2.388

PACKAGE 5A (CEP) STORM DRAIN SYSTEM

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan

NEW CEP SD ANALYSIS



Project File: SD Line-4-10 CP-100yr.stm	Number of lines: 8	Date: 12/30/2021

Hydraulic Grade Line Computations

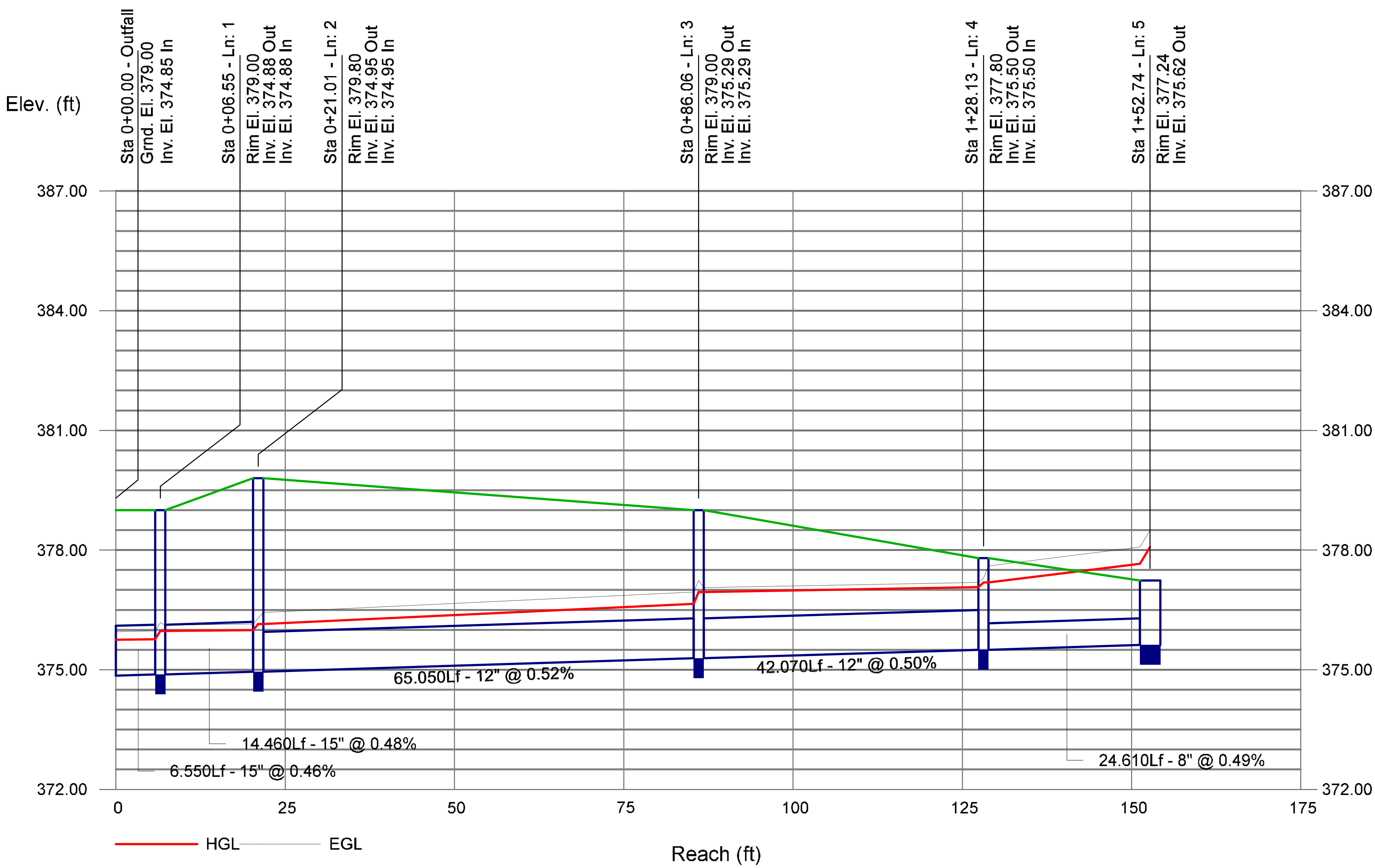
Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
	(in)	(cfs)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	(ft)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)	(K)	(ft)
8	8	1.30	375.29	376.95	0.67	0.35	3.72	0.22	377.16	0.988	78.860	375.68	377.73	0.67	0.35	3.72	0.22	377.94	0.987	0.987	0.779	1.00	0.22
7	6	0.30	376.16	377.28	0.50	0.20	1.53	0.04	377.32	0.244	22.000	376.52	377.33	0.50	0.20	1.53	0.04	377.37	0.244	0.244	0.054	1.00	0.04
6	8	0.30	375.50	377.19	0.67	0.35	0.86	0.01	377.20	0.053	157.190	376.16	377.27	0.67	0.35	0.86	0.01	377.28	0.053	0.053	0.083	1.00	0.01
5	8	1.81	375.50	377.19	0.67	0.35	5.19	0.42	377.60	1.915	24.610	375.62	377.66	0.67	0.35	5.19	0.42	378.07	1.914	1.914	0.471	1.00	0.42
4	12	2.11	375.29	376.95	1.00	0.79	2.69	0.11	377.06	0.299	42.070	375.50	377.07	1.00	0.79	2.69	0.11	377.19	0.299	0.299	0.126	1.00	0.11
3	12	3.41	374.95	376.15	1.00	0.79	4.34	0.29	376.44	0.782	65.050	375.29	376.65	1.00	0.79	4.34	0.29	376.95	0.781	0.781	0.508	1.00	0.29
2	15	3.41	374.88	375.97	1.09	1.14	2.99	0.14	376.11	0.215	14.460	374.95	375.99	1.04	1.10	3.11	0.15	376.15	0.230	0.222	0.032	1.00	0.15
1	15	3.41	374.85	375.75	0.90	0.95	3.61	0.20	375.95	0.315	6.550	374.88	375.76	0.88	0.93	3.68	0.21	375.97	0.330	0.323	0.021	1.00	0.21

Project File: SD Line-4-10 CP-100yr.stm | Number of lines: 8 | Run Date: 12/30/2021

; c = cir e = ellip b = box

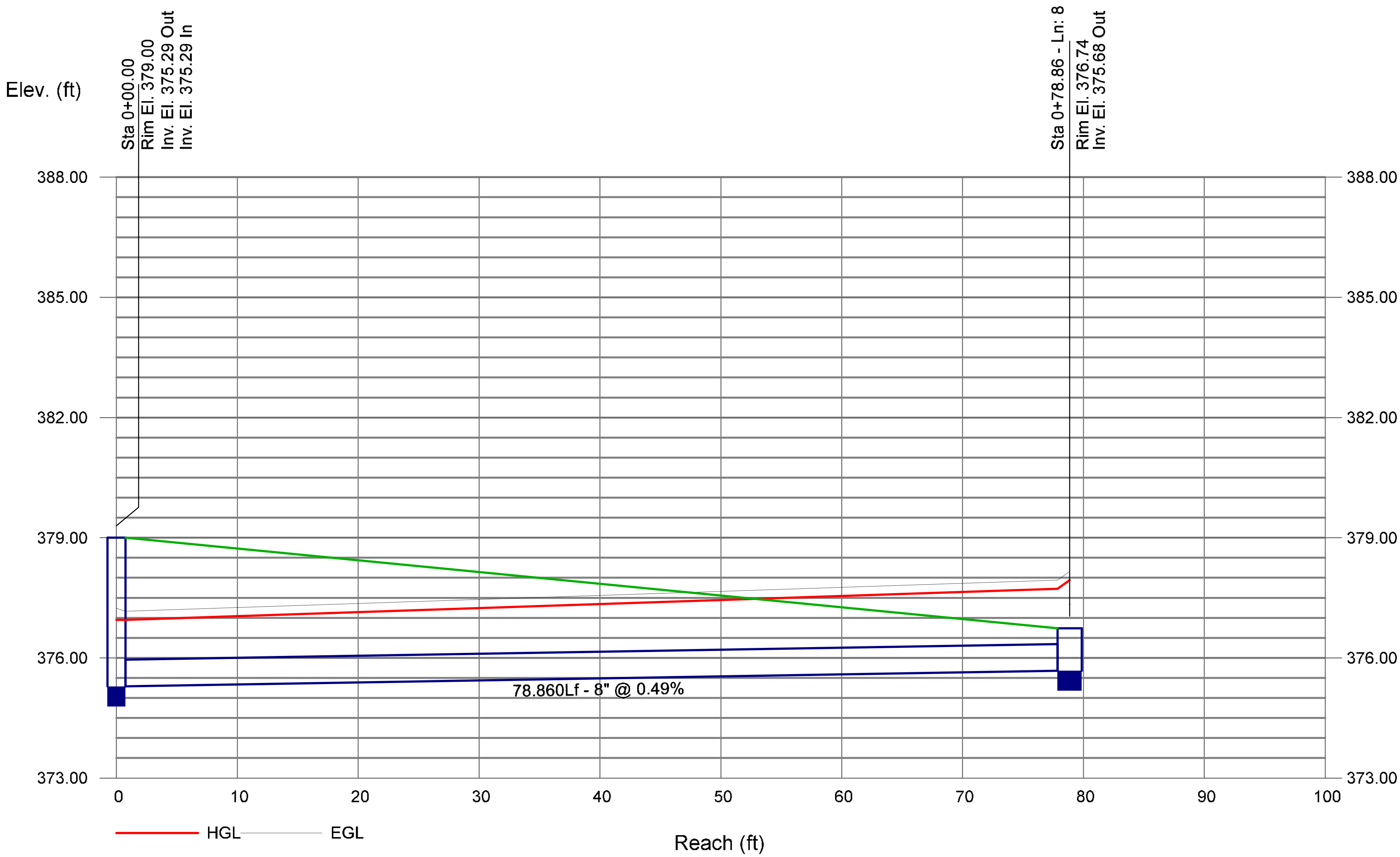
Storm Sewer Profile

Proj. file: SD Line-4-10 CP-100yr.stm

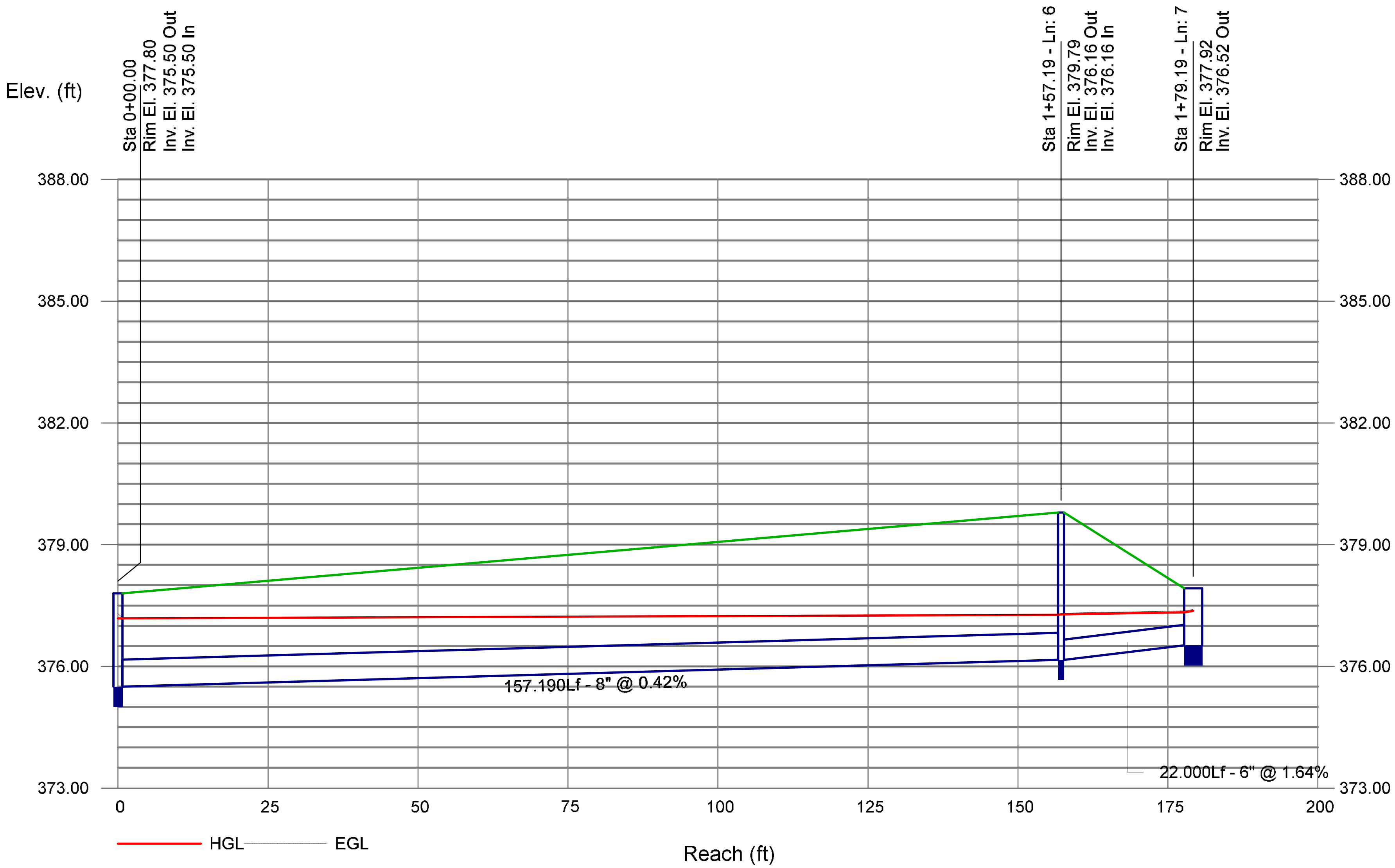


Storm Sewers

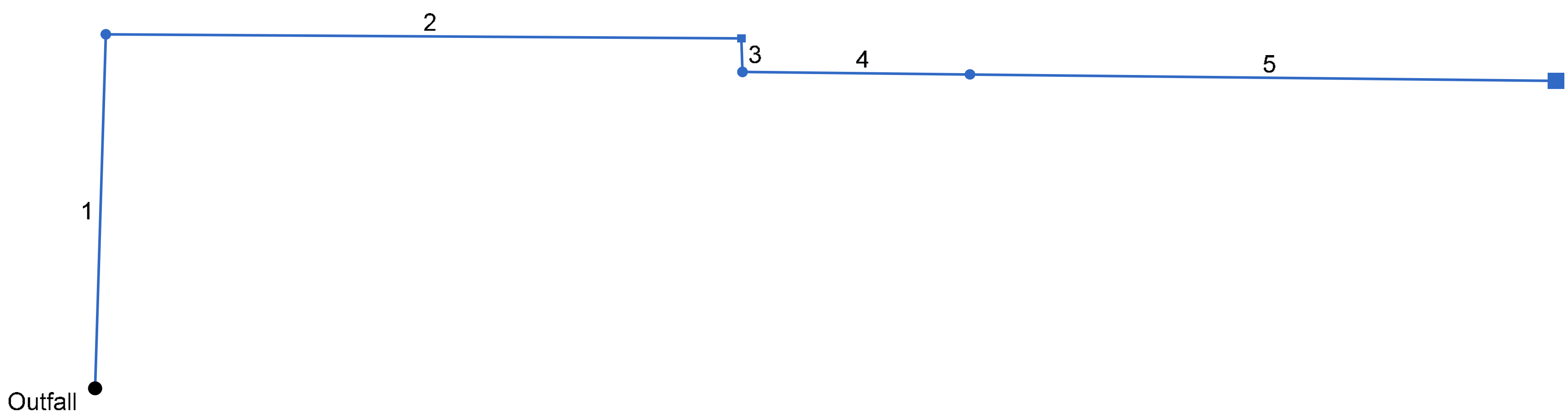
Storm Sewer Profile



Storm Sewer Profile



Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: SD Line-06 CP-100yr.stm	Number of lines: 5	Date: 12/30/2021

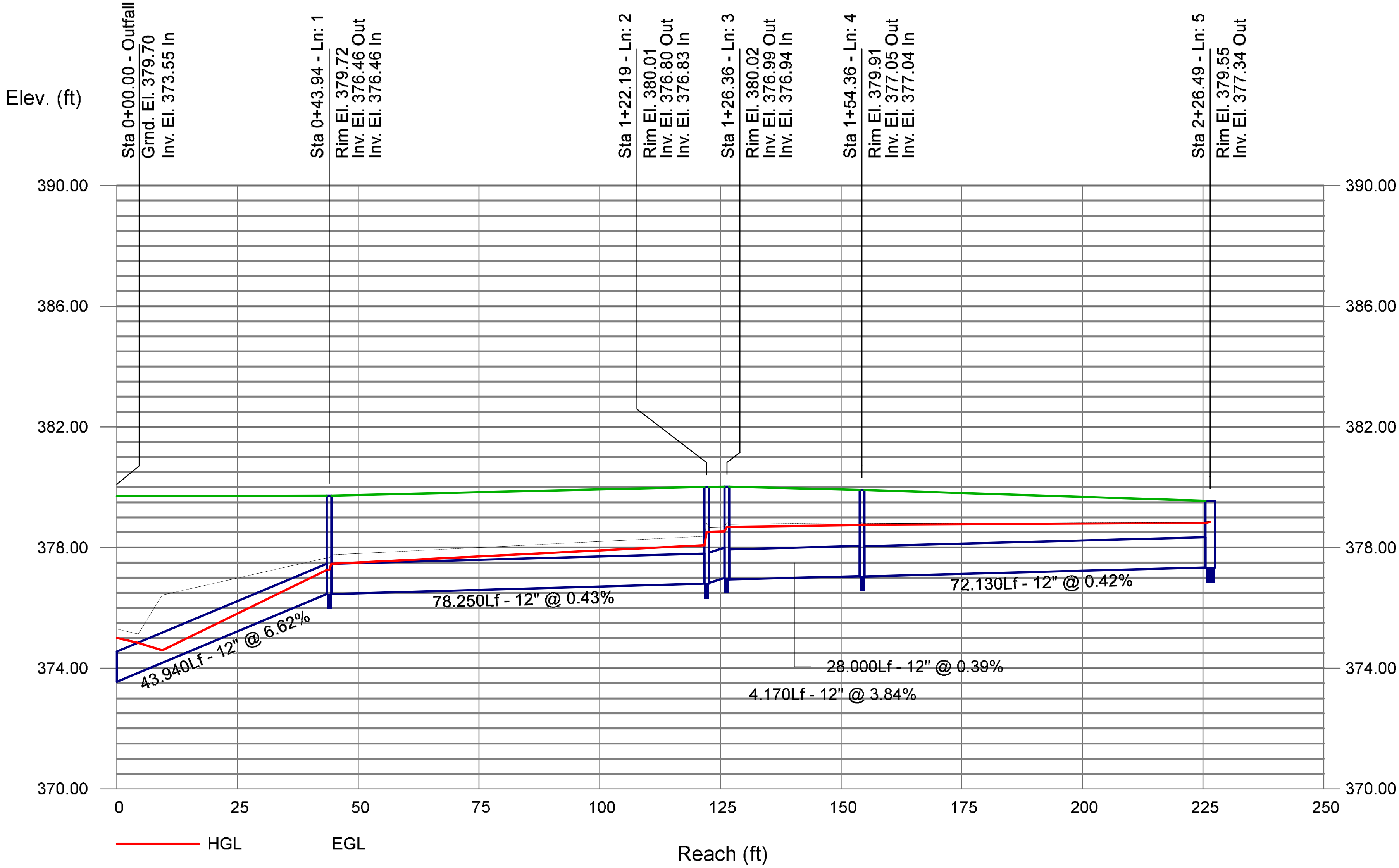
Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
	(in)	(cfs)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	(ft)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)	(K)	(ft)
5	12	1.10	377.04	378.76	1.00	0.79	1.40	0.03	378.79	0.081	72.130	377.34	378.82	1.00	0.79	1.40	0.03	378.85	0.081	0.081	0.059	1.00	0.03
4	12	1.75	376.94	378.69	1.00	0.79	2.23	0.08	378.77	0.206	28.000	377.05	378.75	1.00	0.79	2.23	0.08	378.82	0.206	0.206	0.058	0.15	0.01
3	12	2.47	376.83	378.52	1.00	0.79	3.15	0.15	378.67	0.410	4.170	376.99	378.53	1.00	0.79	3.14	0.15	378.69	0.410	0.410	0.017	1.00	0.15
2	12	3.42	376.46	377.46	1.00*	0.79	4.36	0.29	377.75	0.786	78.250	376.80	378.08	1.00	0.79	4.35	0.29	378.37	0.786	0.786	0.615	1.50	0.44
1	12	3.42	373.55	375.00	1.00	0.67	4.36	0.29	375.29	0.786	43.940	376.46	377.25 j	0.79**	0.67	5.14	0.41	377.66	0.843	0.815	n/a	1.00	n/a

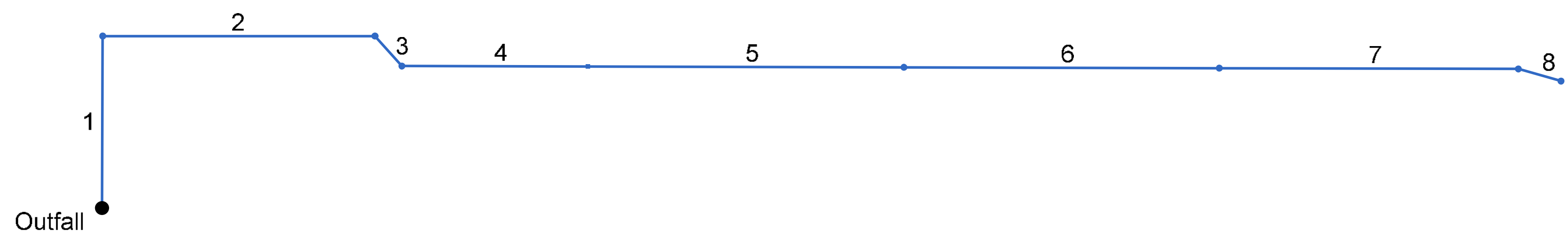
Project File: SD Line-06 CP-100yr.stm	Number of lines: 5	Run Date: 12/30/2021

Notes: * depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

Storm Sewer Profile



Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: SD Line-05 CP-100yr Bypass.stm	Number of lines: 8	Date: 12/30/2021

Hydraulic Grade Line Computations

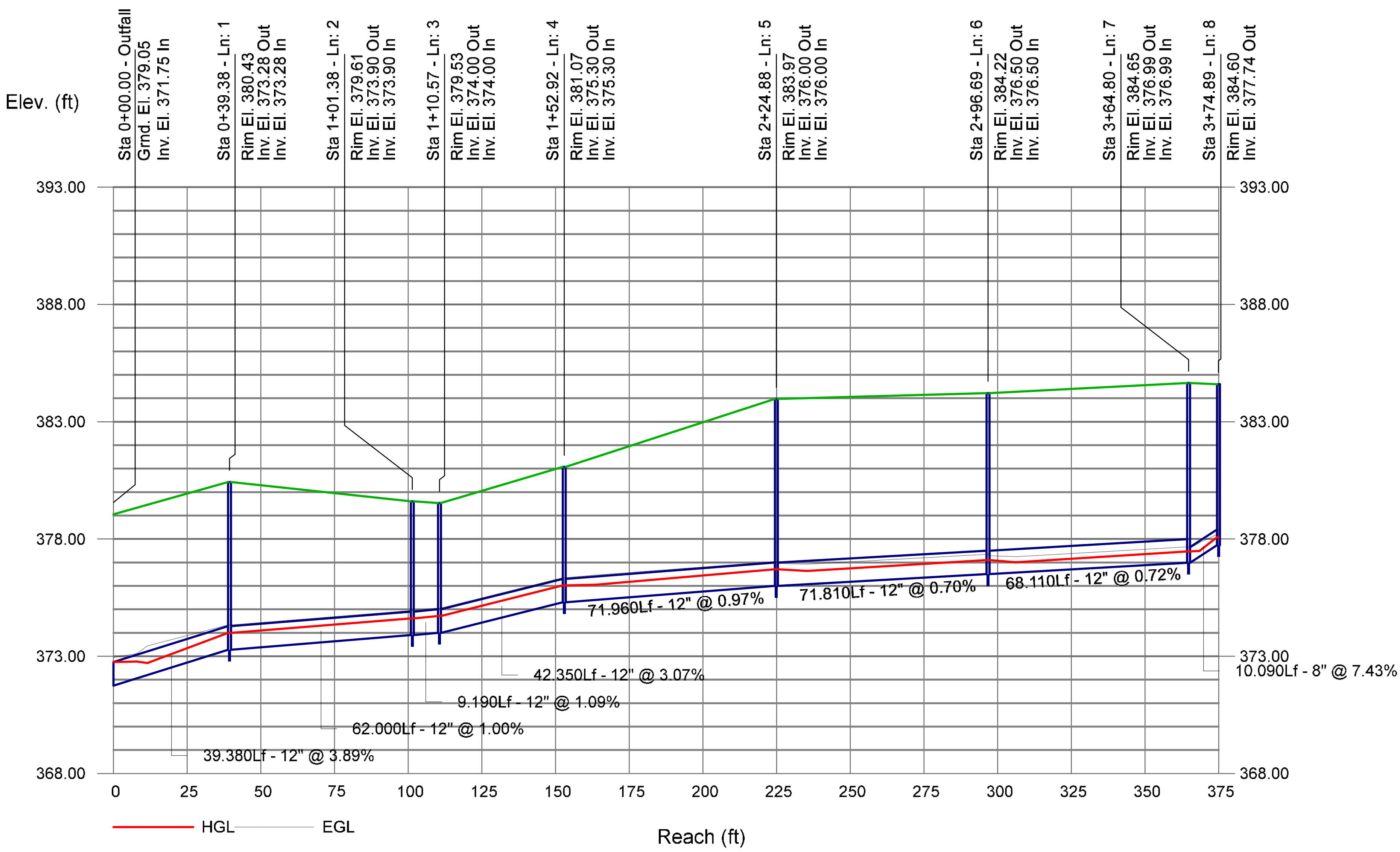
Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
	(in)	(cfs)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	(ft)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)	(K)	(ft)
8	8	0.50	376.99	377.47	0.48	0.17	1.85	0.13	377.60	0.000	10.090	377.74	378.07 j	0.33**	0.17	2.89	0.13	378.20	0.000	0.000	n/a	1.00	n/a
7	12	1.30	376.50	377.10	0.60	0.37	2.67	0.19	377.28	0.000	68.110	376.99	377.47 j	0.48**	0.37	3.48	0.19	377.66	0.000	0.000	n/a	0.32	0.06
6	12	1.95	376.00	376.71	0.71	0.49	3.27	0.25	376.96	0.000	71.810	376.50	377.10 j	0.60**	0.49	4.00	0.25	377.34	0.000	0.000	n/a	0.50	n/a
5	12	2.75	375.30	376.02	0.72	0.60	4.56	0.33	376.35	0.000	71.960	376.00	376.71 j	0.71**	0.60	4.61	0.33	377.04	0.000	0.000	n/a	0.15	0.05
4	12	2.80	374.00	374.72	0.72*	0.60	4.65	0.34	375.05	0.000	42.350	375.30	376.02	0.72**	0.60	4.65	0.34	376.35	0.000	0.000	n/a	0.50	0.17
3	12	2.80	373.90	374.62	0.72*	0.60	4.65	0.34	374.95	0.000	9.190	374.00	374.72	0.72**	0.60	4.65	0.34	375.05	0.000	0.000	n/a	0.78	0.26
2	12	2.80	373.28	374.00	0.72*	0.60	4.65	0.34	374.33	0.000	62.000	373.90	374.62	0.72**	0.60	4.65	0.34	374.95	0.000	0.000	n/a	0.78	0.26
1	12	2.80	371.75	372.75	1.00	0.60	3.57	0.20	372.95	0.527	39.380	373.28	374.00 j	0.72**	0.60	4.65	0.34	374.33	0.707	0.617	n/a	1.00	0.34

Project File: SD Line-05 CP-100yr Bypass.stm | Number of lines: 8 | Run Date: 12/30/2021

Notes: * depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

Storm Sewer Profile

Proj. file: SD Line-05 CP-100yr Bypass.stm



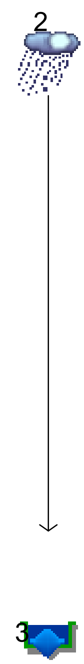
RATIONAL METHOD HYDROGRAPH PROGRAM

RUN DATE 12/30/2021
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 6 MIN.
6 HOUR RAINFALL 2.5 INCHES
BASIN AREA 1.78 ACRES
RUNOFF COEFFICIENT 0.89
PEAK DISCHARGE 6.45 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 6	DISCHARGE (CFS) = 0.2
TIME (MIN) = 12	DISCHARGE (CFS) = 0.2
TIME (MIN) = 18	DISCHARGE (CFS) = 0.2
TIME (MIN) = 24	DISCHARGE (CFS) = 0.2
TIME (MIN) = 30	DISCHARGE (CFS) = 0.3
TIME (MIN) = 36	DISCHARGE (CFS) = 0.3
TIME (MIN) = 42	DISCHARGE (CFS) = 0.3
TIME (MIN) = 48	DISCHARGE (CFS) = 0.3
TIME (MIN) = 54	DISCHARGE (CFS) = 0.3
TIME (MIN) = 60	DISCHARGE (CFS) = 0.3
TIME (MIN) = 66	DISCHARGE (CFS) = 0.3
TIME (MIN) = 72	DISCHARGE (CFS) = 0.3
TIME (MIN) = 78	DISCHARGE (CFS) = 0.3
TIME (MIN) = 84	DISCHARGE (CFS) = 0.3
TIME (MIN) = 90	DISCHARGE (CFS) = 0.3
TIME (MIN) = 96	DISCHARGE (CFS) = 0.3
TIME (MIN) = 102	DISCHARGE (CFS) = 0.3
TIME (MIN) = 108	DISCHARGE (CFS) = 0.3
TIME (MIN) = 114	DISCHARGE (CFS) = 0.3
TIME (MIN) = 120	DISCHARGE (CFS) = 0.4
TIME (MIN) = 126	DISCHARGE (CFS) = 0.4
TIME (MIN) = 132	DISCHARGE (CFS) = 0.4
TIME (MIN) = 138	DISCHARGE (CFS) = 0.4
TIME (MIN) = 144	DISCHARGE (CFS) = 0.4
TIME (MIN) = 150	DISCHARGE (CFS) = 0.4
TIME (MIN) = 156	DISCHARGE (CFS) = 0.4
TIME (MIN) = 162	DISCHARGE (CFS) = 0.5
TIME (MIN) = 168	DISCHARGE (CFS) = 0.5
TIME (MIN) = 174	DISCHARGE (CFS) = 0.5
TIME (MIN) = 180	DISCHARGE (CFS) = 0.5
TIME (MIN) = 186	DISCHARGE (CFS) = 0.6
TIME (MIN) = 192	DISCHARGE (CFS) = 0.6
TIME (MIN) = 198	DISCHARGE (CFS) = 0.7
TIME (MIN) = 204	DISCHARGE (CFS) = 0.7
TIME (MIN) = 210	DISCHARGE (CFS) = 0.8
TIME (MIN) = 216	DISCHARGE (CFS) = 0.9
TIME (MIN) = 222	DISCHARGE (CFS) = 1.1
TIME (MIN) = 228	DISCHARGE (CFS) = 1.3
TIME (MIN) = 234	DISCHARGE (CFS) = 1.8
TIME (MIN) = 240	DISCHARGE (CFS) = 5.4
TIME (MIN) = 246	DISCHARGE (CFS) = 6.45
TIME (MIN) = 252	DISCHARGE (CFS) = 1.5
TIME (MIN) = 258	DISCHARGE (CFS) = 1
TIME (MIN) = 264	DISCHARGE (CFS) = 0.8
TIME (MIN) = 270	DISCHARGE (CFS) = 0.6
TIME (MIN) = 276	DISCHARGE (CFS) = 0.6
TIME (MIN) = 282	DISCHARGE (CFS) = 0.5
TIME (MIN) = 288	DISCHARGE (CFS) = 0.5
TIME (MIN) = 294	DISCHARGE (CFS) = 0.4
TIME (MIN) = 300	DISCHARGE (CFS) = 0.4
TIME (MIN) = 306	DISCHARGE (CFS) = 0.4
TIME (MIN) = 312	DISCHARGE (CFS) = 0.3
TIME (MIN) = 318	DISCHARGE (CFS) = 0.3
TIME (MIN) = 324	DISCHARGE (CFS) = 0.3
TIME (MIN) = 330	DISCHARGE (CFS) = 0.3
TIME (MIN) = 336	DISCHARGE (CFS) = 0.3
TIME (MIN) = 342	DISCHARGE (CFS) = 0.3
TIME (MIN) = 348	DISCHARGE (CFS) = 0.3
TIME (MIN) = 354	DISCHARGE (CFS) = 0.2
TIME (MIN) = 360	DISCHARGE (CFS) = 0.2
TIME (MIN) = 366	DISCHARGE (CFS) = 0

Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022



Legend

Hyd.	Origin	Description
2	Manual	hydrograph 1
3	Reservoir	Detention 1

Project: Det-PK 5A BMP 8_Calcs yr100.gpw

Thursday, 12 / 30 / 2021

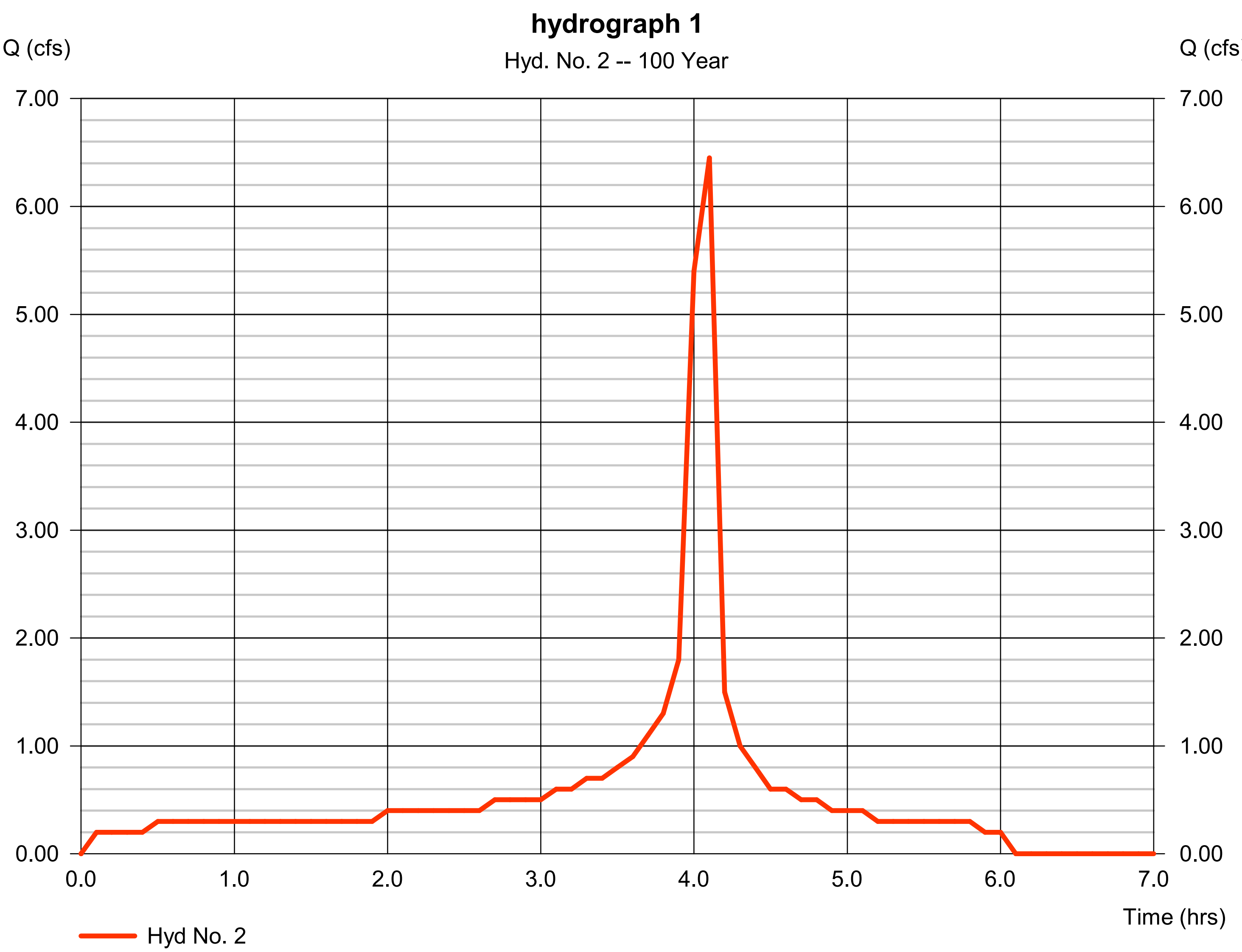
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Thursday, 12 / 30 / 2021

Hyd. No. 2

hydrograph 1

Hydrograph type	= Manual	Peak discharge	= 6.450 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.10 hrs
Time interval	= 6 min	Hyd. volume	= 14,274 cuft



Hydrograph Report

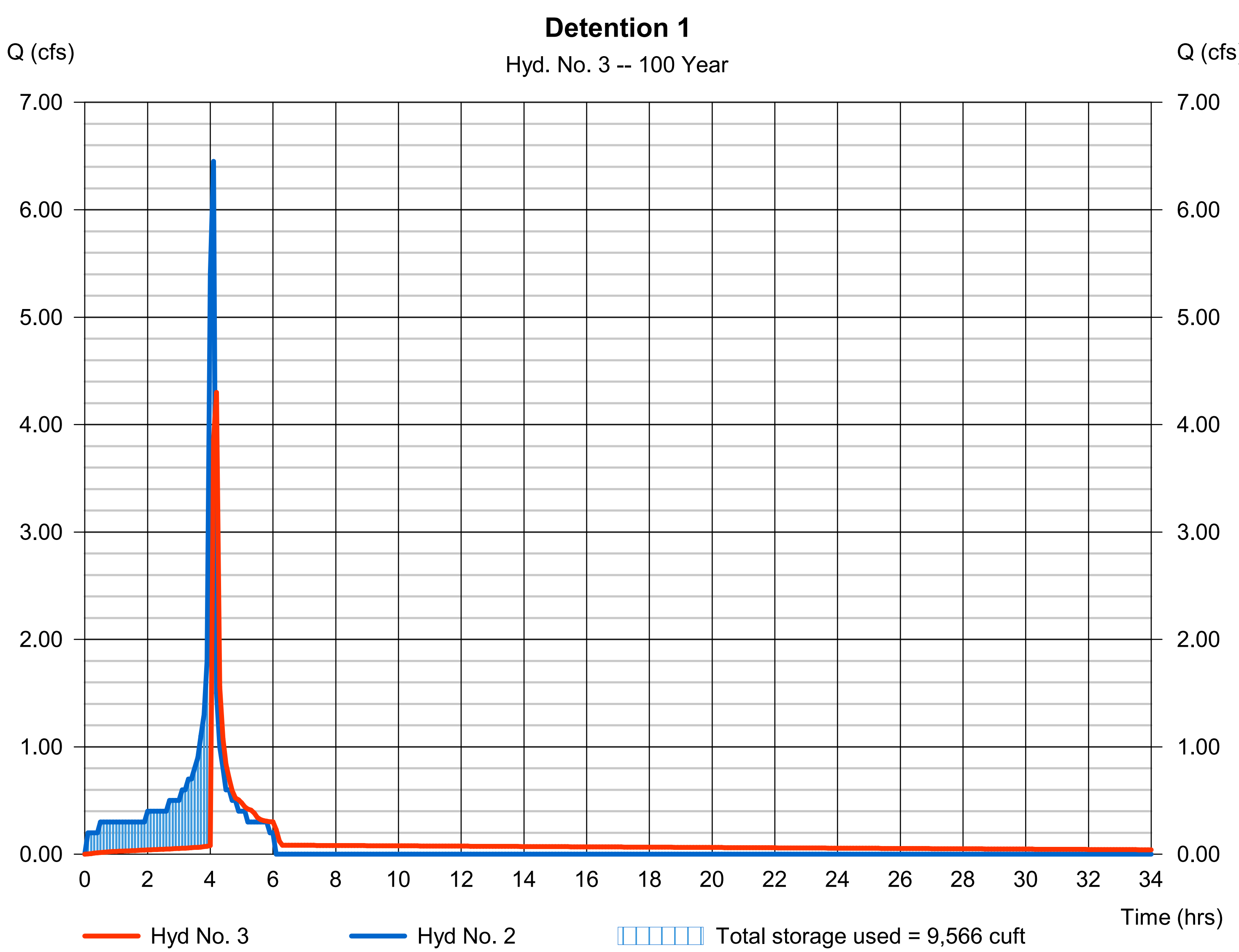
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Thursday, 12 / 30 / 2021

Hyd. No. 3

Detention 1

Hydrograph type	= Reservoir	Peak discharge	= 4.298 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.20 hrs
Time interval	= 6 min	Hyd. volume	= 15,599 cuft
Inflow hyd. No.	= 2 - hydrograph 1	Max. Elevation	= 103.96 ft
Reservoir name	= Detention Basin-BMP #8	Max. Storage	= 9,566 cuft

Storage Indication method used.



Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Thursday, 12 / 30 / 2021

Pond No. 1 - Detention Basin-BMP #8

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 100.00 ft. Voids = 95.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	2,540	0	0
1.00	101.00	2,540	2,413	2,413
2.00	102.00	2,540	2,413	4,826
3.00	103.00	2,540	2,413	7,239
4.00	104.00	2,540	2,413	9,652

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	1.32	Inactive	Inactive
Span (in)	= 12.00	1.32	0.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 100.00	100.00	0.00	0.00
Length (ft)	= 10.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.30	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 4.00	Inactive	Inactive	Inactive
Crest El. (ft)	= 103.50	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= 1	Rect	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

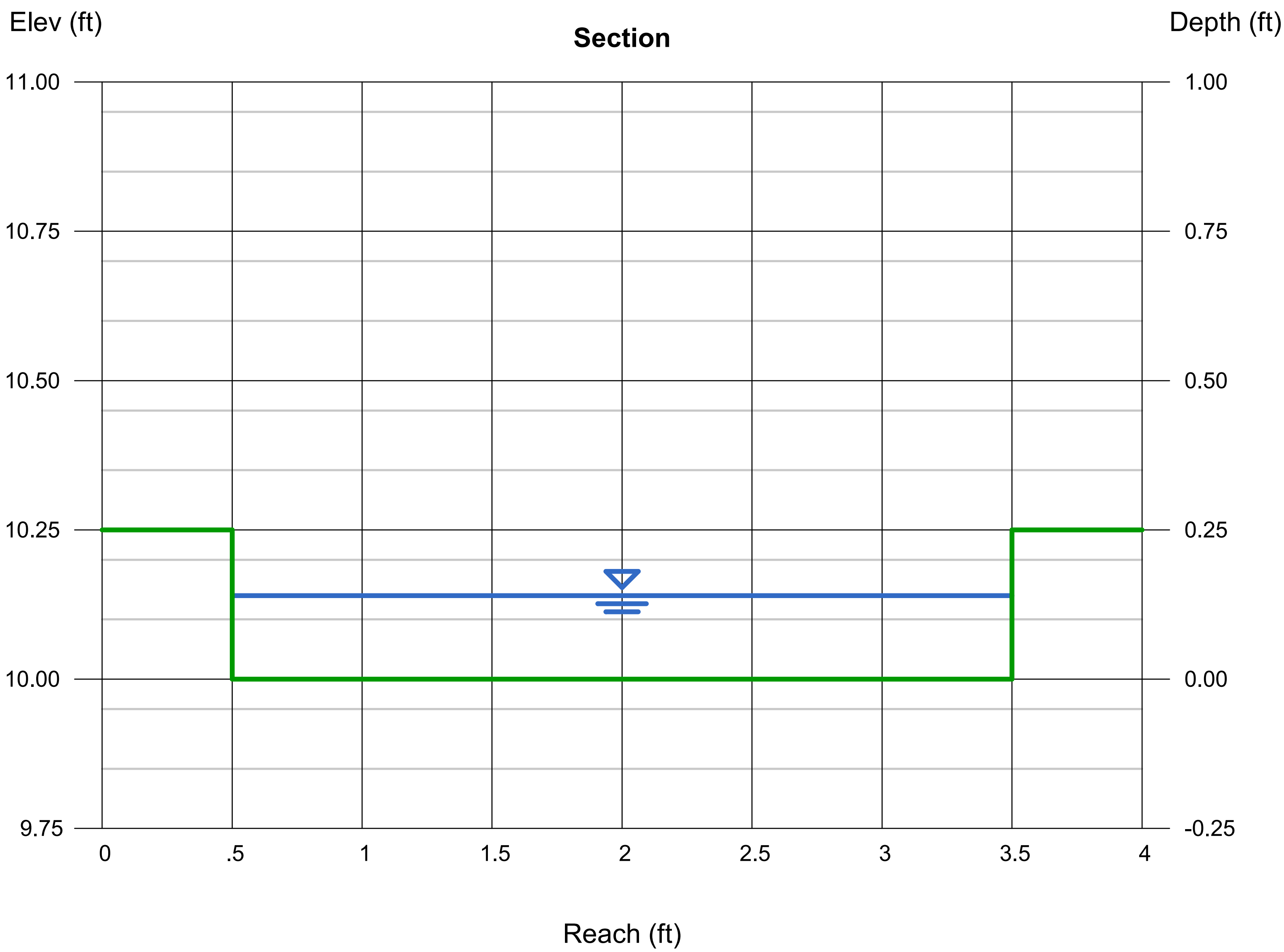
Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	100.00	0.00	0.00	---	---	0.00	---	---	---	---	---	0.000
1.00	2,413	101.00	0.04 ic	0.04 ic	---	---	0.00	---	---	---	---	---	0.043
2.00	4,826	102.00	0.06 ic	0.06 ic	---	---	0.00	---	---	---	---	---	0.063
3.00	7,239	103.00	0.08 ic	0.08 ic	---	---	0.00	---	---	---	---	---	0.078
4.00	9,652	104.00	4.77 ic	0.06 ic	---	---	4.71	---	---	---	---	---	4.773

Channel Report

Discharge Point 2 -Ex Curb Outlet

Rectangular		**Highlighted**	
Bottom Width (ft)	= 3.00	Depth (ft)	= 0.14
Total Depth (ft)	= 0.25	Q (cfs)	= 1.400
		Area (sqft)	= 0.42
Invert Elev (ft)	= 10.00	Velocity (ft/s)	= 3.33
Slope (%)	= 1.50	Wetted Perim (ft)	= 3.28
N-Value	= 0.013	Crit Depth, Yc (ft)	= 0.19
		Top Width (ft)	= 3.00
Calculations		EGL (ft)	= 0.31
Compute by:	Known Q		
Known Q (cfs)	= 1.40		



Channel Report

Discharge Point 2 (2.1)- Ultimate Curb Outlet

Rectangular

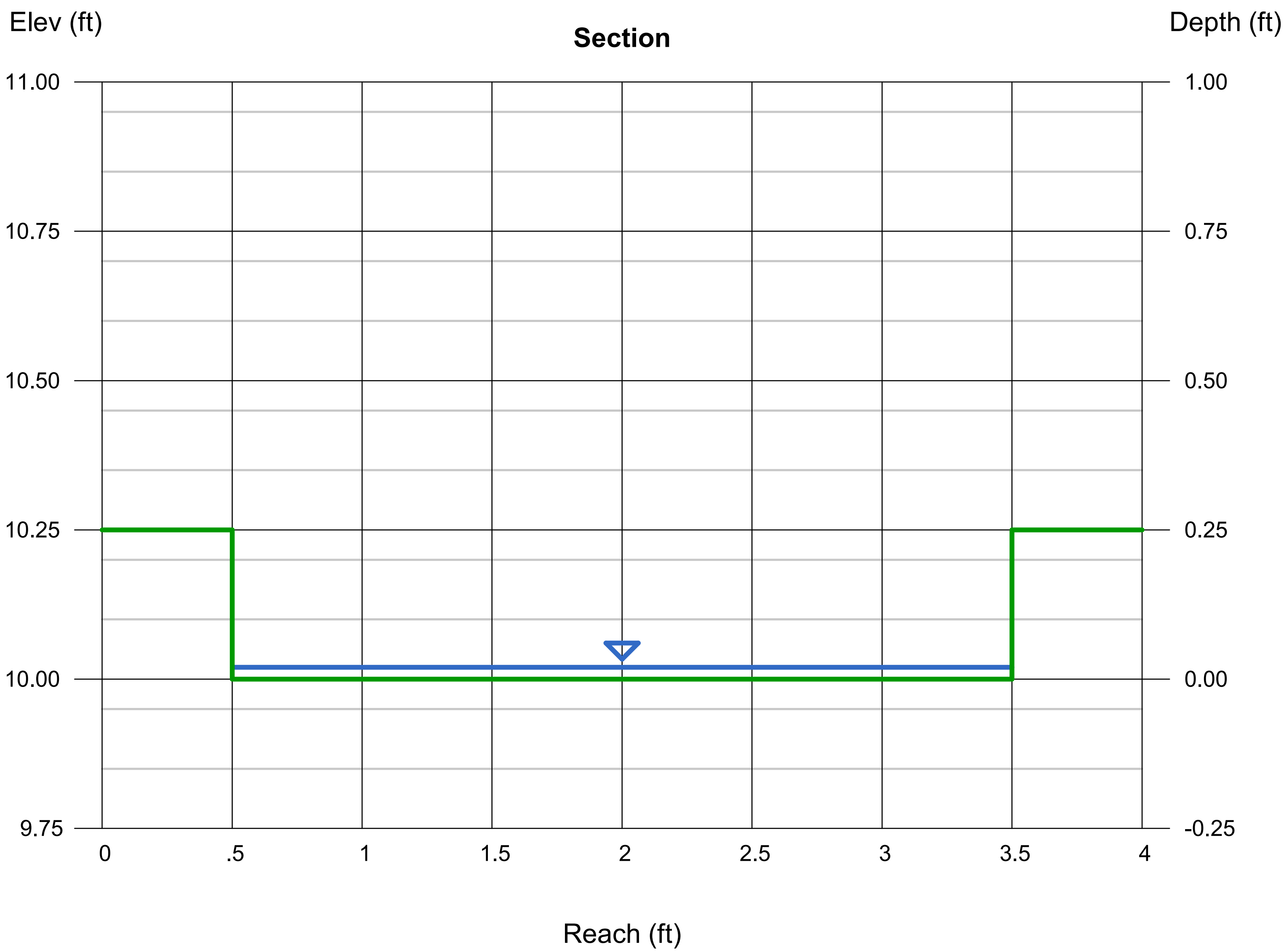
Bottom Width (ft)	= 3.00
Total Depth (ft)	= 0.25
Invert Elev (ft)	= 10.00
Slope (%)	= 1.50
N-Value	= 0.013

Calculations

Compute by:	Known Q
Known Q (cfs)	= 0.03

Highlighted

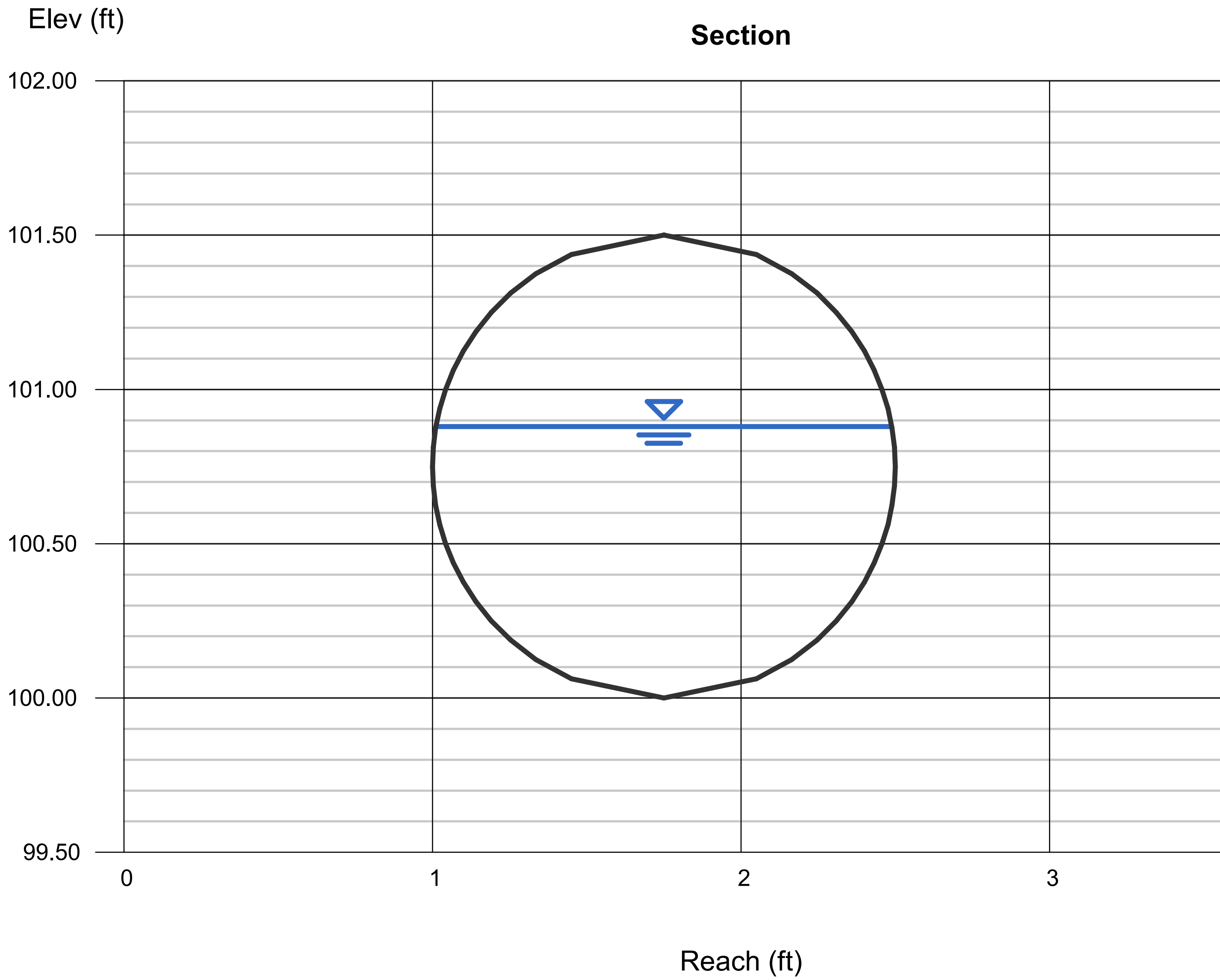
Depth (ft)	= 0.02
Q (cfs)	= 0.030
Area (sqft)	= 0.06
Velocity (ft/s)	= 0.50
Wetted Perim (ft)	= 3.04
Crit Depth, Yc (ft)	= 0.02
Top Width (ft)	= 3.00
EGL (ft)	= 0.02



Channel Report

Discharge Point 2 - Ultimate 18 inch SD

Circular		**Highlighted**	
Diameter (ft)	= 1.50	Depth (ft)	= 0.88
		Q (cfs)	= 8.130
		Area (sqft)	= 1.08
Invert Elev (ft)	= 100.00	Velocity (ft/s)	= 7.51
Slope (%)	= 1.22	Wetted Perim (ft)	= 2.62
N-Value	= 0.012	Crit Depth, Yc (ft)	= 1.11
		Top Width (ft)	= 1.48
Calculations		EGL (ft)	= 1.76
Compute by:	Known Q		
Known Q (cfs)	= 8.13		



APPENDIX D:

Hydrologic Information

Chapter 2

Hydrology

The design discharge depends upon many variables. Some of the more important variables are duration and intensity of rainfall; storm frequency; ground cover; and the size, imperviousness, slope, and shape of the drainage area.

2.1. Discharge Flow Methods

The designer should check with Drainage and Flood Plain Management Section, Public Works Department, to determine if there are established storm discharge flows.

If the project involves a watershed of major size or importance, flood flows may already be established through one or more of the following activities:

1. Master Plan Developments in the City and/or County
2. Studies for Development and Road Projects near the proposed project
3. Flood Insurance Studies prepared by FEMA based on existing land use at the time the study was completed. Urbanization may have caused increased flows. FEMA maps can be viewed at the SanGIS web site (www.sangis.org).
4. Recorded flows may be available from the United States Geological Survey (USGS) or the County of San Diego

If no established storm discharge flows are available, the applicable methods are:

1. Rational Method for watersheds less than 0.5 square miles – See Appendix A
2. Modified Rational Method for watersheds between 0.5 and 1.0 square miles – See Appendix A; or,
3. Natural Resources Conservation Service (NRCS) Method (formally called Soil Conservation Service (SCS) Method) for watersheds greater than 1.0 square miles – See Appendix B; or
4. Hydrologic Engineering Center (HEC) computer method.

2.2. Design Storm Frequency

Design storm frequency shall be based upon the following criteria:

1. Within floodplain and floodplain fringe areas as defined by FEMA, the runoff criteria shall be based upon a 100-year frequency storm.

2. For all drainage channels and storm water conveyance systems, which will convey drainage from a tributary area equal to or greater than one (1) square mile, the runoff criteria, shall be based upon a 100-year frequency storm.

3. For tributary areas under one (1) square mile:

   a. The storm water conveyance system shall be designed so that the combination of storm drain system capacity and overflow (streets and gutter) will be able to carry the 100-year frequency storm without damage to or flooding of adjacent existing buildings or potential building sites.

   b. The runoff criteria for the underground storm drain system shall be based upon a 50-year frequency storm.

2.3. Soil Type

For storm drain, culverts, channels, and all associated structures, Type D soil shall be used for all areas.

2.4. Other Requirements

1. Design runoff for drainage and flood control facilities within the City shall be based upon full development of the watershed area in accordance with the land uses shown on the City of San Diego, Progress Guide and General Plan.

2. When determining criteria for floodplain management and flood proofing, design runoff within the City shall be based upon existing conditions in accordance with the City Floodplain Management Requirements and FEMA Regulations.

3. Under City requirements, the minimum elevation of the finished, first floor elevation of any building is 2 feet above the 100-year frequency flood elevation.

2.5. Water Quality Considerations

Requirements for hydrologic studies specific to the design of pollution prevention controls and hydromodification management controls are detailed in the Storm Water Standards. Where the Storm Water Standards specify modifications to the guidelines stated herein on discharge flow methods, design storm frequency, or soil type, the modifications shall supersede these but only for the purposes stated in the Storm Water Standards. Where the Storm Water Standards does not specify a modification, the guidance found here in Chapter 2 shall apply.

Chapter 4

Storm Drains

Underground conduits operate in conjunction with surface drainage to maintain public safety and manage flooding during storm events. The entire storm water conveyance system (underground conduits and street surface improvements) must have the capacity to convey the peak discharge from a 100-year design event without affecting property located adjacent to the right-of-way. Street drainage systems shall meet the criteria regarding the maximum flow width, depth, and velocity as described in Chapter 3 of this Manual. To satisfy these criteria, it is often necessary to supplement surface drainage with underground conveyance. This chapter summarizes the general design criteria for underground drainage conduits in the City of San Diego and describes the methods to apply when designing these systems.

4.1. Design Criteria

4.1.1 Hydraulic Capacity

Storm drains shall have the capacity to convey the discharge from the Design Storm Frequency as defined in Section 2.2.

The conduit shall convey the design flow with the hydraulic grade line (HGL) maintaining a minimum freeboard of 1 foot below the ground surface or gutter flow line during the design event.

Storm drains draining the public right-of-way shall not be less than 18 inches in diameter. The cross-sectional area of the pipe shall not decrease when proceeding down gradient within the storm drain system. Diversion of drainage is not allowed (i.e., the discharge point and all inlets of a storm drain system shall be within the same watershed).

This Manual references its design criteria and procedures to storm drain conduit with a circular cross-section. These criteria and procedures can be adapted to other cross-section shapes (e.g., arches, other non-circular or non-rectangular shapes) by comparing their section factor ($AR^{2/3}$).

4.1.2 Manning Roughness Coefficient

Appendix C provides a table of recommended Manning Roughness Coefficients for underground conduits.

4.1.3 Alignment and Curvature

4.1.3.1 Horizontal Alignment

Storm drains shall adhere to a straight alignment or a circular curve of uniform radius within the same run of pipe (i.e., from one clean-out, inlet, or other drainage structure to another). If curved, the storm drain shall follow the alignment of overlying streets whenever reasonable. All storm drains within a slope shall be aligned perpendicular to the slope contours. Provide a flat access area over all public storm drains.

The horizontal alignment of a storm drain system shall maintain a minimum horizontal clearance of no less than ten feet (10') (outside diameter to outside diameter) from sanitary sewer lines and five feet (5') (outside diameter to outside diameter) from potable water mains, reclaimed water mains, and other storm drains unless prior approval from the City is obtained.

The material type, length of pipe segments, and bevel of joints limit the curvature of the storm drain. Appendix D presents additional information on pipe alignment based on pipe characteristics.

When designing the junction of two storm drains, priority shall be given to the larger of the connecting storm drains. Flow from the smaller storm drain shall not oppose the flow in the main line without prior approval from the City. Specifically, when the angle of confluence (φ) is measured from the centerline of the main line, the angle of confluence shall be less than or equal to 90 degrees at all times. Figure 4–1 illustrates the definition of angle of confluence used in this Manual. The angle of confluence shall be further limited to 60 degrees or less in cases where:

1. The smaller pipe is 36 inches in diameter or larger; or
2. The flow from the smaller pipe is greater than or equal to 10 percent of the main-line flow.

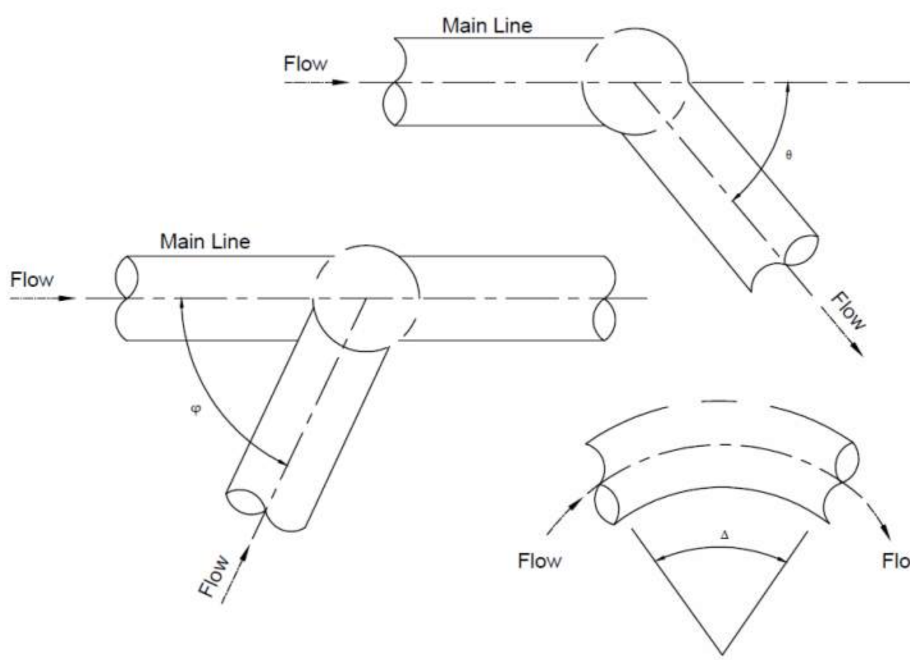


Figure 4-1. Definition Sketch for Angle of Deflection (θ), Angle of Confluence (φ), and Bend Radius (Δ)

dictate the type and degree of protection required. When protection is warranted, the invert of the pipe (i.e., the lower 90 degrees of the pipe) shall be protected on all straight-aways and the invert and walls (i.e., the lower 180 degrees of the pipe) shall be protected on all curves.

Additional conduit thickness shall be considered sacrificial and shall not be included in a structural analysis.

4.1.10 Storm Drain Plans

Storm drain plans shall provide a minimum amount of information regarding storm drain design and construction, including **all** of the following:

1. Plan and profile for all public storm drains showing all cleanouts, inlets, and catch basins with their respective invert elevations, rim elevations, type, and station; and
2. Stationing, which shall increase in the up-grade direction from the lower end of the storm drain; and
3. Hydraulic Grade Line (HGL) of the flow within the pipe, including hydraulic jumps; and
4. Design flow and velocity (50-year, or 100-year, as appropriate); and
5. Pipe design load rating or equivalent information (depending on pipe material, this might include pipe gauge or wall thickness); and
6. Flow and velocity at the outfall of the pipe; and
7. Flow capacity of the pipe (Q_{pipe}); and
8. Length, material, and diameter of all storm drains; and
9. Property lines, right-of-way limits, street names and widths, finished grade; and
10. Conflicting underground utilities; and
11. Drawing numbers for related easements and existing structures; and
12. Delineation of the drainage basin for the storm drain that includes area calculation.

4.2. Hydraulic Design of Storm Drains

This section presents general procedures for hydraulic design and evaluation of storm drains.

4.2.1 Minimum Gradient

The minimum pipe gradient shall be 0.5 percent grade or the pipe shall have a minimum velocity of four feet per second (fps) with the pipe flowing one quarter full. Flatter grades may be approved where no other practical solution is available. Pipes shall be designed to flow full and free of pressure heads except for short runs where the grade changes and a small pressure head cannot be avoided. Where it is necessary to design for a pressure head in a system and it is approved by the City Engineer, pressure pipe with water-tight joints shall be used.

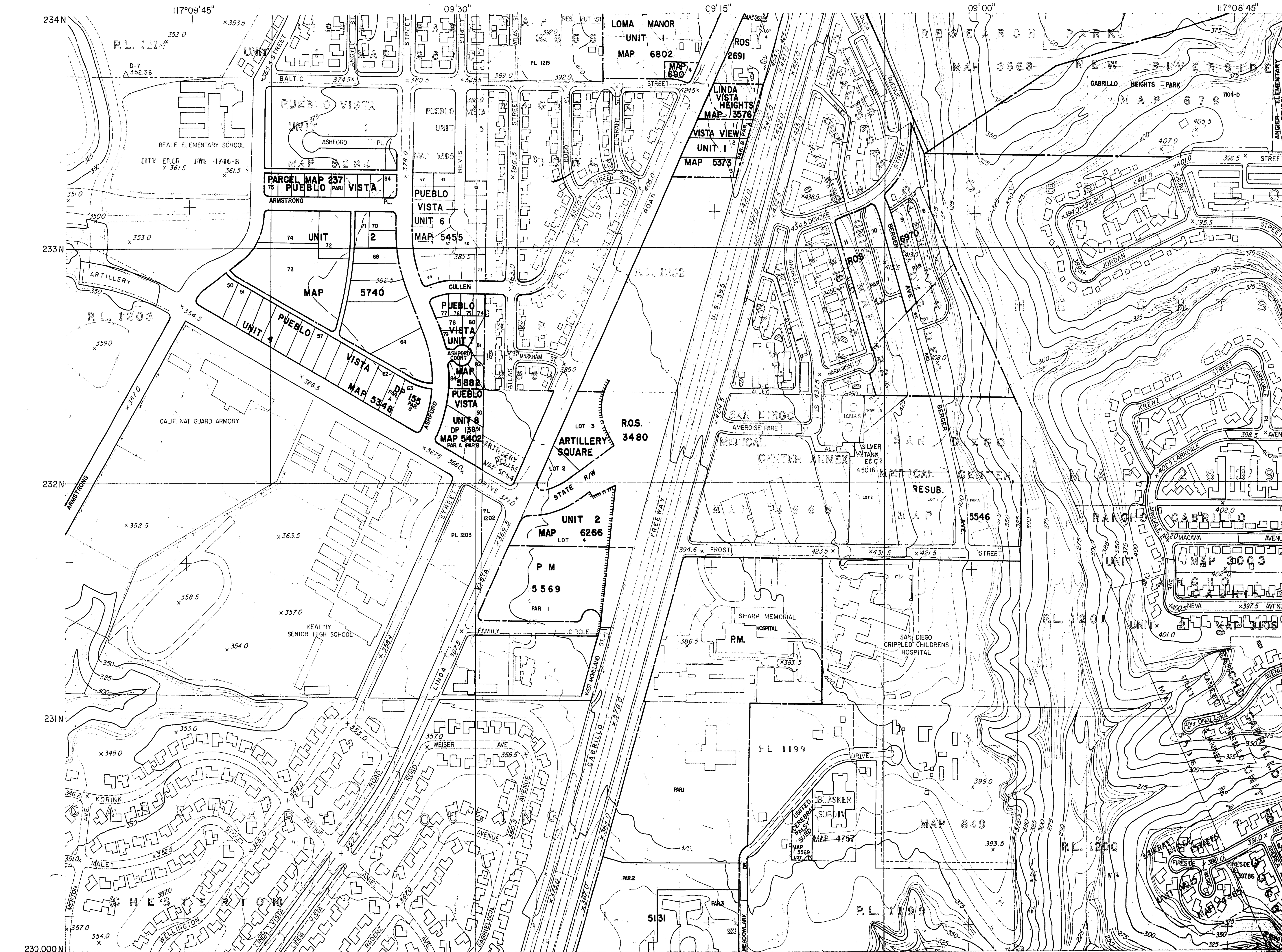
FEMA


PROJECT LOCATION
AREA OF MINIMAL FLOOD HAZARD
Zone X
Zone A
SAN DIEGO, CITY OF
060295
06073C1616G
eff. 5/16/2012
06073C1617G
eff. 5/16/2012

HISTORIC DRAINAGE PATTERN

CITY OF SAN DIEGO

METROPOLITAN TOPOGRAPHIC SURVEY



Compiled by
AMERICAN AERIAL SURVEYS, INC.
Covina, California
by stereophotogrammetric methods, under the direction of the City Engineer of the City of San Diego, California
Photography by A.A.S. dated July 7, 1963
Control by U.S.C. & G.S., U.S.G.S. and the City of San Diego
North American Datum 1927

BASE MAP	
DRAWN:	
REVISED:	
11-17-77	
TR	

SCALE 1:2400

200 0 200 400 600 800 1000 Feet

DATUM IS MEAN SEA LEVEL CONTOUR INTERVAL 5 FEET

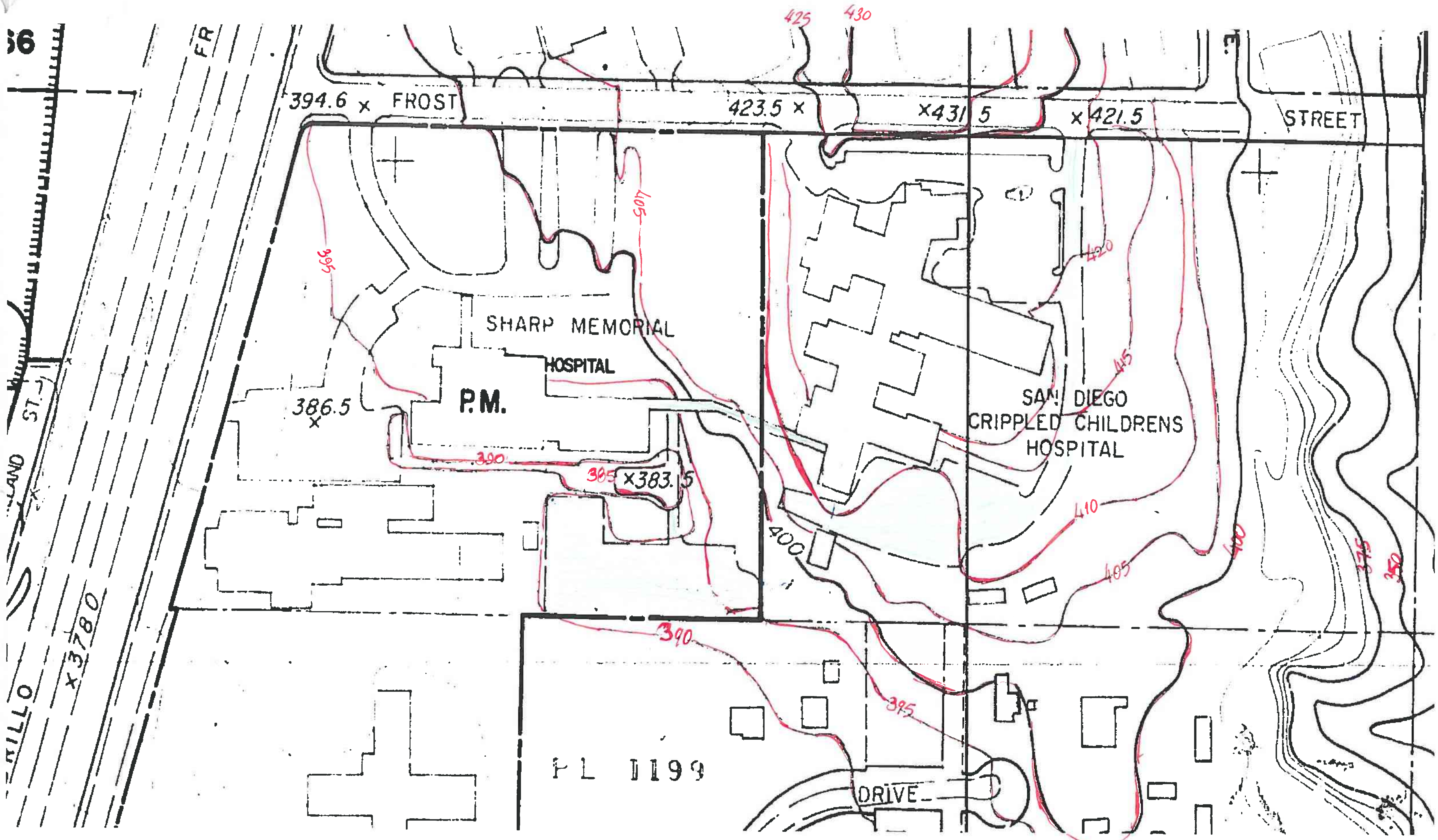
ONE THOUSAND FOOT CALIFORNIA RECTANGULAR GRID (ZONE 6)
THE LAST THREE DIGITS OF THE GRID NUMBERS ARE OMITTED

NOTE: THE RECTANGULAR COORDINATE VALUES ARE SHOWN ON THE SOUTH AND WEST MARGINS
THE GEOGRAPHIC VALUES ARE SHOWN ON THE EAST AND NORTH MARGINS

	234-1719	
230-1713		230-1725
	226-1719	

SAN DIEGO
SAN DIEGO COUNTY
CALIFORNIA

230-1719



FROST
STREET
SHARP MEMORIAL
HOSPITAL
P.M.
SAN DIEGO
CRIPPLED CHILDRENS
HOSPITAL
DRIVE
394.6
423.5
431.5
421.5
386.5
383.5
400
390
395
405
410
415
420
425
430
PL 1199
x 3780

ADDENDUM #1
FOR
MASTER DRAINAGE STUDY
for

SHARP MMC CAMPUS REDEVELOPMENT

PACKAGE 1A UTILITY RE-ROUTE
PACKAGE 3A MARY BIRCH EXPANSION
PACKAGE 4 ED EXPANSION
PACKAGE 5A NEW CEP
PACKAGE 7A NEW TOWER
PACKAGE 8 CONCOURSE ADDITION

Prepared By:

BWE
STRUCTURAL ENGINEERING • CIVIL ENGINEERING • SURVEYING • LAND PLANNING

9449 Balboa Avenue, Suite 270
San Diego, CA 92123
BWE Project: 9545U.10.00

Date: August, 2022

DECLARATION OF RESPONSIBLE CHARGE

I, HEREBY DECLARE THAT I AM THE CIVIL ENGINEER OF WORK FOR THIS PROJECT, THAT I HAVE EXERCISED RESPONSIBLE CHARGE OVER THE DESIGN OF THE PROJECT AS DEFINED IN SECTION 6703 OF THE BUSINESS AND PROFESSIONS CODE, AND THAT THE DESIGN IS CONSISTENT WITH CURRENT DESIGN.

I UNDERSTAND THAT THE CHECK OF PROJECT DRAWING AND SPECIFICATIONS BY THE COUNTY OF SAN DIEGO IS CONFINED TO A REVIEW ONLY AND DOES NOT RELIEVE ME, AS ENGINEER OF WORK, OF MY RESPONSIBILITIES FOR PROJECT DESIGN.

August 26, 2022

MICHAEL A. SLAWSON DATE:
R.C.E. # 56127
EXP. 12/31/2022

Addendum #1

Original Master Drainage Report dated July, 2022 was prepared for the SHARP MMC Campus Redevelopment project. This report was approved by the City under Package 5A (PTS # 0694839) of the master redevelopment project. This addendum is made to address minor comments to the master drainage study submitted under Package 4 (PTS-0694841) of the SHARP MMC Campus Redevelopment project.

Addendum #1 is prepared to revise and replace the following sections/tables from the approved master drainage report dated July, 2022.

1) Table 7-1 Summary of Areas and footnote for Discharge Point #3

	Area (Acres)			**Percent Impervious Area**	**Percent Pervious Area**
	Total	**Impervious (Ai)**	**Pervious (Ap)**		
Existing	2.46	1.96	0.50	79.7%	20.3%
Proposed	2.46	1.98	0.48	80.5%	19.5%
Percentage Change		**1.0%**	**-4.0%**		

The increase in impervious area in the proposed condition is minimal. This is because majority of the redevelopment is occurring in an area which was already paved in the existing condition.

2) Table 7-3 Existing and Proposed Conditions Peak Flow Rates Summary for Discharge Point #3 (unmitigated condition)

Drainage Area (acres)		**100 Yr Flow (cfs)**		
Existing Condition	**Proposed Condition**	**Existing Condition**	**Proposed Condition (Unmitigated)**	**% Change from Existing Condition**
2.46	2.46	8.27	8.60	**3.99%**

3) Table 7-4 Detention Summary Table for Discharge Point #3

		100-yr Detention Flow Rate (cfs)			Detention Volume Provided (cf)
		Inflow	Outflow	Detained	
Discharge Location 2	**BMP #3**	9.40	1.48	7.92	16,910
Discharge Location 2	**BMP #4**	2.85	2.30	0.55	5,453
Discharge Location 2	**BMP #10**	2.00	0.34	1.66	3,496
Discharge Location 3	**BMP #5**	3.92	3.20	0.72	5,093
Discharge Location 4	**BMP #12**	3.55	2.00	1.55	4,679
Discharge Location 5	**BMP #8**	6.45	4.30	2.15	9,652
	Total	28.17	13.62	14.55	45,857

4) Table 7-5 Existing and Proposed Conditions Peak Flow Rates Summary for Discharge Point #3 (mitigated condition)

100 Yr Flow (cfs)			
Existing Condition	**Proposed Condition (Unmitigated)**	**Proposed Condition (Mitigated)**	**% Change from Existing Condition**
8.27	8.60	7.88	**-4.72%**

In the proposed condition the mitigated peak flow rate due to the 100-year storm event can be expected to be reduced by 0.39 (=8.27-7.88) cfs from existing condition. Detention of peak flow rate is achieved by routing flow via BMP #5.

5) Appendix B: Replace existing condition hydrology analysis (CivilD results).
6) Appendix B: Add existing condition pervious/impervious areas exhibit.
7) Appendix B: Replace existing condition drainage exhibit.
8) Appendix C: Add proposed condition pervious/impervious areas exhibit.
9) Appendix C: Replace proposed condition drainage exhibit.
10) Appendix C: Replace detention analysis for BMP #5.

9. Conclusion: Total peak 100 year flow rates in the existing and proposed conditions are 36.64 cfs and 37.65 cfs respectively. But, the mitigated condition peak flow rate from the site is 23.10 cfs.

All other information in the Master Drainage Report remains unchanged.

Appendix B

Existing Condition Hydrology Analysis
Pervious/Impervious Areas Exhibit (Existing Condition)
Existing Condition Hydrology Map

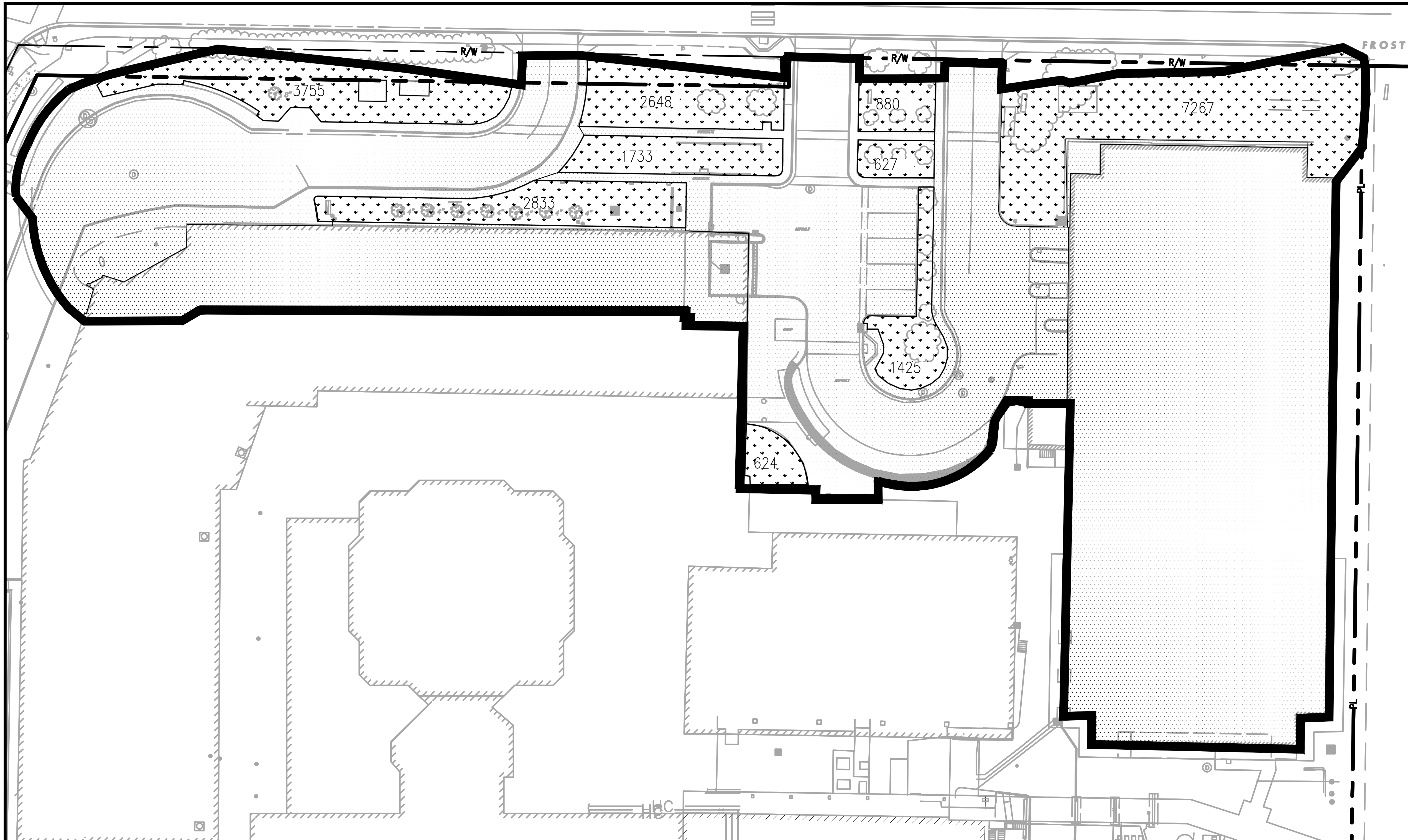
```
                  San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2005 Version 6.5

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 09/14/22
------------------------------------------------------------------------
Existing Condition Hydrology Analysis
Analysis Point 3
100 yr Storm Event
City of San Diego
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

------------------------------------------------------------------------


Program License Serial Number 6116

------------------------------------------------------------------------
Rational hydrology study storm event year is   100.0
English (in-lb) input data Units used
English (in) rainfall data used

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      300.000 to Point/Station      301.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
User specified 'C' value of 0.850 given for subarea
Initial subarea flow distance  =   58.000(Ft.)
Highest elevation =  407.240(Ft.)
Lowest elevation =  402.000(Ft.)
Elevation difference =    5.240(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     1.65 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.8500)*(  58.000^.5)/(   9.034^(1/3)]=   1.65
Setting time of concentration to 5 minutes
Rainfall intensity (I) =      4.389(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.850
```

```
Subarea runoff =      0.149(CFS)
Total initial stream area =       0.040(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      301.000 to Point/Station      302.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
______________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.746(CFS)
Depth of flow =   0.091(Ft.), Average velocity =   2.154(Ft/s)
        ******* Irregular Channel Data ***********
-----------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              0.50
        2              0.12              0.00
        3             20.00              0.24
Manning's 'N' friction factor =   0.016
-----------------------------------------------------------------
Sub-Channel flow  =      0.746(CFS)
  '     '        flow top width =      7.586(Ft.)
  '     '    velocity=    2.154(Ft/s)
  '     '        area =      0.346(Sq.Ft)
  '     '        Froude number =     1.777

Upstream point elevation =   402.000(Ft.)
Downstream point elevation =   396.790(Ft.)
Flow length =   156.000(Ft.)
Travel time  =    1.21 min.
Time of concentration =    6.21 min.
Depth of flow =   0.091(Ft.)
Average velocity =   2.154(Ft/s)
Total irregular channel flow =     0.746(CFS)
Irregular channel normal depth above invert elev. =   0.091(Ft.)
Average velocity of channel(s) =   2.154(Ft/s)

Sub-Channel No. 1 Critical depth =      0.115(Ft.)
  '     '       '     Critical flow top width =      9.573(Ft.)
  '     '       '     Critical flow velocity=    1.353(Ft/s)
  '     '       '     Critical flow area =      0.552(Sq.Ft)

 Adding area flow to channel
User specified 'C' value of 0.850 given for subarea
Rainfall intensity =      4.027(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =      1.095(CFS) for    0.320(Ac.)
Total runoff =      1.245(CFS)  Total area =       0.36(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

```
Process from Point/Station      302.000 to Point/Station      302.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.850 given for subarea
Time of concentration =     6.21 min.
Rainfall intensity =      4.027(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =      1.198(CFS) for    0.350(Ac.)
Total runoff =      2.443(CFS)  Total area =       0.71(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      302.000 to Point/Station      302.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.850 given for subarea
Time of concentration =     6.21 min.
Rainfall intensity =      4.027(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =      1.985(CFS) for    0.580(Ac.)
Total runoff =      4.428(CFS)  Total area =       1.29(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      302.000 to Point/Station      303.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   396.790(Ft.)
Downstream point/station elevation =   393.400(Ft.)
Pipe length  =    65.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     4.428(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     4.428(CFS)
Normal flow depth in pipe =    6.31(In.)
Flow top width inside pipe =   11.98(In.)
Critical Depth =   10.58(In.)
Pipe flow velocity =     10.58(Ft/s)
Travel time through pipe =    0.10 min.
Time of concentration (TC) =     6.31 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      303.000 to Point/Station      303.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.850 given for subarea
Time of concentration =     6.31 min.
Rainfall intensity =      4.002(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =      0.952(CFS) for    0.280(Ac.)
```

```
Total runoff =      5.381(CFS)  Total area =       1.57(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      303.000 to Point/Station      304.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   393.400(Ft.)
Downstream point/station elevation =   392.300(Ft.)
Pipe length  =   137.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.381(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     5.381(CFS)
Normal flow depth in pipe =   11.44(In.)
Flow top width inside pipe =   12.77(In.)
Critical Depth =   11.29(In.)
Pipe flow velocity =      5.36(Ft/s)
Travel time through pipe =    0.43 min.
Time of concentration (TC) =     6.74 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      304.000 to Point/Station      304.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.850 given for subarea
Time of concentration =     6.74 min.
Rainfall intensity =      3.903(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =      0.663(CFS) for    0.200(Ac.)
Total runoff =      6.044(CFS)  Total area =       1.77(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      304.000 to Point/Station      305.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   392.300(Ft.)
Downstream point/station elevation =   390.840(Ft.)
Pipe length  =   175.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     6.044(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     6.044(CFS)
Normal flow depth in pipe =   10.36(In.)
Flow top width inside pipe =   17.79(In.)
Critical Depth =   11.40(In.)
Pipe flow velocity =      5.74(Ft/s)
Travel time through pipe =    0.51 min.
Time of concentration (TC) =     7.24 min.
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      305.000 to Point/Station      305.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.850 given for subarea
Time of concentration =     7.24 min.
Rainfall intensity =      3.797(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =      0.549(CFS) for    0.170(Ac.)
Total runoff =      6.593(CFS)  Total area =        1.94(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      305.000 to Point/Station      305.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.850 given for subarea
Time of concentration =     7.24 min.
Rainfall intensity =      3.797(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.850
Subarea runoff =      1.678(CFS) for    0.520(Ac.)
Total runoff =      8.271(CFS)  Total area =        2.46(Ac.)
End of computations, total study area =           2.460 (Ac.)
```



PERVIOUS/IMPERVIOUS AREA SUMMARY

TOTAL SITE AREA = 2.46 AC
IMPERVIOUS AREA = 1.96 AC
IMPERVIOUS % = 79.7

PERVIOUS AREA = 0.50 AC
PERVIOUS % = 20.3

LEGEND

LEGEND		SYMBOL
OUTER DRAINAGE BOUNDARY		
PERVIOUS AREA	LANDSCAPE/DIRT AREA	
IMPERVIOUS AREA	CONCRETE/ASPHALT DRIVEWAY	

25 0 50 100
SCALE IN FEET
1 inch = 50 ft.

BWE
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

SYM	DESCRIPTION	DATE	APPR

ISSUE DATE:	
DRAWN BY:	
CHECKED BY:	
B&W JOB NUMBER:	
CLIENT JOB NUMBER:	

PROJECT

SHARP MMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

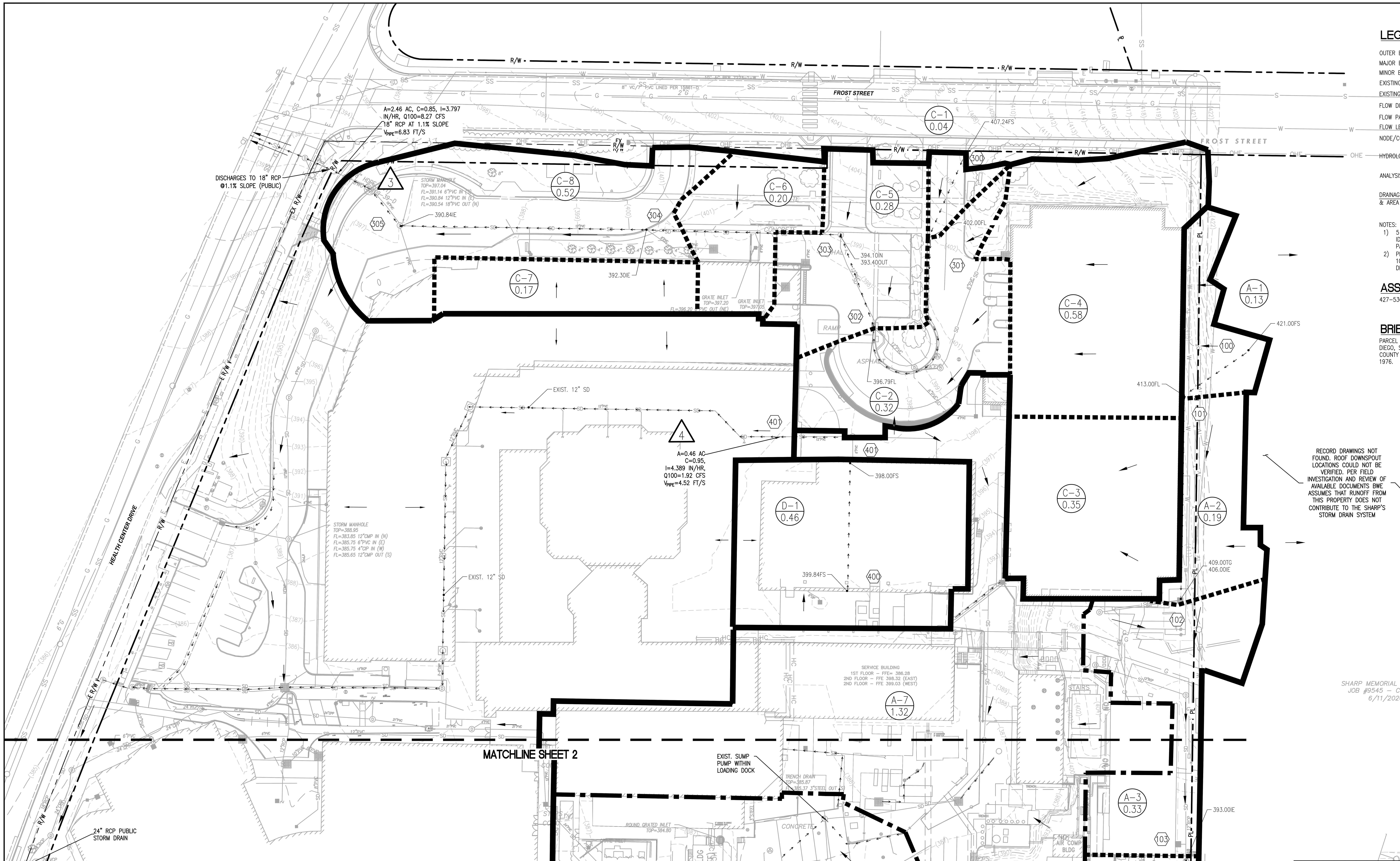
SHEET TITLE

PERVIOUS/IMPERVIOUS AREAS EXISTING CONDITION

SHEET OF

PACKAGE-4

PLOT: M:\PROJECTS\9500\9545U.10.00 SHARP MMC\DWGS\EXHIBITS\DRAINAGE\9545U.10.00 PERV-IMP-EXST-PK-4.DWG Min GC 9/19/2022 10:12 AM



LEGEND

	SYMBOL
OUTER BASIN BOUNDARY	
MAJOR BASIN BOUNDARY	
MINOR BASIN BOUNDARY	
EXISTING STORM DRAIN	SD
EXISTING CONTOUR	XXX
FLOW DIRECTION	
FLOW PATH	
FLOW LENGTH	L=XXX.X'
NODE/CONTOUR ELEVATION	306.43TC 301.33IE
HYDROLOGY NODE	200
ANALYSIS/DISCHARGE POINT	
DRAINAGE BASIN MARKER & AREA (AC)	A-3 X.XX

NOTES:
1) 5 MAJOR POINT OF COMPLIANCES (POCs) HAVE BEEN IDENTIFIED BASED ON THE EXISTING DRAINAGE PATTERN OF THE SITE.
2) PEAK FLOW RATES ARE CALCULATED UTILIZING 100-YEAR DESIGN STORM EVENT AND CITY OF SAN DIEGO NOMOGRAPH METHOD.

ASSESSOR'S PARCEL NUMBER

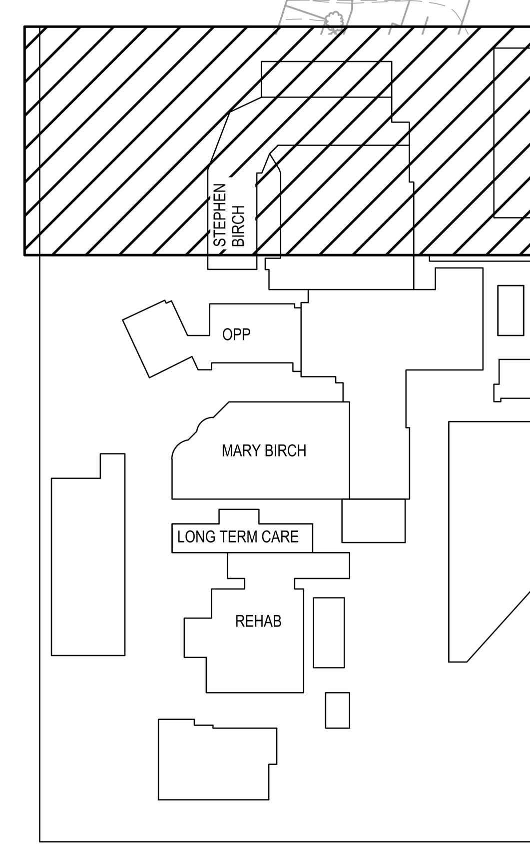
427-530-02

BRIEF LEGAL DESCRIPTION

PARCEL 1 OF PARCEL MAP 5131 IN THE CITY OF SAN DIEGO, STATE OF CALIFORNIA, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY SEPTEMBER 24, 1976.

DRAINAGE BASIN DETAILS

DRAINAGE BASIN	BASIN AREA (AC)	BASIN RUNOFF COEFFICIENT	BASIN RAINFALL INTENSITY (IN/HR)	BASIN Q100 PEAK FLOW RATE (CFS)
A-1	0.13	0.96	4.389	0.55
A-2	0.19	0.96	4.236	0.77
A-7	1.32	0.96	4.907	4.91
C-1	0.04	0.85	4.389	0.15
C-2	0.32	0.85	4.027	1.10
C-3	0.35	0.85	4.027	1.20
C-4	0.58	0.85	4.027	1.99
C-5	0.28	0.85	4.002	0.95
C-6	0.20	0.85	3.903	0.67
C-7	0.17	0.85	3.797	0.55
C-8	0.52	0.85	3.797	1.68
D-1	0.46	0.95	4.389	1.92



KEY PLAN

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

SYM	DESCRIPTION	DATE	APPR

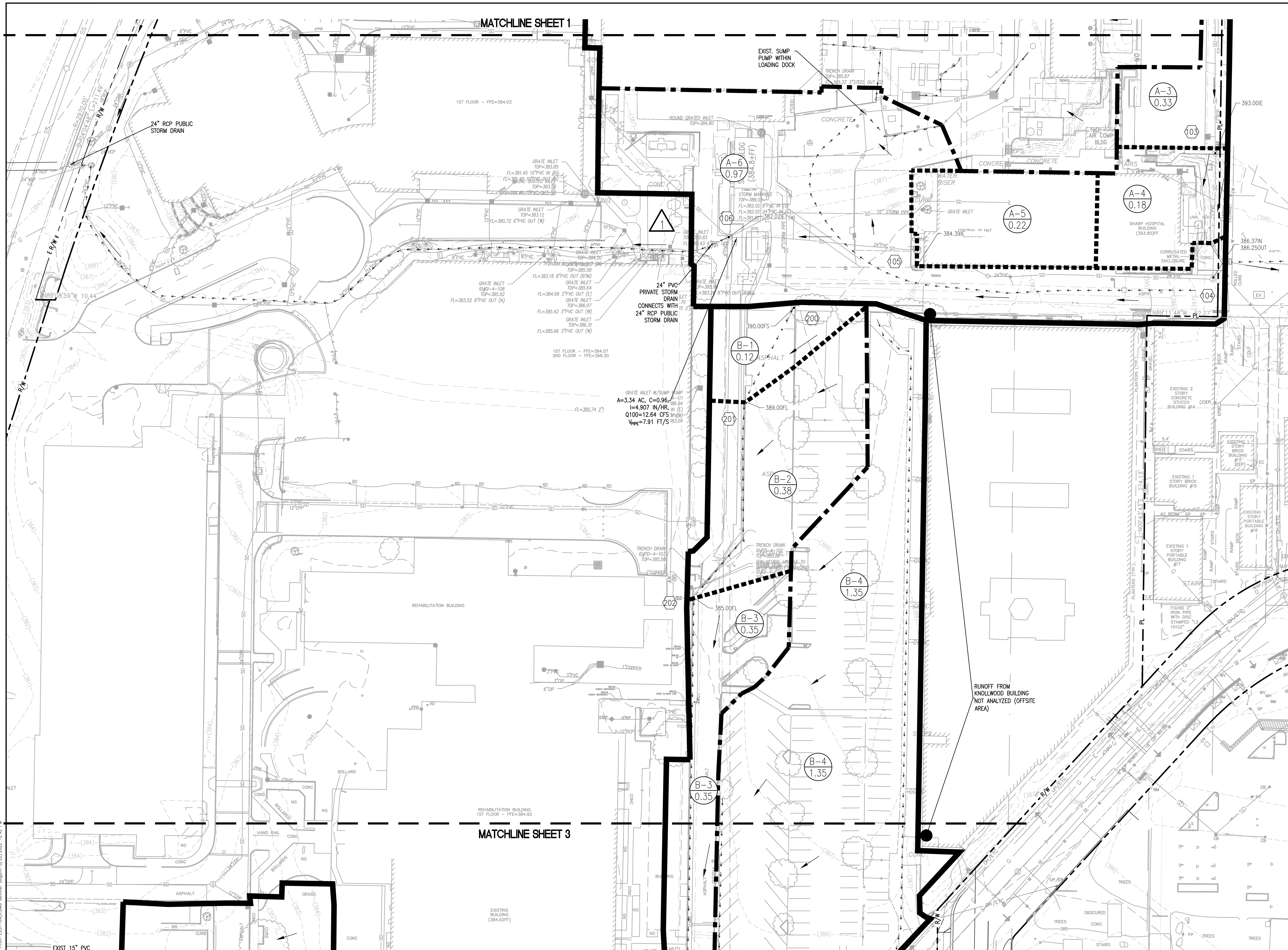
BENCHMARK:	
ISSUE DATE:	09/17/2021
DRAWN BY:	MDS
CHECKED BY:	MGC
BWE JOB NUMBER:	9545.10.00
CLIENT JOB NUMBER:	

PROJECT
SHARP MMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

SHEET TITLE
EXISTING CONDITION HYDROLOGY EXHIBIT

SHEET 1 OF 3

PLOT: W:\PROJECTS\9500\9545\10.00 SHARP MMC\DWGS\EXHIBITS\DRAINAGE\954510.00 HYDR-EXST-OVER.DWG MH: GC 9/19/2022 10:55 AM



LEGEND	SYMBOL
OUTER BASIN BOUNDARY	
MAJOR BASIN BOUNDARY	
MINOR BASIN BOUNDARY	
EXISTING STORM DRAIN	SD
EXISTING CONTOUR	XXX
FLOW DIRECTION	
FLOW PATH	
FLOW LENGTH	L=XXX.X'
NODE/CONTOUR ELEVATION	306.43TG 301.33IE
HYDROLOGY NODE	200
ANALYSIS/DISCHARGE POINT	1
DRAINAGE BASIN MARKER & AREA (AC)	A-3 X.XX

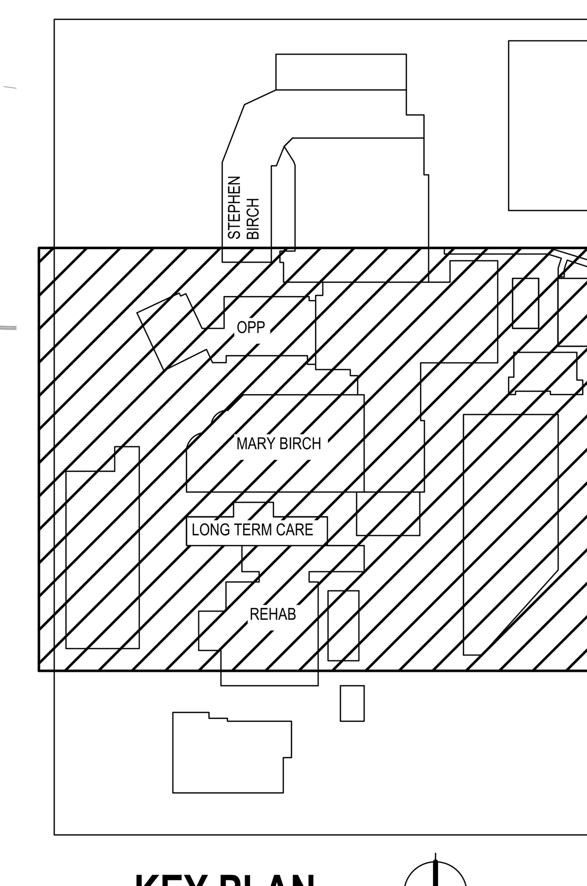
SCALE: 1"=30'

DRAINAGE BASIN DETAILS

DRAINAGE BASIN	BASIN AREA (AC)	BASIN RUNOFF COEFFICIENT	BASIN RAINFALL INTENSITY (IN/HR)	BASIN Q100 PEAK FLOW RATE (CFS)
A-3	0.33	0.96	4.079	1.29
A-4	0.18	0.96	4.042	0.70
A-5	0.22	0.96	3.872	0.82
A-6	0.97	0.96	3.872	3.61
B-1	0.40	0.85	4.389	0.45
B-2	0.35	0.85	4.067	1.31

DRAINAGE BASIN DETAILS

DRAINAGE BASIN	BASIN AREA (AC)	BASIN RUNOFF COEFFICIENT	BASIN RAINFALL INTENSITY (IN/HR)	BASIN Q100 PEAK FLOW RATE (CFS)
B-3	0.35	0.85	3.415	1.02
B-4	1.35	0.85	3.415	3.92



KEY PLAN

BWE
CIVIL • STRUCTURAL • SURVEY • PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123
619.299.5550

SYM	DESCRIPTION	DATE	APPR

BENCHMARK:

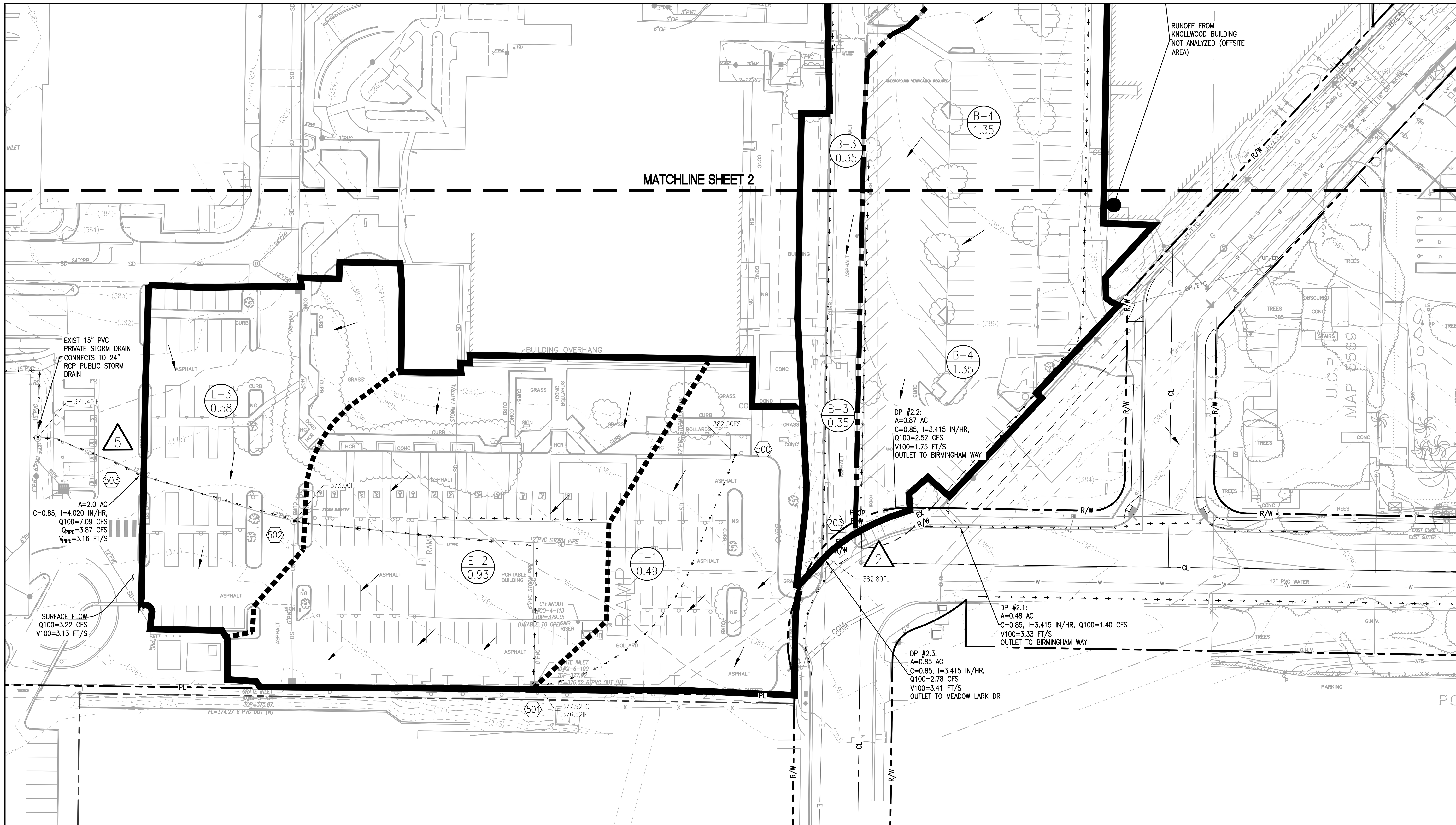
ISSUE DATE:	09/17/2021
DRAWN BY:	MDS
CHECKED BY:	MGC
B&W JOB NUMBER:	9545.10.00
CLIENT JOB NUMBER:	

PROJECT

SHARP MMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

SHEET TITLE

EXISTING CONDITION HYDROLOGY EXHIBIT



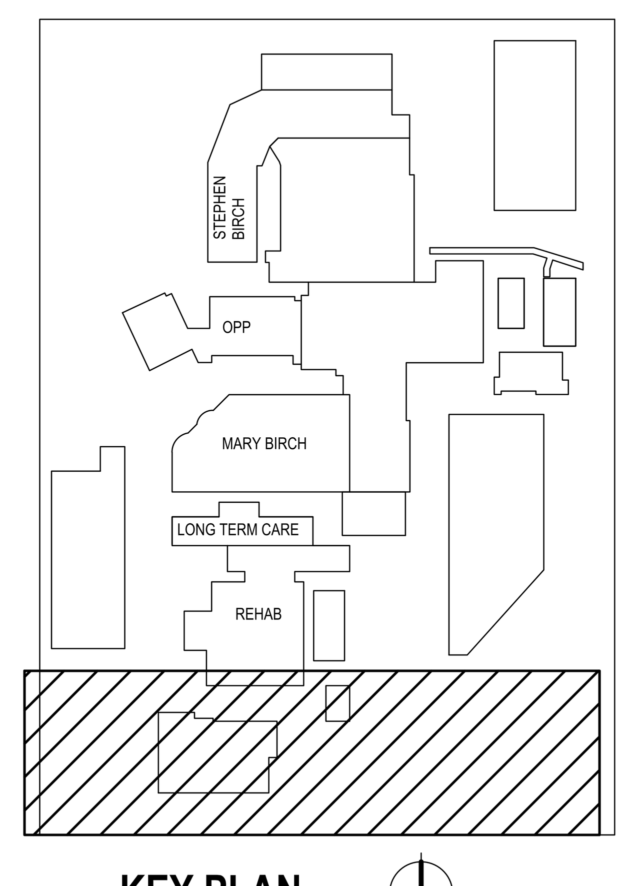
LEGEND

LEGEND	SYMBOL
OUTER BASIN BOUNDARY	
MAJOR BASIN BOUNDARY	
MINOR BASIN BOUNDARY	
EXISTING STORM DRAIN	SD
EXISTING CONTOUR	XXX
FLOW DIRECTION	
FLOW PATH	
FLOW LENGTH	L=XXX.X'
NODE/CONTOUR ELEVATION	306.43TG / 301.33IE
HYDROLOGY NODE	200
ANALYSIS/DISCHARGE POINT	1
DRAINAGE BASIN MARKER & AREA (AC)	A-3 / X.XX

DRAINAGE BASIN DETAILS

DRAINAGE BASIN	BASIN AREA (AC)	BASIN RUNOFF COEFFICIENT	BASIN RAINFALL INTENSITY (IN/HR)	BASIN Q100 PEAK FLOW RATE (CFS)
E-1	0.49	0.85	4.389	1.83
E-2	0.93	0.85	4.148	3.28
E-3	0.58	0.85	4.020	1.98

SCALE: 1"=30'



KEY PLAN

CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123
619.299.5550

SYM	DESCRIPTION	DATE	APPR

BENCHMARK:

ISSUE DATE:	09/17/2021
DRAWN BY:	MDS
CHECKED BY:	MGC
B&W JOB NUMBER:	9545.10.00
CLIENT JOB NUMBER:	

PROJECT
SHARP MMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

SHEET TITLE
EXISTING CONDITION
HYDOLOGY EXHIBIT

SHEET 3 OF 3

PLOT: W:\PROJECTS\9500\9545U.10.00 SHARP MMC\DWGS\EXHIBITS\DRAINAGE\9545U.10.00 HYDR-EXST-OVER.DWG Jennifer Bogorin 8/22/2022 12:15 PM

Appendix C

Pervious/Impervious Areas Exhibit (Proposed Condition)
Proposed Condition Hydrology Analysis
Detention Analysis
Proposed Condition Hydrology Map

```
                 San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2005 Version 6.5

Rational method hydrology  program based on
San Diego County Flood Control Division 1985 hydrology manual
        Rational Hydrology Study        Date: 09/16/22
------------------------------------------------------------------------
Proposed Condition Hydrology Analysis
Analysis Point 3
100 yr Storm Event
City of San Diego
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

------------------------------------------------------------------------


Program License Serial Number 6116

------------------------------------------------------------------------
Rational hydrology study storm event year is   100.0
English (in-lb) input data Units used
English (in) rainfall data used

Standard intensity of Appendix I-B used for year and
Elevation 0 - 1500 feet
Factor (to multiply * intensity)  =  1.000
Only used if inside City of San Diego
San Diego hydrology manual 'C' values used
Runoff coefficients by rational method


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      300.000 to Point/Station      301.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
User specified 'C' value of 0.860 given for subarea
Initial subarea flow distance  =  144.000(Ft.)
Highest elevation =  403.840(Ft.)
Lowest elevation =  397.730(Ft.)
Elevation difference =    6.110(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     3.20 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.8600)*( 144.000^.5)/(   4.243^(1/3)]=   3.20
Setting time of concentration to 5 minutes
Rainfall intensity (I) =      4.389(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.860
```

```
Subarea runoff =      1.510(CFS)
Total initial stream area =       0.400(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      301.000 to Point/Station      302.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   395.140(Ft.)
Downstream point/station elevation =   394.420(Ft.)
Pipe length  =   138.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.510(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     1.510(CFS)
Normal flow depth in pipe =    6.61(In.)
Flow top width inside pipe =   11.94(In.)
Critical Depth =    6.25(In.)
Pipe flow velocity =      3.41(Ft/s)
Travel time through pipe =    0.68 min.
Time of concentration (TC) =     5.68 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      302.000 to Point/Station      303.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   394.420(Ft.)
Downstream point/station elevation =   393.360(Ft.)
Pipe length  =   203.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.510(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     1.510(CFS)
Normal flow depth in pipe =    6.60(In.)
Flow top width inside pipe =   11.94(In.)
Critical Depth =    6.25(In.)
Pipe flow velocity =      3.41(Ft/s)
Travel time through pipe =    0.99 min.
Time of concentration (TC) =     6.67 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      303.000 to Point/Station      303.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.860 given for subarea
Time of concentration =     6.67 min.
Rainfall intensity =      3.918(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.860
Subarea runoff =      1.752(CFS) for    0.520(Ac.)
Total runoff =      3.262(CFS)  Total area =       0.92(Ac.)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      303.000 to Point/Station      304.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   393.360(Ft.)
Downstream point/station elevation =   392.820(Ft.)
Pipe length  =    92.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.262(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     3.262(CFS)
Normal flow depth in pipe =    8.89(In.)
Flow top width inside pipe =   14.74(In.)
Critical Depth =    8.73(In.)
Pipe flow velocity =      4.31(Ft/s)
Travel time through pipe =    0.36 min.
Time of concentration (TC) =     7.02 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      304.000 to Point/Station      309.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.860 given for subarea
Time of concentration =     7.02 min.
Rainfall intensity =      3.841(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.860
Subarea runoff =      0.661(CFS) for    0.200(Ac.)
Total runoff =      3.923(CFS)  Total area =       1.12(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      309.000 to Point/Station      309.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      1.120(Ac.)
Runoff from this stream =      3.923(CFS)
Time of concentration =    7.02 min.
Rainfall intensity =     3.841(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      305.000 to Point/Station      306.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
User specified 'C' value of 0.860 given for subarea
Initial subarea flow distance  =   58.000(Ft.)
Highest elevation =  407.240(Ft.)
```

```
Lowest elevation =  402.000(Ft.)
Elevation difference =    5.240(Ft.)
Time of concentration calculated by the urban
areas overland flow method (App X-C) =     1.58 min.
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.8600)*(  58.000^.5)/(   9.034^(1/3)]=   1.58
Setting time of concentration to 5 minutes
Rainfall intensity (I) =      4.389(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.860
Subarea runoff =      0.189(CFS)
Total initial stream area =        0.050(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      306.000 to Point/Station      307.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
______________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.472(CFS)
Depth of flow =   0.095(Ft.), Average velocity =   2.124(Ft/s)
        ******* Irregular Channel Data ***********
-----------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00            0.50
        2              0.12            0.00
        3             10.00            0.20
Manning's 'N' friction factor =   0.016
-----------------------------------------------------------------
Sub-Channel flow  =      0.472(CFS)
  '     '        flow top width =      4.696(Ft.)
  '     '    velocity=    2.125(Ft/s)
  '     '        area =      0.222(Sq.Ft)
  '     '        Froude number =     1.722

Upstream point elevation =   402.000(Ft.)
Downstream point elevation =   400.500(Ft.)
Flow length =    48.000(Ft.)
Travel time  =    0.38 min.
Time of concentration =    5.38 min.
Depth of flow =   0.095(Ft.)
Average velocity =   2.124(Ft/s)
Total irregular channel flow =     0.472(CFS)
Irregular channel normal depth above invert elev. =   0.095(Ft.)
Average velocity of channel(s) =   2.124(Ft/s)

Sub-Channel No. 1 Critical depth =      0.117(Ft.)
  '     '       '     Critical flow top width =      5.817(Ft.)
  '     '       '     Critical flow velocity=    1.384(Ft/s)
  '     '       '     Critical flow area =      0.341(Sq.Ft)
```

```
 Adding area flow to channel
User specified 'C' value of 0.860 given for subarea
Rainfall intensity =      4.262(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.860
Subarea runoff =      0.550(CFS) for    0.150(Ac.)
Total runoff =      0.738(CFS)  Total area =       0.20(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      307.000 to Point/Station      308.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   397.000(Ft.)
Downstream point/station elevation =   394.450(Ft.)
Pipe length  =    39.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.738(CFS)
Nearest computed pipe diameter  =      6.00(In.)
Calculated individual pipe flow  =     0.738(CFS)
Normal flow depth in pipe =    3.05(In.)
Flow top width inside pipe =    6.00(In.)
Critical Depth =    5.17(In.)
Pipe flow velocity =      7.36(Ft/s)
Travel time through pipe =    0.09 min.
Time of concentration (TC) =     5.46 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      308.000 to Point/Station      308.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.860 given for subarea
Time of concentration =     5.46 min.
Rainfall intensity =      4.234(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.860
Subarea runoff =      1.274(CFS) for    0.350(Ac.)
Total runoff =      2.013(CFS)  Total area =       0.55(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      308.000 to Point/Station      308.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.860 given for subarea
Time of concentration =     5.46 min.
Rainfall intensity =      4.234(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.860
Subarea runoff =      2.112(CFS) for    0.580(Ac.)
Total runoff =      4.125(CFS)  Total area =       1.13(Ac.)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      308.000 to Point/Station      309.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   394.450(Ft.)
Downstream point/station elevation =   390.250(Ft.)
Pipe length  =   445.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     4.125(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     4.125(CFS)
Normal flow depth in pipe =    8.87(In.)
Flow top width inside pipe =   14.75(In.)
Critical Depth =    9.87(In.)
Pipe flow velocity =      5.46(Ft/s)
Travel time through pipe =    1.36 min.
Time of concentration (TC) =     6.82 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      309.000 to Point/Station      309.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
User specified 'C' value of 0.860 given for subarea
Time of concentration =     6.82 min.
Rainfall intensity =      3.884(In/Hr) for a   100.0 year storm
Runoff coefficient used for sub-area, Rational method,Q=KCIA, C = 0.860
Subarea runoff =      0.701(CFS) for    0.210(Ac.)
Total runoff =      4.826(CFS)  Total area =       1.34(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      309.000 to Point/Station      310.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      1.340(Ac.)
Runoff from this stream =      4.826(CFS)
Time of concentration =    6.82 min.
Rainfall intensity =     3.884(In/Hr)
Summary of stream data:

Stream   Flow rate      TC           Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        3.923      7.02                 3.841
2        4.826      6.82                 3.884
Qmax(1) =
           1.000 *    1.000 *     3.923) +
           0.989 *    1.000 *     4.826) + =       8.696
```

```
Qmax(2) =
           1.000 *    0.972 *     3.923) +
           1.000 *    1.000 *     4.826) + =       8.637

Total of 2 streams to confluence:
Flow rates before confluence point:
       3.923      4.826
Maximum flow rates at confluence using above data:
        8.696        8.637
Area of streams before confluence:
        1.120        1.340
Results of confluence:
Total flow rate =      8.696(CFS)
Time of concentration =     7.024 min.
Effective stream area after confluence =      2.460(Ac.)
End of computations, total study area =           2.460 (Ac.)
```

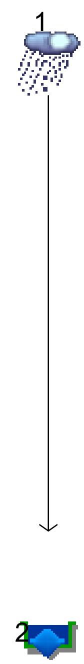
RATIONAL METHOD HYDROGRAPH PROGRAM

RUN DATE 9/19/2022
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 7 MIN.
6 HOUR RAINFALL 2.5 INCHES
BASIN AREA 1.12 ACRES
RUNOFF COEFFICIENT 0.86
PEAK DISCHARGE 3.92 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 7	DISCHARGE (CFS) = 0.1
TIME (MIN) = 14	DISCHARGE (CFS) = 0.1
TIME (MIN) = 21	DISCHARGE (CFS) = 0.2
TIME (MIN) = 28	DISCHARGE (CFS) = 0.2
TIME (MIN) = 35	DISCHARGE (CFS) = 0.2
TIME (MIN) = 42	DISCHARGE (CFS) = 0.2
TIME (MIN) = 49	DISCHARGE (CFS) = 0.2
TIME (MIN) = 56	DISCHARGE (CFS) = 0.2
TIME (MIN) = 63	DISCHARGE (CFS) = 0.2
TIME (MIN) = 70	DISCHARGE (CFS) = 0.2
TIME (MIN) = 77	DISCHARGE (CFS) = 0.2
TIME (MIN) = 84	DISCHARGE (CFS) = 0.2
TIME (MIN) = 91	DISCHARGE (CFS) = 0.2
TIME (MIN) = 98	DISCHARGE (CFS) = 0.2
TIME (MIN) = 105	DISCHARGE (CFS) = 0.2
TIME (MIN) = 112	DISCHARGE (CFS) = 0.2
TIME (MIN) = 119	DISCHARGE (CFS) = 0.2
TIME (MIN) = 126	DISCHARGE (CFS) = 0.2
TIME (MIN) = 133	DISCHARGE (CFS) = 0.2
TIME (MIN) = 140	DISCHARGE (CFS) = 0.2
TIME (MIN) = 147	DISCHARGE (CFS) = 0.3
TIME (MIN) = 154	DISCHARGE (CFS) = 0.3
TIME (MIN) = 161	DISCHARGE (CFS) = 0.3
TIME (MIN) = 168	DISCHARGE (CFS) = 0.3
TIME (MIN) = 175	DISCHARGE (CFS) = 0.3
TIME (MIN) = 182	DISCHARGE (CFS) = 0.3
TIME (MIN) = 189	DISCHARGE (CFS) = 0.4
TIME (MIN) = 196	DISCHARGE (CFS) = 0.4
TIME (MIN) = 203	DISCHARGE (CFS) = 0.5
TIME (MIN) = 210	DISCHARGE (CFS) = 0.5
TIME (MIN) = 217	DISCHARGE (CFS) = 0.6
TIME (MIN) = 224	DISCHARGE (CFS) = 0.7
TIME (MIN) = 231	DISCHARGE (CFS) = 1
TIME (MIN) = 238	DISCHARGE (CFS) = 2.6
TIME (MIN) = 245	DISCHARGE (CFS) = 3.92
TIME (MIN) = 252	DISCHARGE (CFS) = 0.8
TIME (MIN) = 259	DISCHARGE (CFS) = 0.5
TIME (MIN) = 266	DISCHARGE (CFS) = 0.4
TIME (MIN) = 273	DISCHARGE (CFS) = 0.4
TIME (MIN) = 280	DISCHARGE (CFS) = 0.3
TIME (MIN) = 287	DISCHARGE (CFS) = 0.3
TIME (MIN) = 294	DISCHARGE (CFS) = 0.3
TIME (MIN) = 301	DISCHARGE (CFS) = 0.2
TIME (MIN) = 308	DISCHARGE (CFS) = 0.2
TIME (MIN) = 315	DISCHARGE (CFS) = 0.2
TIME (MIN) = 322	DISCHARGE (CFS) = 0.2
TIME (MIN) = 329	DISCHARGE (CFS) = 0.2
TIME (MIN) = 336	DISCHARGE (CFS) = 0.2
TIME (MIN) = 343	DISCHARGE (CFS) = 0.2
TIME (MIN) = 350	DISCHARGE (CFS) = 0.2
TIME (MIN) = 357	DISCHARGE (CFS) = 0.1
TIME (MIN) = 364	DISCHARGE (CFS) = 0

Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022



Legend

Hyd.	Origin	Description
1	Manual	hydrograph 1
2	Reservoir	Detention 1

Project: Det-PK 4 BMP 5_Calcs yr100.gpw

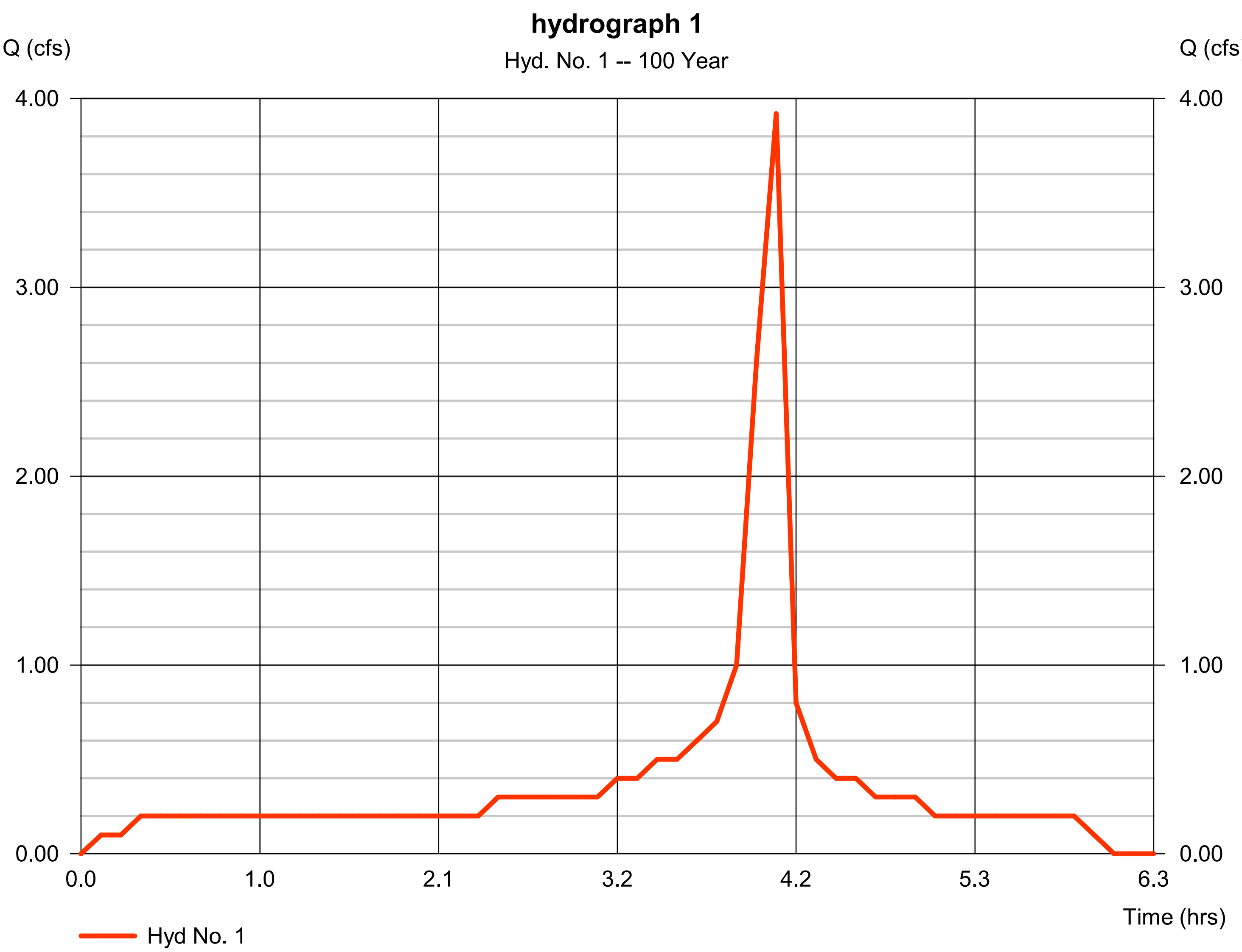
Saturday, 09 / 17 / 2022

Hydrograph Report

Hyd. No. 1

hydrograph 1

Hydrograph type	= Manual	Peak discharge	= 3.920 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.08 hrs
Time interval	= 7 min	Hyd. volume	= 8,786 cuft



Hydrograph Report

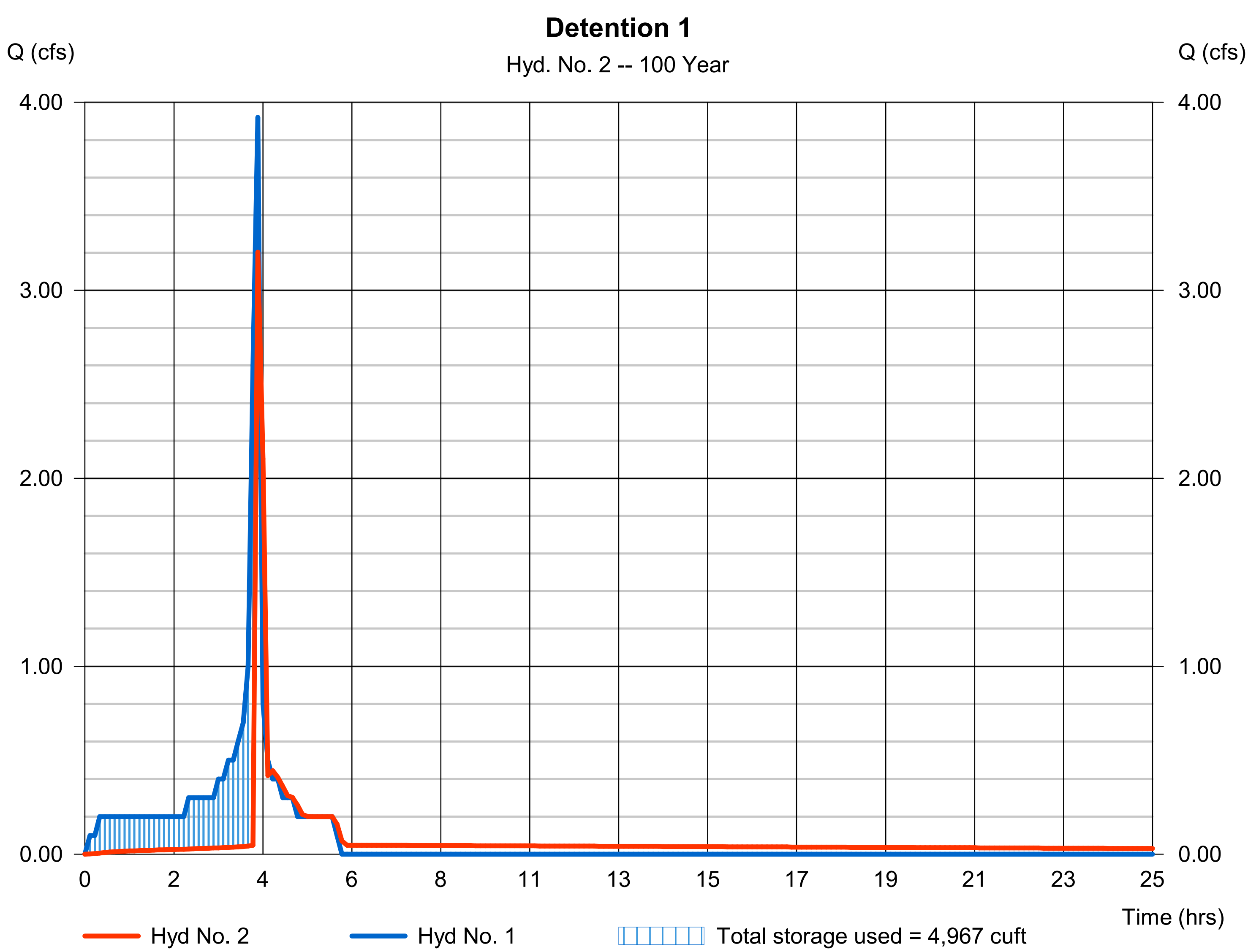
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Saturday, 09 / 17 / 2022

Hyd. No. 2

Detention 1

Hydrograph type	= Reservoir	Peak discharge	= 3.202 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.08 hrs
Time interval	= 7 min	Hyd. volume	= 8,766 cuft
Inflow hyd. No.	= 1 - hydrograph 1	Max. Elevation	= 103.89 ft
Reservoir name	= Det-SBA pk4-BMP 5	Max. Storage	= 4,967 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - Det-SBA pk4-BMP 5

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 100.00 ft. Voids = 95.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	1,345	0	0
1.00	101.00	1,345	1,278	1,278
2.00	102.00	1,345	1,278	2,556
3.00	103.00	1,345	1,278	3,833
4.00	104.00	1,345	1,278	5,111

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 18.00	1.00	Inactive	Inactive
Span (in)	= 18.00	1.00	0.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 100.00	100.00	0.00	0.00
Length (ft)	= 10.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.30	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

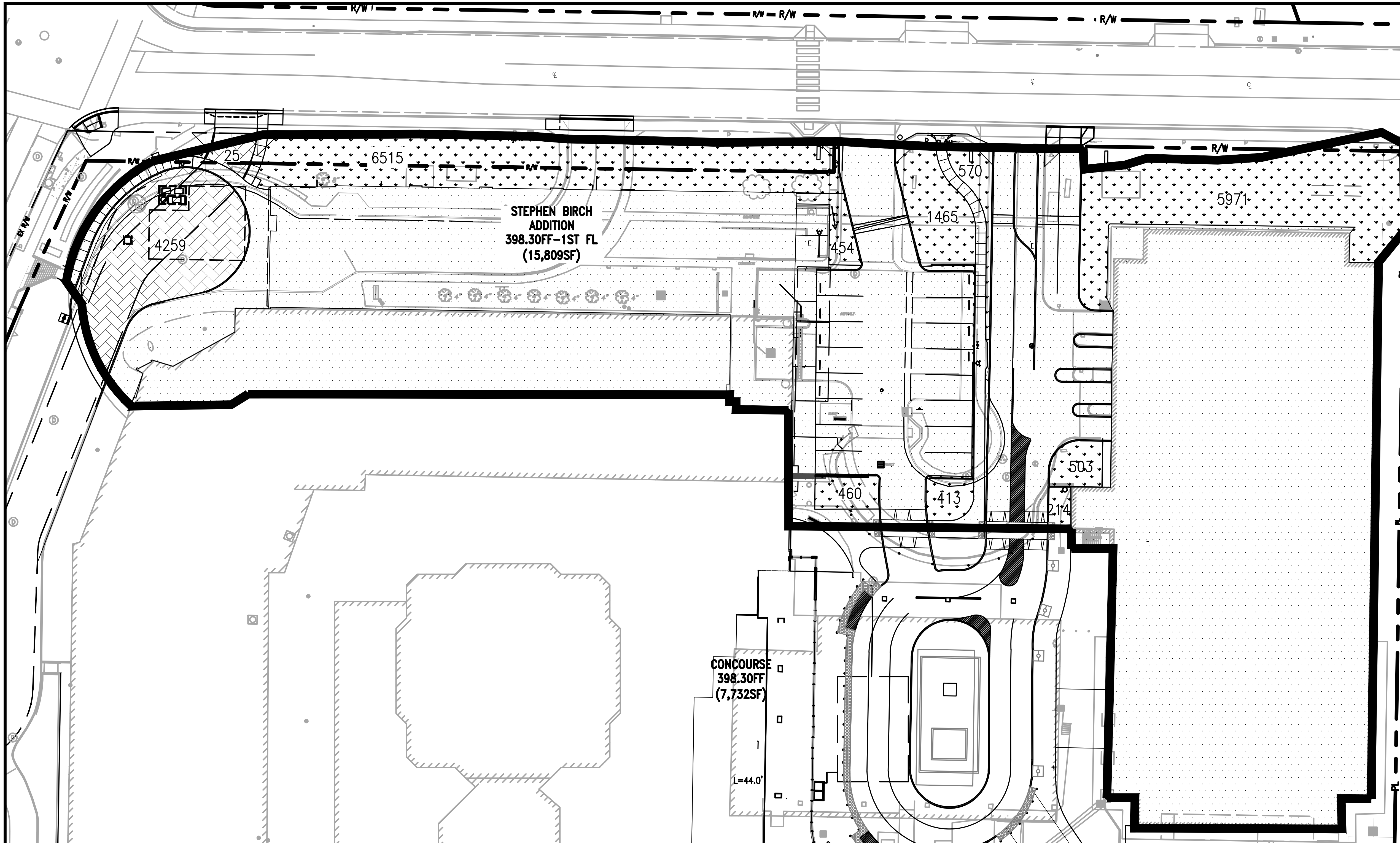
	[A]	[B]	[C]	[D]
Crest Len (ft)	= 3.93	Inactive	Inactive	Inactive
Crest El. (ft)	= 103.50	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= 1	Rect	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	100.00	0.00	0.00	---	---	0.00	---	---	---	---	---	0.000
1.00	1,278	101.00	0.03 ic	0.03 ic	---	---	0.00	---	---	---	---	---	0.025
2.00	2,556	102.00	0.04 ic	0.04 ic	---	---	0.00	---	---	---	---	---	0.036
3.00	3,833	103.00	0.05 ic	0.04 ic	---	---	0.00	---	---	---	---	---	0.045
4.00	5,111	104.00	4.67 oc	0.04 ic	---	---	4.63	---	---	---	---	---	4.668



PERVIOUS/IMPERVIOUS AREA SUMMARY

TOTAL SITE AREA = 2.46 AC
IMPERVIOUS AREA = 1.98 AC
IMPERVIOUS % = 80.5
PERVIOUS AREA = 0.48 AC
PERVIOUS % = 19.5

LEGEND

LEGEND		SYMBOL
OUTER DRAINAGE BOUNDARY		
PERVIOUS AREA	LANDSCAPE/DIRT AREA	
IMPERVIOUS AREA	CONCRETE/ASPHALT DRIVEWAY	
PERVIOUS AREA	PERVIOUS PAVERS	

BWE
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

SYM	DESCRIPTION	DATE	APPR

ISSUE DATE:
DRAWN BY:
CHECKED BY:
B&W JOB NUMBER:
CLIENT JOB NUMBER:

PROJECT

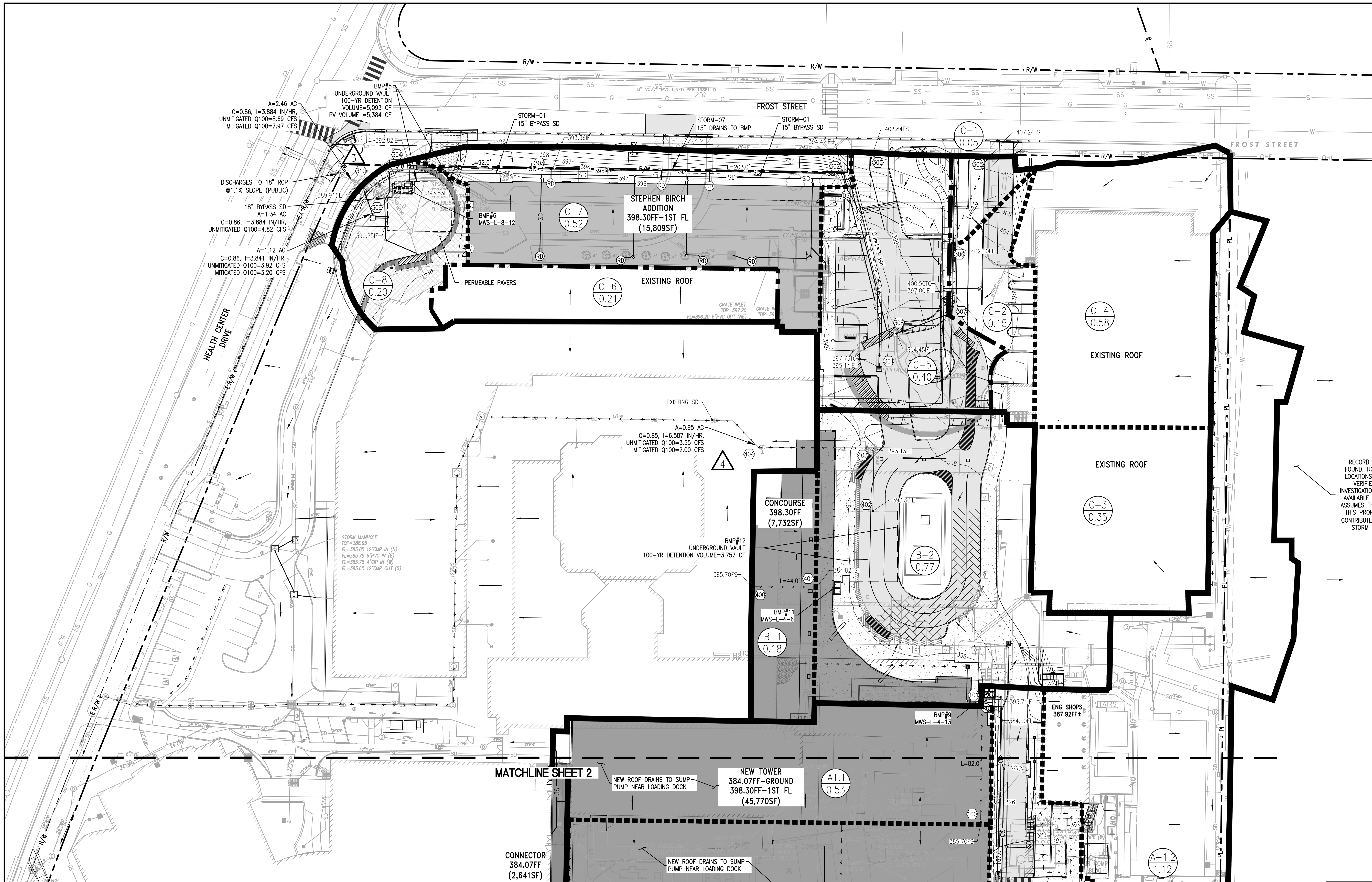
SHARP MMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

SHEET TITLE

PERVIOUS/IMPERVIOUS AREAS PROPOSED CONDITION

SHEET OF

PACKAGE-4



LEGEND / SYMBOL

- OUTER BASIN BOUNDARY
- MAJOR BASIN BOUNDARY
- MINOR BASIN BOUNDARY
- EXISTING STORM DRAIN
- NEW STORM DRAIN — SD
- EXISTING CONTOUR — XXX
- NEW CONTOUR — XXX
- FLOW DIRECTION
- FLOW PATH
- FLOW LENGTH — L=XXX.X'
- NODE/CONTOUR ELEVATION — 307.85FL 304.35IE
- HYDROLOGY NODE — 200
- ANALYSIS/EXIT POINT — 1
- DRAINAGE BASIN MARKER & AREA (AC) — B-X X.XX

NOTES:

1) PEAK FLOW RATES ARE CALCULATED UTILIZING CITY OF SD DRAINAGE DESIGN MANUAL. THE CITY OF SAN DIEGO NOMOGRAPH METHOD WAS USED TO CALCULATED FLOW RATES.
2) DRAINAGE AREA DIVERSION IS ANTICIPATED IN THE PROPOSED CONDITION BASED ON THE EXISTING CONDITION DRAINAGE PATTERN. BUT, HISTORIC DRAINAGE PATTERN IS MAINTAINED TO THE MAXIMUM EXTENT TECHNICALLY FEASIBLE.
3) STORM DRAIN SYSTEM IS DESIGNED TO CONVEY RUNOFF DUE TO 50-YR STORM EVENT.
4) AN ONSITE OVERLAND RELEASE WILL BE PROVIDED TO CONVEY EXCESS RUNOFF DUE TO 50 YEAR OR LARGER FREQUENCY STORM EVENTS.
5) PUMP IS REQUIRED TO DISCHARGE RUNOFF FROM LOADING DOCK AREA.
6) RUNOFF ORIGINATING FROM THE ADJACENT KNOOLWOOD BUILDING ROOF NEEDS TO BYPASS THE PROPOSED BMPS.

DRAINAGE BASIN DETAILS

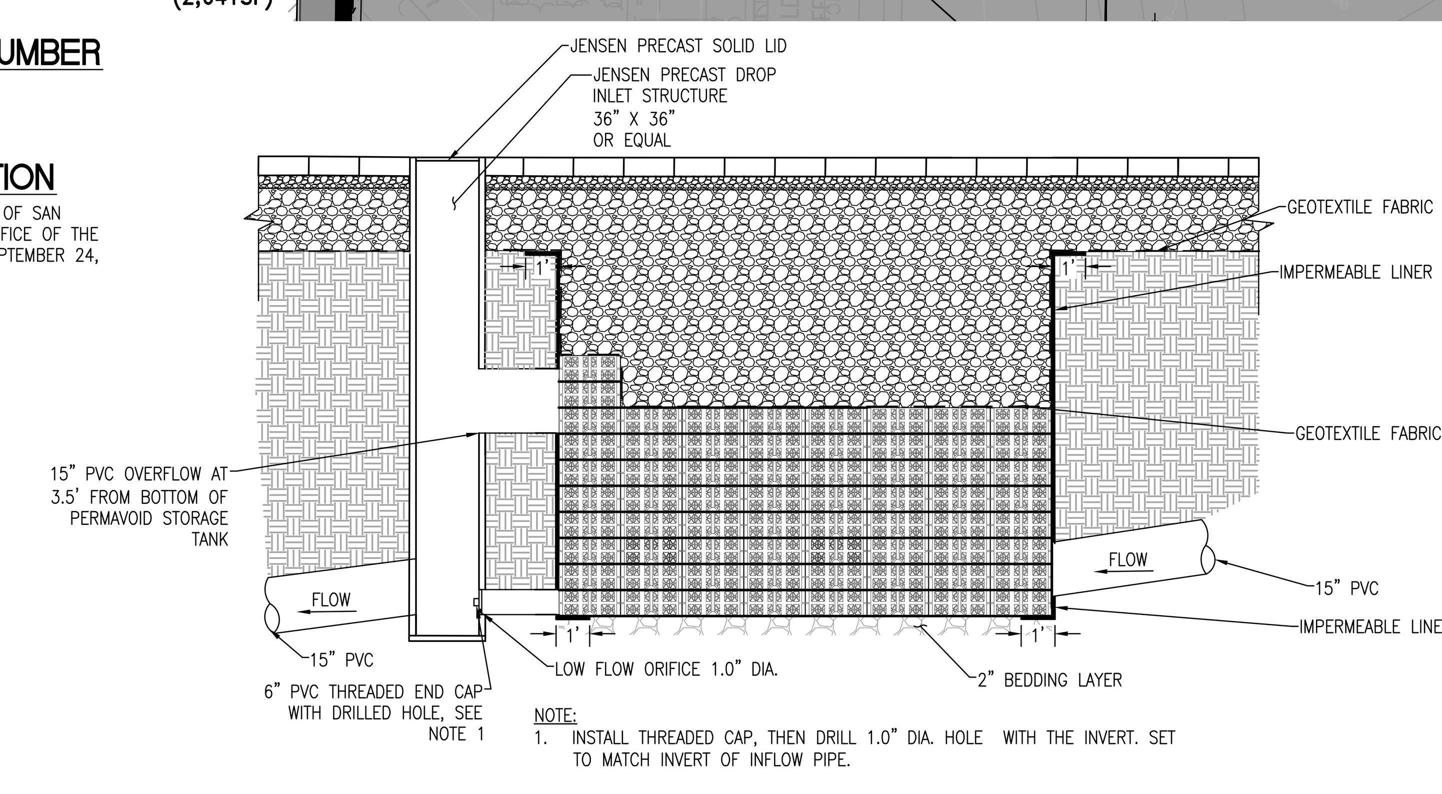
DRAINAGE BASIN	BASIN AREA (AC)	BASIN RUNOFF COEFFICIENT	BASIN RAINFALL INTENSITY (IN/HR)	BASIN UNMITIGATED Q100 PEAK FLOW RATE (CFS)
B-1	0.18	0.85	4.389	0.67
B-2	0.77	0.85	4.389	2.87
C-1	0.05	0.86	4.389	0.19
C-2	0.15	0.86	4.262	0.55
C-3	0.35	0.86	4.234	1.27
C-4	0.58	0.86	4.234	2.11
C-5	0.40	0.86	4.389	1.51
C-6	0.21	0.86	3.884	0.70
C-7	0.52	0.86	3.918	1.75
C-8	0.20	0.86	3.841	0.66

ASSESSOR'S PARCEL NUMBER

427-530-02

BRIEF LEGAL DESCRIPTION

PARCEL 1 OF PARCEL MAP 5131 IN THE CITY OF SAN DIEGO, STATE OF CALIFORNIA, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY SEPTEMBER 24, 1976.



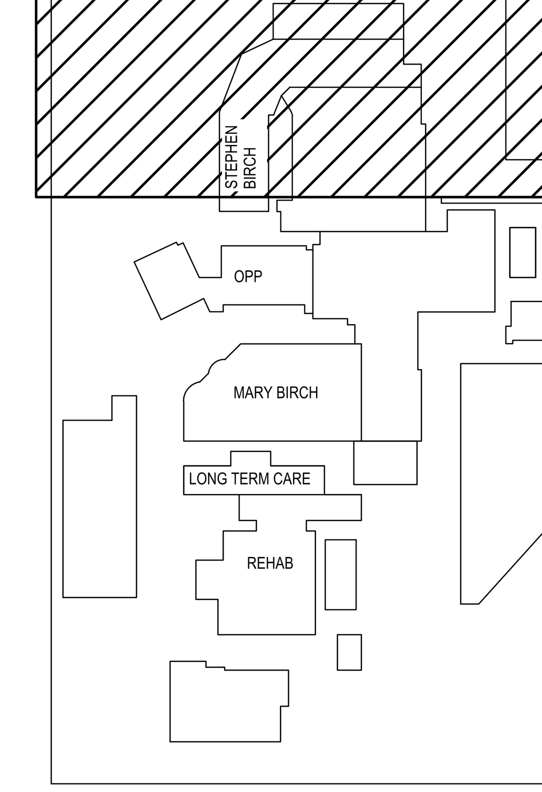
NOTE:
1. INSTALL THREADED CAP, THEN DRILL 1.0" DIA. HOLE WITH THE INVERT, SET TO MATCH INVERT OF INFLOW PIPE.

PERMAVOID UNDERGROUND STORAGE (PVT) BMP #5
NO SCALE

Q AND V AT DISCHARGE POINTS

Discharge Point #	Type of Discharge	Discharge Location	Proposed Unmitigated Q (cfs)	Proposed Unmitigated V (ft/s)	Proposed Mitigated Q (cfs)	Proposed Mitigated V (ft/s)
3	Pipe	18" PIPE @1.1%	8.69	6.87	7.97	6.73
		18" Bypass @ 0.78%	4.82	5.16		
		15" Outlet @ 0.5%	3.92	4.13	3.20	3.96
4	Pipe	12" PIPE @1.00%	3.55	5.14	2	4.6

30 15 0 30 60 90
SCALE: 1"=30'



KEY PLAN

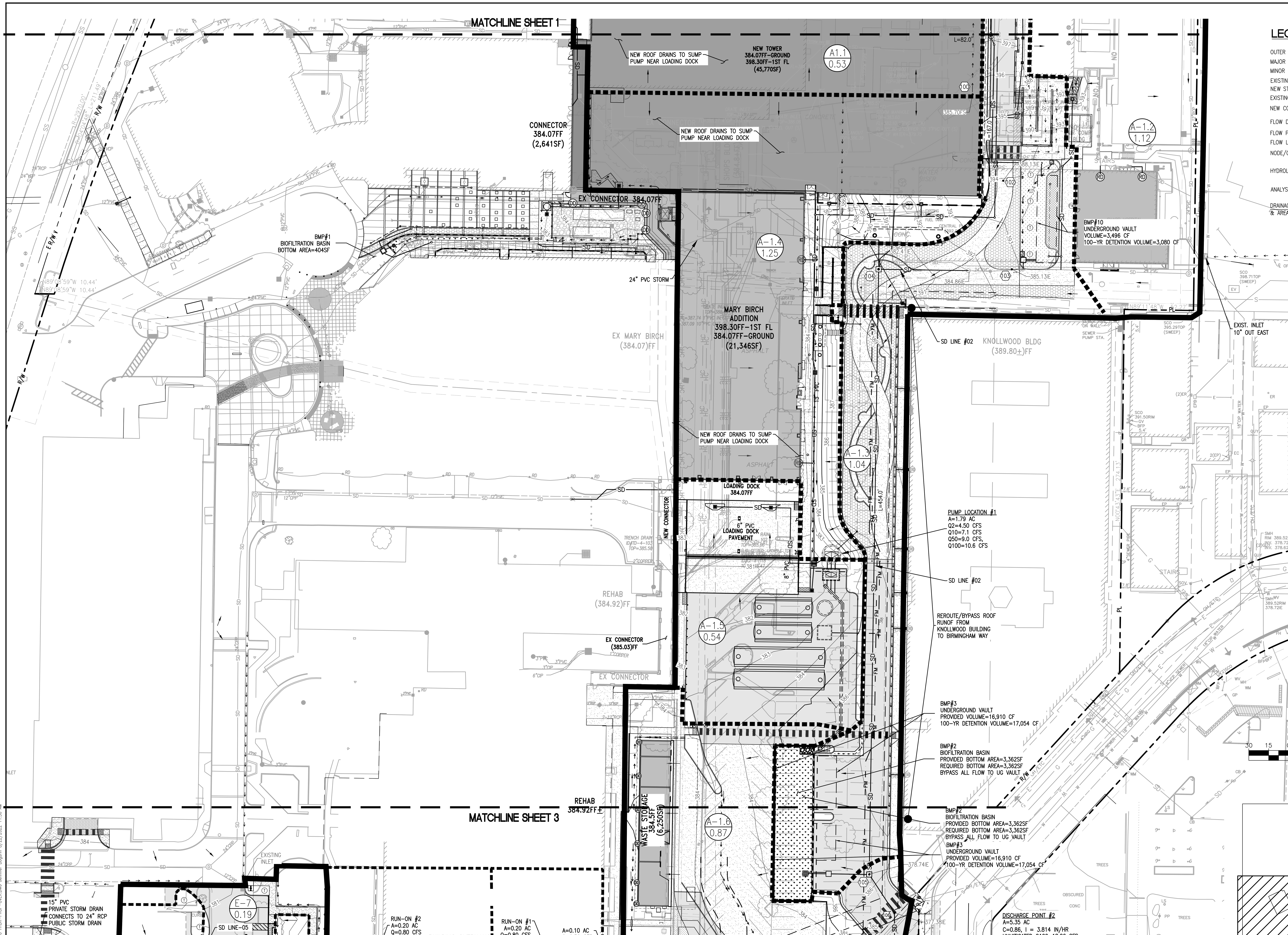
BWE
CIVIL·STRUCTURAL·SURVEY·PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

SYM	DESCRIPTION	DATE	APPR

BENCHMARK:
ISSUE DATE: 09/17/2021
DRAWN BY: MDS
CHECKED BY: MGC
BWE JOB NUMBER: 9545.10.00
CLIENT JOB NUMBER:

PROJECT
SHARP MMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

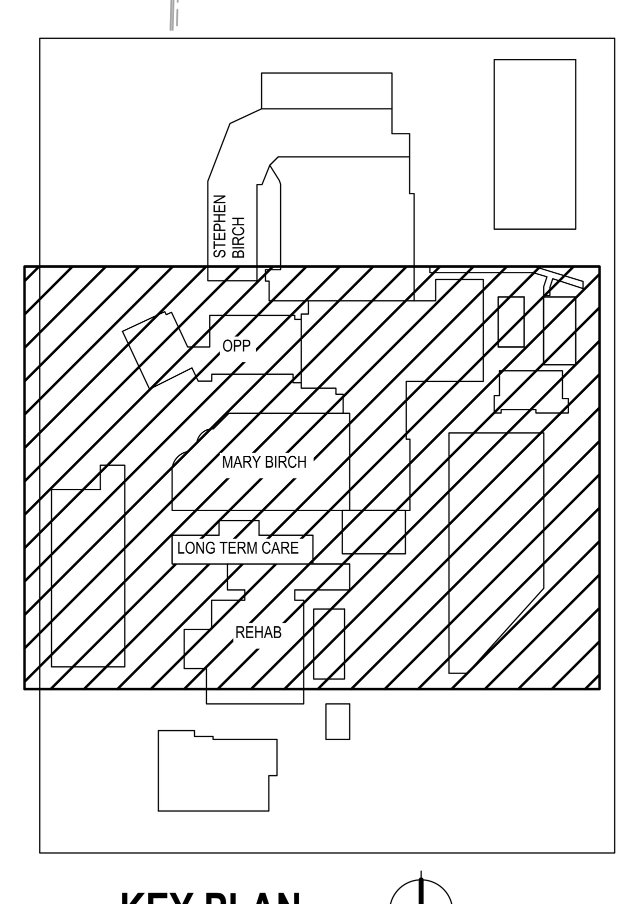
SHEET TITLE
PROPOSED CONDITION
HYDROLOGY EXHIBIT



LEGEND	SYMBOL
OUTER BASIN BOUNDARY	
MAJOR BASIN BOUNDARY	
MINOR BASIN BOUNDARY	
EXISTING STORM DRAIN	SD
NEW STORM DRAIN	SD
EXISTING CONTOUR	XXX
NEW CONTOUR	XXX
FLOW DIRECTION	
FLOW PATH	
FLOW LENGTH	L=XXX.X'
NODE/CONTOUR ELEVATION	307.85FL 304.35IE
HYDROLOGY NODE	200
ANALYSIS/EXIT POINT	1
DRAINAGE BASIN MARKER & AREA (AC)	B-X X.XX

DRAINAGE BASIN DETAILS

DRAINAGE BASIN	BASIN AREA (AC)	BASIN RUNOFF COEFFICIENT	BASIN RAINFALL INTENSITY (IN/HR)	BASIN UNMITIGATED Q100 PEAK FLOW RATE (CFS)
A-1.1	0.53	0.86	4.389	2.00
A-1.2	1.12	0.86	4.218	4.06
A-1.3	1.04	0.86	3.840	3.43
A-1.4	1.25	0.86	3.840	4.13
A-1.5	0.54	0.86	3.840	1.78



KEY PLAN

BWE
CIVIL·STRUCTURAL·SURVEY·PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123
619.299.5550

SYM	DESCRIPTION	DATE	APPR

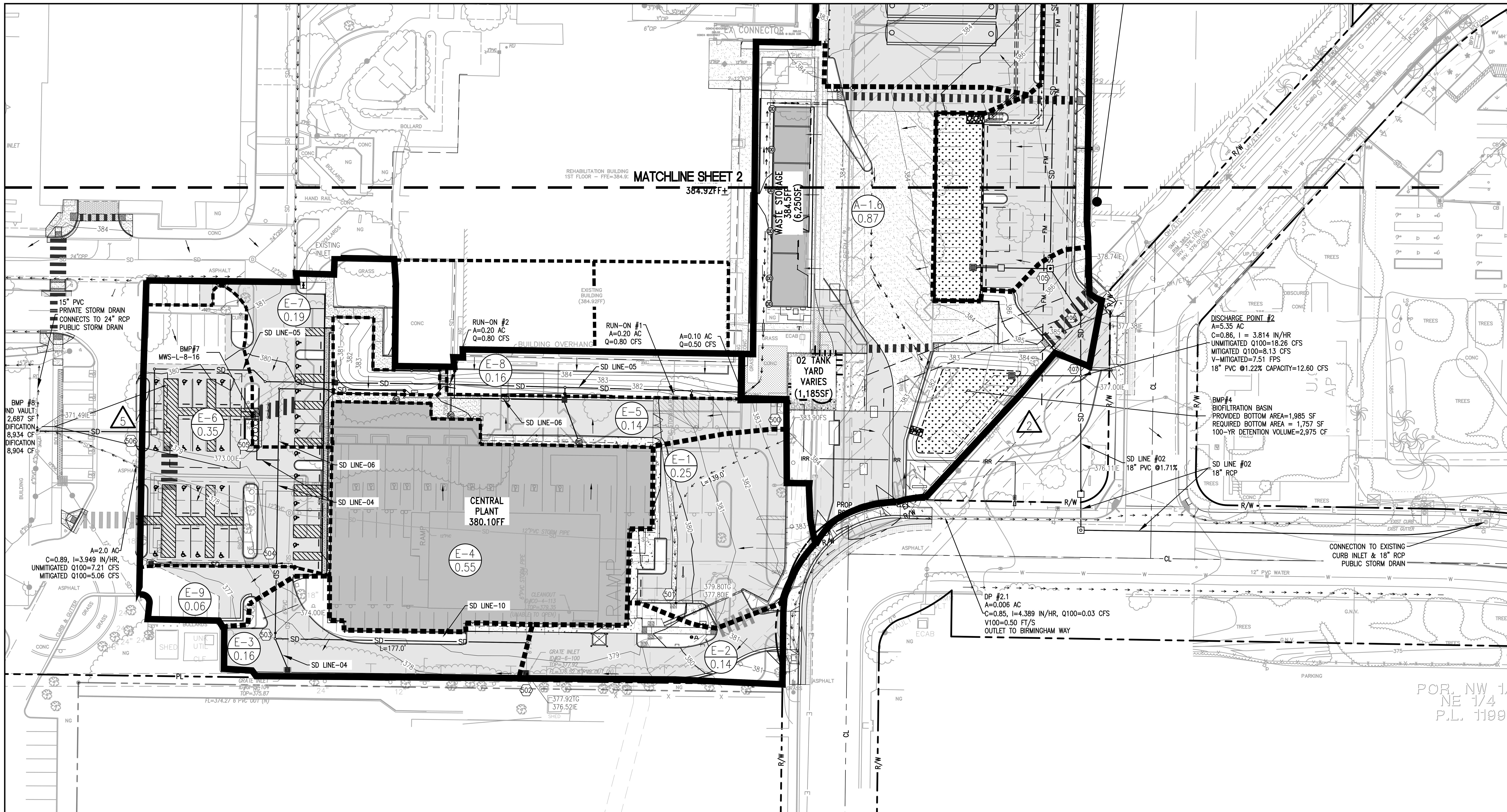
BENCHMARK:
ISSUE DATE: 09/17/2021
DRAWN BY: MDS
CHECKED BY: MGC
B&W JOB NUMBER: 9545.10.00
CLIENT JOB NUMBER:

PROJECT
SHARP MMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

SHEET TITLE
PROPOSED CONDITION HYDROLOGY EXHIBIT

SHEET 2 OF 3

PLOT: W:\PROJECTS\9500\9545\10.00 SHARP MMC\DWGS\EXHIBITS\DRAINAGE\9545.10.00 HYDR-PROP-OVERDNG Jennifer Bogorin 8/22/2022 11:56 AM

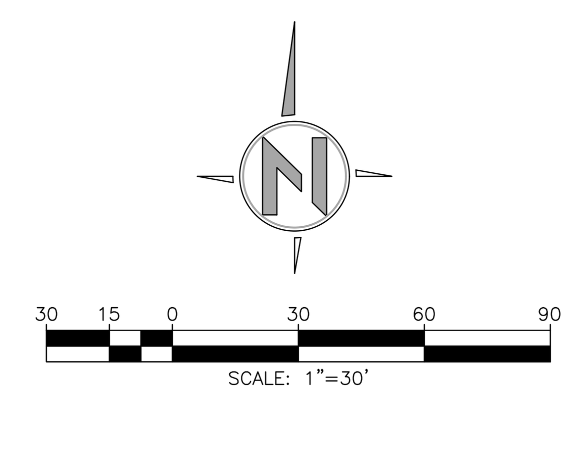


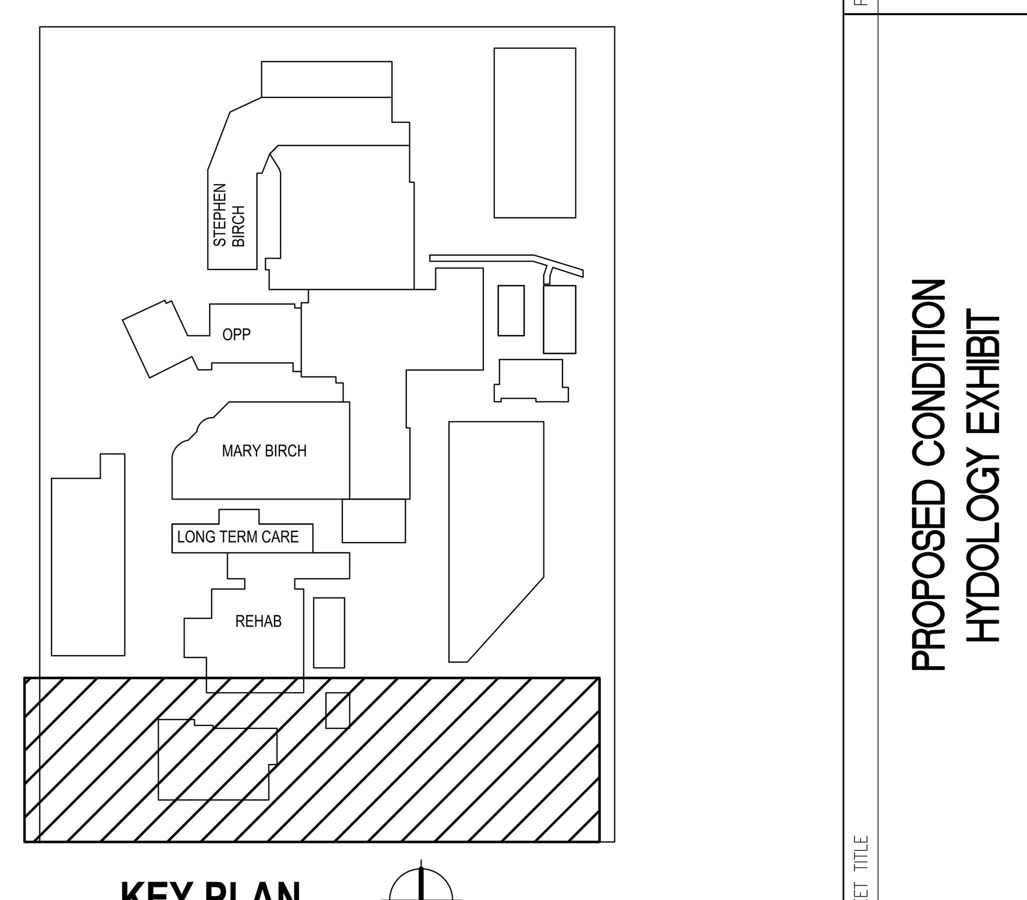
LEGEND

LEGEND	SYMBOL
OUTER BASIN BOUNDARY	
MAJOR BASIN BOUNDARY	
MINOR BASIN BOUNDARY	
EXISTING STORM DRAIN	SD
NEW STORM DRAIN	SD
EXISTING CONTOUR	XXX
NEW CONTOUR	XXX
FLOW DIRECTION	
FLOW PATH	
FLOW LENGTH	L=XXX.X'
NODE/CONTOUR ELEVATION	307.85FL 304.35IE
HYDROLOGY NODE	200
ANALYSIS/EXIT POINT	1
DRAINAGE BASIN MARKER & AREA (AC)	B-X X.XX

DRAINAGE BASIN DETAILS

DRAINAGE BASIN	BASIN AREA (AC)	BASIN RUNOFF COEFFICIENT	BASIN RAINFALL INTENSITY (IN/HR)	BASIN UNMITIGATED Q100 PEAK FLOW RATE (CFS)
A-1.6	0.87	0.86	3.814	2.85
E-1	0.25	0.89	4.389	0.98
E-2	0.14	0.89	4.258	0.53
E-3	0.16	0.89	4.084	0.58
E-4	0.55	0.89	3.949	1.93
E-5	0.14	0.89	3.949	0.49
E-6	0.35	0.89	4.033	1.26
E-7	0.19	0.89	3.949	0.69
E-8	0.16	0.89	3.949	0.56
E-9	0.06	0.89	3.949	0.21





KEY PLAN

BWE
CIVIL-STRUCTURAL-SURVEY-PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

SYM	DESCRIPTION	DATE	APPR

BENCHMARK:

ISSUE DATE: 09/17/2021
DRAWN BY: MDS
CHECKED BY: MGC
B&W JOB NUMBER: 9545.10.00
CLIENT JOB NUMBER:

PROJECT

SHARP MMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

SHEET TITLE

PROPOSED CONDITION HYDROLOGY EXHIBIT

SHEET 3 OF 3

PLOT: W:\PROJECTS\9500\9545\10.00 SHARP MMC\DWGS\EXHIBITS\DRAINAGE\9545.10.00 HYDR-PROP-OVER.DWG Jennifer Bogarin 8/22/2022 11:56 AM

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Attachment 6
Geotechnical and Groundwater Investigation Report

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

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

GEOTECHNICAL INVESTIGATION
MARY BIRCH HOSPITAL EXPANSION
SHARP METROPOLITAN MEDICAL CAMPUS
MASTER PLAN
7901 FROST STREET
SAN DIEGO, CALIFORNIA

Prepared for:

Sharp Healthcare
7901 Frost Street
San Diego, California 92123

Project No. 12764.001

Revised December 8, 2020
(October 2, 2020)

Leighton Consulting, Inc.
A LEIGHTON GROUP COMPANY

Revised December 8, 2020
(October 2, 2020)

Project No. 12764.001

Sharp Healthcare
7901 Frost Street
San Diego, California 92123

Attention: Mr. Tim Crowe

Subject: Geotechnical Investigation
Mary Birch Hospital Expansion Project
Sharp Metropolitan Medical Campus Master Plan
7901 Frost Street
San Diego, California

In accordance with your request and authorization, Leighton Consulting, Inc. (Leighton) has conducted a geotechnical investigation for the proposed expansion of the Mary Birch Hospital at the Sharp Metropolitan Medical Campus located at 7901 Frost Street in San Diego, California. Our geotechnical study of the site was performed in general accordance with the Office of Statewide Health Planning & Development (OSHPD) requirements within the 2016 California Building Code.

Based on the results of our study, it is our professional opinion that the proposed expansion of the Mary Birch Hospital is feasible provided the recommendations provided herein are incorporated into the design and construction of the proposed improvements. The accompanying geotechnical report presents a summary of our current investigation and provides geotechnical conclusions and recommendations relative to the design and construction of the expansion of Mary Birch Hospital.

Leighton

If you have any questions regarding our report, please do not hesitate to contact Robert Stroh at 858-300-4090. We appreciate this opportunity to be of service.

Respectfully submitted,

LEIGHTON CONSULTING, INC.

Robert C. Stroh, CEG 2099
Associate Engineering Geologist
(858) 300-4090, rstroh@leightongroup.com

Sean Colorado, GE 2507
Senior Principal Engineer
(858) 300-8490, scolorado@leightongroup.com

Distribution: (1) Addressee via email

TABLE OF CONTENTS

Leighton

Leighton

TABLE OF CONTENTS (Continued)

TABLES

FIGURES

APPENDICES

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept* *responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are <u>not</u> final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals' plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for information purposes only.* To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are <u>Not</u> Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer's services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will <u>not</u> of itself be sufficient to prevent moisture infiltration. Confront the risk of moisture infiltration*** by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are <u>not</u> building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

Telephone: 301/565-2733
e-mail: info@geoprofessional.org www.geoprofessional.org

1.0 INTRODUCTION

We recommend that all individuals utilizing this report read the preceding information sheet prepared by the Geoprofessional Business Association (GBA) and the Limitations, Section 7.0, located at the end of this report.

1.1 Purpose and Scope

This report presents the results of our geotechnical investigation for the proposed expansion of the Mary Birch Hospital within the Sharp Metropolitan Medical Campus located at 7901 Frost Street in San Diego, California (Figure 1). The purpose of our investigation was to identify and evaluate the geologic hazards and significant geotechnical conditions present at the site in order to provide geotechnical recommendations for the proposed structure. Our scope of services for this project included:

- Review of pertinent documents regarding the geotechnical conditions at the site.
- Markout of the exploration locations, notification and coordination of underground utility locators, and coordination with site personnel.
- Excavation of eight exploratory borings in the proximity of the proposed expansion.
- Review of previous geotechnical investigations for the current site area.
- Laboratory testing of selected soil samples. Laboratory testing consisted of unit weight, moisture content, direct shear, expansion index, 200 wash, modified Proctor, and corrosivity tests including - minimum electrical resistivity, pH, and water-soluble sulfate and chloride content tests.
- This study included a review of the subsurface exploration and laboratory testing programs previously conducted by others. The laboratory testing consisted of particle size analysis, Atterberg limits, direct shear, expansion index, and laboratory compaction test data.
- Preparation of this report presenting our findings, conclusions, and geotechnical recommendations with respect to the proposed geotechnical design, site grading and general construction considerations.

1.2 Site Location and Description

The site currently consists of a paved parking lot and utilities. Both underground and above ground utilities are within the footprint of the proposed building addition. The paved parking is located to the north of the covered loading dock and east of the fire access lane. A tree/shrub/grass area is located east of the existing hospital building. Access to the site is provided by driveway entry named Mary Birch Lane along the east of Health Center Drive. In general, the site is bounded by the fire access lane to the east, the existing Mary Birch hospital building to the west, a covered loading dock to the south and Outpatient Pavilion and South Tower to the north. Site topography within the limits of the proposed project is generally flat lying and ranges in elevation from approximately 386 feet at the south-western portion of the site to 389 feet at the northern portion of the site (Figure 2). According to exhibits provided by the project civil engineer, some conduit manholes within the building pad and loading dock extend down to elevation 373 feet.

The latitude and longitude coordinates for the project are:
Latitude: 32.7982º N
Longitude: 117.1544º W

1.3 Proposed Development

The proposed expansion of the Mary Birch Hospital is planned to be constructed within an early phase as part of a much larger Sharp Metropolitan Medical Campus Master Plan redevelopment and retrofit undertaking. The Campus Master Plan is programed to be undertaken in a phased approach over several years.

Generally, the Mary Birch Expansion will be a six-story tall building with an overall footprint of approximately 21,000 SF. The floors and roof will be constructed out of concrete fill over metal deck, supported by steel beams and steel columns. The foundation system will consist of reinforced concrete continuous grade beams under the moment frames and spread footings under the gravity columns. Also proposed is a separate one-story loading dock with overhead canopy. The loading dock platform will be constructed on shallow spread footings. The foundations system of the canopy will consist of reinforced concrete pier footings. The approximate limits of the proposed expansion are depicted on Figure 2.

The finish floor elevation of the proposed addition is to be approximately 384 feet. The loading dock is to be at the same elevation and the loading dock ramp is approximately 4 feet lower and slopes up at 2 percent toward the loading dock driveway. Grades are expected to be lowered up to 10 feet to attain pad grade within the loading dock canopy footprint and 5 feet within the building pad.

2.0 SUBSURFACE EXPLORATION AND LABORATORY TESTING

2.1 Site Investigation

Our subsurface exploration was performed from July 29 to August 6, 2020, which consisted of excavating eight 8-inch diameter geotechnical borings (B-1 through B-7 and B-18) to depths of approximately 15 to 28 feet below the existing ground surface (bgs). Due to very limited site access and the presence of numerous site utilities, we have also utilized other investigations to supplement our data (Section 2.3). Borings B-1 through B-7 were drilled with a truck-mounted CME-95 drill rig and B-18 was drilled with a track-mounted limited-access drill rig. The purpose of our subsurface exploration was to evaluate the underlying stratigraphy, physical characteristics, and specific engineering properties of the soils within the area of the proposed improvements.

During the exploration operations, a geologist from our firm prepared geologic logs and collected bulk and relatively undisturbed samples for laboratory testing and evaluation. Disturbed standard penetration test (SPT) and relatively undisturbed split-barrel soil sampling using a 140-pound automatic-trip hammer free falling 30-inches were performed in accordance with ASTM International standards ASTM D 1586 and ASTM D 3550, respectively. After logging and field testing, the bore holes were backfilled with soil cuttings. Boreholes deeper than 20 feet were backfilled with bentonite in accordance with Department of Environmental Health (DEH) requirements. The boring logs are provided in Appendix B, laboratory test results are included in Appendix C, and the approximate geotechnical boring locations are depicted on Figure 2 (Geotechnical Map).

In addition to the geotechnical borings, a geophysical survey was performed on August 26, 2020 by Atlas Technical Consultants to measure shear wave velocity within the subsurface materials. The approximate location of the survey line is shown on Figure 2 and a copy of the survey report is included in Appendix B.

2.2 Laboratory Testing

Laboratory testing performed on representative soil samples obtained during our subsurface exploration included the following: direct shear, 200 wash, expansion index, laboratory compaction by modified Proctor, geochemical analysis for corrosion, moisture, and density. A discussion of the laboratory tests performed and a summary of the laboratory test results are presented in Appendix C. In-situ moisture and density test results are provided on the boring logs (Appendix B).

2.3 Previous Investigations

As part of our study, we have compiled geotechnical data that has been developed across the campus as part of previous design and construction projects. The studies that provided data within the vicinity of the expansion of Mary Birch Hospital include the following geotechnical reports:

- San Diego Geotechnical Consultants, 1988, Geotechnical Investigation, New Central Utility Plan, Medical Office Building and Women's Center, Sharp Hospital, San Diego, California, dated December 21.

- Shannon & Wilson, Inc., 2011a, Response to Comments by the California Geological Survey, Sharp Memorial Hospital – Central Tower, SPC-2 upgrade, 7901 Frost Street, San Diego, California, OSHPD Permit No. IL-090824-37, Facility No. 12364 dated March 30.

Boring logs from these previous studies that are in the vicinity of the Mary Birch Expansion have been included in Appendix B. Laboratory testing that was performed on samples from the previous borings are included in Appendix C. The locations of the previous explorations are presented on Figure 2.

3.0 SUMMARY OF GEOTECHNICAL CONDITIONS

3.1 Geologic Setting

The project area is situated in the Peninsular Ranges Geomorphic Province. This geomorphic province encompasses an area that extends approximately 900 miles from the Transverse Ranges and the Los Angeles Basin south to the southern tip of Baja California, and varies in width from approximately 30 to 100 miles (Norris and Webb, 1990). The province is characterized by mountainous terrain on the east composed mostly of Mesozoic igneous and metamorphic rocks, and relatively low-lying coastal terraces to the west underlain by late Cretaceous-aged, Tertiary-aged, and Quaternary-aged sedimentary units. Most of the coastal region of the County of San Diego, including the site, occur within this coastal region and are underlain by sedimentary units. Specifically, the site is located within the coastal plain section of the Peninsular Range Geomorphic Province of California, which generally consists of subdued landforms underlain by sedimentary bedrock.

3.2 Site-Specific Geology

Based on our subsurface exploration, and review of pertinent geologic literature and maps (Appendix A), the geologic units underlying the site consist of undocumented artificial fill materials overlying Quaternary-aged Very Old Paralic Deposits, which in turn are underlain by the Mission Valley Formation and Stadium Conglomerate. A brief description of the geologic units encountered on the site is presented below. The approximate lateral and vertical distribution of these units are shown on the Geologic Cross-Sections A-A' and B-B' (Figure 3), and the approximate areal distribution is shown on Figure 2. The general distribution of the geologic formations in the site area is shown on Figure 4, the Geologic Map.

3.2.1 Undocumented Artificial Fill (Afu)

Based on our subsurface exploration, artificial fill soils were encountered in all current and previous geotechnical borings (B-1 through B-7 and B-18 (Current Borings), B-1 and B-5 (San Diego Geotechnical Consultants, 1988) and B-2 (Shannon & Wilson, 2011a)) with thickness varying between 0.4 feet to 13 feet. The thickness of fill soils within the footprint of the proposed building are anticipated to be less than 2 feet, except where existing utilities are present. As encountered during our subsurface exploration, the fill soils generally consisted of loose to very dense, reddish brown to dark reddish brown, dry to very moist, fine-grained, silty to clayey sands with trace gravel. Asphalt concrete over the aggregate base was encountered at the surface within broings B-5 to B-7. Asphalt concrete was also encountered in borings B-1 to B-4, but without underlying aggregate base. It should be noted that the existing pavement and aggregate base section at these borings ranges from approximately 4 inches to 17 inches in thickness.

Undocumented fills are also anticipated to be encountered where buried utilities or below grade structures are present beneath the site.

3.2.2 Quaternary-aged Very Old Paralic Deposits ($Qvop_8$)

Underlying the existing undocumented artificial fill soils, the Quaternary-aged Very Old Paralic Deposits was encountered in all of our geotechnical borings. During our drilling exploration, this material generally consisted of medium dense to very dense, yellowish red to dark reddish-brown, moist, silty or clayey sandstone with variable amounts of gravel and very dense, light yellowish brown to reddish brown, moist, silty gravel with fine sand and trace cobble. A gravel-cobble conglomerate was encountered at depth within the Very Old Paralic Deposits during drilling. The cobble located throughout this unit is 6 to 8 inches in diameter with isolated cobbles up to 1 foot in diameter. Note that this unit was formerly named Lindavista Formation as shown in the previous boring logs by others. Previous investigations classified the material as very dense, light gray brown to reddish brown, damp to moist, silty or clayey sandstone.

3.2.3 Mission Valley Formation (Tmv) and Stadium Conglomerate (Tst)

Although only encountered within one of our boring explorations (B-4), the underlying Mission Valley Formation and Stadium Conglomerate likely occur occur below the cobble-gravel conglomerate that caused drilling refusal on all of the borings. These materials are anticipated to consist of very dense, coarse-grained, light brown to reddish brown, silty cobble-gravel conglomerate with sand. It should be noted that several previous studies (Appendix A) have identified the underlying conglomerate as Stadium Conglomerate. However, based on our interpretation of the geology shown on Figure 4, we believe that the conglomerate is that of the Mission Valley Formation.

3.3 Geologic Structure

The site is located within Zone 52 of the City of San Diego Seismic Safety Study Map (Figure 7) and is classified as “gently sloping to steep terrain, favorable geologic structure, low risk.” Based on previously completed geotechnical report (Appendix A) and our recent subsurface exploration, along with previous work completed at nearby sites, the project site is underlain by generally massive (favorably oriented) geologic structure consisting sandy and clayey gravel-cobble conglomerate of the Mission Valley Formation and the Stadium Conglomerate.

3.4 Landslides

Several formations within the San Diego region are particularly prone to landsliding (Friars Formation). These formations generally have high clay content and mobilize when they become saturated with water. Other factors, such as steeply dipping bedding that project out of the face of the slope and/or the presence of fracture planes, will also increase the potential for landsliding.

No landslides or indications of deep-seated landsliding were identified at the site during our field exploration or our review of available geologic literature, topographic maps, and stereoscopic aerial photographs. Furthermore, as discussed in Section 3.3 the site is underlain by generally massive, favorable oriented geologic structure. Therefore, the potential for significant landslides or large-scale slope instability at the site is considered low.

3.5 Surface and Groundwater

No indication of surface water or evidence of surface ponding was encountered during our geotechnical investigation performed at the site. However, surface water may drain as sheet flow across the site during rainy periods.

Groundwater was not encountered during our subsurface exploration at the site. It should be noted that groundwater levels may fluctuate with seasonal variations and irrigation and local perched groundwater conditions may exist at the contact between the undocumented artificial fill and the Very Old Paralic Deposits. Beyond nuisance seepage into open holes, we do not anticipate groundwater will be a constraint to the development of the site.

3.6 Engineering Characteristics of On-site Soils

Based on the results of our laboratory testing of representative on-site soils, and our professional experience on similar sites with similar soils conditions, the engineering characteristics of the on-site soils are discussed below.

3.6.1 Compressible Soils

The site is underlain by undocumented artificial fill materials. No records for compaction testing were available at the time of our exploration. Therefore, generally, the upper 1 to 2 feet of undocumented artificial fill is considered compressible in their current state. Recommendations for remedial grading of these soils are provided in the following sections of this report.

3.6.2 Expansion Potential

Expansion index testing on one representative soil sample indicated that the onsite soils generally have a very low potential (EI < 20) for expansion (Appendix C). However, higher expansive soils may be encountered during the grading of the site and during foundation excavation. Expansive soils are not anticipated to significantly impact the proposed site improvements.

3.6.3 Hydrocollapse

Based on the results of our observations during our field investigation, undocumented fill is underlain by dense to moderately indurated Very Old Paralic Deposits and Tertiary-aged Formations. Therefore, the potential for hydro-collapse of the underlying earth materials is considered low at the site.

3.6.4 Soil Corrosivity

A preliminary screening of the on-site soils was performed to evaluate their potential corrosive effect on concrete and ferrous metals. In summary, laboratory testing on representative soil samples obtained during our subsurface exploration evaluated pH, minimum electrical resistivity, and chloride and soluble sulfate content. The samples tested had pH values ranging from 6.9 to 8.1, and a measured minimum electrical resistivity of 1400 ohm-cm, respectively. Test results also indicated that the samples had maximum chloride content of 120 parts per million (ppm), and maximum soluble sulfate content of 165 ppm.

3.6.5 Excavation Characteristics

It is anticipated that the Very Old Paralic Deposits can be excavated with conventional heavy-duty construction equipment. If oversize material (larger than 6 inches in maximum dimensions) is generated, it should be placed in non-structural areas or hauled off site. Also, difficult excavation conditions may be encountered with deeper excavations (elevator pits, utilities, deepened piles, etc.) founded in concretionary and cemented layers below where the Very Old Paralic Deposits transitioned into cobble conglomerate material. It should be noted that drilling refusal was encountered with the Limited Access Drill Rig in Boring B-18 and with a more powerful CME 95 Drill Rig in Borings B-1 through B-7 on the cobble conglomerate. These materials likely will require heavy ripping or breaking with specialized equipment during excavation.

3.7 Flood Hazard

According to a Federal Emergency Management Agency (FEMA) flood insurance rate map (FEMA, 1997), the site is not located within a flood zone (Figure 8). In addition, based on our review of topographic maps and aerial photographs, the site is not located downstream of a dam (Figure 9).

3.8 Infiltration

Based on the results of previous geotechnical investigations and our current investigation, the site is anticipated to be a “No Infiltration Site” based on City of San Diego Storm Water Standards (2018).

3.9 Exceptional Geologic Conditions

Exceptional geologic conditions are potential hazards that are present across the State of California, and occur on a site by site basis. We have addressed the presence or non-presence of these items typically present across the State in the sections below.

3.9.1 Hazardous Materials

The site has been developed as a hospital site since the 1950's. We understand emergency fuel is stored within underground storage tanks near the central utility plant. We are not aware of any unauthorized releases into the subsurface within the hospital campus. The presence of methane gas, hydrogen-sulfide gas, tar seeps, and other naturally occurring hazardous materials has not been previously observed or mapped. Therefore, it is our opinion that the probability of such materials existing at the Mary Birch Hospital expansion site is very low.

3.9.2 Regional Subsidence

The site area is not currently utilized for groundwater or oil withdraws. In addition, the dense nature of the Mission Valley Formation and Stadium Conglomerate is not prone to subsidence settlement due to withdraw of fluids. Therefore, regional subsidence potential is considered nil.

3.9.3 Non-Tectonic Faulting

Surface expressions of differential settlement, such as ground fissures, can develop in areas affected by ground water withdrawal or banking activities, including geothermal production. The site location is not within an area affected by differential settlement caused by non-tectonic sources.

3.9.4 Volcanic Eruption

The proposed site is not located within or near a mapped area of potential volcanic hazards (Miller, C.D., 1989). The nearest volcanic activity is located in the Salton Sea area of southern California, approximately 70 miles east of the site.

3.9.5 Asbestos

Due to the lack of proximal sources of serpentinic or ultramafic rock bodies, naturally-occurring asbestos is not considered a hazard at the site.

3.9.6 Radon-222 Gas

Historically, Radon-222 gas has not typically been recognized as an environmental consideration in San Diego County. In particular the site area is not mapped as containing organic rich marine shales commonly characterized has potentially containing Radon-222 gas (Churchill, 2003). Therefore, based on our review of the referenced literature, and our site exploration, the potential for the occurrence of Radon-222 gas at the site is considered low.

4.0 SEISMICITY

4.1 Regional Tectonic Setting

The site is located within the Peninsular Ranges Geomorphic Province, which is traversed by several major active faults. The Whittier-Elsinore, San Jacinto, and the San Andreas faults are major active fault systems located east of the site, and the Rose Canyon, Newport-Inglewood (offshore), and Coronado Bank are active faults located west to southwest of the site (Jennings, 2010), see Figure 5. The primary seismic risk to the site area is the Rose Canyon fault zone located approximately 3.0 miles west of the site (USGS, 2008).

The Rose Canyon fault zone consists predominantly of right-lateral strike-slip faults that extend south-southeast bisecting the San Diego metropolitan area (Figure 6). Various fault strands display strike-slip, normal, oblique, or reverse components of displacement. The Rose Canyon fault zone extends offshore at La Jolla and continues north-northwest subparallel to the coastline. The offshore segments are poorly constrained regarding location and character. South of downtown, the fault zone splits into several splays that underlie San Diego Bay, Coronado, and the ocean floor south of Coronado (Treiman, 1993 and 2000; Kennedy and Clarke, 1999). Portions of the fault zone in the Mount Soledad, Rose Canyon, and downtown San Diego areas have been designated by the State of California (CGS, 2003) as being Earthquake Fault Zones.

4.2 Local Faulting

The California Geologic Survey (CGS, 2013) defines a Holocene-active fault as a fault which has “had surface displacement within Holocene time (about the last 11,700 years).” Our review of available geologic literature (Appendix A) indicates that there are no known pre-Holocene or Holocene-active faults transecting the site. The subject site is also not located within any State mapped Earthquake Fault Zones or City of San Diego mapped fault zones. The nearest active fault is the Rose Canyon fault located approximately 3 miles west of the site (USGS, 2008).

4.3 Seismicity

The site is considered to lie within a seismically active region, as is all of Southern California. As previously mentioned above, the Rose Canyon fault zone located approximately 3 miles west of the site is considered the 'active' fault having the most significant effect at the site from a design standpoint.

Historically, the San Diego region has been spared major destructive earthquakes. The most recent earthquake on the Rose Canyon fault in San Diego occurred after A.D. 1523 but before the Spanish arrived in 1769. Studies by Rockwell and Murbach (1999) indicate that the earthquake occurred at A.D. 1650 ± 125. Two additional earthquakes, the 1800 M6.5 and 1862 M5.9, may have also occurred in the Rose Canyon fault zone. However, no direct evidence of ground rupture within the Rose Canyon fault zone for those events was recorded.

The site location with respect to significant past earthquakes (>M5.0) is shown on the Historical Seismicity Map in Appendix D. The historic seismicity for the site has been tabulated utilizing the computer software EQSEARCH (Blake, 2018). The results are presented in Appendix D. The results indicate that the maximum historical site acceleration from 1800 to present has been estimated to be 0.137g.

4.4 Seismic Hazards

Severe ground shaking is most likely to occur during an earthquake on one of the regional active faults in Southern California. The effect of seismic shaking may be mitigated by adhering to the California Building Code or state-of-the-art seismic design parameters of the Structural Engineers Association of California.

4.4.1 Shallow Ground Rupture

No pre-Holocene or Holocene-active faults are mapped transecting or projecting toward the site. Due to the absence of faults at the site, surface rupture from faulting is considered low. In addition, due to the lack of nearby slopes, ground cracking due to shaking from a seismic event is also considered low.

4.4.2 Mapped Fault Zones

The site is not located within a State mapped Earthquake Fault Zone (EFZ), nor is it located within a City of San Diego fault zone. As previously discussed, the subject site is not underlain by known faults.

4.4.3 Site Class

Utilizing 2016 California Building Code (CBC) procedures, we have characterized the site soil profile to be a Site Class C based on our subsurface explorations using SPT blow counts, experience with similar sites in the project area, previously completed geotechnical studies on the Campus (Appendix A), and the completion of a geophysical survey (Appendix B).

4.4.4 Building Code Mapped Spectral Acceleration Parameters

The effect of seismic shaking may be mitigated by adhering to the California Building Code and state-of-the-art seismic design practices of the Structural Engineers Association of California. Provided below in Table 1 are the spectral acceleration parameters for the project determined in accordance with the 2016 CBC (CBSC, 2016) and the SEA/OSHPD Web Application.

Table 1
2016 CBC Mapped Spectral Acceleration Parameters

Site Class	C		
Site Coefficients	F_a	=	1.000
	F_v	=	1.387
Mapped MCE Spectral Accelerations	S_S	=	1.080g
	S_1	=	0.413g
Site Modified MCE Spectral Accelerations	S_{MS}	=	1.080g
	S_{M1}	=	0.573g
Design Spectral Accelerations	S_{DS}	=	0.720g
	S_{D1}	=	0.382g

Utilizing ASCE Standard 7-10, in accordance with Sections 11.8.3, the following additional parameters for the peak horizontal ground acceleration are associated with the Geometric Mean Maximum Considered Earthquake (MCE_G). The mapped MCE_G peak ground acceleration (PGA) is 0.461g for the site. For a Site Class C, the F_{PGA} is 1.0 and the mapped peak ground acceleration adjusted for Site Class effects (PGA_M) is 0.461g for the site.

4.5 Secondary Seismic Hazards

In general, secondary seismic hazards can include soil liquefaction, seismically-induced settlement, lateral displacement, surface manifestations of liquefaction, landsliding, seiches, and tsunamis. The potential for secondary seismic hazards at the subject site is discussed below.

4.5.1 Liquefaction and Dynamic Settlement

Liquefaction and dynamic settlement of soils can be caused by strong vibratory motion due to earthquakes. Granular soils tend to densify when subjected to shear strains induced by ground shaking during earthquakes. Research and historical data indicate that loose granular soils underlain by a near surface groundwater table are most susceptible to liquefaction, while the most clayey materials are not susceptible to liquefaction. Liquefaction is characterized by a loss of shear strength in the affected soil layer, thereby causing the soil to behave as a viscous liquid. This effect may be manifested at the ground surface by settlement and, possibly, sand boils where insufficient confining overburden is present over liquefied layers. Where sloping ground conditions are present, liquefaction-induced instability can result.

The site is underlain at depth by Quaternary-aged Very Old Paralic Deposits in turn underlain by the Mission Valley Formation and Stadium Conglomerate (Figure 4). Based on the underlying dense character of the Very Old Paralic Deposits, the presence of moderately indurated Tertiary-aged materials below those, and the lack of a shallow groundwater table, it is our opinion that the potential for liquefaction and seismic related settlement across the site is low.

4.5.2 Lateral Spread

Empirical relationships have been derived (Youd et al., 1999) to estimate the magnitude of lateral spread due to liquefaction. These relationships include parameters such as earthquake magnitude, distance of the earthquake from the site, slope height and angle, the thickness of liquefiable soil, and gradation characteristics of the soil.

The susceptibility to earthquake-induced lateral spread is considered to be low for the site because of the lack of susceptibility to liquefaction and a lack of open descending slope faces in the site vicinity.

4.5.3 Tsunamis and Seiches

Based upon the California Emergency Management Agency Tsunami Inundation Map (CalEMA, 2009), the site is not located within a tsunami inundation area. In addition, based on the generally strike-slip character of off-shore faulting and proposed elevation of the site with respect to sea level, the possibility of seiches and/or tsunamis is considered to be nil.

4.6 Landslides

Several formations within the San Diego region are particularly prone to landsliding. These formations generally have high clay content and mobilize when they become saturated with water. Other factors, such as steeply dipping bedding that project out of the face of the slope and/or the presence of fracture planes, will also increase the potential for landsliding (Figure 7).

No landslides or indications of deep-seated landsliding were indicated at the site during our field exploration or our review of available geologic literature, topographic maps, and stereoscopic aerial photographs. Furthermore, our field reconnaissance and the local geologic maps indicate the site is generally underlain by generally flat topography and favorable oriented geologic structure, consisting of massively bedded sandstone. Therefore, the potential for significant landslides or large-scale slope instability at the site is considered nil.

4.7 Flood Hazard

According to a Federal Emergency Management Agency (FEMA) flood insurance rate map (FEMA, 2012); the site is not located within a floodplain. Based on our review of topographic maps, the site is not located downstream of a dam or within a dam inundation area (Figures 8 and 9). Based on this review and our site reconnaissance, the potential for flooding of the site is considered low.

5.0 CONCLUSIONS

Based on the results of our geotechnical investigation of the site, it is our opinion that the proposed project is feasible from a geotechnical standpoint, provided the following conclusions and recommendations are incorporated into the project plans and specifications.

- As the site is located in the seismically active southern California area, all structures should be designed to tolerate the dynamic loading resulting from seismic ground motions;
- The site is not transected by pre-Holocene or Holocene-active faults;
- The existing undocumented artificial fill materials are considered potentially compressible and generally unsuitable in their present state to support additional fill or structural loads;
- Based on laboratory testing and site mapping, the site materials possess a very low to low expansion potential. It is possible that higher expansion materials may be encountered in locations not explored;
- The existing onsite soils are generally suitable for use as engineered fill, provided they are free of organic material, debris, and rock fragments larger than 8 inches in maximum dimension;
- If import soils are planned, the soils should be granular in nature, and have an expansion index less than 50 (per ASTM Test Method D 4829) and have a low corrosion impact to the proposed improvements;
- Based on the results of our subsurface exploration, we anticipate that the on-site materials should be generally excavatable with conventional heavy-duty earthwork equipment. However, deeper excavations (drilled piles, elevator pits, utilities, etc.) may encounter concretionary and cemented conglomerate layers within the Very Old Paralic Deposits and underlying formation that may require heavy ripping or breaking with specialized equipment during excavation;
- Groundwater was not encountered during our investigation, nor is groundwater anticipated to be encountered during site excavation and construction except as possible seepage during/after episodes of precipitation or in areas of irrigation;

- Based on the results of our geotechnical evaluation, it is our opinion that the proposed expansion of Mary Birch Hospital can be supported with conventional foundations and the loading dock canopy on drilled piles;
- Although Leighton does not practice corrosion engineering, laboratory test results indicate the soils present on the site have a low potential for sulfate attack on normal concrete. However, the onsite soils are considered to have a corrosive potential for corrosion to buried uncoated ferrous metal. A corrosion consultant may be consulted to provide additional recommendations.

6.0 RECOMMENDATIONS

The following recommendations have been developed based on support of the structure by shallow foundations that bear on competent Very Old Paralic Deposits.

6.1 Earthwork

We anticipate that earthwork at the site will consist of minor cuts and fills to cuts extending to 10 feet in depth to attain subgrade elevations within the building pad and loading dock area. We recommend that earthwork on the site be performed in accordance with the following recommendations and the General Earthwork and Grading Specifications for Rough Grading included in Appendix E. In case of conflict, the following recommendations supersede those in Appendix E.

6.1.1 Site Preparation

Prior to grading, all areas to receive structural fill or engineered structures should be cleared of surface and subsurface obstructions, including any existing debris and undocumented or loose fill soils, and stripped of vegetation. Removed vegetation and debris should be properly disposed off-site. Where trees are present, the entire root ball should be removed. It is anticipated that existing utilities will be removed from the building pads. Areas disturbed by demolition activities should be restored to grade with properly compacted fill. All areas to receive fill and/or other surface improvements should be scarified to a minimum depth of 6 inches, brought to above-optimum moisture conditions, and recompacted to at least 90 percent relative compaction (based on ASTM Test Method D 1557).

6.1.2 Excavations and Oversize Material

Excavations of the onsite materials may generally be accomplished with conventional heavy-duty earthwork equipment. However, concretionary and cemented layers with oversize rock within the Very Old Paralic Deposits and underlying formation may require heavy ripping or breaking with specialized equipment during excavation if encountered. Excavation for utilities may also be difficult in some areas. Also, artificial fill soils present on site may cave during trenching operations. In accordance with OSHA requirements, excavations deeper than 5 feet should be shored or be laid back in accordance with Section 6.7 if workers are to enter such excavations.

6.2 Removal of Compressible Soils

The weathered upper portions of the very old Paralic Deposits and undocumented artificial fill soils at the site may settle as a result of wetting or settle under the surcharge of engineered fill and/or structural loads supported on conventional foundations. The following recommendations are based on foundations extending to bear on competent Very Old Paralic Deposits.

In the building slab areas, we recommend that the upper 1 foot of soil below proposed subgrade elevations be removed and reprocessed in accordance with Section 6.3 below. Prior to placement of fill soil and in areas of planned improvements, the upper 6 inches of ground surface should be scarified, moisture conditioned as necessary, and properly recompacted.

In non-building areas, such as concrete hardscape, we recommended that the upper 1 feet of soil materials below proposed subgrade elevations should be removed and reprocessed in accordance with Section 6.3 below. Horizontally, the limits of the removal bottoms should extend at least 2 feet laterally beyond the limits of the proposed improvements.

In general, the soil that is removed may be reused and placed as engineered fill provided the material is moisture conditioned to at least 2 percent above optimum moisture content, and then recompacted prior to additional fill placement or construction. Soil with an expansion index greater than 50 should not be used within 5 feet of finish grade. The actual depth and extent of the required removals should be confirmed during grading operations by the geotechnical consultant.

6.3 Engineered Fill

The onsite soils are generally suitable for use as compacted fill provided they are free of organic material, debris, and rock fragments larger than 6 inches in maximum dimension. The onsite soils generally have moisture contents below optimum and may require moisture conditioning prior to use as compacted fill. All fill soils should be brought to at least 2 percent above-optimum moisture conditions and compacted in uniform lifts to at least 90 percent relative compaction based on laboratory standard ASTM Test Method D 1557. The optimum lift thickness required to produce a uniformly compacted fill will depend on the type and size of compaction equipment used. In general, fill should be placed in lifts not exceeding 8 inches in thickness.

6.4 Cut/Fill Transition Mitigation

Although grading plans were not available at the time of this report, proposed cuts are expected to expose competent formation within portions of the pad not transected by deeper utilities and all footings are expected to be supported by Very Old Paralic Deposits.

6.5 Expansive Soils and Selective Grading

Based on our laboratory testing and observations, we anticipate the onsite soil materials possess a very low to low expansion potential (Appendix C). Selective grading to provide low expansion materials below slabs is not anticipated.

6.6 Import Soils

If import soils are used, the soil should be granular in nature, and have an expansion index less than 50 (per ASTM Test Method D 4829), and have a low corrosion impact to the proposed improvements. Beneath pavements, subgrade materials should possess an R-Value of 20, or greater. Import soils and/or the borrow site location should be evaluated by the geotechnical consultant prior to import.

6.7 Temporary Excavations

Sloping excavations may be utilized when adequate space allows. Based on the results of our evaluation, we provide the following recommendations for sloped excavations in fill soils or Very Old Paralic Deposits without seepage conditions.

Table 2
Maximum Slope Ratios

Excavation Depth (feet)	Maximum Slope Ratio Fill Soils	Maximum Slope Ratio In Very Old Paralic Deposit
0 to 5	1:1 (Horizontal to Vertical)	1:1 (Horizontal to Vertical)

The above values are based on the assumption that no surcharge loading or equipment is present within 10 feet of the top of slope. Care should be taken during design of excavations adjacent to the existing structures so that foundation support is preserved. A “competent person” should observe the slope on a daily basis for signs of instability. All excavations should comply with current OSHA requirements.

6.8 Foundation Design

Based on our understanding of the project, we recommend that conventional spread footings founded in granular undisturbed Very Old Paralic Deposits to support the proposed structure. The ancillary canopy structures may be supported by drilled pier foundations. Where both shallow and deep foundation elements support the same structure, the superstructure should be analyzed in accordance with 2016 CBC Section 1808A.2. Where shallow foundations are constructed alongside existing shallow spread footings, any excavation below the depth of the bottom of the existing footing should be performed in a manner to avoid compromising the bearing capacity of the existing footings. The structural engineer should develop a plan showing the anticipated depth of the existing footings that are adjacent to the proposed Mary Birch Hospital Expansion foundations and are to be protected in-place.

6.8.1 Shallow Spread Footings

Shallow spread footings may be used to support the proposed hospital building. Where spread footings need to be deepened to bear on competent Very Old Paralic Deposits, a controlled low strength material (CLSM) can be used to fill the additional excavation prior to construction of the footing. The CLSM should consist of a two-sack, sand-cement slurry and have and have a minimum compressive strength of 125 psi when tested in accordance with ASTM D4832. Water content in the CLSM should be maintained at a proportion to minimize subsidence and bleed water shrinkage. The CLSM should be placed on competent materials. Any standing water and any loose or soft materials should be removed prior to placement of the CLSM. Deepening of spread footings should be anticipated where existing backfilled utility trenches are present where proposed foundations are planned.

Based on exhibits provided by the project structural engineer, we understand grade beams embedded 6 to 10 feet below the finish floor are planned to support the proposed hospital expansion. With the lowering of grades and the anticipated depth of grade beam foundations, we anticipate locally the additional depth needed to bear footings on competent materials will be less than 5 feet. The thickness of CLSM beneath footings should not exceed the width of the footing supported by the CLSM. If greater thickness is needed, the width of the excavation should be increased so that the thickness of the CLSM does not exceed the width of the CLSM. Alternatively, the structural engineer should provide a design for deepening the footing below the design bottom of footing depth.

Footings should extend a minimum of 24 inches beneath the lowest adjacent finish subgrade. At these depths, footings may be designed for a maximum allowable bearing pressure of 8,000 pounds per square foot (psf). This capacity is for dead plus live loads. With an ultimate capacity of at least 32,000 psf, the allowable bearing value may be increased by one-third for short-term wind or seismic loads. The minimum recommended width of footings is 18 inches for continuous footings and 24 inches for square or round footings. The allowable bearing pressures may be increased by 1,000 psf for each additional foot of width or depth of structural concrete, to a maximum value of 12,000 psf. For the allowable pressure of 12,000 psf, footings possess an ultimate value of at least 48,000 psf.

The recommended allowable-bearing capacity is based on a maximum total settlement of 5/8 inch and a differential of 3/8-inch. Since settlement is a function of footing size and contact bearing pressures, some differential settlement can be expected where a large differential loading condition exists. However, for most cases, differential settlements are considered unlikely to exceed 1/4 inch.

Footings should be designed in accordance with the structural engineer's requirements and have a minimum reinforcement of four No. 5 reinforcing bars (two top and two bottom). Reinforcement of individual column footings should be per the structural requirements.

6.8.2 Modulus of Subgrade Reaction

We understand the modulus of subgrade reaction will be used to model deflections for grade beams. Grade beams and mat foundations typically experience some deflection due to loads placed and the reaction of the soils underlying the foundations. A design coefficient of subgrade reaction of K_1, of 400 pounds per cubic inch (pci) may be used for evaluating such deflections at the site. This value is based on support by competent Very Old Paralic Deposits and is considered as applied to a unit square foot area. The value should be adjusted for the design foundation size. The coefficient of subgrade reaction K_b for a footing of specific width may be evaluated using the following equation.

$$K_b = K_1 \, [(b+1)/2b]^2$$

where b is the least width of the foundation in feet

Detailed analysis to evaluate deflection should be carried out by the structural engineer. In some cases, refinement of the geotechnical recommendations may be needed to improve agreement between geotechnical and structural models.

6.8.3 Drilled Pile Foundations

Cast-in-drilled-hole (CIDH) friction piles at least 18 inches in diameter may be used to support the ancillary canopy structures. For the analysis and development of the vertical capacity of CIDH friction piles, an allowable downward skin friction of 200 psf may be utilized. No increase may be utilized for short term downward loads. For upward loads, a skin friction of 130 psf may be utilized and a one-third increase can be used for wind and seismic loads. Skin friction may be combined with end bearing for downwardly loaded piles where the bottom of the drilled pile excavation has been cleaned of any loose accumulation of cuttings, a value of 4,000 psf may be utilized for allowable end bearing.

Pile settlement is anticipated to be less than 1/4 inch under design loads and normal service conditions. The design skin friction is based on center to center pile spacing of at least 3 pile diameters from other excavations. Where piles or excavation are spaced more closely, a reduction in pile capacity is necessary. Construction of piles should be sequenced such that the concrete of constructed piles is allowed to setup prior to construction of piles within 5 diameters. Where excavations for later phases of buildings are planned near proposed foundations, extending footings deeper with structural concrete should be considered to mitigate impacts. Skin friction and end bearing may be relied upon within the portion of the pile that is at or below the depth of future excavation.

To resist lateral loads, CIDH piles can be designed in accordance with Section 1807A.3 of the 2016 CBC. For level ground conditions, we recommend lateral soil bearing pressures determined from Table 1806A.2 of 200 psf per foot of depth below the finish grade be used for determination of parameters S1 and S3 in the Non-constrained and Constrained designs, respectively. As allowed by Section 1806A.3.4, a two-times increase in lateral bearing pressure may be used for short term loading for buildings that are not adversely affected by ½-inch motion at the ground surface. These pressures assume piles spaced at least eight diameters center-to-center. Where piles are more closely spaced, lateral soil bearing pressures should be reduced using the appropriate reduction factor determined from Figure 10 or 11 (Caltrans, 2019). Where sloping ground is present, revised parameters should be provided. Where retaining structures are present or proposed, lateral surcharge may need to be considered in the retaining wall design to accommodate lateral pile surcharge loading. Similar considerations should be addressed if underground storage tanks are situated within eight pile diameters of laterally loaded piles.

Where the ground surface is level and buried utilities, vaults, tanks, or structures are not present within 8 pile diameters, piles at least 2 feet in diameter may be considered to be laterally supported and Exception 1 of Section 1810A.2.2 withn the 2016 CBC may be applied to piles with a length that does not exceed 12 times the least horizontal dimension .

6.8.4 Pile Installation

All pile installation should be performed under the observation of the geotechnical consultant and consistent with standard practice. Drilling equipment should be powerful enough to drill through the overlying fill soils and into the dense to very dense formational material to the design penetration depths. Once a pile excavation has been started, we recommend the pile be completed within 8 hours, which includes inspection, placement of the reinforcement, and placement of the concrete.

Caving of friable, soft or loose soils may occur where open excavations are made. Additionally, existing footings may surcharge excavations. Therefore, a permanent starter casing may be considered to protect the top of the borehole to mitigate caving or surcharge conditions where fill is present. The manner in which a permanent casing is constructed significantly affects the available skin friction. Where permanent casing is planned, we recommend that skin friction be neglected. Casing should be installed tight to the surrounding soil. Loose materials should be removed from the bottom of the pile excavation prior to concrete placement.

If pile excavations become bell-shaped and cannot be advanced due to severe caving, the caved region may be filled with a sand/cement slurry and redrilled. Redrilling may continue when the slurry has reached suitable set and strength. In this case, it may be prudent to utilize casing or other special methods to facilitate continued drilling after the slurry has set.

6.8.5 Foundation Setback

We recommend a minimum horizontal setback distance from the face of slopes and retaining walls for all structural foundations, footings, and other settlement-sensitive structures as indicated on the Table 3 below. This distance is measured from the outside bottom edge of the footing, horizontally to the slope face, and is based on the slope height. However, the foundation setback distance may be revised by the geotechnical consultant on a case-by-case basis if the geotechnical conditions are different than anticipated.

Table 3
Minimum Foundation Setback from Slope Faces

Slope Height	Setback
less than 5 feet	5 feet
5 to 15 feet	7 feet

Please note that the soils within the structural setback area possess poor lateral stability, and improvements (such as retaining walls, sidewalks, fences, pavements, etc.) constructed within this setback area may be subject to lateral movement and/or differential settlement. Potential distress to such improvements may be mitigated by providing a deepened footing or a grade beam foundation system to support the improvement. Depending on their proximity to the top of slopes, these structures may require retaining walls and/or deepened foundations.

In addition, open or backfilled utility trenches that parallel or nearly parallel structure footings should not encroach within an imaginary 2 to 1 (horizontal to vertical) downward sloping line starting 9 inches above the bottom edge of the footing and should also not be located closer than 18 inches from the face of the footing. Deepened footings should meet the setbacks as described above.

Where pipes may cross under footings, the footings should be specially designed. Pipe sleeves should be provided where pipes cross through footings or footing walls and sleeve clearances should provide for possible footing settlement, but not less than 1 inch around the pipe.

6.8.6 Floor Slabs

Slabs-on-grade should be at least 5 inches thick and be reinforced with No. 4 rebars 18 inches on center each way (minimum) placed at mid-height in the slab. We recommend control joints be provided across the slab at appropriate intervals as designed by the project architect.

For slab areas where vapor control is appropriate, a minimum 15-mil vapor barrier should be provided between the underslab and gravel capillary break. The vapor barrier should have a permeance of less than 0.01 perms across the entire slab area in the final constructed condition. Measures to protect the barrier should be implemented throughout the installation and slab construction process to prevent damage (ASTM E1643). Vapor barrier materials should conform to ASTM E1745 Class A. The gravel capillary break should consist of a layer of uniform 3/8-inch to 1/2-inch gravel that is at least 4-inches thick. The mix design of the slab concrete should be proportioned to control bleeding, shrinkage and curling.

Moisture barriers can retard, but not eliminate moisture vapor movement from the underlying soils up through the slabs. Moisture barriers can also prolong the timeframe needed for slabs to fully cure. We recommend that the floor covering/insulation installer test the moisture vapor flux rate prior to flooring installation. “Breathable” floor coverings should be considered if the vapor flux rates are high. Additional guidance is provided in ACI Publications 302.1R-15 Guide for Concrete Floor and Slab Construction and 302.2R-06 Guide for Concrete Slab that Receive Moisture-Sensitive Floor Materials.

The potential for slab cracking may be reduced by careful control of water/cement ratios. The contractor should take appropriate curing precautions during the pouring of concrete in hot weather to minimize cracking of the slabs. We recommend that a slipsheet (or equivalent) be utilized if grouted tile, marble tile, or other crack-sensitive floor covering is planned directly on concrete slabs. All slabs should be designed in accordance with structural considerations. If heavy vehicle or equipment loading is proposed for the slabs, greater thickness and increased reinforcing may be required. The additional measures should be designed by the structural engineer using a modulus of subgrade reaction of 150 pounds per cubic inch. Additional moisture/waterproofing measures that may be needed to accomplish desired serviceability of the building finishes and should be designed by the project architect

6.8.7 Loading Dock Slab

The project includes a loading dock with capacity to receive up to 6 trucks at a time. A PCC pavement section for the proposed loading dock slab has been provided based on the design standards presented in the ACI "Guide for the Design and construction of Concrete Parking Lots" (ACI 330R-08) and the assumed Average Daily Truck Traffic Indices (ADTT). The ADTT is to be determined by the design-build designers.

Table 4
PCC Pavement Sections

ADTT*	PCC (Inches)
>700	8.5
≤ 300	7.5
≤ 10	6.5

*Traffic Categories and ADTT per ACI 330, Table 3.3.

The above recommended concrete sections are based on properly compacted fill soils with a very low expansion potential (EI<21) and R-Value greater than 25. They also include a thickness increase of 15% to account for a free edge condition. All utility trenches should be compacted to 90 percent relative compaction and pavement subgrade (upper 12-inches) uniformly compacted (non-yielding) to 95 percent of the laboratory maximum dry density (ASTM D1557) and at/or slightly above optimum moisture content. Compaction should extend a minimum of 12-inches beyond formlines. Slab edges and construction joint details provided by ACI should be followed. Concrete should have a minimum flexural strength of 550 psi. Concrete testing should be performed to confirm quality of aggregates, strength requirements and shrinkage limits during construction. Construction and crack control joints should be designed per structural engineer's requirements ACI guidelines.

6.8.8 Lateral Earth Pressures and Retaining Wall Design

Should retaining walls be added to the project, Table 6 presents the lateral earth pressure values for level or sloping backfill for walls backfilled with and bearing against fully drained soils of very low to low expansion potential (less than 50 per ASTM D 4829).

Table 5
Static Equivalent Fluid Weight (pcf)

Conditions	Level	2:1 Slope
Active	36	55
At-Rest	55	80
Passive	300 (Maximum of 3 ksf)	150 (Sloping Down)

Walls up to 10 feet in height should be designed for the applicable equivalent fluid unit weight values provided above. If conditions other than those covered herein are anticipated, the equivalent fluid unit weight values should be provided on an individual case-by-case basis by the geotechnical engineer. A surcharge load for a restrained or unrestrained wall resulting from automobile traffic may be assumed to be equivalent to a uniform lateral pressure of 75 psf which is in addition to the equivalent fluid pressure given above. For other uniform surcharge loads, a uniform pressure equal to 0.35q should be applied to the wall. The wall pressures assume walls are backfilled with free draining materials and water is not allowed to accumulate behind walls. A typical drainage design is contained in Appendix E. Wall backfill should be compacted by mechanical methods to at least 90 percent relative compaction (based on ASTM D 1557). If foundations are planned over the wall backfill, the wall backfill should be compacted to 95 percent. Wall footings should be designed in accordance with the foundation design recommendations and reinforced in accordance with structural considerations. For all retaining walls, we recommend a minimum horizontal distance from the outside base of the footing to daylight as outlined in Section 6.8.5.

Lateral soil resistance developed against lateral structural movement can be obtained from the passive pressure value provided above. Further, for sliding resistance, the friction coefficient of 0.35 may be used at the concrete and soil interface. These values may be increased by one-third when considering loads of short duration including wind or seismic loads. The total resistance may be taken as the sum of the frictional and passive resistance provided that the passive portion does not exceed two-thirds of the total resistance. The passive resistance and frictional coefficients are allowable values with a factor of safety of 1.5. The passive value for level ground assumes level conditions extend horizontally at least eight times the height of the surface imposing the horizontal loading.

To account for potential redistribution of forces during a seismic event, retaining walls providing lateral support where exterior grades on opposites sides differ by more than 6 feet fall under the requirements of 2016 CBC Section 1803.5.12 and/or ASCE 7-10 Section 15.6.1 and should also be analyzed for seismic loading. For that analysis, an additional uniform lateral seismic force of 9H should be considered for the design of the retaining walls with level backfill, where H is the height of the wall. This value should be increased by 150% for restrained walls.

6.8.9 Shoring of Excavations

For deeper excavations and protection of existing foundations, we recommend that excavations be retained either by a cantilever or braced shoring system with cast-in-place soldier piles and sheeting or lagging (i.e. shotcrete and/or wood), as needed. Based on our experience with similar projects, if lateral movement of the shoring system cannot be tolerated, we recommend the utilization of a braced or anchored pile system.

Shoring of excavations is typically performed by specialty contractors with knowledge of the San Diego County area soil conditions. Lateral earth pressures for design of shoring are presented below:

Cantilever Shoring System

Active pressure = 36H(psf), triangular distribution
Passive Pressure = 400h (psf)
H = wall height (active case) or h = embedment (passive case)

Multi-Braced Shoring System

Active Pressure = 24H (psf), rectangular distribution
Passive Pressure = 400h (psf)
H = wall height (active case) or h = embedment (passive case)

Based on subsurface materials encountered during the geotechnical exploration and our experience with nearby projects, it is our opinion that the caving potential of the on-site soils is moderate due to the presence of dense to very dense, but yet friable sands and gravels associated with the underlying Very Old Paralic Deposits. To accommodate installation of the shoring in the dense to hard underlying geologic units, wide-flange sections may be installed into pre-drilled holes surrounded by concrete. If caving of the drilled holes occurs, drilling slurry or casing may be required. In addition, caving of drilled holes for the tieback anchors should be anticipated. During downward advancement of the shoring walls care in these cases should be exercised which may include the excavation of shorter open-face segments.

If portions of the planned excavations are proposed with sloped temporary excavations, we recommend a maximum slope of 1 to 1 (horizontal to vertical). Sloped excavations should be observed by the geotechnical consultant during excavation. It should be noted that where temporary slopes excavate proposed foundational soil, then proposed footings will need to be deepened to bear on competent formation.

Settlement monitoring of adjacent building, sidewalks and adjacent settlement sensitive structures should be considered to evaluate the performance of the shoring. Shoring of the excavation is the responsibility of the contractor. Extreme caution should be used to minimize damage to existing pavement, utilities, and/or structures caused by settlement or reduction of lateral support.

6.9 Control of Surface Waters

Regarding Best Management Practices (BMP) and Low Impact Development (LID) measures, we are of the opinion that infiltration basins, and other on-site storm water retention and infiltration systems can potentially create adverse perched groundwater conditions, both on-site and off-site, when not installed using proper design recommendations (such as the use of liners) and infiltration design parameters. Due to the dense nature of the Very Old Paralic Deposits and existing site constraints and conditions, we do not recommend infiltration of surface storm water into the existing site soils. However, Low Impact Development (LID) BMPs that contain and filter surface waters (flow-through planters and bioretention areas) are acceptable provided that they are completely lined with an impermeable liner and have subdrain systems that tie into an approved existing or proposed storm drain system.

Surface storm water should be transported off the site in approved drainage devices or unobstructed swales. We recommend a minimum flow gradient for unpaved drainage within 5 feet of structures of 2 percent sloping away. All area drain inlets should be maintained and kept clear of debris in order to function properly. In addition, landscaping should not cause any obstruction to site drainage. Rerouting of drainage patterns and/or installation of area drains should be performed, if necessary, by a qualified civil engineer or a landscape architect.

6.10 Non-Vehicular Concrete Flatwork

Concrete sidewalks and other flatwork (including construction joints) should be designed by the project civil engineer and should have a minimum thickness of 4 inches with No. 4 bars at 24 inches on center or No. 3 bars at 18 inches on center. For all concrete flatwork, the upper 12 inches of subgrade soils should be moisture conditioned to at least 2 percent above optimum moisture content depending on the soil type and compacted to at least 90 percent relative compaction based on ASTM Test Method D1557 prior to the concrete placement. Moisture testing should be confirmed 24 hours prior to concrete placement.

6.11 Geochemical Considerations

Concrete in direct contact with soil or water that contains a high concentration of soluble sulfates can be subject to chemical deterioration commonly known as “sulfate attack.” Soluble sulfate test results (Appendix C) indicate an exposure class of S0. We recommend that concrete in contact with earth materials be designed in accordance with Section 4 of ACI 318-14 (ACI, 2014).

Based on the results of preliminary screening laboratory testing, the site soils have a corrosive potential to buried uncoated metal conduits (Caltrans, 2018). We recommend measures to mitigate corrosion be implemented during design and construction. Leighton does not practice corrosion engineering. Therefore, a corrosion engineer may be contacted for additional recommendations.

6.12 Construction Observation and Plan Reviews

The recommendations provided in this report are based on preliminary design information and subsurface conditions disclosed by widely spaced borings. The interpolated subsurface conditions should be checked in the field during construction. Construction observation of all onsite excavations and field density testing of all compacted fill should be performed by a representative of this office so that construction is in accordance with the recommendations of this report. We recommend that where possible, excavation exposures be geologically mapped by the geotechnical consultant during grading for the presence of potentially adverse geologic conditions.

Final project grading and foundation plans should be reviewed by Leighton as part of the design development process to ensure that recommendations provided in this report are incorporated in the project plans.

7.0 LIMITATIONS

The conclusions and recommendations presented in this report are based in part upon data that were obtained from a limited number of observations, site visits, excavations, samples, and tests. Such information is by necessity incomplete. The nature of many sites is such that differing geotechnical or geological conditions can occur within small distances and under varying climatic conditions. Changes in subsurface conditions can and do occur over time. Therefore, the findings, conclusions, and recommendations presented in this report can be relied upon only if Leighton has the opportunity to observe the subsurface conditions during grading and construction of the project, in order to confirm that our preliminary findings are representative for the site.

Figures

Project: 12764.001	Eng/Geol: SAC/RCS
Scale: 1 " = 500 '	Date: September 2020

Base Map: Bing Maps 2020
Thematic Information: Leighton
Author: Leighton Geomatics (mmurphy)

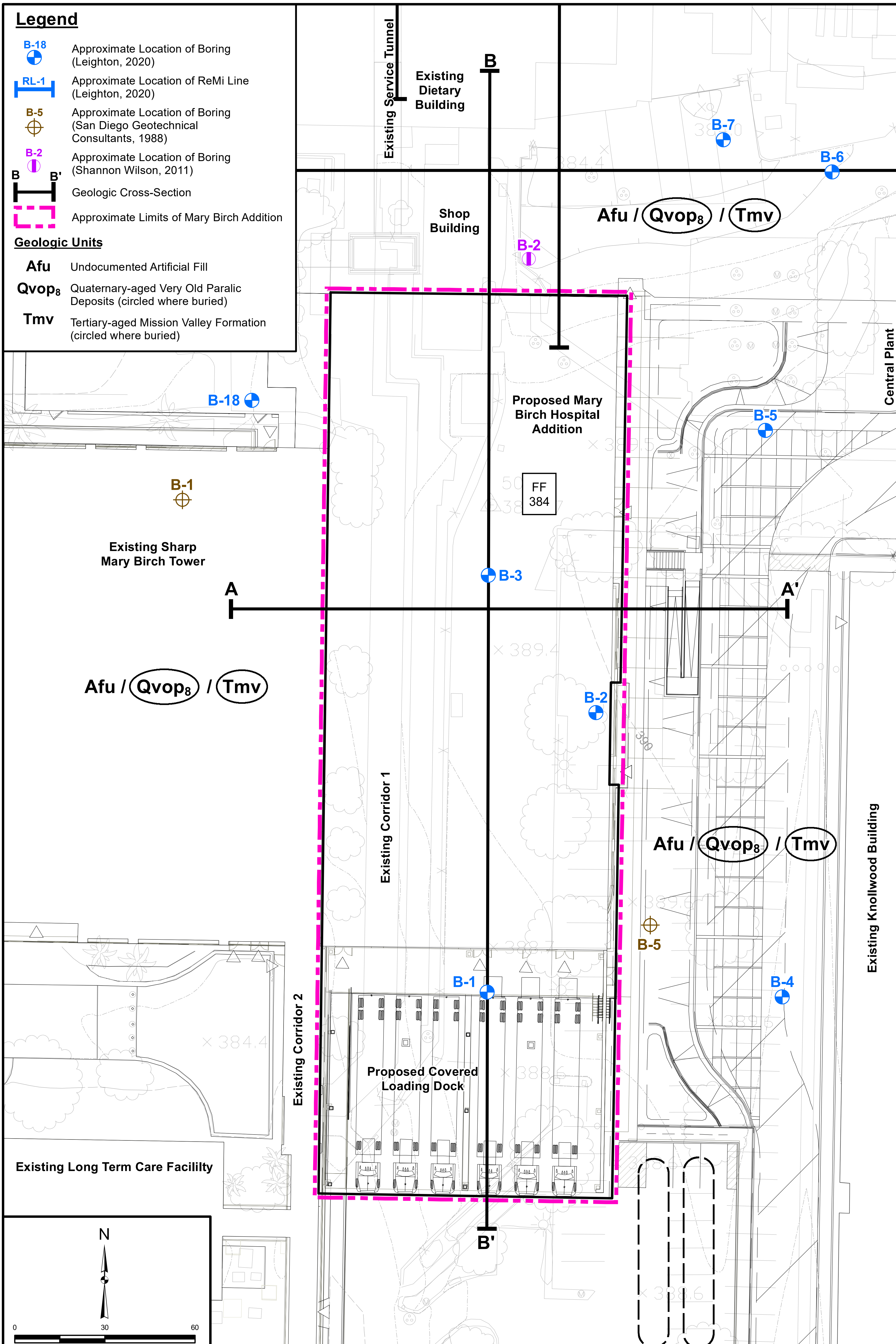
SITE LOCATION MAP

Mary Birch Hospital Expansion
Sharp Metropolitan Medical Campus
San Diego, California

Figure 1

Leighton

Map Saved as P:\Drafting\12764\Maps\Mary Birch\12764-001_F01_SLM-MB_2020-08-14.mxd on 9/3/2020 9:28:25 AM



Project: 12764.001	Eng/Geol: SAC/RCS
Scale: 1 " = 30 '	Date: December 2020

Base Maps: HDR/Taylor Design, 2020, Site Development – Package 2, Design Development – 100%, SMMC Campus Redevelopment, plot date September 15. and BWE, 2020, Site Plan – Package 2, Design Development – 50%, SMMC Campus Redevelopment, plot date June 10.
Author: (kmanchikanti)

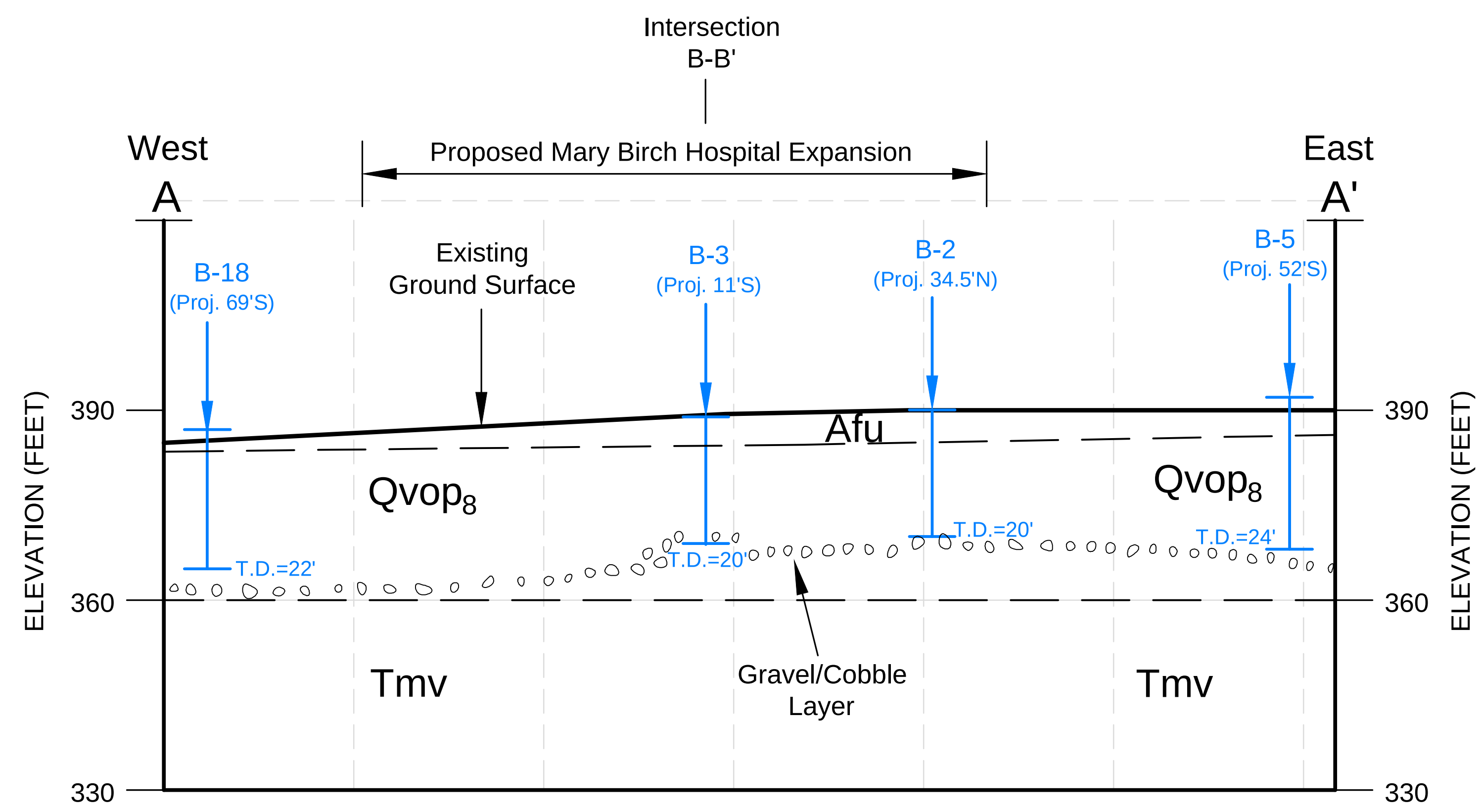
GEOTECHNICAL MAP

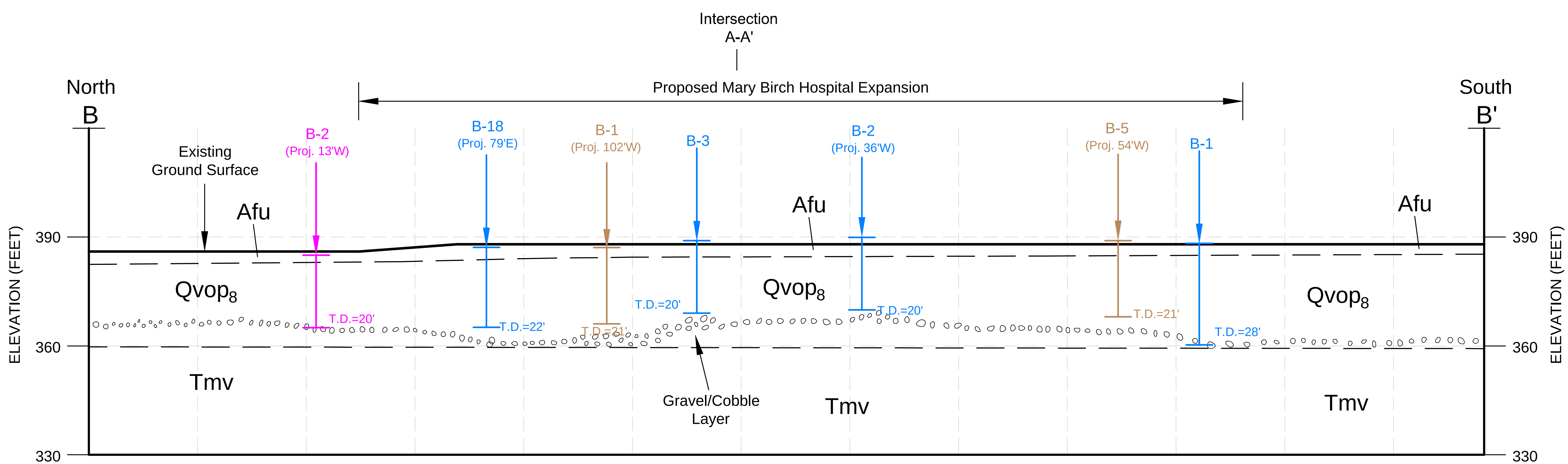
Mary Birch Hospital Expansion
Sharp Metropolitan Medical Campus
San Diego, California

Figure 2

Leighton

Map Saved as C:\Users\kmanchikanti\Documents\Maps\12764-001_F02_GM_2020-08-18.mxd on 12/8/2020 1:10:45 PM





Legend

B-18, T.D.=22'	Boring Location showing Total Depth (Leighton, 2020)
B-5, T.D.=21'	Boring Location showing Total Depth (San Diego Geotechnical Consultants, 1988)
B-2, T.D.=18.5'	Boring Location showing Total Depth (Shannon Wilson, 2011)
— — —	Approximate Geologic Contact

Geologic Units

Afu	Undocumented Artificial Fill
$Qvop_8$	Quaternary-aged Very Old Paralic Deposits
Tmv	Tertiary-aged Mission Valley Formation

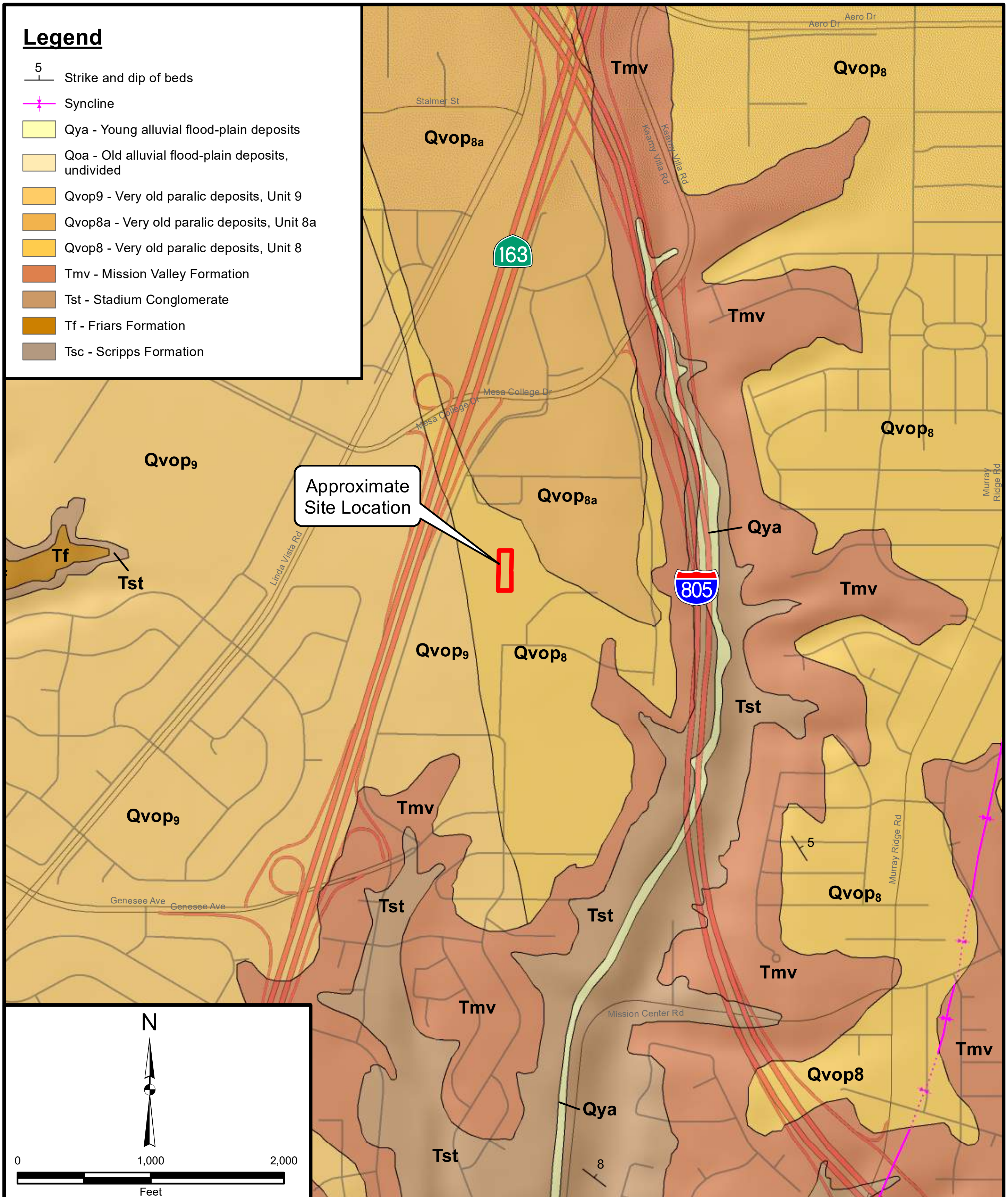
Project: 12764.001	Eng/Geol: SAC/RCS
Scale: 1"=30'	Date: September 2020
Reference:	
Author: MAM	

GEOLOGIC CROSS SECTIONS A-A' & B-B'

Mary Birch Hospital Expansion
Sharp Metropolitan Medical Campus
San Diego, California

Figure 3

Leighton



Project: 12764.001 | Eng/Geol: SAC/RCS

Scale: 1 " = 1,000 ' | Date: September 2020

Base map: Kennedy, M.P. and Tan, S.S, 2008, Geologic Map of the San Diego 30' X 60' Quadrangle, California Compiled by Michael P. Digital Preparation by Kelly R. Bovard, Anne G. Garcia and Diane Burns, California Geological Survey.
Author: Leighton Geomatics (mmurphy)

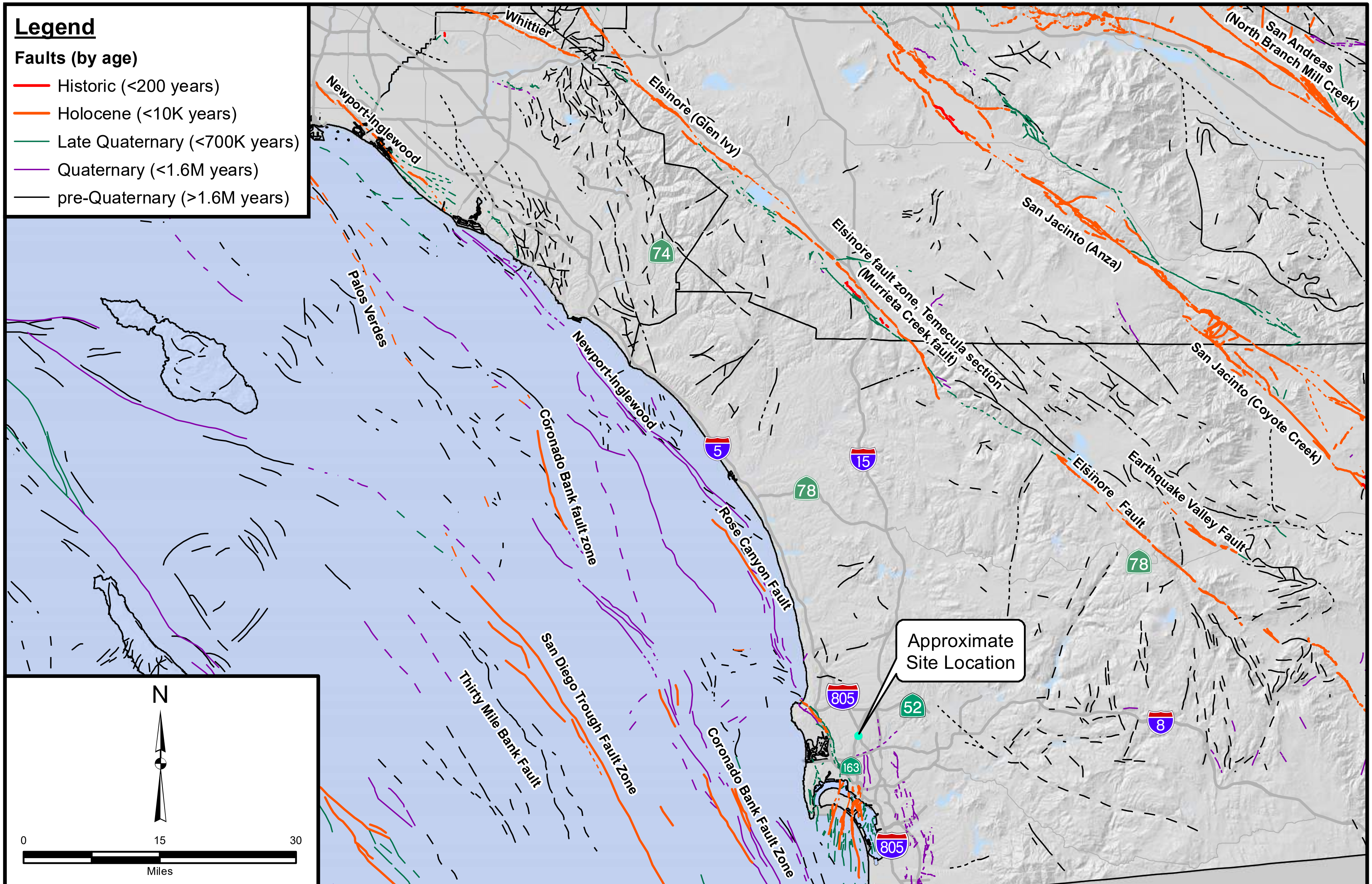
GEOLOGIC MAP

Mary Birch Hospital Expansion
Sharp Metropolitan Medical Campus
San Diego, California

Figure 4

Leighton

Map Saved as P:\Drafting\12764\Maps\Mary Birch\12764-001_F04_GM_2020-08-14.mxd on 9/3/2020 9:31:52 AM



Project: 12764.001	Eng/Geol: SAC/RCS
Scale: 1 " = 15 miles	Date: September 2020

Faults: Bryant, Bryant CGS 2010
Thematic Information: Leighton
Author: Leighton Geomatics (mmurphy)

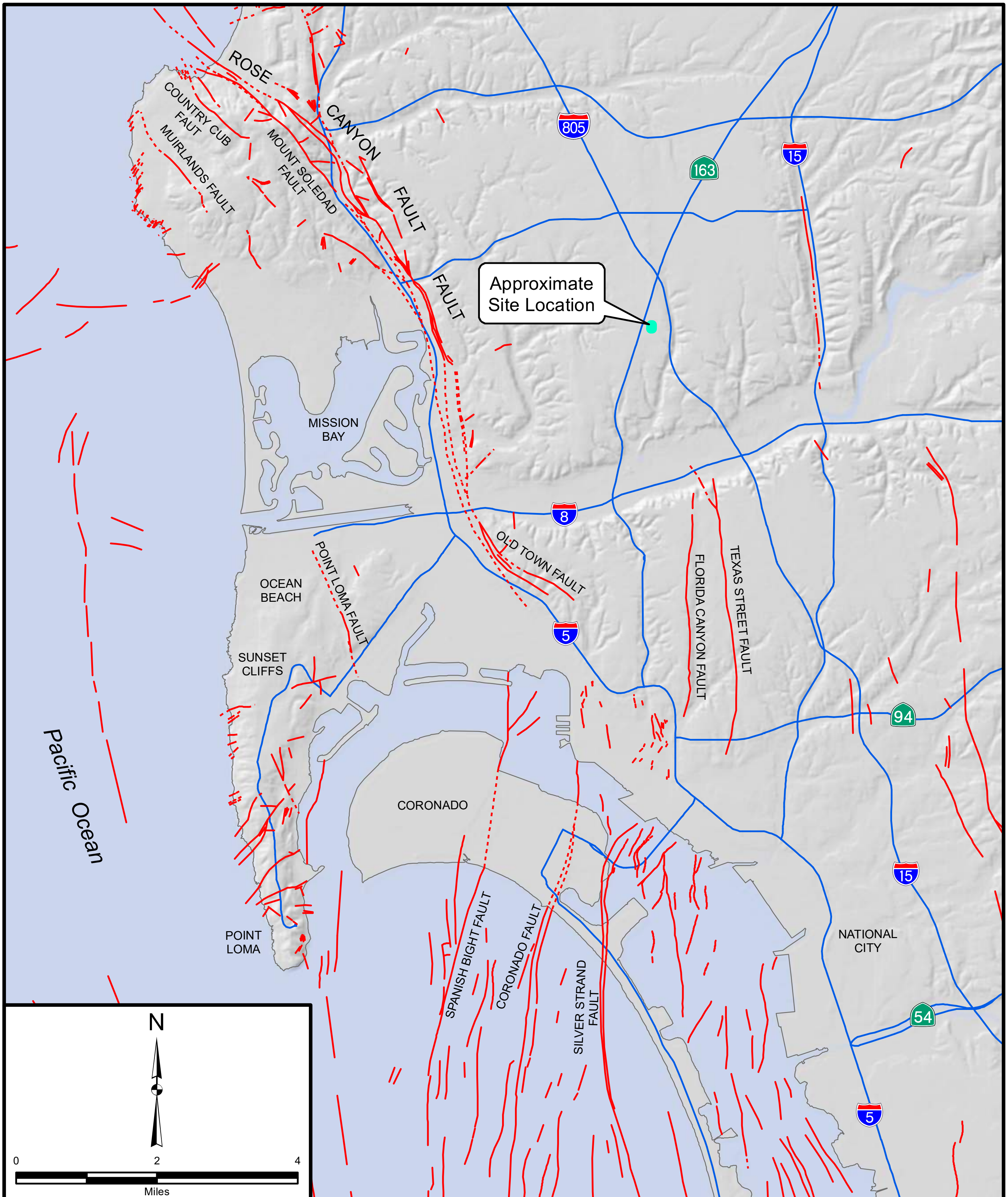
REGIONAL FAULT MAP

Mary Birch Hospital Expansion
Sharp Metropolitan Medical Campus
San Diego, California

Figure 5

Leighton

Map Saved as P:\Drafting\12764\Maps\Mary Birch\12764-001_F05_RFM_2020-08-14.mxd on 8/14/2020 10:50:12 AM



Project: 12764.001	Eng/Geol: SAC/RCS
Scale: 1 " = 2 miles	Date: September 2020

Base Map: ESRI ArcGIS Online 2020
Thematic Information: Leighton
Author: Leighton Geomatics (mmurphy)

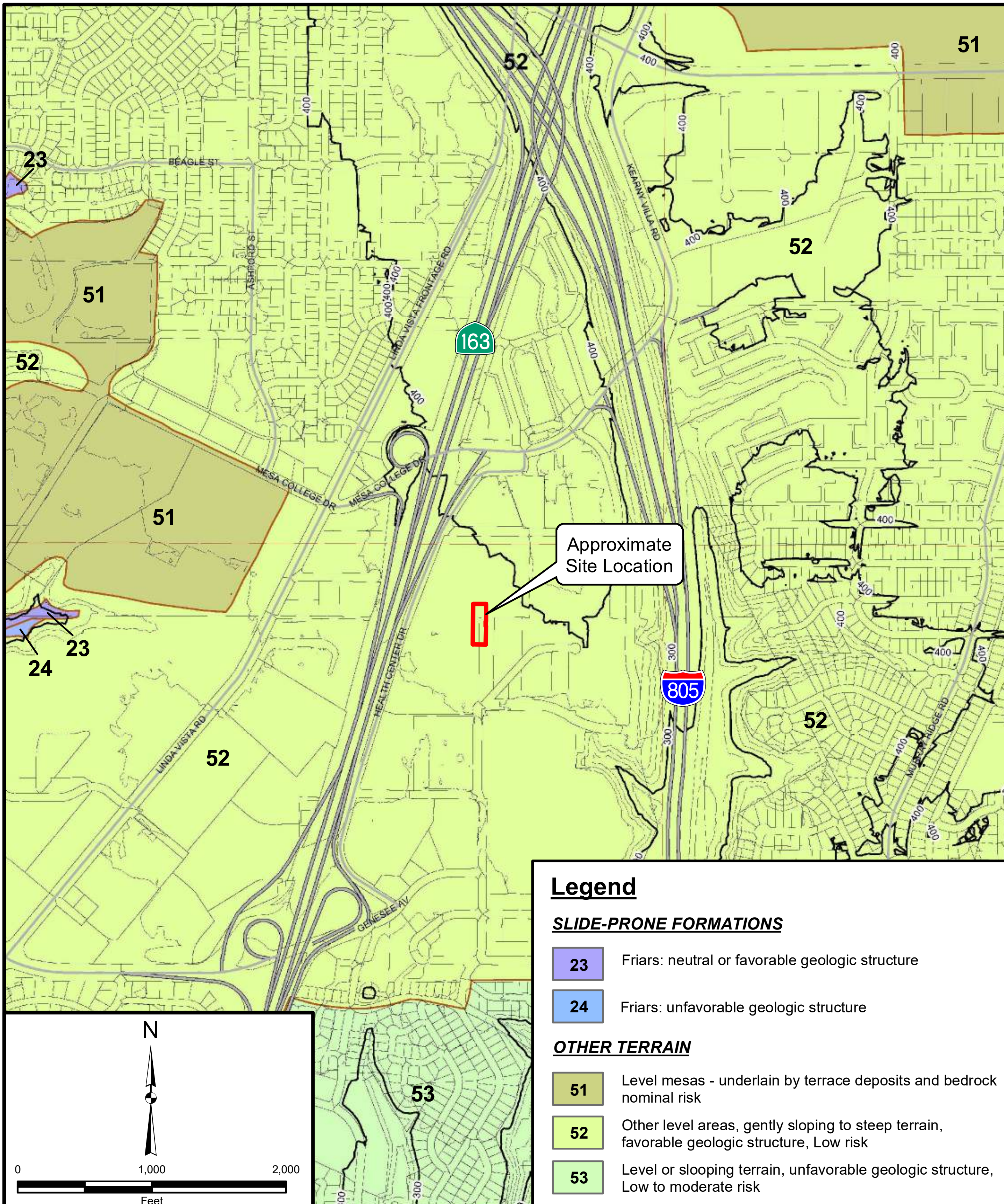
ROSE CANYON FAULT MAP

Mary Birch Hospital Expansion
Sharp Metropolitan Medical Campus
San Diego, California

Figure 6

Leighton

Map Saved as P:\Drafting\12764\Maps\Mary Birch\12764-001_F06_RCFM_2020-08-14.mxd on 8/14/2020 11:01:12 AM



Legend

SLIDE-PRONE FORMATIONS

23	Friars: neutral or favorable geologic structure
24	Friars: unfavorable geologic structure

OTHER TERRAIN

51	Level mesas - underlain by terrace deposits and bedrock nominal risk
52	Other level areas, gently sloping to steep terrain, favorable geologic structure, Low risk
53	Level or sloping terrain, unfavorable geologic structure, Low to moderate risk

Project: 12764.001
Eng/Geol: SAC/RCS
Scale: 1 " = 1,000 '
Date: September 2020

Reference: City of San Diego Seismic Safety Study, Geologic Hazards and Faults, dated 4/3/2008.

Author: Leighton Geomatics (mmurphy)

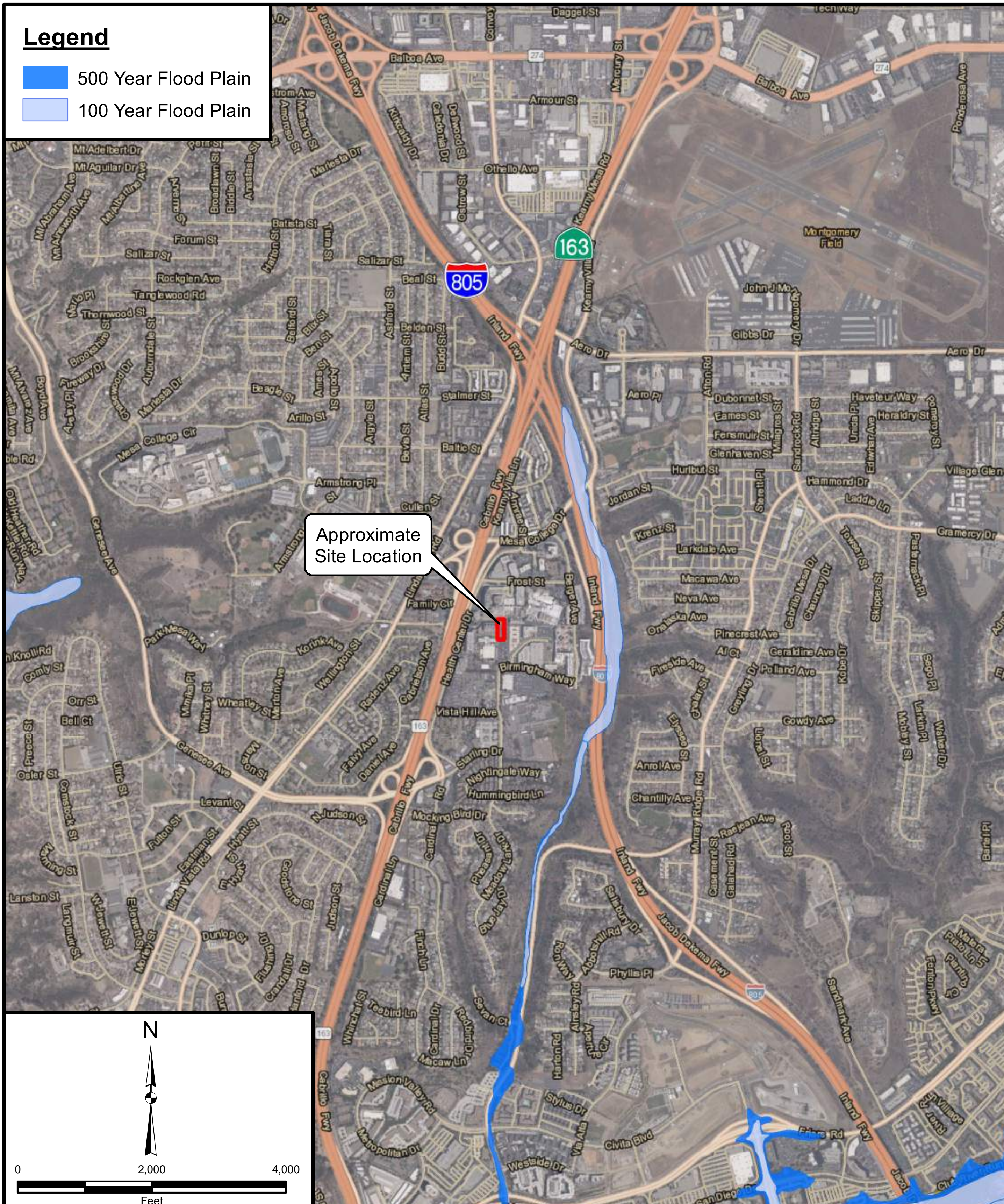
CITY OF SAN DIEGO SEISMIC SAFETY STUDY MAP

Mary Birch Hospital Expansion
Sharp Metropolitan Medical Campus
San Diego, California

Figure 7

Leighton

Map Saved as P:\Drafting\12764\Maps\Mary Birch\12764-001_F07_CSDSSSM_2020-08-14.mxd on 9/3/2020 9:36:47 AM



Project: 12764.001	Eng/Geol: SAC/RCS
Scale: 1 " = 2,000 '	Date: September 2020

Base Map: Bing Maps 2020
Thematic Information: SanGIS, 2020.
Author: Leighton Geomatics (mmurphy)

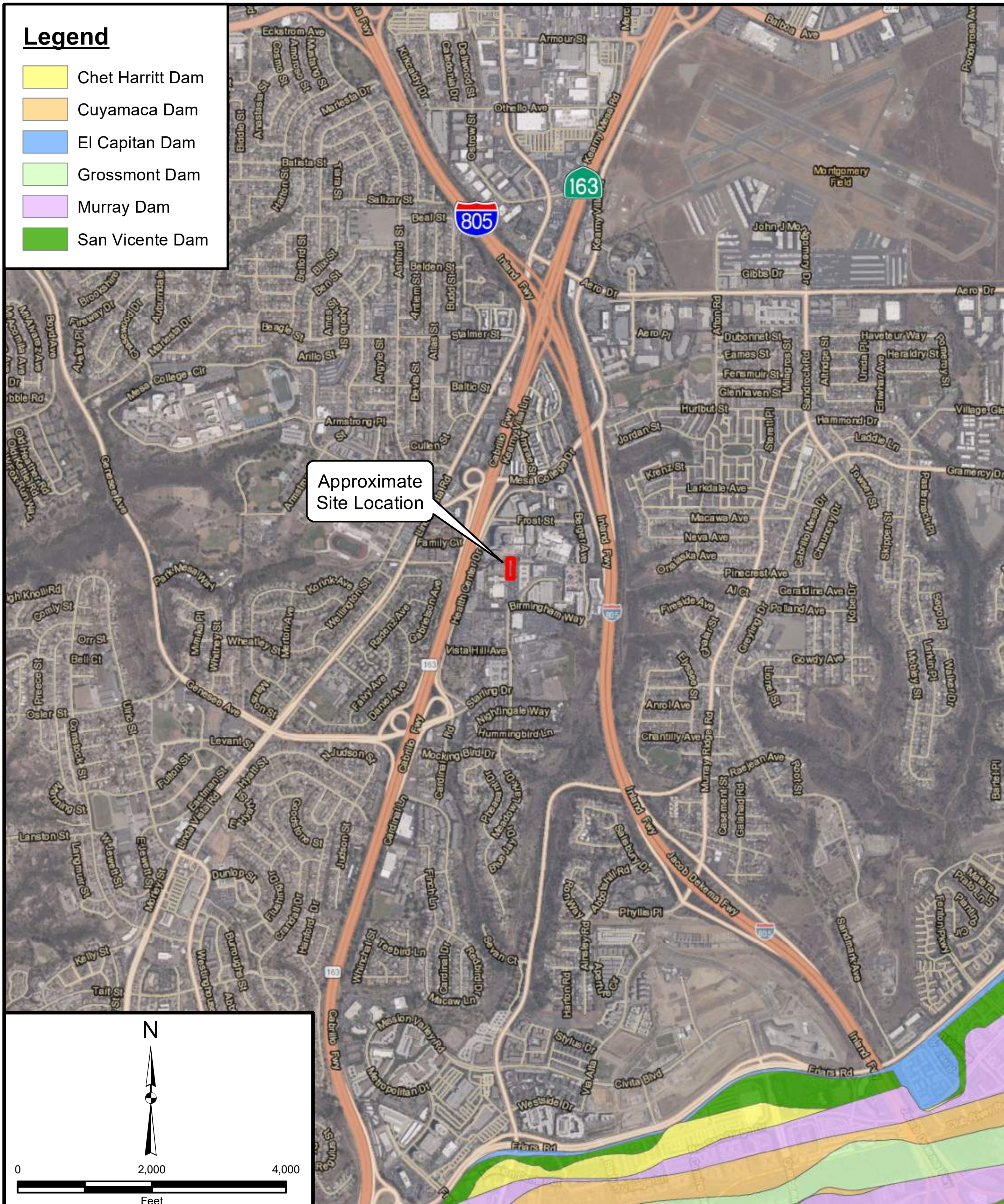
FLOOD HAZARD MAP

Mary Birch Hospital Expansion
Sharp Metropolitan Medical Campus
San Diego, California

Figure 8

Leighton

Map Saved as P:\Drafting\12764\Maps\Mary Birch\12764-001_F08_FHM_2020-08-14.mxd on 9/3/2020 9:37:56 AM



Project: 12764.001	Eng/Geol: SAC/RCS
Scale: 1 " = 2,000 '	Date: September 2020

Base Map: Bing Maps 2020
Thematic Information: Leighton, SanGIS, 2020.
Author: Leighton Geomatics (mmurphy)

DAM INUNDATION MAP

Mary Birch Hospital Expansion
Sharp Metropolitan Medical Campus
San Diego, California

Figure 9

Leighton

Map Saved as P:\Drafting\12764\Maps\Mary Birch\12764-001_F09_DIM_2020-08-17.mxd on 9/3/2020 9:39:15 AM

Appendix A
References

APPENDIX A
REFERENCES

American Concrete Institute (ACI), 2014, Building Code Requirements for Structural Concrete (ACI 318-14) and Commentary.

Atlas Technical Consultants, 2020, Geophysical Evaluation, Sharp Healthcare SMH, San Diego, California, Atlas No. 120378SWG, August 28, 2020.

California Geologic Survey (CGS), 2018, Fault Rupture Hazard Zones in California, Special Publication No. 42, Revised 2018.

__________, 2002, Note 49-Guidelines for Evaluating, the Hazard of Surface Fault Rupture, dated May 2002.

California Emergency Management Agency (CalEMA), California Geological Survey, and University of Southern California, 2009, Tsunami Inundation Map for Emergency Planning, La Jolla Quadrangle, Scale 1:52,000, June 1.

California Building Standards Commission (CBSC), 2016, California Building Code, Volumes 1 and 2.

__________, 2016b, California Green Building Code.

Caltrans, 2018, Corrosion Guidelines, Version 3.0, March 2018.

City of San Diego, 2018 – Storm Water Standards, Part 1: BMP Design Manual – Appendix C and Appendix D, Geotechnical and Groundwater Investigation Requirements, dated January 2018.

__________, 2008, Seismic Safety Study, Geologic Hazards and Faults, Grid Tile 26, Grid Scale 800, dated April 3, 2008.

__________, 2018, City of San Diego Guidelines for Geotechnical Reports 2018.

FEMA, 2012, Flood Insurance Map, dated May 16.

Geovision Geophysical Services, 2001, Surface Wave(SASW) Measurements, dated June 29, 2001.

Jennings, C.W., 2010, Fault Activity Map of California and Adjacent Areas: California Division of Mines and Geology, California Geologic Map Series, Map No. 6

APPENDIX A
REFERENCES (Continued)

Kennedy, M.P., and Tan, S.S., 2008, Geologic Map of the San Diego Quadrangle, California, California Geologic Survey, 1:100,000 scale.

Norris, R.M., and Webb, R.W., 1990, Geology of California, Second Edition: John Wiley & Sons, Inc.

San Diego Geotechnical Consultants, Inc., 1988, Geotechnical Investigation, New Central Utility Plant, Medical Office Building and Women's Center, Sharp Hospital, San Diego, California, dated December 21, 1988.

SEAOC, 2019, USGS Seismic Design Data via SEAOC/OSHPD Seismic Design Maps Web Application, accessed November 13, 2019 at https://seismicmaps.org

Shannon and Wilson, Inc., 2011a, Response to Comments by the California Geological Survey, Sharp Memorial Hospital – Central Tower SPC-2 Upgrade, 7901 Frost Street, San Diego, California, OSHPD NO. IL-090824-37, dated March 30, 2011.

———————, Inc., 2011b, Response to Comments by the California Geological Survey, Sharp Memorial Hospital – South Tower SPC-2 Upgrade, 7901 Frost Street, San Diego, California, OSHPD NO. HL-100694-37, dated March 31, 2011.

Taylor Design, 2020, Sharp Metropolitan Medical Campus, Package 1, Campus Connector, Schematic Design – 100 percent SD, dated June 19, 2020.

Treiman, J.A., 1993, The Rose Canyon Fault Zone, Southern California: California Division of Mines and Geology, Open File Report 93-02, 45p.

———————, 2000, Silver Strand Fault, Coronado Fault, Spanish Bight Fault, San Diego Fault and Downtown Graben, Southern Rose Canyon Fault Zone, San Diego, California, California Division of Mines and Geology, Unpublished Fault Evaluation Report FER-245.

United States Geologic Survey (USGS), 2008 National Seismic Hazard Maps-Source Parameters.

APPENDIX A
REFERENCES (Continued)

United States Department of Agriculture, 1953, Aerial Photographs, Flight AXN-3M, Numbers 196 and 197, scale approximately 1:24,000, dated March 31.

Youd, T. L., Hanson C. M., and Bartlett, S. F., 1999, Revised MLR Equations for Predicting Lateral Spread Displacement, Proceedings of the 7th U.S.-Japan Workshop on Earthquake Resistant Design of Lifeline Facilities and Countermeasures Against Soil Liquefaction, November 19, 1999, pp. 99-114.

Appendix B
Boring Logs

GEOTECHNICAL BORING LOG KEY

Date		Sheet 1 of 1	
Project	KEY TO BORING LOG GRAPHICS	Project No.	
Drilling Co.		Type of Rig	
Hole Diameter	Drive Weight		Drop "
Elevation Top of Elevation '	Location		

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION Logged By Sampled By	Type of Tests
	0								Asphaltic concrete.	
									Portland cement concrete.	
								CL	Inorganic clay of low to medium plasticity; gravelly clay; sandy clay; silty clay; lean clay.	
								CH	Inorganic clay; high plasticity, fat clays.	
								OL	Organic clay; medium to plasticity, organic silts.	
	5							ML	Inorganic silt; clayey silt with low plasticity.	
								MH	Inorganic silt; diatomaceous fine sandy or silty soils; elastic silt.	
								ML-CL	Clayey silt to silty clay.	
								GW	Well-graded gravel; gravel-sand mixture, little or no fines.	
								GP	Poorly graded gravel; gravel-sand mixture, little or no fines.	
	10							GM	Silty gravel; gravel-sand-silt mixtures.	
								GC	Clayey gravel; gravel-sand-clay mixtures.	
								SW	Well-graded sand; gravelly sand, little or no fines.	
								SP	Poorly graded sand; gravelly sand, little or no fines.	
								SM	Silty sand; poorly graded sand-silt mixtures.	
	15							SC	Clayey sand; sand-clay mixtures.	
									Bedrock.	
									Ground water encountered at time of drilling.	
				B-1					Bulk Sample 1.	
	20			C-1					Core Sample.	
				G-1					Grab Sample.	
				R-1					Modified California Sampler (3" O.D., 2.5 I.D.).	
				SH-1					Shelby Tube Sampler (3" O.D.).	
				S-1					Standard Penetration Test SPT (Sampler (2" O.D., 1.4" I.D.).	
	25			PUSH					Sampler Penetrates without Hammer Blow.	
	30									

SAMPLE TYPES:

S SPLIT SPOON
R RING SAMPLE
B BULK SAMPLE
T TUBE SAMPLE
G GRAB SAMPLE
SH SHELBY TUBE

TYPE OF TESTS:

DS DIRECT SHEAR
MD MAXIMUM DENSITY
CN CONSOLIDATION
CR CORROSION
SA SIEVE ANALYSIS
AT ATTERBURG LIMITS
EI EXPANSION INDEX
RV R-VALUE

LEIGHTON

GEOTECHNICAL BORING LOG B-1

Project No.	12764.001	**Date Drilled**	7-29-20
Project	Sharp Metro Master Plan (MBH)	**Logged By**	RNB
Drilling Co.	Baja Exploration	**Hole Diameter**	8"
Drilling Method	CME-95 - 140lb - Autohammer - 30" Drop	**Ground Elevation**	389' msl
Location	See Figure 2	**Sampled By**	RNB

SOIL DESCRIPTION

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	Soil Description	Type of Tests
	0								5" ASPHALT CONCRETE	
								SM	UNDOCUMENTED ARTIFICIAL FILL (Afu)	
				B-1 1'-5'			3.6	SM	@ 5"-1': Silty SAND, loose to medium dense, dark reddish brown (5 yr 3/4), moist, fine-grained	EI, CR
									VERY OLD PARALIC DEPOSITS (Qvop8) @ 1': Silty SANDSTONE, medium dense to dense, yellowish red (5 yr 5/6), moist, fine-grained, trace oxidiation	
385										
	5			R-1	50/4"				@ 5': Becomes very dense	DS
380										
	10			R-2	50/5"		5			-200
375										
	15			R-3	33 50/5"	111	8		@ 15': Becomes reddish brown (5 yr 4/4)	
370										
	20			R-4	43 50/4"	108	8			
								GM	@ 23': Cobble CONGLOMERATE, very dense, light reddish brown (5 yr 6/4), moist, cobble/gravel is well-rounded, fine-grained sand matrix	
365										
	25			S-1	50/1"					
				S-2	50/1"					
									Auger Refusal on Cobble at 28 Feet (bgs) **No Groundwater or Seepage Encountered** **Backfilled with Bentonite Grout on 7/29/2020**	
360										
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

GEOTECHNICAL BORING LOG B-2

Project No.	12764.001	**Date Drilled**	7-29-20
Project	Sharp Metro Master Plan (MBH)	**Logged By**	RNB
Drilling Co.	Baja Exploration	**Hole Diameter**	8"
Drilling Method	CME-95 - 140lb - Autohammer - 30" Drop	**Ground Elevation**	390' msl
Location	See Figure 2	**Sampled By**	RNB

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
390	0								4" ASPHALT CONCRETE	
				B-1 1'-5'				SM	UNDOCUMENTED ARTIFICIAL FILL (Afu)) @ 4"-1.5': Silty SAND, loose to medium dense, dark reddish brown (2.5 yr 3/4), moist, fine-grained	
								SM	VERY OLD PARALIC DEPOSITS (Qvop8) @ 1.5': Silty SANDSTONE, medium dense to dense, red (2.5 yr 4/8), moist, fine-grained, trace oxidiation	MD
385	5			R-1	50/4"				@ 5': Becomes very dense	DS
380	10			R-2	50/3"	112	6		@ 10': Becomes red (2.5 yr 4/8) and mottled with light yellowish brown (10 yr 6/4)	
375	15			S-1	21 28 32					-200
				S-2	50/1"			GM	@ 19': Cobble CONGLOMERATE, very dense, light reddish brown (5 yr 6/4), moist, cobble/gravel is well-rounded, fine-grained sand matrix	
370	20								**Auger Refusal on Cobble at 20 Feet (bgs)** **No Groundwater or Seepage Encountered** **Backfilled with Soil Cuttings on 7/29/2020**	
365	25									
360	30									

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GEOTECHNICAL BORING LOG B-3

Project No.	12764.001	**Date Drilled**	7-29-20
Project	Sharp Metro Master Plan (MBH)	**Logged By**	RNB
Drilling Co.	Baja Exploration	**Hole Diameter**	8"
Drilling Method	CME-95 - 140lb - Autohammer - 30" Drop	**Ground Elevation**	389' msl
Location	See Figure 2	**Sampled By**	RNB

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0								4-1/2" ASPHALT CONCRETE	
								SC	UNDOCUMENTED ARTIFICIAL FILL (Afu)) @ 4-1/2": Clayey SAND, loose to medium dense, dark reddish brown (7.5 yr 3/4), moist, fine-grained	
								SC	VERY OLD PARALIC DEPOSITS (Qvop8) @ 1.5': Clayey SANDSTONE, medium dense to dense, red (2.5 yr 4/8), moist, fine-grained, trace oxidation	
385										
	5			R-1 B-1 5'-10'	50/6"	122	7	SM	@ 5': Silty SANDSTONE, very dense, red (2.5 yr 4/8), moist, fine-grained, trace oxidation	
380										
	10			R-2	50/6"	113	10		@ 10': Becomes light yellowish brown (10 yr 6/4)	
375										
	15			R-3	37 50/3"	116	8			
				S-1	19 26 32				@ 18': Becomes light yellowish brown (10 yr 6/4) mottled with reddish brown (2.5 yr 4/4)	
370										
	20								**Bottom of Boring at 19.5 Feet (bgs)** **No Groundwater or Seepage Encountered** **Backfilled with Soil Cuttings on 7/29/2020**	
365										
	25									
360										
	30									

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

GEOTECHNICAL BORING LOG B-4

Project No.	12764.001	**Date Drilled**	7-29-20
Project	Sharp Metro Master Plan (MBH)	**Logged By**	RNB
Drilling Co.	Baja Exploration	**Hole Diameter**	8"
Drilling Method	CME-95 - 140lb - Autohammer - 30" Drop	**Ground Elevation**	390' msl
Location	See Figure 2	**Sampled By**	RNB

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
390	0								5" ASPHALT CONCRETE	
				B-1 1'-5'				SC	UNDOCUMENTED ARTIFICIAL FILL (Afu) @ .5": Clayey SAND, loose, dark reddish brown (5 yr 3/4), moist, fine-grained	RV
								SC	VERY OLD PARALIC DEPOSITS (Qvop8) @ 2.5': Clayey SANDSTONE, medium dense to dense, yellowish red (5 yr 5/6), moist, fine-grained, trace oxidation	
385	5			R-1	50/4"	101	6	SM	@ 5': Silty SANDSTONE, very dense, yellowish red (5 yr 5/6), moist, fine-grained, trace oxidation	
380	10			R-2	50/5"	110	6		@ 10': Becomes reddish brown (5 yr 4/4)	
375	15			R-3	27 50/5"	119	11		@ 15': Becomes reddish brown (5 yr 4/4) mottled with light yellowish brown (10 yr 6/4)	
370	20			S-1	27 34 50/4"			SM	MISSION VALLEY FORMATION (Tmv) @ 20': Silty SANDSTONE, very dense, light yellowish brown (10 yr 6/4), moist, fine-grained	
				S-2	50/1"				@ 24': Gravel/Cobble layer encountered	
365	25								**Auger Refusal on Cobble at 24 Feet (bgs)** **No Groundwater or Seepage Encountered** **Backfilled with Bentonite Grout on 7/29/2020**	
360	30									

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

*** * * This log is a part of a report by Leighton and should not be used as a stand-alone document. * * ***

GEOTECHNICAL BORING LOG B-5

Project No.	12764.001	**Date Drilled**	7-30-20
Project	Sharp Metro Master Plan (MBH)	**Logged By**	RNB
Drilling Co.	Baja Exploration	**Hole Diameter**	8"
Drilling Method	CME-95 - 140lb - Autohammer - 30" Drop	**Ground Elevation**	390' msl
Location	See Figure 2	**Sampled By**	RNB

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
390	0								5" ASPHALT CONCRETE over 4" AGGREGATE BASE	
				B-1 1'-5'				SC	UNDOCUMENTED ARTIFICIAL FILL (Afu) @ 9"-4': Clayey SAND, loose to medium dense, dark reddish brown (5 yr 3/4), moist, fine-grained, trace gravel	-200, EI, CR
								SC	VERY OLD PARALIC DEPOSITS (Qvop8) @ 4': Clayey SANDSTONE, medium dense to dense, red (2.5 yr 4/6), moist, fine-grained, trace oxidation	
385	5			R-1	50/4"			SM	@ 5': Silty SANDSTONE, very dense, red (2.5 yr 4/6), moist, fine-grained, trace oxidation	DS
380	10			R-2	39 50/5"	111	14		@ 10': Becomes dark reddish brown (2.5 yr 2.5/4)	
375	15			R-3	33 50/5"	120	10			
370	20			R-4	37 50/5"	117	7	SC	@ 20': Clayey SANDSTONE, very dense, red (2.5 yr 4/6), moist, fine- to medium-grained, trace gravel, trace oxidation	-200
				S-1	50/2"			GM GM	@ 23': Cobble CONGLOMERATE, very dense, light reddish brown (5 yr 6/4), to reddish brown (2.5 yr 4/4), moist, cobble/gravel is well-rounded, fine-grained sand matrix	
365	25								**Auger Refusal on Cobble at 24 Feet (bgs)** **No Groundwater or Seepage Encountered** **Backfilled with Bentonite Grout on 7/30/2020**	
360	30									

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

*** * * This log is a part of a report by Leighton and should not be used as a stand-alone document. * * ***

GEOTECHNICAL BORING LOG B-6

Project No.	12764.001	**Date Drilled**	7-30-20
Project	Sharp Metro Master Plan (MBH)	**Logged By**	RNB
Drilling Co.	Baja Exploration	**Hole Diameter**	8"
Drilling Method	CME-95 - 140lb - Autohammer - 30" Drop	**Ground Elevation**	386' msl
Location	See Figure 2	**Sampled By**	RNB

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0								5" ASPHALT CONCRETE over 6" AGGREGATE BASE	
385				B-1 1'-5'				SC	UNDOCUMENTED ARTIFICIAL FILL (Afu) @ 11": Clayey SAND, loose, dark reddish brown (5 yr 3/4), moist, fine-grained, trace gravel	MD, CR
380	5			R-1	7 15 16	115	9		@ 5': Becomes medium dense	
375	10			R-2	4 5 6	115	9		@ 10': Becomes loose	
370	15			S-1	50/1"			GM	VERY OLD PARALIC DEPOSITS (Qvop) @ 14': Cobble CONGLOMERATE, very dense, light reddish brown (5 yr 6/4) to reddish brown (2.5 yr 4/4), moist, cobble/gravel is well-rounded, fine-grained sand matrix, trace oxidation staining	
				S-2	50/3"					
365	20								**Auger Refusal on Cobble at 18 Feet (bgs)** **No Groundwater or Seepage Encountered** **Backfilled with Soil Cuttings on 7/30/2020**	
360	25									
	30									

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

GEOTECHNICAL BORING LOG B-7

Project No.	12764.001	**Date Drilled**	7-30-20
Project	Sharp Metro Master Plan (MBH)	**Logged By**	RNB
Drilling Co.	Baja Exploration	**Hole Diameter**	8"
Drilling Method	CME-95 - 140lb - Autohammer - 30" Drop	**Ground Elevation**	384' msl
Location	See Figure 2	**Sampled By**	RNB

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
									This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
	0								8" Reinforced CONCRETE over 9" AGGREGATE BASE	
				B-1 1.5'-5'				SC	UNDOCUMENTED ARTIFICIAL FILL (Afu) @ 17": Clayey SAND, loose to medium dense, dark reddish brown (5 yr 3/4), moist to very moist, fine-grained, trace gravel	EI
								SM	VERY OLD PARALIC DEPOSITS (Qvop8) @ 3': Silty SANDSTONE, medium dense to dense, red (2.5 yr 4/6), moist, fine-grained, trace oxidation	
380	5			R-1	33 50/4"				@ 5': Becomes very dense	DS
375	10			R-2	25 36 50/6"	106	8			
370				S-1	50/1"			GM	@ 14': Cobble CONGLOMERATE, very dense, reddish brown (2.5 yr 4/4), moist, gravel/cobble is well-rounded, fine- to medium-grained sand matrix, trace oxidation staining	
	15								**Auger Refusal on Cobble at 15 Feet (bgs)** **No Groundwater or Seepage Encountered** **Backfilled with Soil Cuttings on 7/30/2020**	
365	20									
360	25									
355	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

*** * * This log is a part of a report by Leighton and should not be used as a stand-alone document. * * ***

GEOTECHNICAL BORING LOG B-18

Project No.	12764.001	**Date Drilled**	8-6-20
Project	Sharp Metro Master Plan (MBH)	**Logged By**	RNB
Drilling Co.	Baja Exploration	**Hole Diameter**	8"
Drilling Method	LAR - 140lb - Autohammer - 30" Drop	**Ground Elevation**	387' msl
Location	See Figure 2	**Sampled By**	RCS

SOIL DESCRIPTION

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	Soil Description	Type of Tests
	0							SM	UNDOCUMENTED FILL	
				B-1 0.5'-2'				SM	@ 0-0.5': Silty SAND, dark reddish brown, damp to moist, very dense, moderate cementation	-200
385				R-1	50/6"	106	8		VERY OLD PARALIC DEPOSITS (Qvop8) @ 0.5': Silty SANDSTONE, dark reddish brown, damp to moist, very dense, moderate cementation	
				B-2 3'-6'						EI, CR
	5			R-2	50/4"		8			
380										
									@ 8': Becomes more clayey, brown to reddish brown	
	10			R-3	21					
				B-3 10'-13'	47 50/2			SC	@ 11': Clayey SANDSTONE, reddish brown, moist, very dense, weak to moderately cemented	DS
375										
	15			R-4	25 50/3"		13		Disturbed	
370										
	20			R-5	36 50/3"	120	9			
365									@ 22': Refusal on GRAVEL-COBBLE layer	
									Bottom of Boring at 22 Feet **No Groundwater or Seepage Encountered** **Backfilled with Soil Cuttings 8/6/2020**	
	25									
360										
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

Logs from San Diego Geotechnical Consultants, 1988

DEFINITION OF TERMS

PRIMARY DIVISIONS				SYMBOLS	SECONDARY DIVISIONS
COARSE GRAINED SOILS MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 5% FINES)		GW	Well graded gravels, gravel-sand mixtures, little or no fines.
				GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
		GRAVEL WITH FINES		GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
				GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.
	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS (LESS THAN 5% FINES)		SW	Well graded sands, gravelly sands, little or no fines.
				SP	Poorly graded sands or gravelly sands, little or no fines.
		SANDS WITH FINES		SM	Silty sands, sand-silt mixtures, non-plastic fines.
				SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT IS LESS THAN 50%			ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
				CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, lean clays.
				OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50%			MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
				CH	Inorganic clays of high plasticity, fat clays.
				OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS				Pt	Peat and other highly organic soils.

GRAIN SIZES

SILTS AND CLAYS	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

200	40	10	4	3/4"	3"	12"

U.S. STANDARD SERIES SIEVE — CLEAR SQUARE SIEVE OPENINGS

GROUNDWATER LEVEL AT TIME OF DRILLING.

GROUNDWATER LEVEL MEASURED LATER IN STANDPIPE.

LOCATION OF SAMPLE TAKEN USING A STANDARD SPLIT TUBE SAMPLER, 2-INCH O.D., 1-3/8-INCH I.D. DRIVEN WITH A 140 POUND HAMMER FALLING 30-INCHES.

LOCATION OF SAMPLE TAKEN USING A MODIFIED CALIFORNIA SAMPLER, 3-1/8-INCH O.D., WITH 2-1/2-INCH I.D. LINER RINGS, DRIVEN USING THE WEIGHT OF KELLY BAR (LARGE DIAMETER BORINGS) OR USING A 140 POUND HAMMER FALLING 30-INCHES (SMALL DIAMETER BORING).

LOCATION OF SAMPLE TAKEN USING A 3-INCH O.D. THIN-WALLED TUBE SAMPLER (SHELBY TUBE) HYDRAULICALLY PUSHED.

LOCATION OF BULK SAMPLE TAKEN FROM AUGER CUTTINGS.

KEY TO LOGS - UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D-2487)

JOB NO.:	DATE:	FIGURE:
05-6713-003-00-00	DECEMBER 1988	B-1

DATE OBSERVED: 11-21-88 METHOD OF DRILLING: 8" Hollow Stem Auger

LOGGED BY: MD GROUND ELEVATION: 387.0 LOCATION: See Site Plan

LOG OF BORING NO. 1

Sheet 1 of 1

DEPTH (FEET)	CLASSIF-ICATION	BLOWS/FOOT	UNDISTURBED SAMPLE	BULK SAMPLE	MOISTURE CONTENT (%)	IN PLACE DRY DENSITY (PCF)	DESCRIPTION	SOIL TEST
0							A.C. - 3" with no base	Sieve, Atterberg Limits
		50/ 6"					FILL: Dark red-brown slightly clayey, silty fine to medium SAND, moist, loose to medium dense	
5		50/ 3"					LINDAVISTA FORMATION: Light gray-brown silty fine to medium SANDSTONE, trace cobbles, damp, hard	
10		72/ 6"					Becoming light orange to yellow-gray, mosit	
15							Orange-brown medium to coarse SANDSTONE, moist, hard	
20		50/ 6"			11.2	111.3	Light yellow-gray, silty, fine to medium SANDSTONE, red-orange staining in-part, damp to moist, hard	
							Total Depth: 21' No Groundwater Backfilled 11-21-88	
25								
30								
35								

DATE OBSERVED: 11-21-88 METHOD OF DRILLING: 8" Hollow Stem Auger

LOGGED BY: MD GROUND ELEVATION: 389.0 LOCATION: See Site Plan

LOG OF BORING NO. 5

Sheet 1 of 1

DEPTH (FEET)	CLASSIF-ICATION	BLOWS/FOOT	UNDISTURBED SAMPLE	BULK SAMPLE	MOISTURE CONTENT (%)	IN PLACE DRY DENSITY (PCF)	DESCRIPTION	SOIL TEST
0							AC to 4"	
							FILL: Dark brown silty fine to medium SAND, damp to moist, loose	
5							LINDAVISTA FORMATION: Light orange brown silty fine to medium SANDSTONE, damp, hard @ 5' becoming red-brown, moist	
10		50/ 6"	■		10.5	109.0	@ 10' light gray mottling in-part	
15							Brick red fine to medium SANDSTONE, poorly graded, moist, hard, trace cobbles	
20		50/ 3"	■		10.2	105.2	@ 20' gray mottling, trace cobbles	
							Total Depth: 21' No Groundwater Backfilled 11/21/88	
25								
30								
35								

JOB NO.: 05-6713-003-00-00

San Diego Geotechnical Consultants, Inc.

FIGURE: B-6

Logs from Shanon & Wilson, Inc., 2011

BORING 2

Date Drilled: March 5, 2011
Equipment Used: Hollow Stem Auger (7-inch diameter)
Depth to Water: Not Encountered
Driving Weight & Drop: 140 lbs/30 inches
Location : South East of loading dock

SURFACE ELEVATION: 385 (ft. MSL)

ELEVATION (feet)	DEPTH (feet)	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	N VALUE (SPT)	BLOW COUNT (blows / 12-inches)	SAMPLE LOCATION	Description
							4" Asphalt Paving; 2" Base Course
							FILL SM - SILTY SAND - fine, some Clay, few Gravel, very moist, reddish brown
							LINDAVISTA FORMATION (Qln) SC - CLAYEY SAND - fine, moist, reddish brown
	5						SM - SILTY SAND - fine, trace Clay, moist, red brown
				57			
		12.8	109		45		no Clay
	10						
				34			
	15	15.6	112		69/9"		[Hammer bouncing 3" into sample zone / no additional penetration] [Rock at sampler tip]
				20/0"			[Hard drilling] [Rock at sampler tip]
	20						
	25						
	30						
	35						
	40						

END OF BORING AT 18.5 FEET

Notes:

1. Hand auger used to depth of 2.5 feet.
2. Fill encountered to a depth of 2.5 feet.
3. Groundwater not encountered.
4. Boring backfilled with soil cuttings and pavement patched with asphalt.

The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

Job No: 51-1-09001-003 By: SCG Date: 3-7-2011 Checked: Printed: 3-29-11 [LOG FOR FIELD; 51-1-09001-003.GPJ]

LOG OF BORING

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIGURE A-1.2

Geophysical Evaluation, Atlas Technical Consultants, 2020

6280 Riverdale Street
San Diego, CA 92120
(877) 215-4321 | oneatlas.com

August 28, 2020

Atlas No. 120378SWG
Report No. 1

MR. BOB STROH, P.G., CEG
LEIGHTON
3934 MURPHY CANYON ROAD
SAN DIEGO, CALIFORNIA 92123

Subject: Geophysical Evaluation
Sharp Healthcare SMH
San Diego, California

Dear Mr. Stroh:

In accordance with your authorization, Atlas Technical Consultants has performed a geophysical evaluation pertaining to the Sharp Healthcare SMH project located at 7901 Frost Street in San Diego, California (Figure 1). The purpose of our study was to develop a Shear-wave velocity profile to be used for design and construction at the study site. This letter report presents our methodology, equipment used, analysis, and findings. Our services were conducted August 26, 2020.

Our scope of services for the project included performance of one refraction microtremor (ReMi) profile (RL-1) at a preselected area of the project site (Figure 2). The ReMi technique uses recorded surface waves (specifically Rayleigh waves) that are contained in background noise to develop a Shear-wave velocity profile of the study area down to a depth, in this case, of approximately 100 feet. The depth of exploration is dependent on the length of the line and the frequency content of the background noise. The results of the ReMi method are displayed as a one-dimensional sounding which represents the average condition across the length of the line. The ReMi method does not require an increase of material velocity with depth; therefore, low velocity zones (velocity inversions) are detectable with ReMi.

Our ReMi evaluation included the use of a 24-channel Geometrics Geode seismograph and 24, 4.5-Hz vertical component geophones. For RL-1, geophones were spaced 9 feet apart for a total line length of 207 feet. Fifteen records, each 32 seconds long, were recorded and then downloaded to a computer. The data was later processed using Surface Plus 9.1 – Advanced Surface Wave Processing Software (Geogiga Technology Corp., 2020), which uses the refraction microtremor method (Louie, 2001) and other surface wave analysis methods. The program generates phase velocity dispersion curves for each record and provides an interactive dispersion modeling tool where the users determine the best fitting model. The result is a one-dimensional shear-wave velocity model of the site with roughly 85 to 95 percent accuracy.

Figure 3 presents the result for RL-1 from our evaluation. Based on our analysis of the collected data for RL-1, the average characteristic site Shear-wave velocity down to a depth of 100 feet is 2,055 feet per second (ft/s) (CBC, 2019). These values correspond to site classifications of **C**. It should be noted the ReMi results represent the average condition across the length of the line.

The field evaluation and geophysical analyses presented in this report have been conducted in general accordance with current practice and the standard of care exercised by consultants performing similar tasks in the project area. No warranty, express or implied, is made regarding the conclusions and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be present. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration Additional subsurface evaluating will be performed upon request.

This document is intended to be used only in its entirety. No portions of the document, by itself, is designed to completely represent any aspect of the project described herein. Atlas should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document. This report is intended exclusively for use by the client. Any use of or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

We appreciate the opportunity to be of service on this project. Should you have questions related to this report, please call us at (858) 527-0849.

Respectfully submitted,

REGISTERED GEOPHYSICIST
PATRICK F. LEHRMANN
No. 1043
Exp. 1/31/22
STATE OF CALIFORNIA

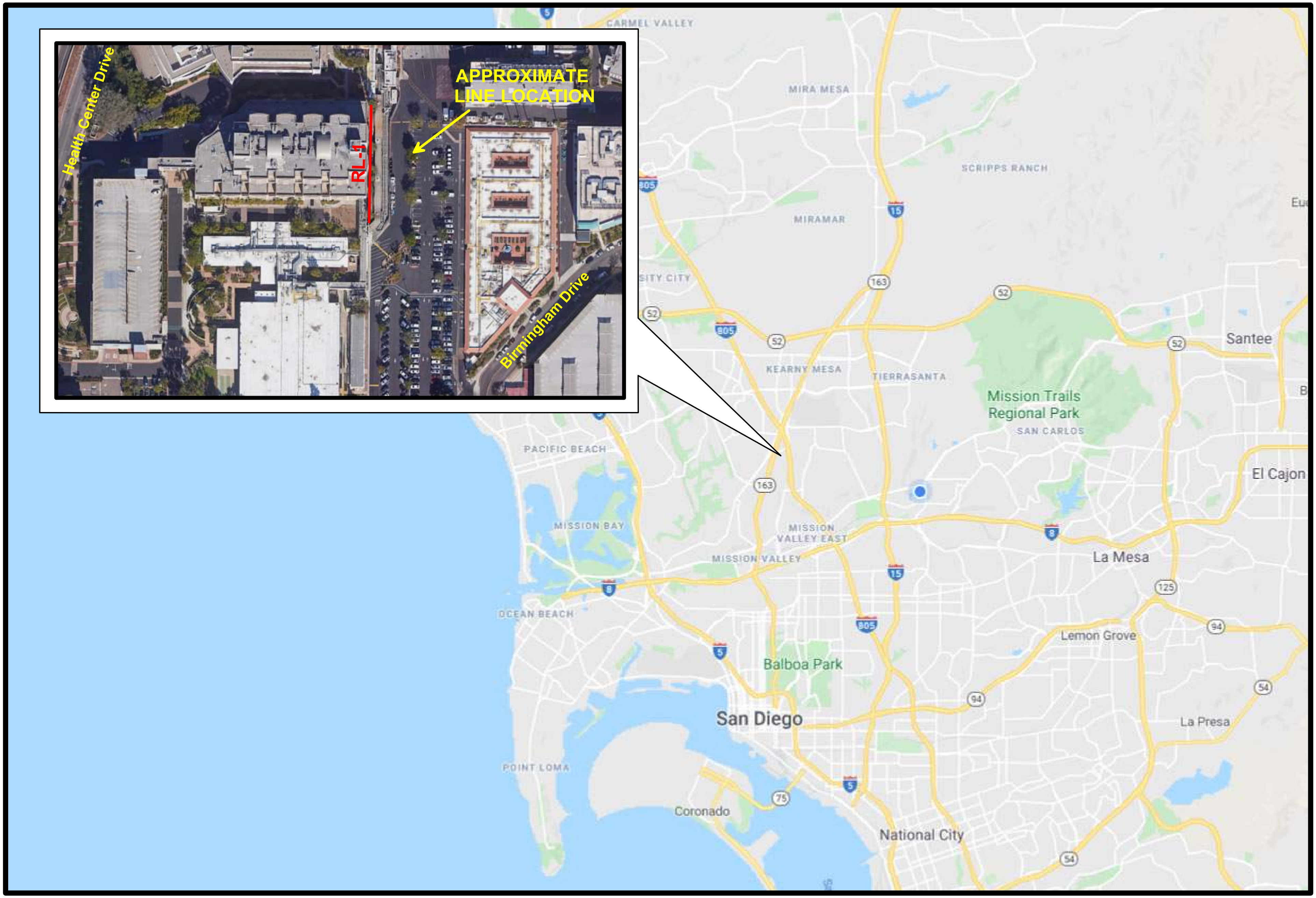
Evan C. Anderson
Senior Staff Geophysicist

Patrick F. Lehrmann, P.G., P.Gp.
Principal Geologist/Geophysicist

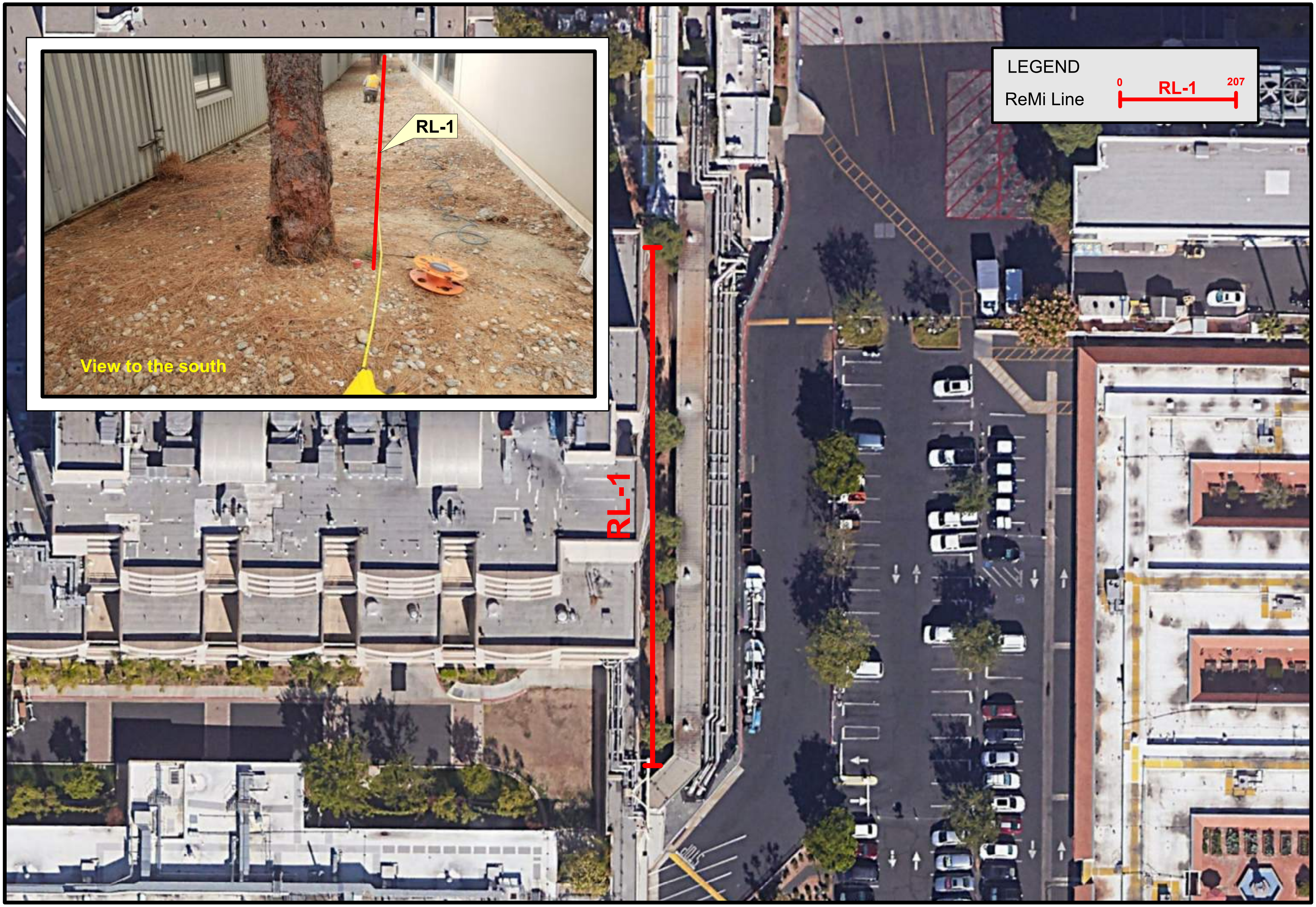
ECA:PFL:pfl:ds

Attachments: Figure 1 – Site Location Map
Figure 2 – Seismic Line Location Map
Figure 3 – ReMi Results (RL-1)

Distribution: Bob Stroh at BStroh@leightongroup.com

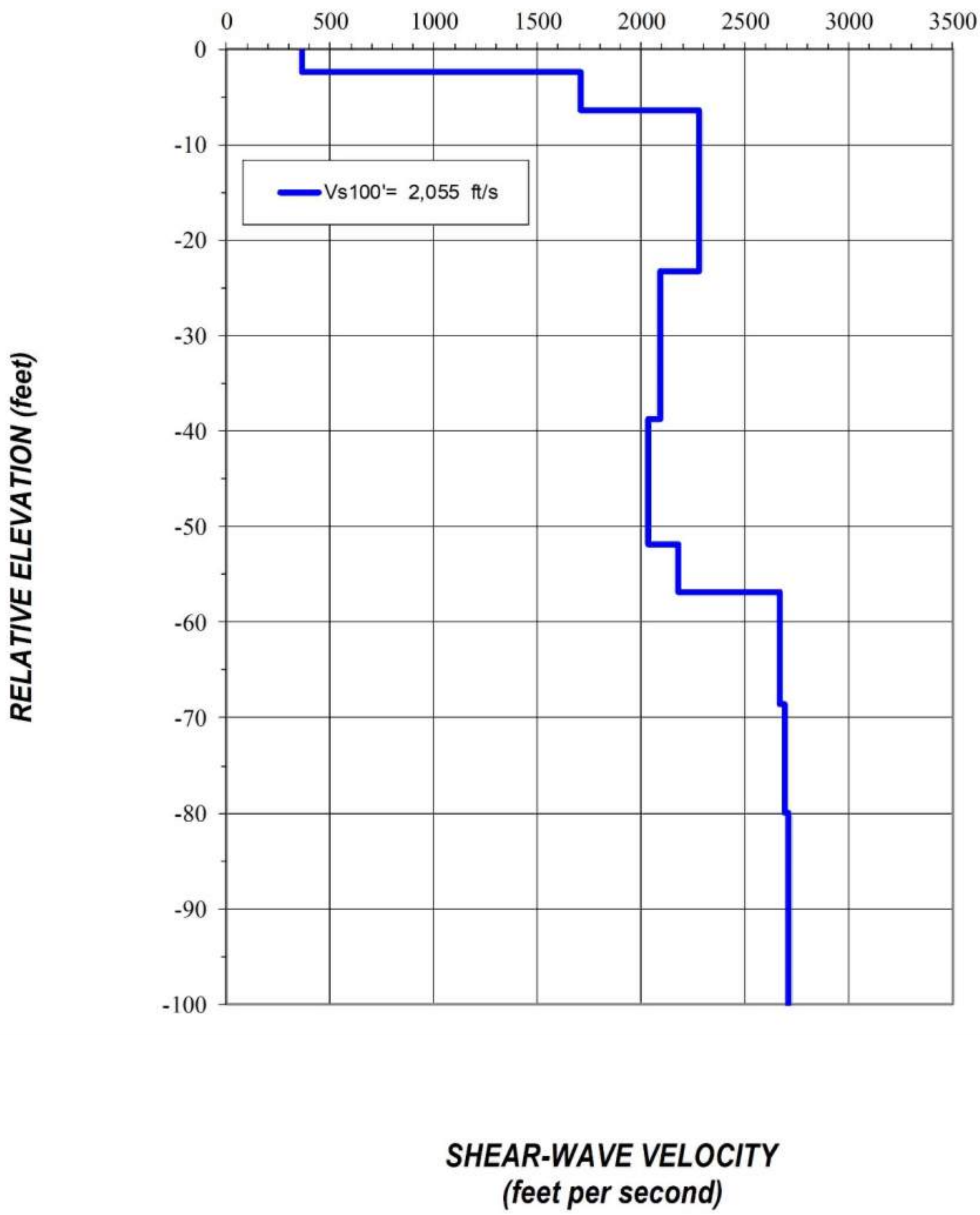


SITE LOCATION MAP	N	Sharp Healthcare SMH San Diego, California	ATLAS Figure 1
		Project No.: 120378SWG / Date: 08/20	



SEISMIC LINE LOCATION MAP	N	Sharp Healthcare SMH San Diego, California Project No.: 120378SWG Date: 08/20	ATLAS Figure 2	0 50 100 **approximate scale in feet**

Vs Model



ReMi RESULTS RL-1	Sharp Healthcare SMH San Diego, California	ATLAS Figure 3
	Project No.: 120378SWG Date: 08/20	

SASW Measurements, Geovision, 2001

SURFACE WAVE (SASW) MEASUREMENTS

Conducted at the

Sharp Memorial Hospital
7901 Frost Street
San Diego, California

Prepared for

Shannon & Wilson, Inc.
400 N. 34th Street, Suite 100
Seattle, Washington 98103

Prepared by

GEOVision Geophysical Services
a Division of Blackhawk GeoServices
1151 Pomona Road, Unit P
Corona, California 92882
(909) 549-1234

Report 1351-01
June 29, 2001

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

INTRODUCTION

In-situ seismic measurements using the Spectral Analysis of Surface Waves (SASW) method were performed in a parking lot immediately north of the Sharp Memorial Hospital, 7901 Frost Street, San Diego, California on June 13, 2001. The purpose of this investigation was to provide a shear wave velocity profile at the site to a depth of 30 meters, to be used for UBC site classification. Subsurface geologic conditions of the site were expected to consist of several feet of fill soils overlying the Lindavista Formation.

This report contains the results of the SASW measurements conducted by Antony Martin and Chuck Carter of **GEO***Vision*. Analysis of the surface wave dispersion data to determine the corresponding shear wave velocity profiles was performed by Antony Martin. An overview of the SASW method is given, followed by the procedures used in this investigation. The shear wave velocity profiles obtained from the SASW data are presented in graphic and tabular form. A brief discussion of the results follows. The SASW method is described in detail in Appendix A.

OVERVIEW OF THE SASW METHOD

Spectral analysis of surface waves (SASW) testing is an in-situ seismic method for determining shear wave velocity (V_S) profiles [Stokoe et al., 1994; Stokoe et al., 1989]. It is non-invasive and non-destructive, with all testing performed on the ground surface at strain levels in the soil in the elastic range (< 0.001%).

The basis of the SASW method is the dispersive characteristic of Rayleigh waves when propagating in a layered medium. The phase velocity, V_R, depends primarily on the material properties (V_S, mass density, and Poisson's ratio or compression wave velocity) over a depth of approximately one wavelength. Waves of different wavelengths, λ, (or frequencies, f) sample different depths. As a result of the variance in the shear stiffness of the layers, waves with different wavelengths travel at different phase velocities; hence, dispersion. A surface wave dispersion curve, or dispersion curve for short, is the variation of V_R with λ or f. SASW testing consists of collecting surface wave phase data in the field, generating the dispersion curve, and then using iterative modeling to back-calculate the shear stiffness profile.

A detailed description of the SASW field procedure is given in Joh [1997]. A vertical dynamic load is used to generate horizontally-propagating Rayleigh waves (Figure 1). The ground motions are monitored by two vertical receivers and recorded by the data acquisition system capable of performing both time and frequency-domain calculations. Theoretical as well as practical considerations, such as attenuation, necessitates the use of several receiver spacings to generate the dispersion curve over the wavelength range required to evaluate the stiffness profile. To minimize phase shifts due to differences in receiver coupling and subsurface variability, the source location is reversed.

After the time-domain motions from the two receivers are converted to frequency-domain records using the Fast Fourier Transform, the cross power spectrum and coherence are calculated. The phase of the cross power spectrum, ϕ_w (f), represents the phase differences between the two receivers as the wavetrain propagates past them. It ranges from $-\pi$ to π in a wrapped form and must be unwrapped through an interactive process called masking. Phase jumps are specified, near-field data (wavelengths longer than three times the distance from the source to first receiver), and low-coherence data are removed. The experimental dispersion curve is calculated from the unwrapped phase angle and the distance between receivers by:

$$V_R = f * d_2/(\Delta\phi/360°),$$

where V_R is Rayleigh wave phase velocity, f is frequency, d_2 is the distance between receivers, and $\Delta\phi$ is the phase difference in degrees.

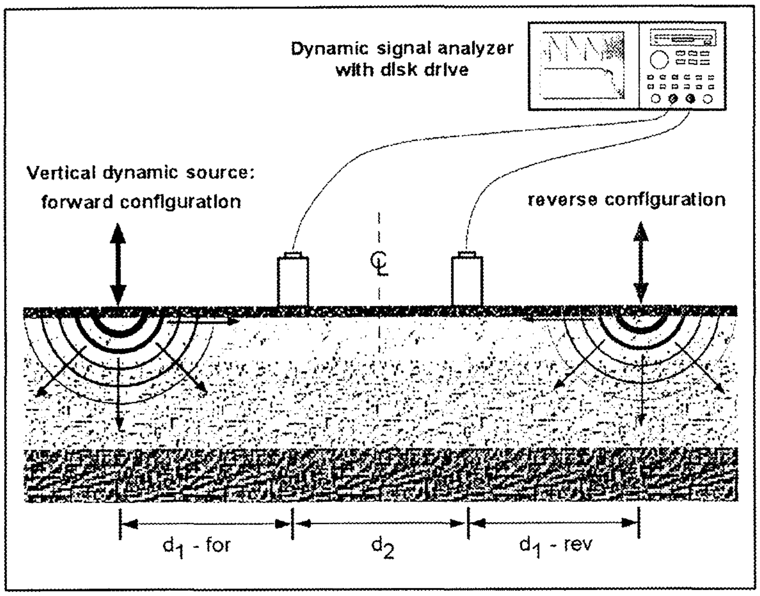


Figure 1 Basic Configuration of SASW Measurements [Modified from Joh, 1997].

WinSASW, a program developed at the University of Texas at Austin, is used to reduce and interpret the dispersion curve. Through iterative forward modeling, a V_S profile is found whose theoretical dispersion curve is a close fit to the field data.

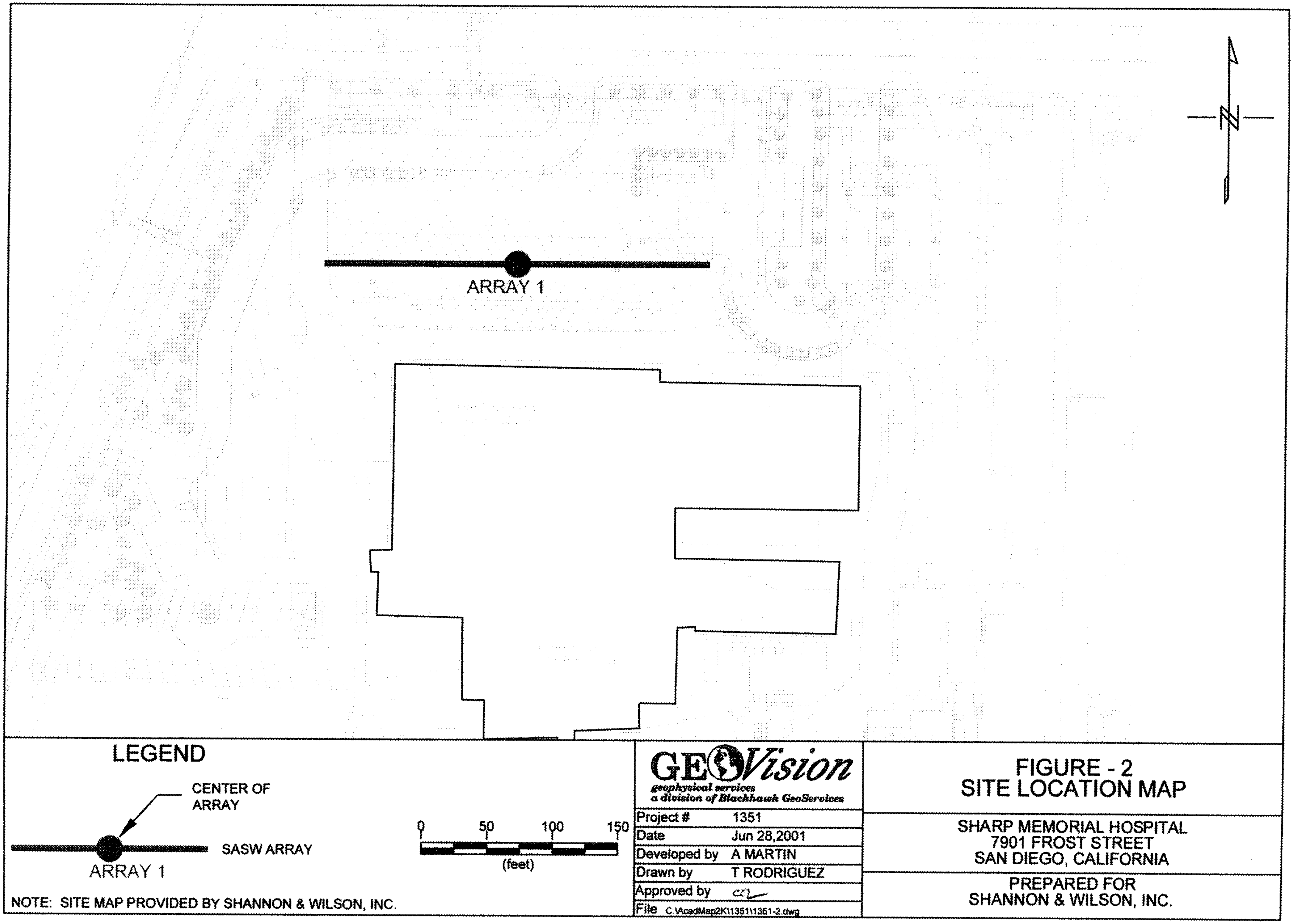
The final model profile is assumed to represent actual site conditions. Several options exist for forward modeling: a formulation that takes into account only fundamental-mode Rayleigh wave motion (called the 2-D solution), and those that include all stress waves and incorporate receiver geometry (3-D solution) [Roesset et al., 1991].

PROCEDURES

SASW data were collected along one array (Array 1) as shown in Figure 2. The general location of the array was selected by Shannon & wilson, Inc. Although SASW data were collected in the evening, the parking lot was in continual use and some noise from vehicular traffic and nearby utility lines was observed.

The data were collected with receiver spacings of 0.2, 0.4, 2, 4, 8, 16, and 30 m, with a common centerline. This provided overlap of data from different receiver spacings. Generally, the high frequency (short wavelength) surface waves were measured across the short spacings and the low frequency (long wavelength) surface waves were measured with the large receiver spacings.

The 0.2 and 0.4 m receiver spacings were used in an attempt to image the thin asphalt layer at the site. For receiver spacings up to 16 m, small hammers, rock hammers, 10-lb, and 20-lb sledgehammers were used as seismic sources (Figure 3). Data from the transient impacts were averaged 10 to 20 times to improve the signal-to-noise ratio. An electromechanical shaker was used for the 16 and 30 m spacing. Surface waves were monitored by two 1-Hz Kinemetrics Ranger Model SS-1 geophones (2 to 30 m receiver spacings) or two Oyo Geospace 100-Hz geophones (0.2 and 0.4 m spacing), and recorded by an HP 35670A dynamic signal analyzer. WinSASW was used to average forward- and reverse-direction data, to mask phase data and to generate the dispersion curve.



NOTE: SITE MAP PROVIDED BY SHANNON & WILSON, INC.

GEOVision
geophysical services
a division of Blackhawk GeoServices

Project #	1351
Date	Jun 28,2001
Developed by	A MARTIN
Drawn by	T RODRIGUEZ
Approved by	
File	C:\AcadMap2K\1351\1351-2.dwg

FIGURE - 2
SITE LOCATION MAP

SHARP MEMORIAL HOSPITAL
7901 FROST STREET
SAN DIEGO, CALIFORNIA

PREPARED FOR
SHANNON & WILSON, INC.

The 2-D model was used for the SASW modeling. This model calculates the fundamental-mode Rayleigh wave dispersion and provides satisfactory results at sites with gradual increases in V_S with depth.

Constant mass density values of 1.9 and 2.1 g/cc were used in the profiles for fill soils and Lindavista Formation, respectively. Within the normal range encountered in geotechnical engineering, variation in mass density has a negligible effect on dispersion. Compression wave velocity, V_P, was calculated from the assumed value of Poisson's ratio, ν, of 0.33, from the relationship:

$$V_P = V_S\,[(2(1-\nu))/(1-2\nu)]^{0.5}$$

Figure 3 SASW Testing with Various Hammers as the Seismic Source.

RESULTS

The fit of the theoretical dispersion curve to the experimental data collected along Array 1 is shown in Figure 4. The V_S profile for Array 1 is shown graphically in Figure 5. The resolution decreases gradually with depth, because of loss of sensitivity of the dispersion curve to changes in V_S at greater depth. The V_S and V_P profile used to match the field data is provided in tabular form as Table 1. The depth to which these profiles are valid is about 30 m. The V_S depth profile shows 1.4 m (4.5 ft) of fill soil with a velocity of 155 to 170 m/s (509 to 558 ft/s) overlying Lindavista Formation with velocity increasing with depth from 425 m/s (1394 ft/s) to 850 m/s (2789 ft/s).

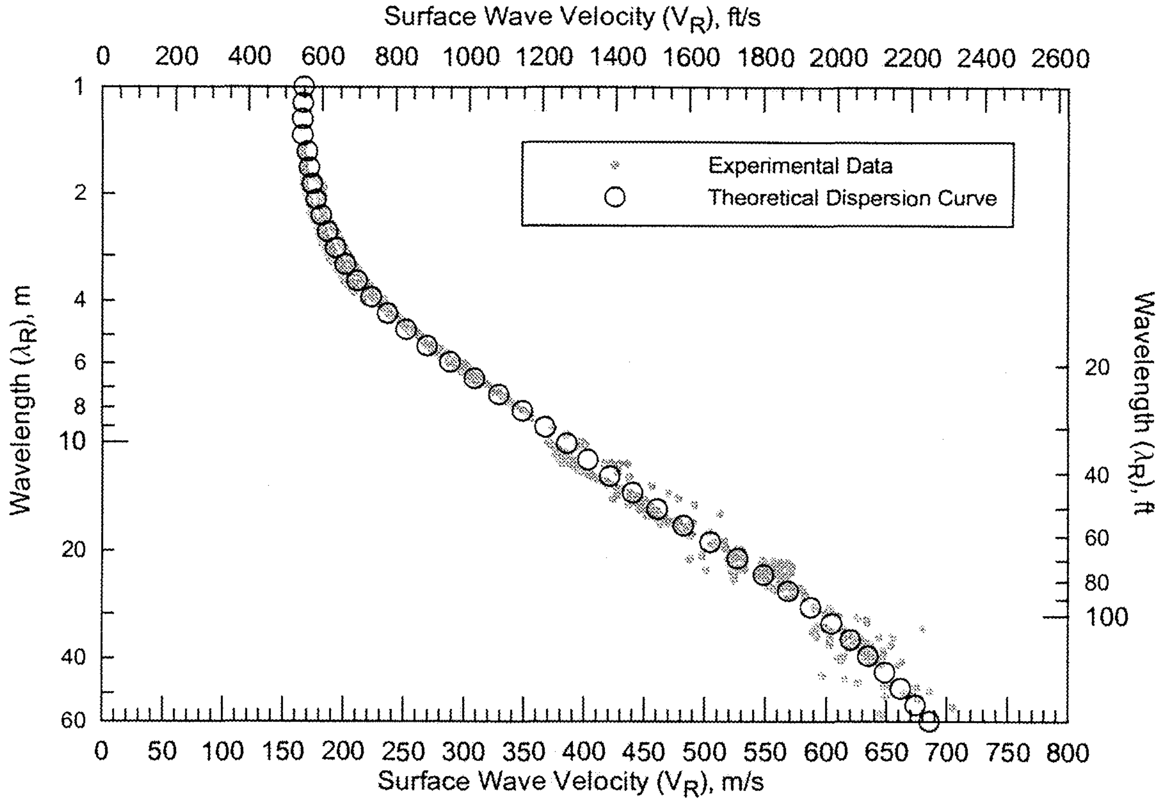


Figure 4 Comparison of Field Experimental Data and Theoretical Dispersion Curve from SASW Testing along Array 1

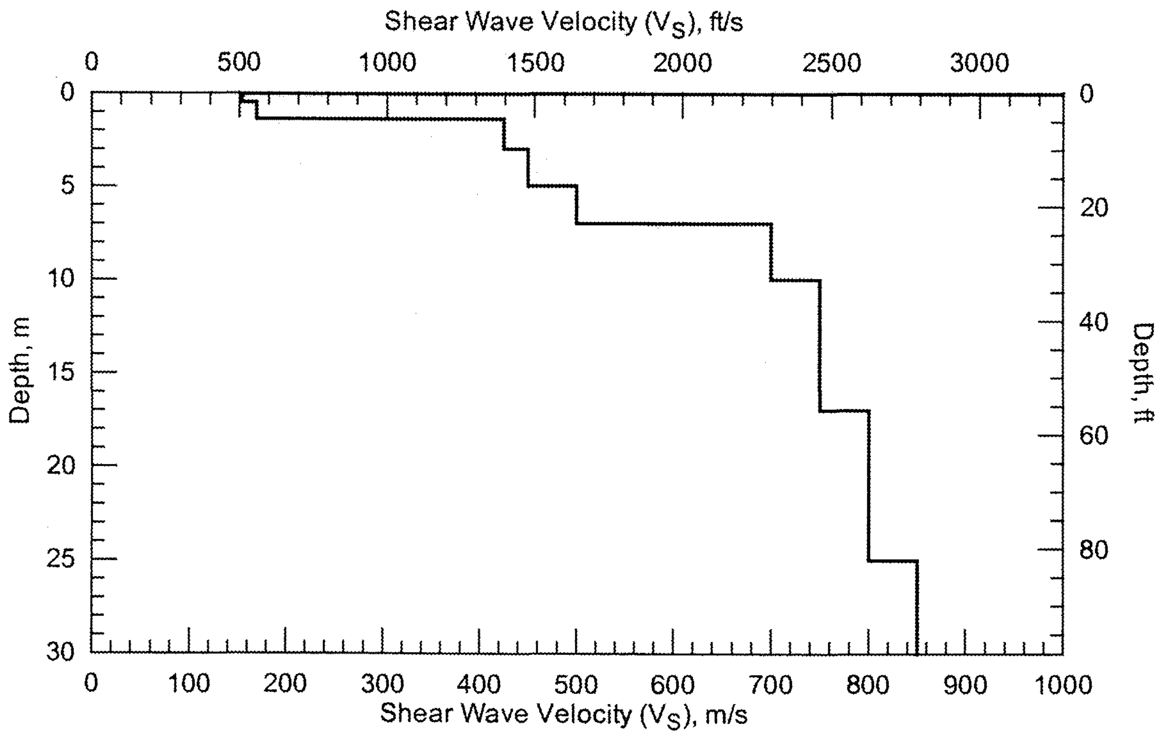


Figure 5 V_S Profile from SASW Testing along Array 1

Table 1 V_S Profile Used in the SASW Model for Array 1

Depth to Top of Layer		Layer Thickness		S-Wave Velocity		P-Wave Velocity	
m	ft	m	ft	m/s	ft/s	m/s	ft/s
0	0.0	0.05	0.2	1000	3281	2000	6561
0.05	0.2	0.45	1.5	155	509	310	1017
0.5	1.6	0.9	3.0	170	558	340	1115
1.4	4.6	1.6	5.2	425	1394	850	2788
3	9.8	2	6.6	450	1476	900	2952
5	16.4	2	6.6	500	1640	1000	3281
7	23.0	3	9.8	700	2297	1400	4593
10	32.8	7	23.0	750	2461	1500	4921
17	55.8	8	26.2	800	2625	1600	5249
25	82.0	10	32.8	850	2789	1700	5577

Note: P-wave velocity calculated assuming Poisson's ratio = 0.33.

DISCUSSION

The surface wave dispersion data from the site have some variability at small wavelengths (Figure 4). This is primarily caused by lateral heterogeneity in shallow soils at the site. The velocities of the small-wavelength surface waves are measured across short distances, whereas the velocities of the longer wavelength surface waves are measured over greater distances. The dispersion data averaged across longer distances are smoother as the affects of localized heterogeneities are averaged. Some of the variability in the surface wave dispersion data may be caused by noise resulting from vehicular traffic, utilities and various other sources.

The theoretical model used to interpret the dispersion assumes horizontally layered, laterally invariant, homogeneous-isotropic material. Although these conditions are seldom strictly met at a site, the results of SASW testing provide a good "global" estimate of the material properties along the array. The results may be more representative of the site than a borehole "point" estimate.

Based on the our experience at other sites, the shear wave velocity models determined by SASW testing are within 20% of the velocities that would be determined by other seismic methods [Brown, 1998]. The average velocities, however, are much more accurate than this, often to better than 10%, because they are much less sensitive to the layering in the model.

Average shear wave velocities to a depth of 30 m, V_s30, is 597 m/s (1959 ft/s) for Array 1. The high velocity asphalt layer was not used in the V_s30 calculation. According to the 1997 Uniform Building Code, the site is classified as C, very dense soil and soft rock (BSSC, 1994).

CONCLUSIONS

Spectral Analysis of Surface Waves (SASW) testing was performed at the Sharp Memorial Hospital, San Diego, California. The shear wave velocity profile for Array 1 a determined by this method is presented in this report as Figure 5 and Table 1. V_s30 is approximately 597 m/s (1959 ft/s) for the array. Therefore, according to the 1997 Uniform Building Code, the site is classified as C, very dense soil and soft rock (BSSC, 1994).

REFERENCES

Brown, L.T., 1998, "Comparison of V_S profiles from SASW and borehole measurements at strong motion sites in Southern California", Master's thesis, University of Texas at Austin.

BSSC, 1994, *NEHRP Recommended provisions for the development of seismic regulations for new buildings, part I: Provisions*, Building Seismic Safety Council, Federal Emergency Management Agency, Washington D.C.

Joh, S.H., 1997, "Advances in interpretation and analysis techniques for spectral-analysis-of-surface-waves (SASW) measurements", Ph.D. Dissertation, University of Texas at Austin.

Roesset, J.M., Chang, D.W. and Stokoe, K.H., II, 1991, "Comparison of 2-D and 3-D Models for Analysis of Surface Wave Tests," *Proceedings, 5th International Conference on Soil Dynamics and Earthquake Engineering*, Karlsruhe, Germany.

Rix, G.J., 1988, "Experimental study of factors affecting the spectral-analysis-of surface-waves method", Ph.D. Dissertation, University of Texas at Austin.

Stokoe, K.H., II, Wright, S.G., Bay, J.A. and Roesset, J.M., 1994, "Characterization of Geotechnical Sites by SASW Method," *ISSMFE Technical Committee 10 for XIII ICSMFE*, Geophysical Characteristics of Sites, A.A. Balkema Publishers/Rotterdam & Brookfield, Netherlands, pp. 146.

Stokoe, K.H.,II, Rix, G.L. and S. Nazarian, 1989, "In situ seismic testing with surface waves" *Proceedings, Twelfth International Conference on Soil Mechanics and Foundation Engineering, Vol. 1*, Rio de Janeiro, Brazil, pp. 330-334.

APPENDIX A

Excerpt from:

Brown, L.T., 1998, "Comparison of V_S profiles from SASW and borehole measurements at strong motion sites in Southern California", Master's thesis, University of Texas at Austin.

Modified from "Brown, L.T., 1998, Comparison of V_S Profiles from SASW and Borehole Measurements at Strong Motion Sites in Southern California, M.S. Thesis, University of Texas at Austin."

OVERVIEW OF SASW METHOD

2.1 INTRODUCTION

Spectral-analysis-of -surface-waves testing, known as SASW testing, is an in-situ seismic method for determining shear wave velocity profiles. It is non-invasive and non-destructive; the test is performed on the ground surface and strain levels in the soil are in the elastic range (< 0.001%). From the modeled shear wave velocity (V_S) profile, a small-strain shear modulus, G_{max}, profile can be determined using an estimated material density, ρ, as:

$$G_{max} = \rho * V_S^2. \qquad (2.1)$$

SASW has been used for a variety of engineering applications requiring shear stiffness data, including earthquake site response, liquefaction susceptibility analysis, soil compaction control, and pavement testing (Brown et al., 1999; Andrus, 1994; Stokoe and Rix, 1987; Rix and Stokoe, 1989).

The basis of the SASW method is the dispersive characteristic of Rayleigh waves when propagating in a layered system. The phase velocity, V_R, depends primarily on the material properties (shear wave velocity, mass density, and Poisson's ratio or compression wave velocity) over a depth of approximately one wavelength. Waves of different wavelengths, λ, (or frequencies, f) sample different depths as illustrated in Fig. 2.1. As a result of the shear stiffnesses of the layers varying, different wavelength waves travel at different phase velocities. A surface wave dispersion curve, or dispersion curve for short, is the variation of V_R with λ or f.

SASW testing consists of collecting surface wave phase data in the field, generating the dispersion curve, and then using iterative modeling to back-calculate the material properties with depth. In this chapter, the development of the SASW method is reviewed. The SASW field procedure is then outlined, including the equipment and experimental setup used in this research. Data reduction and interpretation methods are discussed, with an emphasis on the techniques used to evaluate a shear wave velocity profile from an experimental dispersion curve.

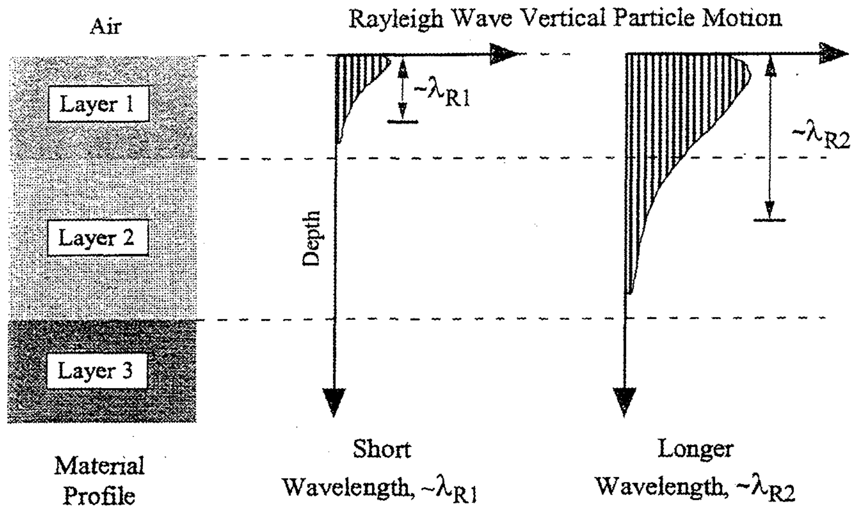


Figure 2.1 The Theoretical Basis of SASW Testing is that Rayleigh Waves of Different Wavelengths Penetrate to Different Depths and Sample Different Material.

2.2.1 RAYLEIGH WAVES

Theoretically, a vertical impact on a half-space generates both body waves and surface waves, with 67% of the impact energy imparted to the Rayleigh waves, 26% to shear waves, and 7% to compression waves (Miller and Pursey, 1955). Rayleigh waves propagate radially outward from the source in a cylindrical wavefront. In contrast, body waves propagate along a hemispherical wavefront (Fig. 2.2). Rayleigh waves produce both vertical and horizontal motion, with the overall motion being a retrograde ellipse at the surface. The variation of particle motion with depth is shown in Fig 2.3.

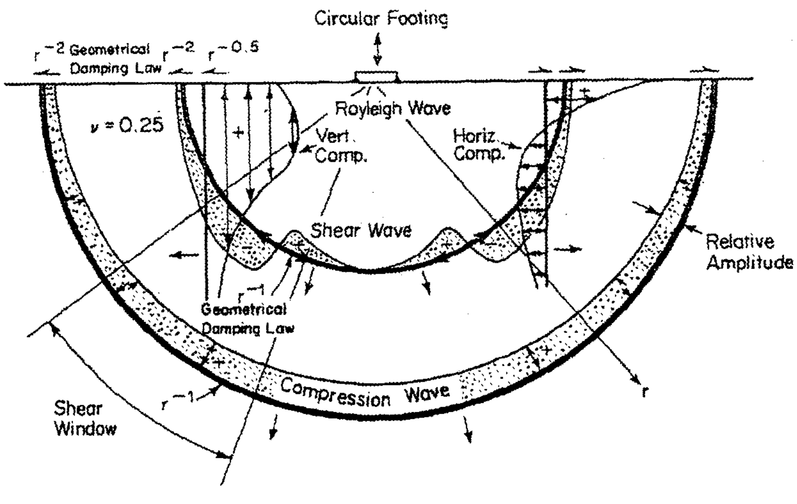


Figure 2.2 Distribution of Displacement Waves from a Circular Footing on a Homogeneous, Isotropic, Elastic Half-space (from Woods, 1968).

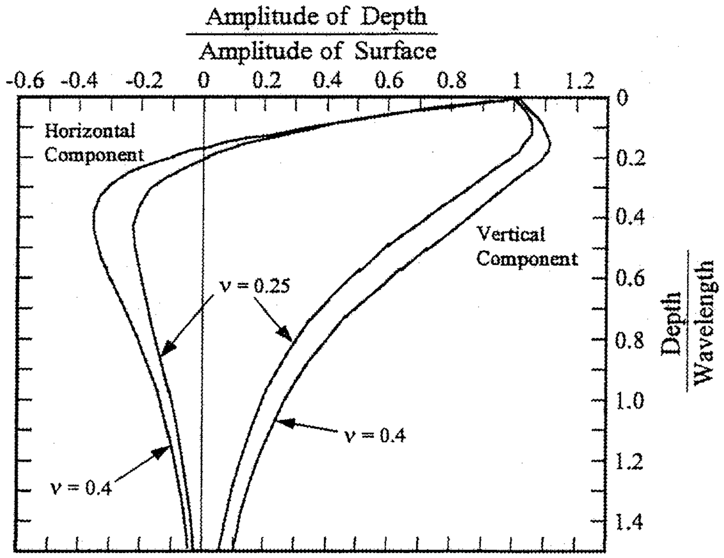


Figure 2.3 Variation of Rayleigh Wave Particle Motion with Depth, for Different Values of Poisson's Ratio, ν (Modified from Woods, 1968).

2.2.2 Development of SASW Method

The SASW method originated from the steady-state Rayleigh wave method of the 1950's - '60's (Richart et al., 1970). In this early method, the Rayleigh-wave phase velocities are measured using receivers pairs at in-phase points of a steady-state wavefield. The receiver pairs must be moved for each wavelength measured. Dispersion data are interpreted by an empirical method.

The introduction of digital signal analyzers, simplified test procedures, more accurate theoretical models, and more efficient computing has led to the development of the modern SASW method.

2.3 SASW Field Measurements

A considerable amount of research has been conducted to develop the theoretical basis and practical applications of the modern SASW method (Nazarian 1984, Sanchez-Salinero 1987, Sheu 1987, Rix 1988, Roesset et al. 1990, and Joh 1997). This work includes the development of a practical and theoretically sound field procedure.

2.3.1 Purpose

The purpose of SASW field work is to measure the data needed to generate the surface wave dispersion curve for the range of wavelengths (or frequencies) needed to back out the material properties to the desired depth. The necessary data consist of surface wave phase differences between pairs of geophones. The general test setup is shown in Figure 2.4.

The source is used to generate surface waves which propagate towards the first and second receiver. The receivers transform the ground motion into electrical signals. As the surface waves pass by the monitoring receivers, the motion between the two receivers will generally be out of phase. The phase difference between the receivers is calculated from the receiver motions recorded by the data acquisition system, as discussed below.

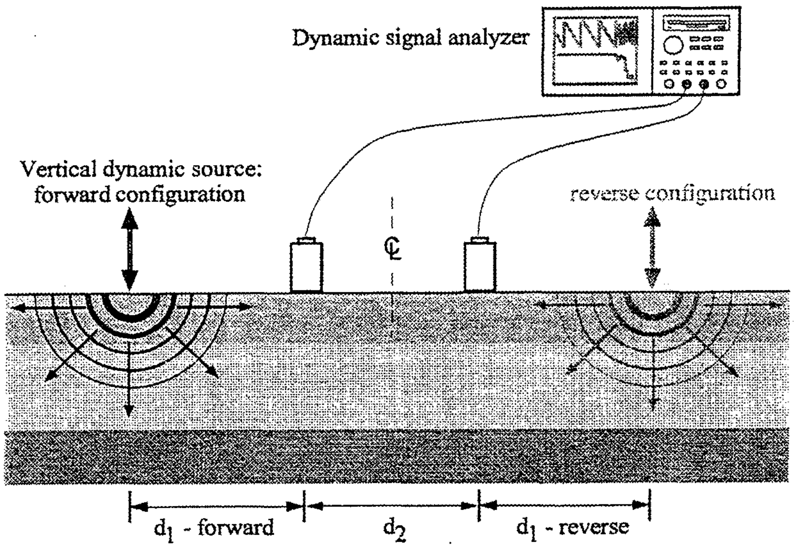


Figure 2.4 Basic configuration of SASW measurements.

2.3.2 Equipment

2.3.2.1 Source

A variety of mechanical systems can be used as surface wave sources. They must be capable of generating vertical dynamic loads on the ground surface. There are two general types of sources: transient impact and continuos sources. The source used depends on the desired profiling depth and site restrictions. Heavier sources are used to generate lower frequency surface waves that penetrate deeper into the ground.

Dropped weights, sledge hammers, and small hand-held hammers are common transient sources. The frequencies generated depend on the material and weight of the source and the stiffness of the site. Hammers are rugged, portable, and have few restrictions in their use on site. Frequencies generated by the 16-lb. (7.3 kg) sledge hammer are approximately 15 to 150 Hz. The geology hammer (pick) generates surface waves in the frequency range of 30 to 300 Hz. Ten to twenty strikes are averaged together in the frequency domain to obtain a higher signal-to-noise ratio.

In the continuous source category, a portable electromagnetic shaker, eccentric mass oscillator, bulldozer, or a vibroseis truck is commonly used. A sweep of frequencies (swept-sine) or random noise may be used as the source function for an electromagnetic shaker or vibroseis truck. The advantage of the swept-sine function is that the energy is concentrated at individual frequencies in succession, resulting in a higher signal-to-noise ratio. Shakers are available with significant output to frequencies as low as 5 Hz. A 50,000-lb vibroseis truck typically generates frequencies down to around 2 to 3 Hz.

Bulldozers or heavy equipment are used to generate continuous random vibrational energy. Because the signal is relatively weak, data must be averaged over a long time (15 to 60 minutes). Depending on the mass, heavy equipment is capable of generating surface waves with frequencies of 1 to 2 Hz.

2.3.2.2 Receivers

Receivers convert particle ground motion into a voltage signal that is recorded by the data acquisition system. Although surface waves produce both vertical and horizontal particle motions, only vertical particle motions are recorded in these SASW measurements. Time-motion records of vertical particle motions are converted to frequency-domain records for later use in calculating the dispersion curve.

The receivers are required to have significant output over the relevant frequency range (1-400 Hz). The receivers are calibrated in the laboratory and are combined in two-receiver sets which possess negligible differences in phase shift between the two receivers. Typically, 70% critically damped 1-Hz and/or 4.5 Hz vertical geophones are used for SASW testing of soils.

2.3.2.3 Data Acquisition System

Several electronic devices can be used to record and process the receiver signals, including dedicated waveform analyzers and microcomputer based systems (Gucunski and Woods, 1991). It is recommended that the recording device have a dynamic range of at least 100 dB with a full-scale sensitivity of 3 mV, have anti-aliasing filters, have two or more recording channels, and be capable of performing spectral calculations in real time in the field (Stokoe et al., 1994).

A dynamic signal analyzer can be used both as a source function generator and a recording device. A dynamic signal analyzer is a digital oscilloscope with a built in microprocessor that allows it to make calculations in both the frequency and time domains. Several sets of spectral calculations are made in the field to monitor the progress of the SASW experiment. The cross power spectrum and coherence are the most important for analyzing the SASW data.

With the dynamic signal analyzer, the time-domain records from the two geophones, x(t) and y(t), are transformed into frequency-domain records, X (f) and Y (f), respectively, using the Fast Fourier Transform algorithm , $\mathcal{F}$:

$$X(f) = \mathcal{F}(x(t)) \tag{2.2}$$

$$Y(f) = \mathcal{F}(y(t)). \tag{2.3}$$

The auto power spectra, $G_{XX}(f)$ and $G_{YY}(f)$, are calculated by:

$$G_{XX}(f) = X^*(f)\,X(f) \tag{2.4}$$

$$G_{YY}(f) = Y^*(f)\,Y(f), \tag{2.5}$$

where * represents the complex conjugate. To reduce the random noise level and incoherent signals, a technique called coherent signal averaging (Model 3562A Operating Manual, 1985) is used in data acquisition. This involves collecting several wavetrains, usually 3 to 5, and averaging the spectra in the frequency domain. The auto power spectra are representative of the source characteristics, site behavior, and receiver response.

The cross power spectrum represents the difference in the wave trains at the two geophones. From the phase of the cross power spectrum, the propagational velocity of different frequency components of the wave train can be calculated. The cross power spectrum, $G_{XY}(f)$, is derived from the averaged frequency-domain records:

$$G_{YX}(f) = Y(f)\,X^*(f). \tag{2.6}$$

The wrapped phase angle, $\phi_w(f)$, ranges from $-\pi$ to π and represents the phase differences at the two receivers as the wavetrain propagates past them. The wrapped phase angle must be unwrapped, as described in Section 2.4.1 on masking, to obtain the true phase angle. The wrapped phase angle at a certain frequency is calculated from that frequency component of the cross power spectrum:

$$\phi_w(f) = \tan^{-1}(\mathrm{im}\,G_{YX}(f) / \mathrm{re}\,G_{YX}(f)), \tag{2.7}$$

Where "im" represents the imaginary part and "re" the real part of a complex number. Coherent signal averaging also allows the calculation of the coherence function, $\gamma^2(f)$, an indicator of signal quality. The coherence function is calculated by:

$$\gamma^2(f) = (\mathrm{abs}(G_{YX}(f))^2 / G_{XX}(f)\,G_{YY}(f), \tag{2.8}$$

where "abs" represents the absolute value of the quantity.

Both time and frequency domain records are calculated in real time in the field so that the experiment can be modified as needed based upon the operator observing the wrapped phase angles and coherence. The data are saved on the attached disk drive. A complete set of frequency domain records is shown in Fig. 2.7.

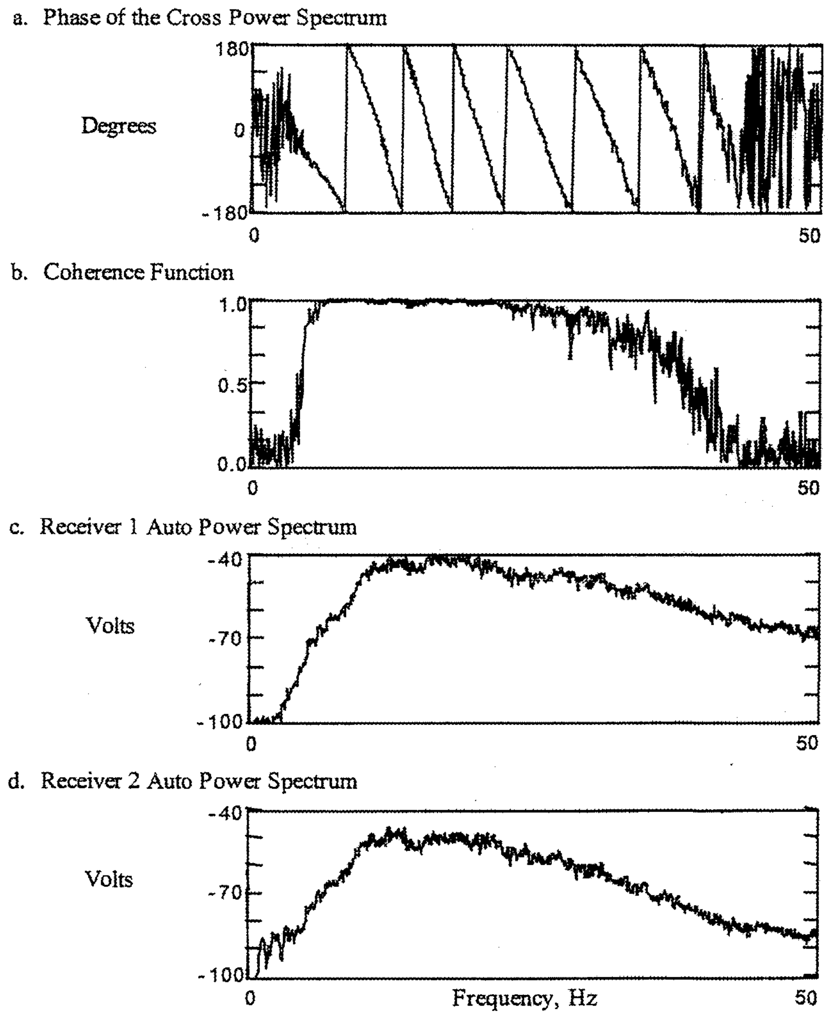


Figure 2.7 Complete Set of Frequency-Domain Records Generated from the SASW Data Acquisition System (from Andrus, 1994).

2.3.3 Experimental Setup

The source-receiver geometry in the SASW testing setup is shown in Figure 2.4. The source and receivers are located along a linear array, with the distance from the source to the first receiver equal to d_1, and the distance between receivers equal to d_2. Theoretical studies (after practical field testing) have shown that the most favorable dispersion curve is generally obtained when the distance to the first receiver is around one to two wavelengths and the distance between receivers is equal to the distance from the source to the first receiver (Sanchez-Salinero 1987, Roesset et al. 1990). To minimize phase shifts due to differences in receiver coupling, the location of the source is reversed. This also helps average out the effects of lateral variability and dipping soil layers.

A wide range of Rayleigh wave wavelengths are needed to evaluate the stiffness profile from SASW testing, typically 1 to 800 ft (0.3 to 250 m) for a shear wave velocity profile depth of 300 ft (90 m). The theoretical considerations previously mentioned as well as attenuation and near-field effects necessitate the use of several receiver spacings to obtain the dispersion curve. By using many receiver spacings, considerable overlap in the frequency range from the individual data sets is produced and a smoother, more representative dispersion curve is obtained. A complete set of receiver spacings is called an array.

Commonly, the source and receiver spacings are increased, keeping a common midpoint. Or, if source mobility is limited by site restrictions or time constraints, the source location may be constant and the receivers moved increasingly further away. The two setups are shown in Fig. 2.8.

The "common receivers midpoint" geometry usually produces the best data, because each receiver spacing setup samples some of the same near-surface material. With a "constant source location" geometry, lateral variability may make the resulting dispersion curve difficult to interpret, but a lot of time is saved by not repositioning the source. The receiver geometry of both setups is such that the measured dispersion curve and resulting stiffness profile is representative of a spatial average of the material properties at the site.

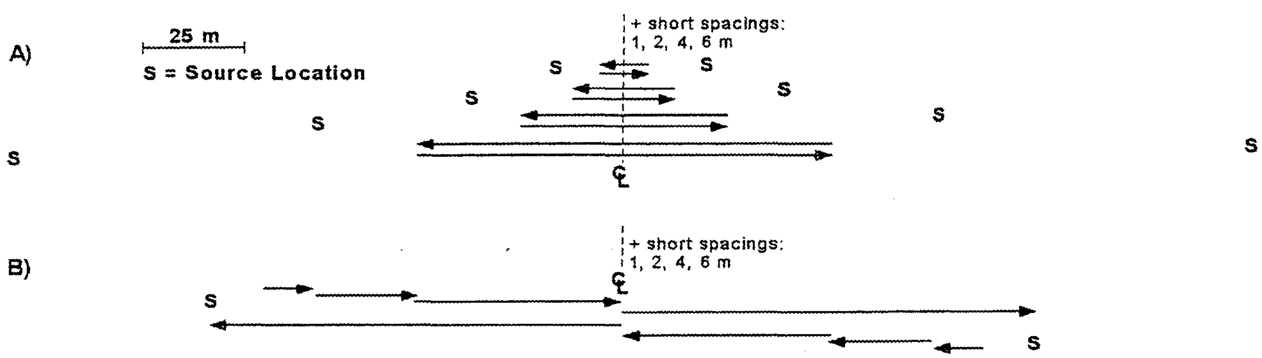


Figure 2.8 Typical Source-Receiver Geometry for 100-m V_S profile. A) Common Receivers Midpoint Array B) Common Source Location Array. Arrow Represents Direction of Surface Wave Propagation as Recorded by Receivers at Both Ends of Arrow, Lines are Offset for Illustrative Purposes Only, Actual Receiver Pairs in Arrays Would Be In-line.

To avoid near-field effects associated with surface waves and body waves, the distance from the source to the first receiver, d_1, is at least half of the maximum desired wavelength (0.5 cycles). The interreceiver distance, d_2, is typically 4-6 times the minimum wavelength. Once the desired wavelength range is determined, the appropriate receiver spacing and source frequency range must be determined, based on initial estimates of the site stiffness. For example, if the Rayleigh wave velocity of a half-space were 500 ft/s (152 m/s), to generate wavelengths between 2 and 20 ft (0.6 to 6.1 m), a frequency range of 25 to 250 Hz would be required. This relationship is calculated by:

$$V_R = f * \lambda. \tag{2.9}$$

An appropriate receiver spacing would be $d_1 = d_2 = 10$ ft. (3.3 m).

2.4 SASW Data Reduction

The raw SASW data collected in the field includes the cross power spectrum, coherence function, and auto spectra for each set of receiver spacings in the experiment. Data reduction and analysis requires a significant amount of computational time and is performed back in the laboratory. The data is first converted to ASCII format and then a windows-based program, WinSASW, developed at the University of Texas (Joh, 1992) is used to reduce and interpret the data. The wrapped phase angle from a cross power spectrum is first unwrapped using an interactive masking process. An individual experimental dispersion curve is calculated for that receiver spacing. The individual dispersion curves from an SASW array make up a composite experimental dispersion curve. To facilitate the interpretation of the dispersion curve, the individual dispersion curves are averaged to form a compact experimental dispersion curve.

2.4.1 Masking

The phase of the cross power spectrum, or phase spectrum, and the coherence function for one receiver spacing at a typical soil site are shown in Fig. 2.9. For a site where shear wave velocity generally increases with depth, the wrapped phase spectrum is a sawtooth pattern with the phase gradually increasing from -180° to 180°, with regular jumps from 180° back to -180°. Poor quality data must be discarded and then the proper number of cycles (jumps) specified to extract the phase spectrum. This process is called masking.

The near-field region is masked out using a filter criteria based on wavelength which is defined by:

$$\lambda \text{ is included if } \lambda \leq k * d_1, \tag{2.10}$$

where k is usually 2, as explained in Section 2.3.3. Frequency ranges with low quality phase data, characterized by significantly undulating phase angles, a backwards sawtooth pattern, or scatter caused by random noise, should also be masked out. The coherence function can be a guide in masking, with low coherence generally indicating high random noise and poor data quality. Wavelengths shorter than four times the diameter of the receiver are also masked out:

$$\lambda \text{ is included if } \lambda \geq 4 * D_R \tag{2.11}$$

where D_R is the diameter of a receiver.

The phase data from the forward and reverse profiles can be averaged together in the frequency domain before masking. An example of the masking process is shown in Fig. 2.9. Once the unwanted data are masked out and the number of cycles specified, the phase spectrum can be unwrapped. The unwrapped phase spectrum is shown in Fig. 2.10.

2.4.2 Experimental Dispersion Curve

The experimental dispersion curve is calculated from the unwrapped phase spectrum and the receiver spacing:

$$V_R = f * \lambda \tag{2.9}$$

$$V_R = f * d_2 / (\Delta\phi/360°), \tag{2.12}$$

where d_2 is the distance between receivers and $\Delta\phi$ is the phase difference in degrees. Experimental dispersion curves are generated for each receiver spacing.

Often the masking process is ambiguous--it may not be clear how many cycles to specify in the unwrapped phase spectrum. Masking is also an iterative process. The unwrapped phase spectrum is modeled as a dispersion curve, checked for consistency, remasked, and modeled again.

All the individual dispersion curves together form the composite experimental dispersion curve. It can be considered the surface wave "signature" of the site.. The composite experimental dispersion curve is sometimes called the field dispersion curve. It may be shown as either phase velocity versus frequency, f, or phase velocity, V_R, versus wavelength, λ. A composite experimental dispersion curve, in terms of log λ - V_R, is shown in Fig. 2.11.

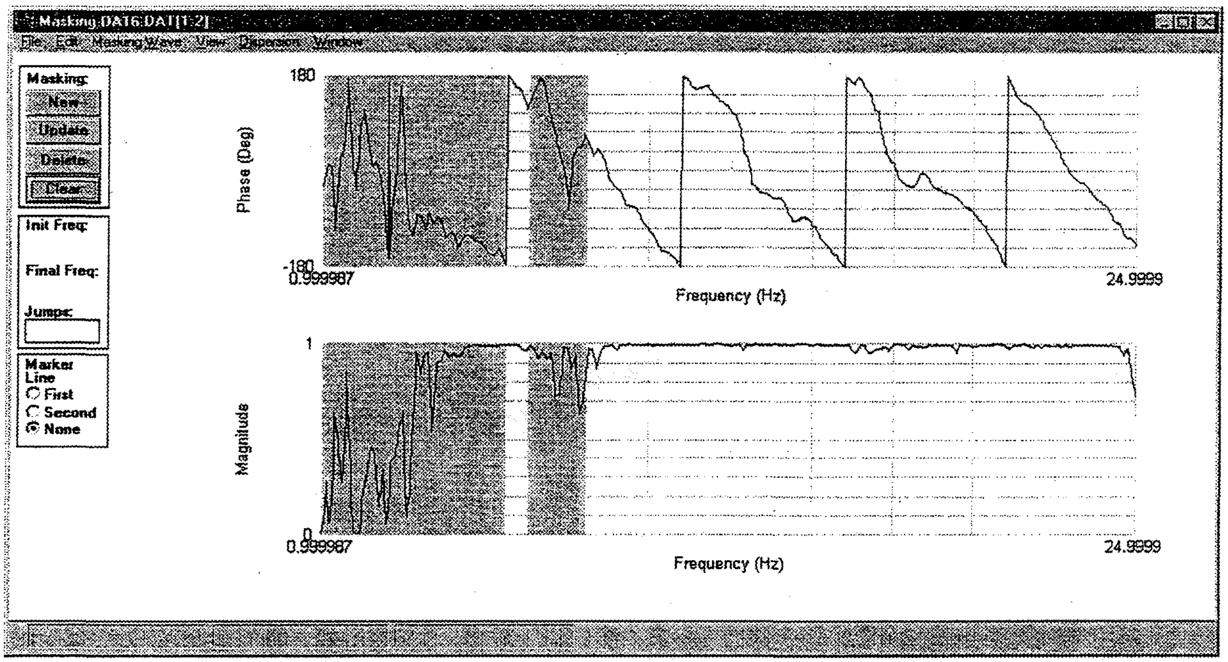


Figure 2.9 Masked Phase of Cross Power Spectrum and Coherence for the 100 ft (30.5 m) Forward Direction Receiver Spacing at Rinaldi Receiving Station.

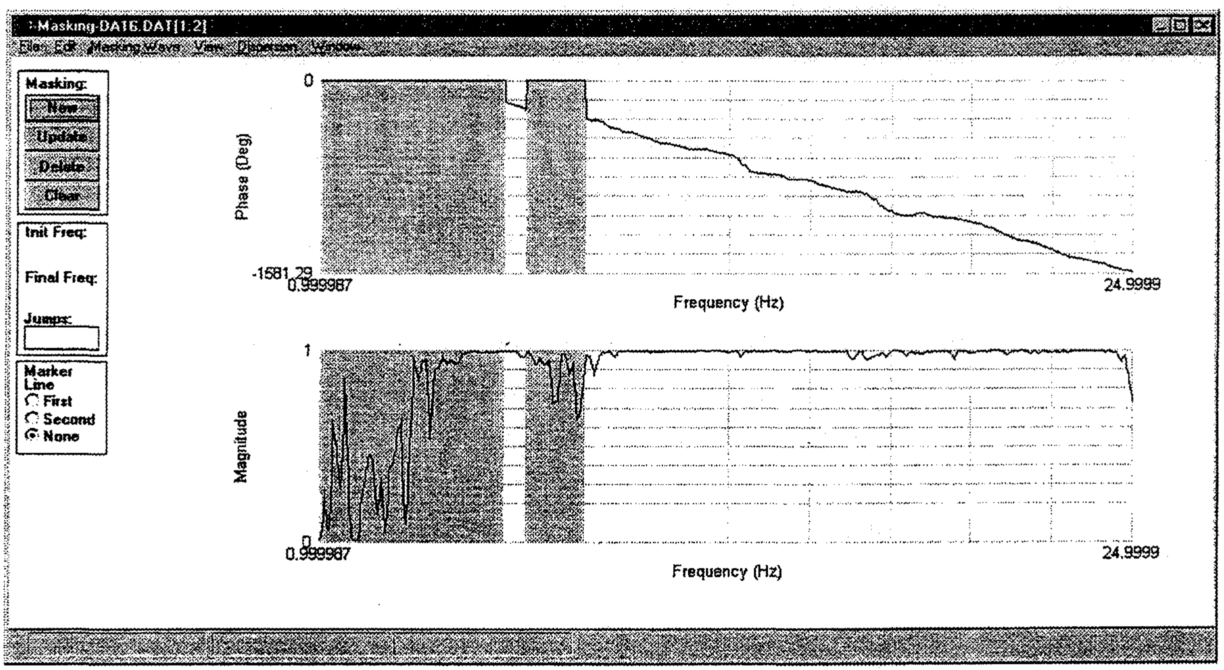


Figure 2.10 Unwrapped Phase Spectrum and Masked Coherence for the 100 ft (30.5 m) Forward Direction Receiver Spacing at Rinaldi Receiving Station.

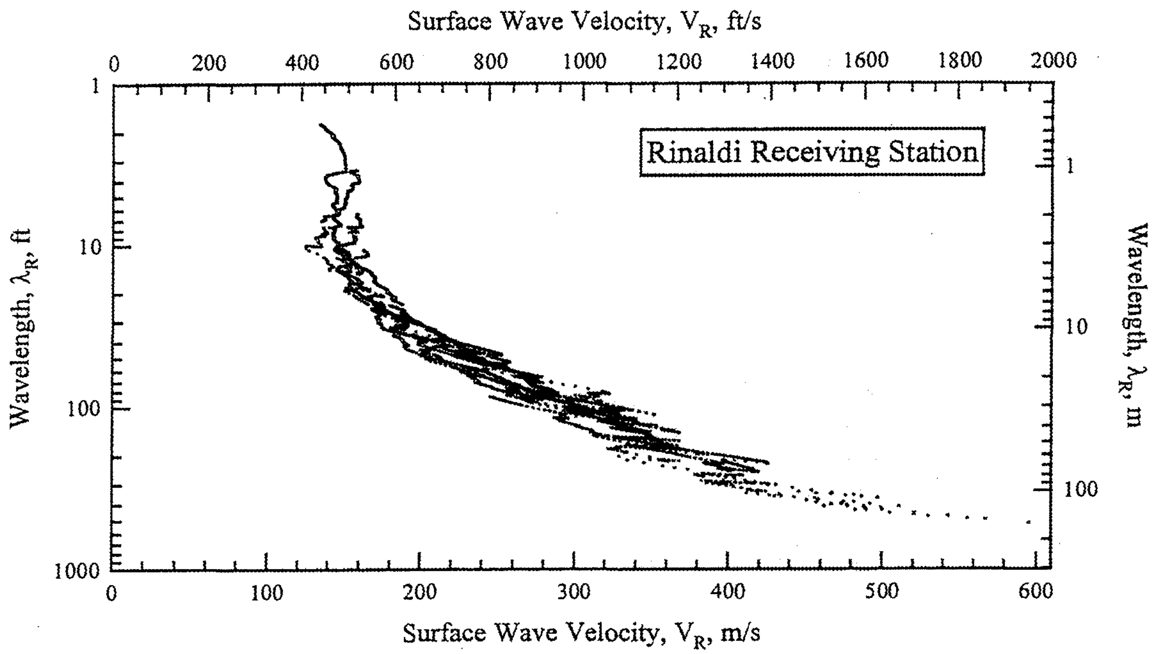


Figure 2.11 Experimental Dispersion Curve for the Rinaldi Receiving Station Site, in Terms of log λ - V_R.

2.4.3 Compact Experimental Dispersion Curve

The composite experimental dispersion curve is difficult to work with in computations. It may contain several thousand data points with considerable scatter. A smoother "compact" dispersion curve containing many fewer points can be calculated. There are several averaging algorithms available for determining the compact dispersion curve. The phase velocities can be averaged in non-overlapping wavelength segments (Rix, 1987). Polynomial best-fit lines to overlapping data segments may produce a smoother curve and more stable inversion process (Joh, 1997).

The compact dispersion curve may be calculated with a linear or logarithmic distribution of data in the wavelength domain. A logarithmically distributed compact dispersion curve gives more weight to the shorter wavelengths (Fig. 2.12), and a linearly distributed compact dispersion curve emphasizes the longer wavelengths. Both distributions are useful in interpreting the dispersion curve; the logarithmically distributed compact curve is used first in modeling the shallow layers and the linear distribution is used for the deeper layers.

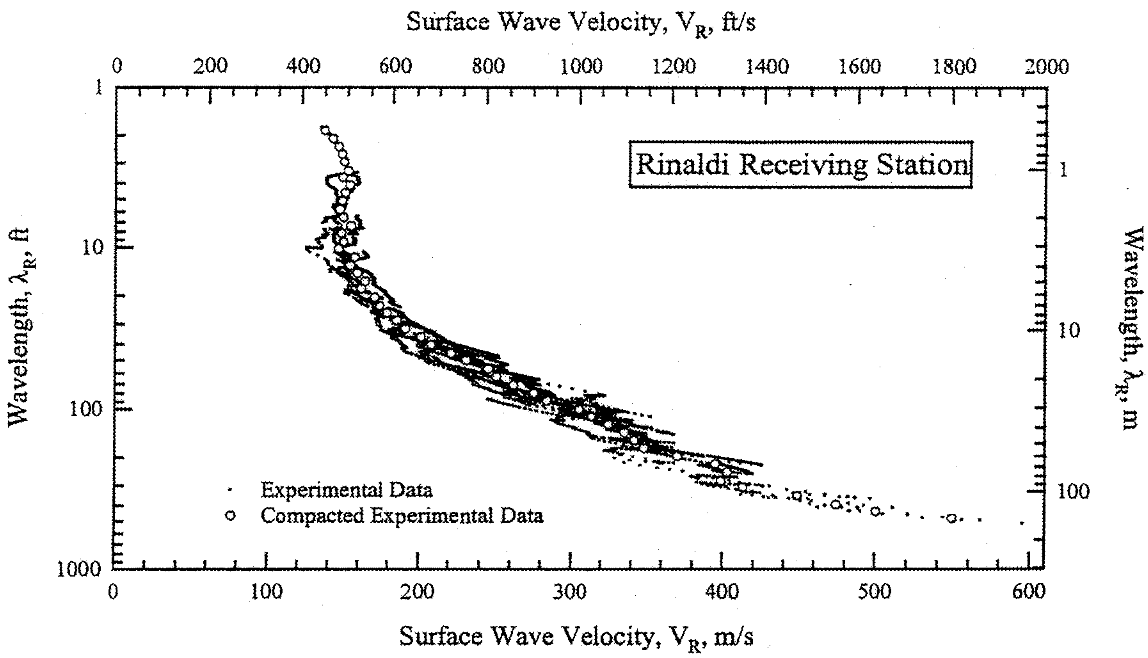


Figure 2.12 Log-Distributed Compact Dispersion Curve for the Rinaldi Receiving Station site.

The averaging can be done in either the frequency or wavelength domain, although frequency domain averaging is theoretically sounder. It separates the variable with uncertainty (V_R) from the one without uncertainty (f). Wavelength domain modeling is usually easier because there is a more apparent physical relationship between wavelength and depth of influence, as shown in Fig. 2.1 and Fig. 2.3.

2.5 SASW DATA INTERPRETATION

The end product of SASW testing is usually a shear wave velocity profile of the subsurface. There are several methods for obtaining this stiffness profile: empirical relationships, iterative forward modeling, and inversion analysis. This section will focus on iterative forward modeling.

The simplified relationship used to interpret data from the steady-state Rayleigh wave method gives the highly smoothed variation of shear wave velocity with depth. Like Heisey et al. (1982) and Roesset et al. (1991), this study found that the shear wave velocity was most closely related to the Rayleigh wave velocity at a depth of 1/3 of the wavelength:

$$z = \lambda/2 \text{ or } \lambda/3. \tag{2.13}$$

Shear wave velocity is determined by:

$$V_S \cong 1.1 * V_R. \tag{2.14}$$

2.5.1 Iterative Forward Modeling

In forward modeling, a theoretical dispersion curve is calculated for a given set of material properties. Layer thickness, and layer properties such as shear wave velocity, Poisson's ratio (or compression wave velocity), and mass density are the specified model parameters. The initial assumed profile is based on background information on the site or estimated from past experience. The entire stiffness profile is usually not modeled initially. First, the near-surface properties are modeled, since the short wavelength portion of the dispersion curve (theoretical or experimental) is independent of the properties of the deeper layers. Longer wavelength portions of the dispersion curve are still affected by the near surface properties, so modeling is done with progressively deeper layers.

There are different ways to calculate the theoretical dispersion curve, as discussed in Section 2.5.2. The theoretical dispersion curve is compared to the composite experimental dispersion curve or compact experimental dispersion curve. If they do not match well enough, the material properties are adjusted and the theoretical dispersion curve is recalculated. This process continues until a satisfactory match between theoretical and experimental dispersion curves is obtained. The interpreter must balance the closeness of the fit to data with the reasonableness of the model parameters. An example of the final match between the theoretical dispersion curve and the compact curve is shown in Fig. 2.13.

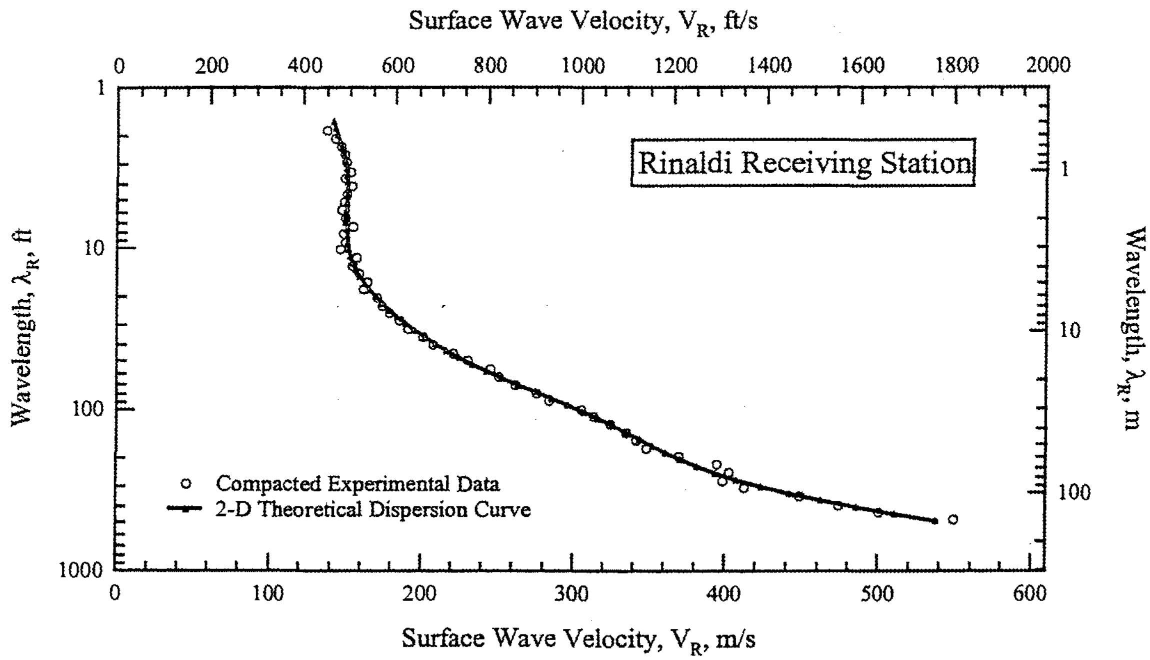


Figure 2.13 Comparison of the Theoretical Dispersion Curve from the SASW Solution with the Compacted Experimental Dispersion Curve, in Terms of log λ - V_R.

The final model stiffness profile is assumed to represent the actual site conditions. A comparison between SASW and borehole seismic results from a "blind" study is shown in Fig. 2.14.

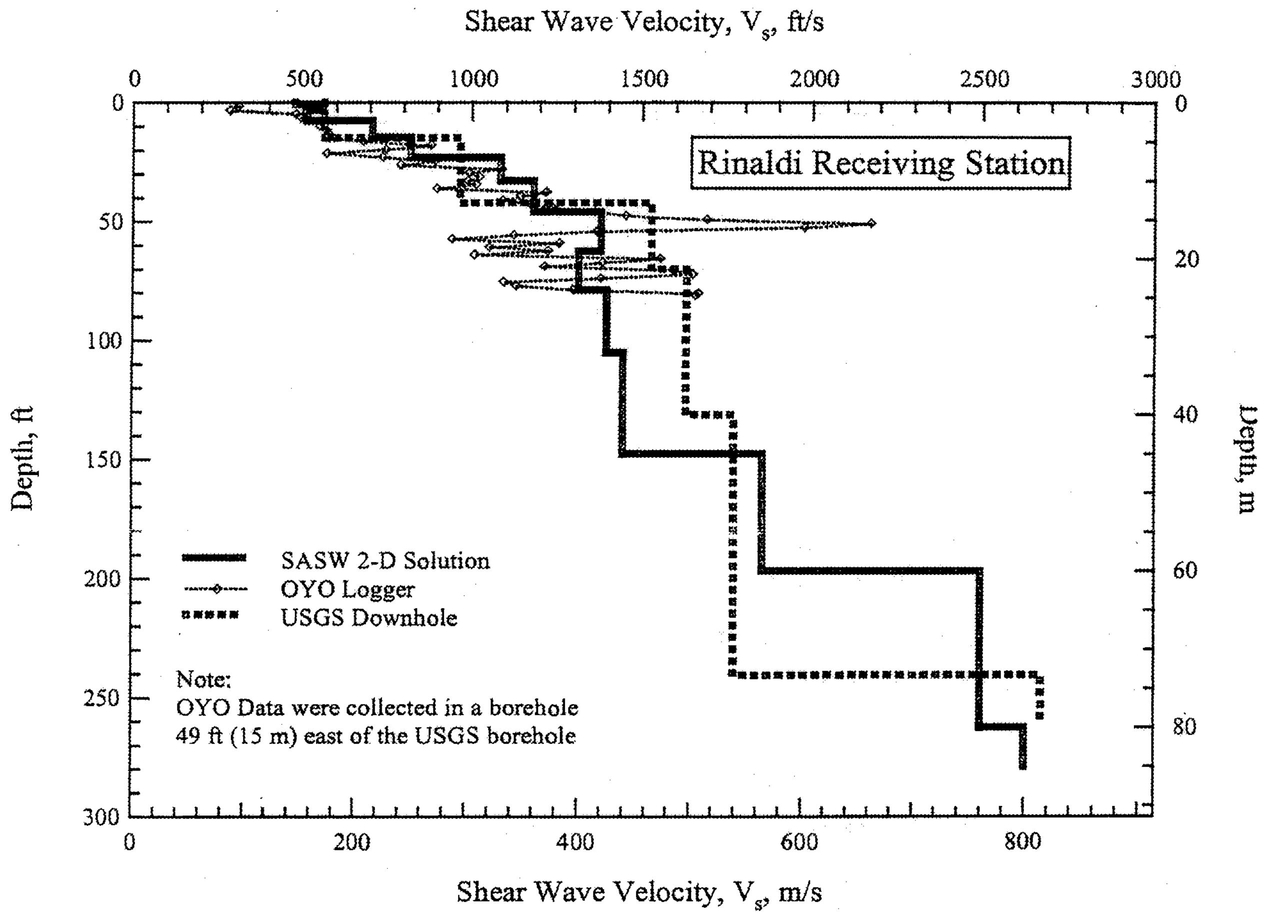


Figure 2.14 Comparison of V_S profiles from SASW 2-D solution, USGS downhole testing (Gibbs et al., 1996), and OYO suspension logging.

For practical reasons, only layer thickness and shear wave velocity are varied in iterative forward modeling. Reasonable estimates of mass density and Poisson's ratio are used throughout the analysis. If the depth of the water table is known, it is be better to specify a compression wave velocity of 5000 ft/s (1500 m/s) for the saturated soil zone and then evaluate Poisson's ratio. The absolute value of mass density is not important since it is only relative differences between layers that affect the theoretical dispersion curve.

Since forward modeling is a trial-and-error procedure and the initial estimate is based on the interpreter's judgment, questions arise concerning the uniqueness and accuracy of the resulting profile. One advantage of a full inversion analysis is that the resolution of the shear wave velocity profile and the sensitivity of the theoretical dispersion curve to the final profile can be quantified. Otherwise, a manual sensitivity analysis can be performed, or the final profile can be reported to a depth with which the interpreter feels confident. For normally dispersive sites V_S can often be resolved to a depth of one half to one third of the longest wavelength in the dispersion curve.

2.5.2 Theoretical Dispersion Curve

The stiffness profile from the forward modeling analysis depends on the method used to calculate the theoretical dispersion curve. The most prominent approaches are the transfer matrix method (Thompson, 1950; and Haskell, 1953) and the dynamic stiffness matrix method.

WinSASW uses the dynamic stiffness matrix method, as described in Kausel and Roesset (1981) and Roesset et al. (1991) to compute a theoretical dispersion curve for a given stiffness profile. It does this by determining the theoretical response of a layered system to a dynamic load. From the vertical response of the system, the theoretical phase spectrum is calculated. The resulting dispersion curve is calculated from the phase spectrum.

It is important to remember that the formulation of the forward problem is a model, based on assumptions which may or may not represent the actual field conditions well. The subsurface is assumed to be a horizontally layered, laterally invariant, homogeneous, isotropic system. It is assumed that if the subsurface model produces a theoretical dispersion curve that is consistent with the field data, the subsurface model is representative of the site. Different formulations of the forward problem exist, from a fundamental-mode Rayleigh wave model to those that incorporate body waves and the experimental geometry.

2.5.2.1 Fundamental-Model Rayleigh Wave Model

In the "2-D" formulation in WinSASW, the response of the layered system due to a vertical line load is calculated. The solution for a plane Rayleigh wave is determined; that is, the wavefronts are planar. The assumption is valid for a very remote source. Body waves are not taken into account. Although it is possible to compute higher modes of propagation, the 2-D analysis in WinSASW uses the first mode (smallest eigenvalue of the dynamic stiffness matrix).

Using the first, or fundamental, mode Rayleigh wave dispersion curve gives good results for sites where the shear wave velocity gradually increases with depth (Foinquinos, 1991). The shear wave velocity profile resulting from a 2-D forward modeling analysis is called a "2-D solution".

2.5.2.2 Full Stress-Wave Model

The "3-D" model simulates body wave effects and higher modes of propagation. These additional waves are important because the surface wave phase data collected in the field are contaminated with body waves and possibly higher modes, and it is not practical to separate modes in SASW analysis. The 3-D formulation models the response of receivers at various distances from a vertical unit circular dynamic load (Kausel and Peek, 1982). The wavefronts are assumed to be cylindrical for the surface waves and hemispherical for the body waves. All stress waves are modeled, so the resulting dispersion curve includes the effects of higher modes of surface waves and body wave reflection and refraction. At sites where the stiffness decreases with depth or there are large contrasts in shear wave velocity, this formulation is a more accurate simulation of the recorded data.

There are several options for 3-D forward modeling: to assume a generalized wavelength-dependent receiver spacing (3-D global) or to incorporate the actual receiver spacings (3-D array) into the model. The computational time is greatly increased, so this theoretical simulation of SASW measurements is only warranted for sites with large stiffness contrasts that must be well resolved. Differences between the 2-D and 3-D solutions are described in Roesset et al. (1991).

2.6 SUMMARY

In this chapter, the development, theoretical basis, field procedures, and methods of data analysis used in the SASW method are reviewed. The goal of SASW testing is to determine a shear wave velocity profile representative of a site. The method takes advantage of the dispersive property of Rayleigh waves, when propagating through a layered system. Testing consists of three parts: field measurements of surface wave phase data, data reduction and generation of an experimental dispersion curve, and evaluation of the corresponding shear wave velocity profile.

The field procedure, including testing equipment and experimental design, is reviewed. Proper sources, receivers, data acquisition system, and experimental setup to collect the surface wave phase spectrum are discussed. Data reduction, consisting of masking out unwanted phase data and generating the experimental dispersion curve, is then explained. Finally, the forward modeling process used to interpret the experimental data is discussed. The current stress wave modeling theories used to generate theoretical surface wave dispersion curves are also briefly presented.

BIBLIOGRAPHY

Andrus, R. D. 1994. In situ characterization of gravelly soils that liquefied in the 1983 Borah Peak Earthquake. Ph.D. dissertation, University of Texas at Austin.

Brown, L.T., Boore, D.M. and K.H. Stokoe, II, 1999, "Comparison of shear-wave velocity profiles from SASW and downhole seismic tests at a strong-motion site", *Proceedings, 12th World Conference on Earthquake Engineering,* Auckland, New Zealand.

Bueno, J. L. 1998. A study on the feasibility of compacting unbound graded aggregate base courses in thicker lifts than presently allowed by state departments of transportation. Master's thesis, University of Texas at Austin.

Foinquinos, M. R. 1991. Analytical study and inversion for the Spectral-Analysis-of-Surface-Waves method. Master's thesis, University of Texas at Austin.

Gibbs, J. F., J. C. Tinsley, and W. B. Joyner. 1996. Seismic velocities and geologic conditions at twelve sites subjected to strong ground motion in the 1994 Northridge, California, Earthquake. *U. S. Geological Survey Open-file Report 96–740.*

Gucunski, N. and R. D. Woods. 1991. Instrumentation for SASW testing. *Geotechnical Special Publication No. 29: Recent Advances in Instrumentation, Data Acquisition, and Testing in Soil Dynamics*, pp. 1–16. New York: American Society of Civil Engineers.

Haskell, N. A. 1953. The distribution of surface waves on multilayered media. *Bulletin of the Seismological Soc. of America* 43:17–34

Heisey, J. S., K. H. Stokoe, II, W. R. Hudson, and A. H. Meyer. 1982. Description of in situ shear wave velocities from spectral-analysis-of-surface-waves. *Research Report No. 256–2.* Center for Transportation Research, University of Texas at Austin.

Joh, S.-H. 1992. *User's guide to WinSASW, a program for data reduction and analysis of SASW measurements*. University of Texas at Austin.

Joh, S.-H. 1997. Advances in interpretation and analysis techniques for spectral-analysis-of-surface-waves (SASW) measurements. Ph.D. dissertation, University of Texas at Austin.

Kausel, E. and J. M. Roesset. 1981. Stiffness matrices for layered soils. *Bulletin of the Seismological Soc. of America* 71:1743–1761.

Kausel, E. and R. Peek. 1982. Dynamic loads in the interior of a layered stratum: An explicit solution. *Bulletin of the Seismological Soc. of America* 72:1459–1508.

Miller, G. F. and H. Pursey. 1955. On the partitioning of energy between elastic waves in a semi-infinite solid. *Proceedings of the Royal Society of London, Series A* 233:55–69.

Model 3562A Dynamic Signal Analyzer Operating Manual. 1985. Everett, Wash.: Hewlett-Packard Co.

Nazarian, S. 1984. In situ determination of elastic moduli of soil deposits and pavement systems by Spectral-Analysis-of-Surface-Waves method. Ph.D. dissertation, Univeristy of Texas at Austin.

Richart, F. E., Jr., J. R. Hall, Jr., and R. D. Woods. 1970. *Vibrations of Soils and Foundations.* Englewood Cliffs, N.J.: Prentice Hall.

Rix, G. J. 1987. A source listing of DispGPIB, a program for the data reduction of SASW measurements. University of Texas at Austin.

Rix, G. J. 1988. Experimental study of factors affecting the Spectral-Analysis-of-Surface-Waves method. Ph.D. dissertation, University of Texas at Austin.

Rix, G. J. and K. H. Stokoe, II. 1989. Stiffness profiling of pavement subgrades. Paper read at Transportation Research Board Annual Meeting, Washington D.C.

Roesset, J. M., D.-W. Chang, and K. H. Stokoe, II. 1991. Comparison of 2-D and 3-D models for analysis of surface wave tests. *Proceedings of the 5th International Conference on Soil Dynamics and Earthquake Engineering,* pp. 111–126.

Roesset, J. M., D.-W. Chang, and K. H. Stokoe, II, and M. Aouad. 1990. Modulus and thickness of the pavement surface layer from SASW tests. *Transportation Research Record* 1260:53–63.

Sanchez-Salinero, I. 1987. Analytical investigation of seismic methods used for engineering applications. Ph.D. dissertation, University of Texas at Austin.

Sheu, J. C. 1987. Applications and limitations of the Spectral-Analysis-of-Surface -Waves method. Ph.D. dissertation, University of Texas at Austin.

Stokoe, K. H., II and G. J. Rix. 1987. Evaluation of compaction treatment of foundation soils at Jackson Lake Dam, Wyoming, by surface wave (SASW) method. *Geotechnical Engineering Center Report GR87-8*, University of Texas at Austin.

Stokoe, K. H., II, S.-H. Joh, and J. A. Bay. 1997. In situ V_s profiles from SASW testing at geotechnical sites shaken by the 1994 Northridge Earthquake. Presented to CUREe at the Northridge Research Conference, Los Angeles, California.

Thompson, W. T. 1950. Transmission of elastic waves through a stratified solid medium. *Journal of Applied Physics* 21:89–93.

Woods, R. D. 1968. Screening of surface waves in soils. *Journal of Soil Mech. and Found. Div., Proc. ASCE,* 94 (SM4):951–979.

Appendix C
Laboratory Testing Procedures and Test Results

APPENDIX C

Laboratory Testing Procedures and Test Results

Direct Shear Strength Tests: Direct shear testing, in accordance with ASTM D3080, was performed on select samples which were soaked for a minimum of 24 hours under a surcharge equal to the applied normal force during testing. After transfer of the samples to the shear box, and reloading the samples, pore pressures set up in the samples due to the transfer were allowed to dissipate for a period of approximately 1 hour prior to application of shearing force. The samples were tested under various normal loads, using a motor-driven, strain-controlled, direct-shear testing apparatus. The test results are presented in the accompanying plots.

Maximum Density Tests: The maximum dry density and optimum moisture content of representative bulk soil samples were determined in accordance with ASTM Test Method D1557. Test results are presented on the *Modified Proctor Compaction Test* figures in this appendix.

Moisture and Density Determination Tests: Moisture content (ASTM Test Method D2937) and dry density determinations were performed on relatively undisturbed ring samples obtained from the test borings. The results of these tests are presented in the geotechnical boring logs (Appendix B).

APPENDIX C (Continued)

Expansion Index Tests: The expansion potential of selected material samples were evaluated by the Expansion Index Text, ASTM Test Method D4829. The specimens were molded under a given compactive energy to approximately 50 percent saturation. The prepared 1-inch thick by 4-inch diameter specimens were loaded to an equivalent 144 psf surcharge and inundated with water until volumetric equilibrium was reached. The results of the tests are presented in the table below:

Sample Location	Sample Description	Expansion Index	Expansion Potential
B-1 at 1-5 Feet	Silty Sand (SM), Reddish Brown	7	Very low
B-5 at 1-5 Feet	Clayey Sand (SC), Reddish Brown	12	Very low
B-7 at 1-5 Feet	Silty Sand (SM), Reddish Brown	11	Very low
B-18 at 3-6 Feet	Silty Sand (SM), Reddish Brown	9	Very low

Particle Size Analysis (ASTM D1140): Particle size analyses were performed by mechanical sieving methods according to ASTM D1140. These tests were performed to assist in the classification of the soil and to determine grain size distributions of the tested soil. The percent fine particles from the analyses are summarized below:

Sample Location	Percent Passing No. 200 Sieve
B-1 at 10 Feet	26
B-2 at 15 Feet	24
B-5 at 1-5 Feet	35
B-5 at 20 Feet	13
B-18 at 0.5-2.0 Feet	15

APPENDIX C (Continued)

Minimum Resistivity and pH Tests: Minimum resistivity and pH tests were performed in general accordance with Caltrans Test Method CT643 and standard geochemical methods. The results are presented in the table below:

Sample Location	Sample Description	pH	Minimum Resistivity (ohms-cm)
B-1 at 1-5 Feet	Silty Sand (SM), Reddish Brown	8.02	1400
B-5 at 1-5 Feet	Clayey Sand (SC), Reddish Brown	8.09	1590
B-6 at 1-5 Feet	Clayey Sand (SC), Reddish Brown	8.07	1500
B-18 at 3-6 Feet	Silty Sand (SM), Reddish Brown	6.85	2300

Chloride Content: Chloride content was tested in accordance with Caltrans Test Method CT422. The results are presented below:

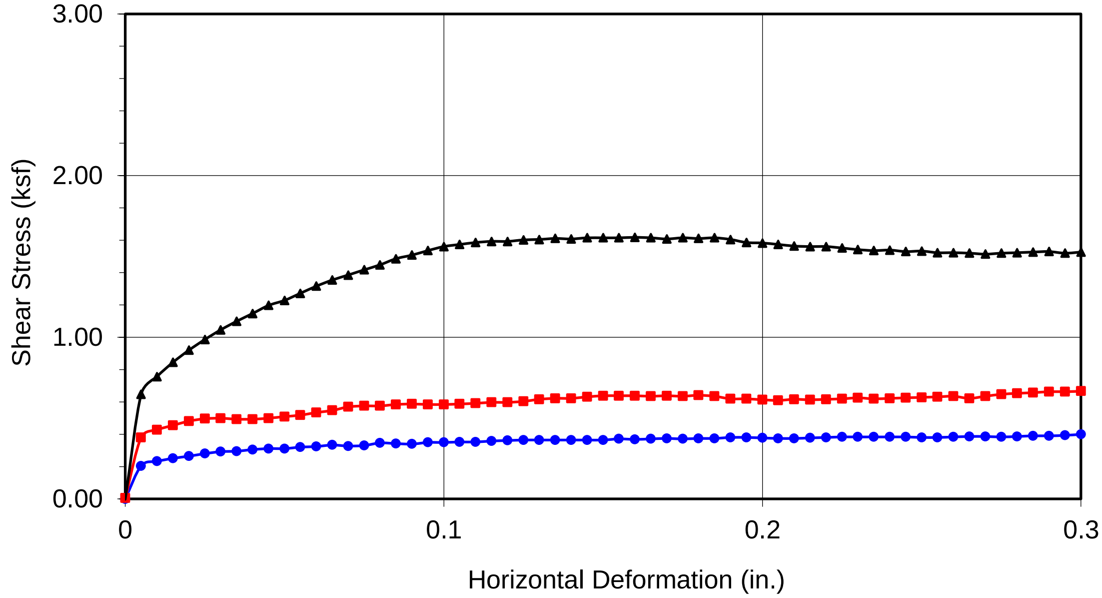
Sample Location	Sample Description	Chloride Content, ppm
B-1 at 1-5 Feet	Silty Sand (SM), Reddish Brown	120
B-5 at 1-5 Feet	Clayey Sand (SC), Reddish Brown	60
B-6 at 1-5 Feet	Clayey Sand (SC), Reddish Brown	60
B-18 at 3-6 Feet	Silty Sand (SM), Reddish Brown	60

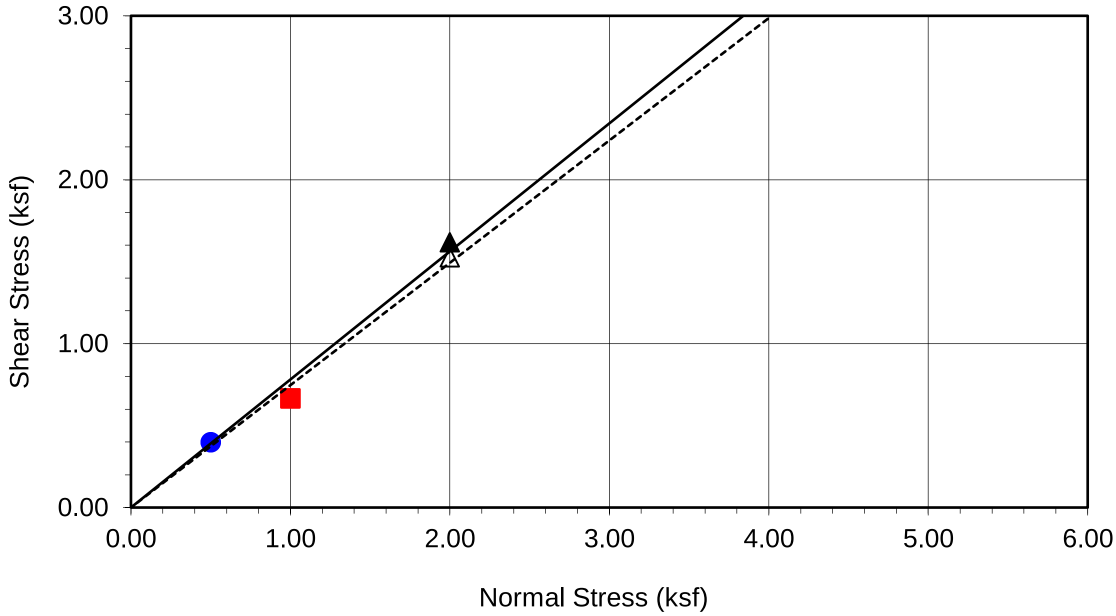
APPENDIX C (Continued)

Soluble Sulfates: The soluble sulfate contents of selected samples were determined by standard geochemical methods (Caltrans Test Method CT417). The test results are presented in the table below:

Sample Location	Sample Description	Sulfate Content, ppm	Exposure Class*
B-1 at 1-5 Feet	Silty Sand (SM), Reddish Brown	165	S0
B-5 at 1-5 Feet	Clayey Sand (SC), Reddish Brown	180	S0
B-6 at 1-5 Feet	Clayey Sand (SC), Reddish Brown	270	S0
B-18 at 3-6 Feet	Silty Sand (SM), Reddish Brown	165	S0

*Based on the 2014 edition of American Concrete Institute (ACI) Committee 318R, Table No. 19.3.1.1





Boring No.	**B-1**
Sample No.	**R-1**
Depth (ft)	**5**
Sample Type:	Ring

Soil Identification:
Silty Sand (SM), Reddish Brown.

Strength Parameters

	C (psf)	ϕ (°)
Peak	0	38
Ultimate	0	37

Normal Stress (kip/ft²)	0.500	1.000	2.000
Peak Shear Stress (kip/ft²)	● 0.399	■ 0.666	▲ 1.618
Shear Stress @ End of Test (ksf)	○ 0.399	□ 0.666	△ 1.527
Deformation Rate (in./min.)	0.0033	0.0033	0.0033
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	4.50	4.50	4.50
Dry Density (pcf)	85.0	97.2	104.0
Saturation (%)	12.3	16.5	19.6
Soil Height Before Shearing (in.)	0.9047	0.9537	0.9498
Final Moisture Content (%)	22.4	18.6	16.7

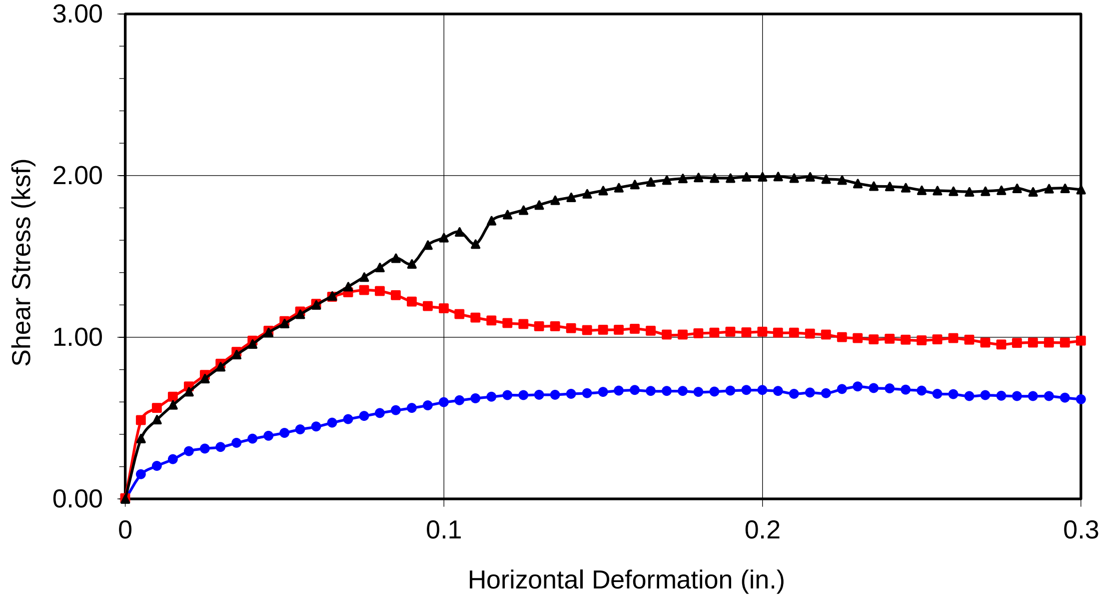
Leighton

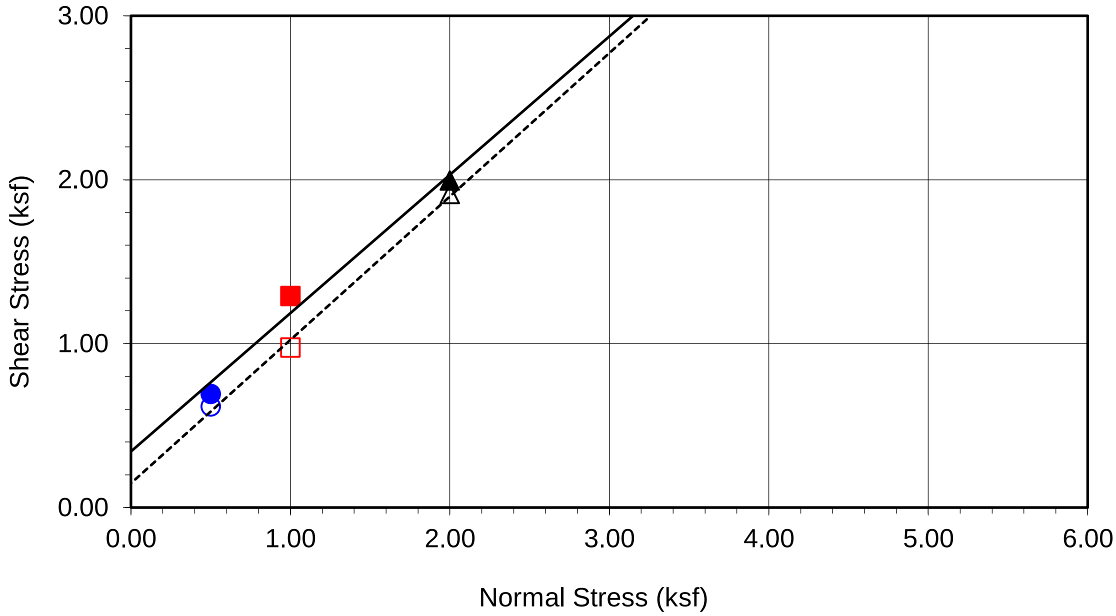
DIRECT SHEAR TEST RESULTS
Consolidated Drained - ASTM D 3080

Project No.: 12764.001

Sharp Metro Master Plan Geo

08-20





Boring No.	**B-5**
Sample No.	**R-1**
Depth (ft)	**5**
Sample Type:	Ring
Soil Identification: Silty Sand (SM), Reddish Brown.	

Strength Parameters

	C (psf)	ϕ (°)
Peak	342	40
Ultimate	148	41

Normal Stress (kip/ft²)	0.500	1.000	2.000
Peak Shear Stress (kip/ft²)	● 0.694	■ 1.291	▲ 1.995
Shear Stress @ End of Test (ksf)	○ 0.616	□ 0.977	△ 1.913
Deformation Rate (in./min.)	0.0033	0.0033	0.0033
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	7.71	7.71	7.71
Dry Density (pcf)	95.0	109.7	99.2
Saturation (%)	26.9	38.8	29.8
Soil Height Before Shearing (in.)	0.9947	0.9946	0.9632
Final Moisture Content (%)	19.6	16.5	17.0

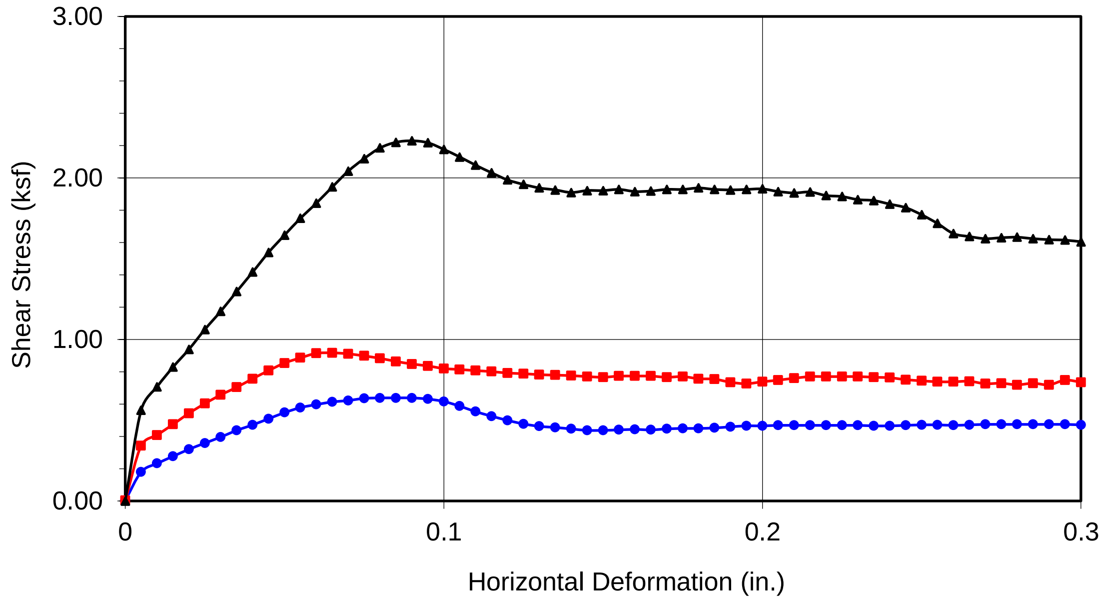
Leighton

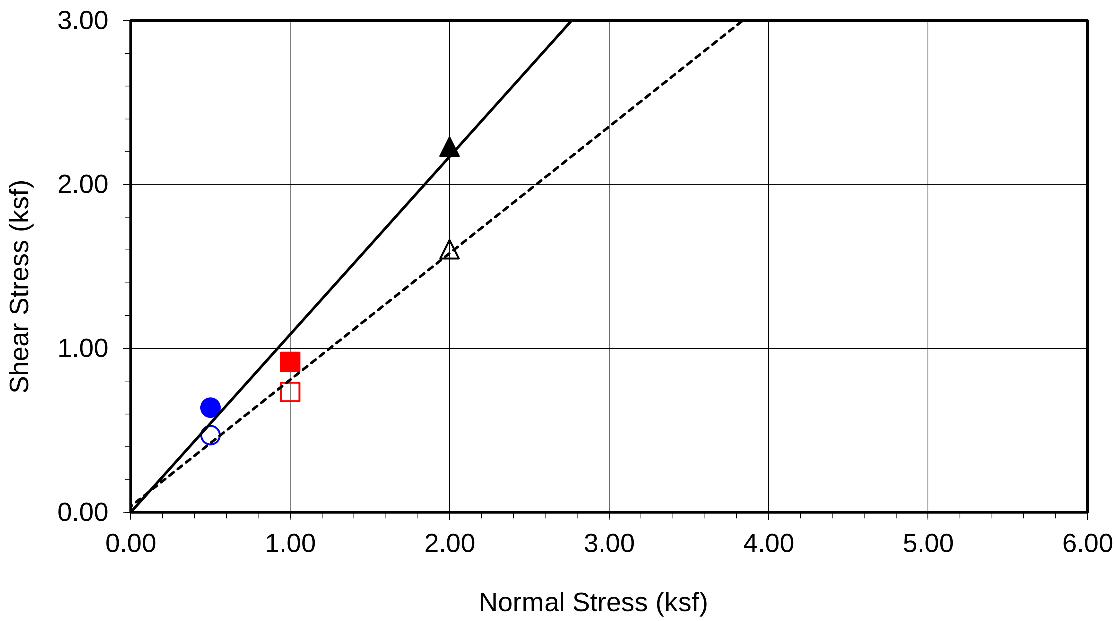
DIRECT SHEAR TEST RESULTS
Consolidated Drained - ASTM D 3080

Project No.: 12764.001

Sharp Metro Master Plan Geo

08-20





Boring No.	**B-7**
Sample No.	**R-1**
Depth (ft)	**5**
Sample Type:	Ring
Soil Identification: Silty Sand (SM), Reddish Brown.	

Strength Parameters

	C (psf)	ϕ (°)
Peak	0	47
Ultimate	36	38

Normal Stress (kip/ft²)	0.500	1.000	2.000
Peak Shear Stress (kip/ft²)	● 0.638	■ 0.917	▲ 2.230
Shear Stress @ End of Test (ksf)	○ 0.471	□ 0.735	△ 1.605
Deformation Rate (in./min.)	0.0033	0.0033	0.0033
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	7.55	7.55	7.55
Dry Density (pcf)	103.4	106.0	107.1
Saturation (%)	32.4	34.5	35.6
Soil Height Before Shearing (in.)	0.9867	0.9861	0.9798
Final Moisture Content (%)	19.3	17.7	17.0

Leighton

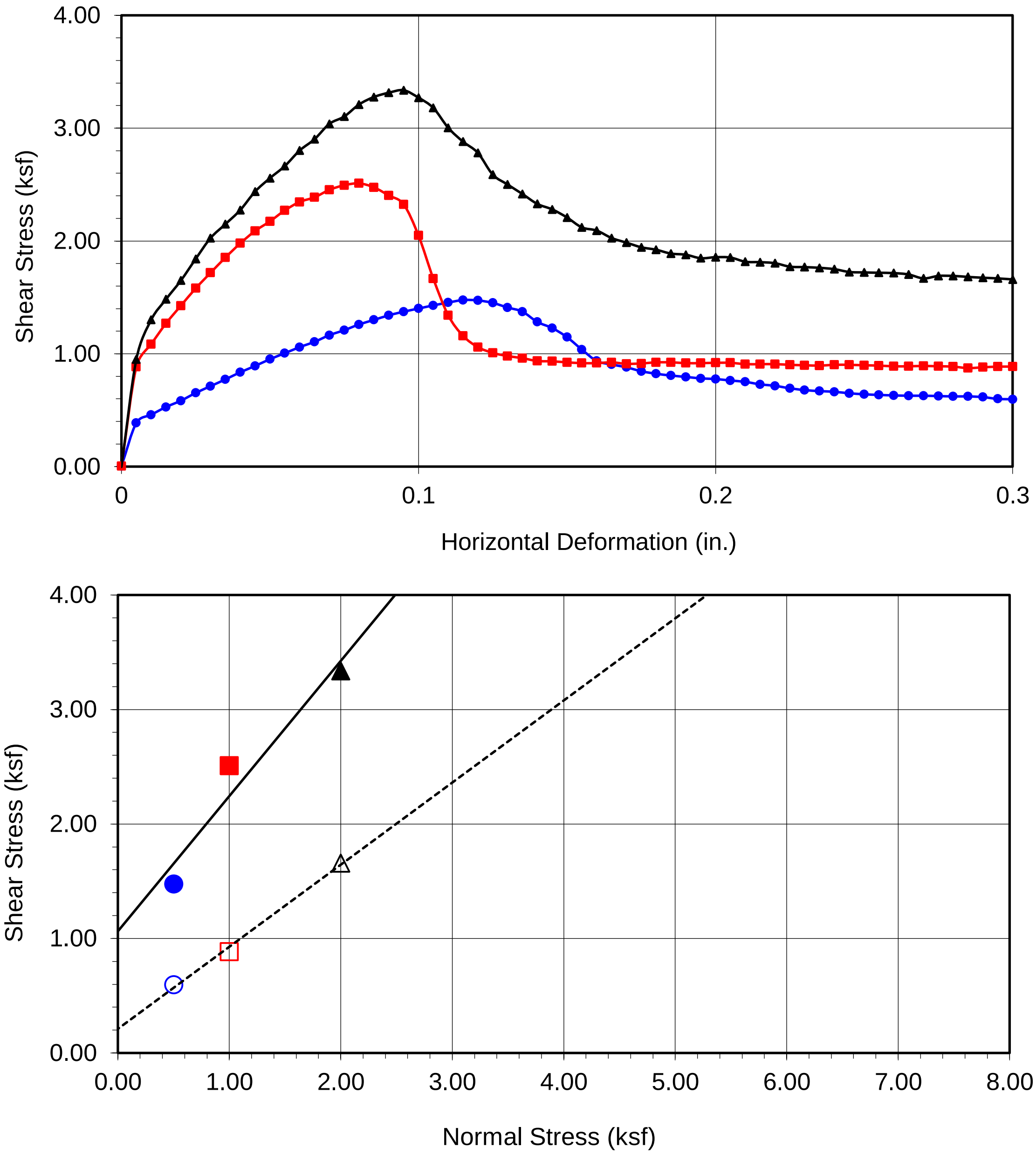
DIRECT SHEAR TEST RESULTS

Consolidated Drained - ASTM D 3080

Project No.: 12764.001

Sharp Metro Master Plan Geo

08-20



Boring No.	**B-18**
Sample No.	**R-3**
Depth (ft)	**10.0 - 11.0**
Sample Type:	Ring

Soil Identification:
Silty Sand (SM), Reddish Brown.

Strength Parameters

	C (psf)	ϕ (°)
Peak	1063	50
Ultimate	211	36

Normal Stress (kip/ft²)	0.500	1.000	2.000
Peak Shear Stress (kip/ft²)	● 1.476	■ 2.510	▲ 3.336
Shear Stress @ End of Test (ksf)	○ 0.597	□ 0.886	△ 1.659
Deformation Rate (in./min.)	0.0033	0.0033	0.0033
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	11.75	11.75	11.75
Dry Density (pcf)	115.9	117.1	117.5
Saturation (%)	69.8	72.1	73.0
Soil Height Before Shearing (in.)	0.9948	0.9922	0.9755
Final Moisture Content (%)	16.3	14.8	14.4

Leighton

DIRECT SHEAR TEST RESULTS
Consolidated Drained - ASTM D 3080

Project No.: 12764.001

Sharp Metro Master Plan Geo

08-20

MODIFIED PROCTOR COMPACTION TEST

ASTM D 1557

Leighton

Project Name:	Sharp Metro Master Plan Geo	Tested By:	L. Parrella	Date:	08/12/20
Project No.:	12764.001	Input By:	M. Vinet	Date:	08/18/20
Boring No.:	B-2	Depth (ft.):	1.0 - 5.0		
Sample No.:	B-1				
Soil Identification:	Silty Sand (SM), Reddish Brown.				

Preparation Method: [X] Moist [ ] Dry   [X] Mechanical Ram [ ] Manual Ram

Mold Volume (ft³) 0.03330   *Ram Weight = 10 lb.; Drop = 18 in.*

TEST NO.	1	2	3	4	5	6
Wt. Compacted Soil + Mold (g)	5631	5707	5622			
Weight of Mold (g)	3521	3521	3521			
Net Weight of Soil (g)	2110	2186	2101			
Wet Weight of Soil + Cont. (g)	1205.8	1207.7	1217.2			
Dry Weight of Soil + Cont. (g)	1178.0	1170.2	1170.6			
Weight of Container (g)	703.2	704.9	712.2			
Moisture Content (%)	5.9	8.1	10.2			
Wet Density (pcf)	139.7	144.7	139.1			
Dry Density (pcf)	132.0	133.9	126.3			

Maximum Dry Density (pcf) **134.5**   **Optimum Moisture Content (%)** **7.4**

PROCEDURE USED

[X] **Procedure A**
Soil Passing No. 4 (4.75 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
May be used if +#4 is 20% or less

[ ] **Procedure B**
Soil Passing 3/8 in. (9.5 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
Use if +#4 is >20% and +3/8 in. is 20% or less

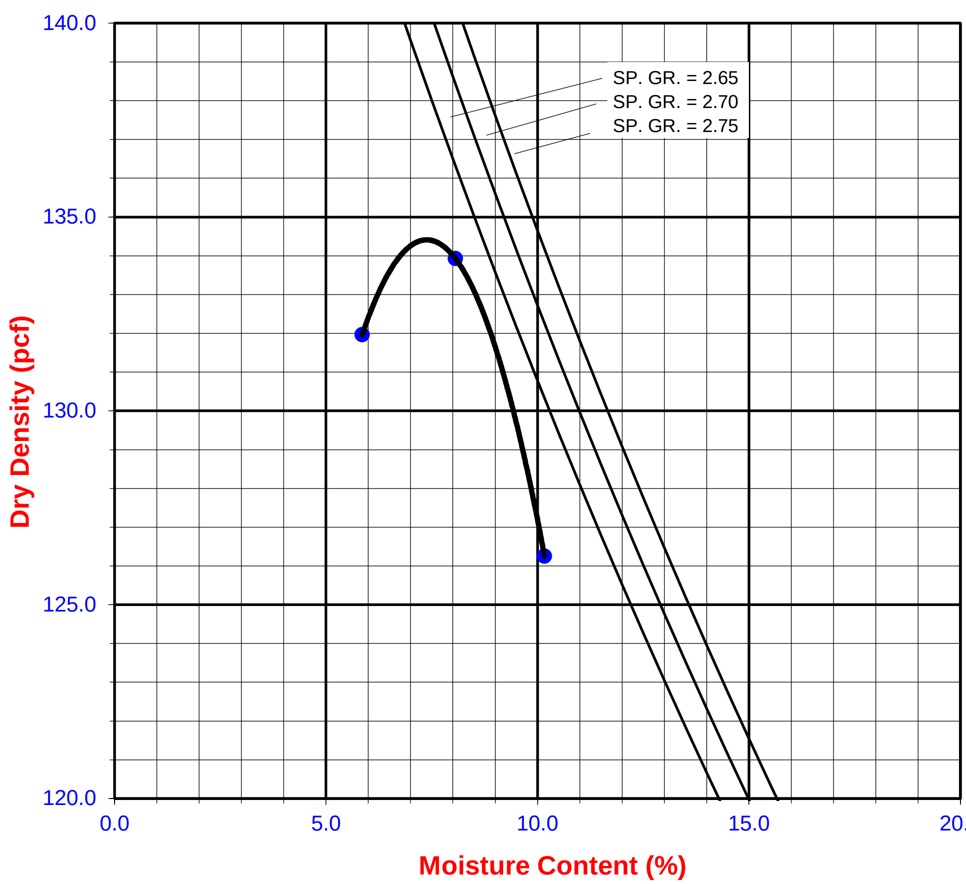
[ ] **Procedure C**
Soil Passing 3/4 in. (19.0 mm) Sieve
Mold : 6 in. (152.4 mm) diameter
Layers : 5 (Five)
Blows per layer : 56 (fifty-six)
Use if +3/8 in. is >20% and +¾ in. is <30%

Particle-Size Distribution:

GR:SA:FI

Atterberg Limits:

LL,PL,PI



Compaction; B-2, B-1 (07-29-20)

MODIFIED PROCTOR COMPACTION TEST

ASTM D 1557

Project Name:	Sharp Metro Master Plan Geo	Tested By:	L. Parrella	Date:	08/14/20
Project No.:	12764.001	Input By:	M. Vinet	Date:	08/18/20
Boring No.:	B-6	Depth (ft.):	1.0 - 5.0		
Sample No.:	B-1				
Soil Identification:	Clayey Sand with Gravel (SC)g, Reddish Brown.				

Preparation Method: [X] Moist [ ] Dry — [X] Mechanical Ram [ ] Manual Ram

Mold Volume (ft³) 0.03330 — *Ram Weight = 10 lb.; Drop = 18 in.*

TEST NO.	1	2	3	4	5	6
Wt. Compacted Soil + Mold (g)	5526	5637	5609			
Weight of Mold (g)	3521	3521	3521			
Net Weight of Soil (g)	2005	2116	2088			
Wet Weight of Soil + Cont. (g)	1203.2	1204.0	1208.3			
Dry Weight of Soil + Cont. (g)	1173.2	1163.3	1160.1			
Weight of Container (g)	706.0	704.0	703.5			
Moisture Content (%)	6.4	8.9	10.6			
Wet Density (pcf)	132.7	140.1	138.2			
Dry Density (pcf)	124.7	128.7	125.0			

Maximum Dry Density (pcf) **128.8** **Optimum Moisture Content (%)** **8.5**

PROCEDURE USED

[ ] **Procedure A**
Soil Passing No. 4 (4.75 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
May be used if +#4 is 20% or less

[X] **Procedure B**
Soil Passing 3/8 in. (9.5 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
Use if +#4 is >20% and +3/8 in. is 20% or less

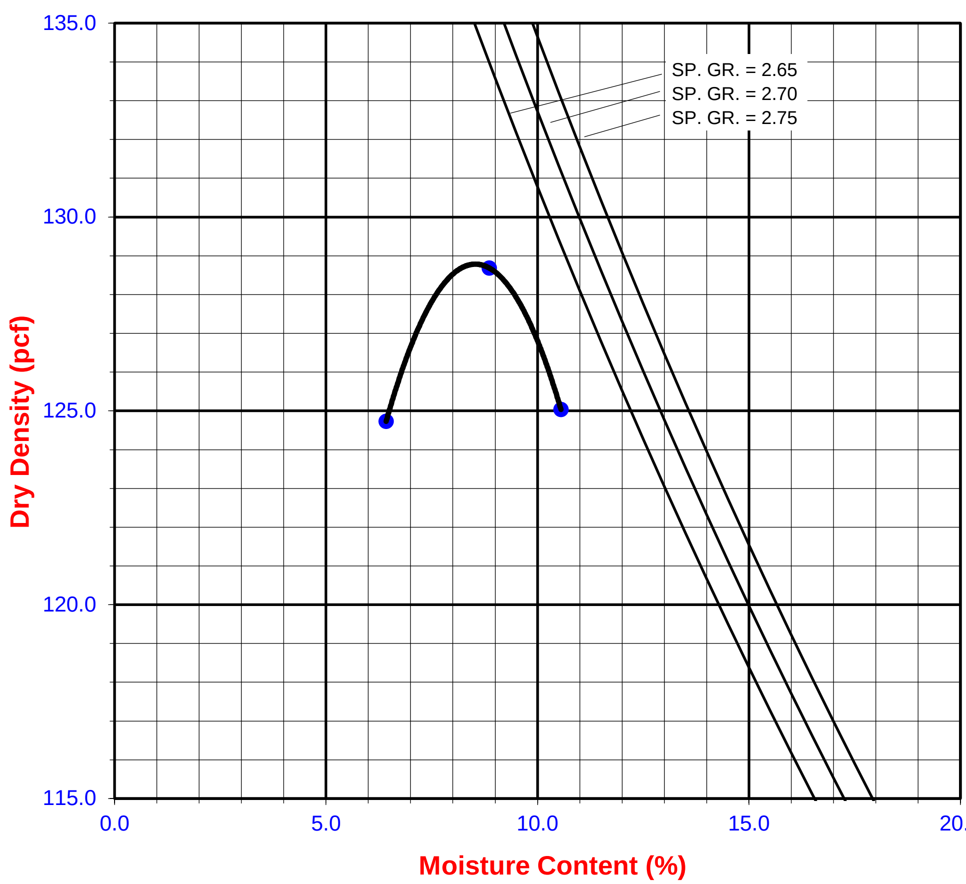
[ ] **Procedure C**
Soil Passing 3/4 in. (19.0 mm) Sieve
Mold : 6 in. (152.4 mm) diameter
Layers : 5 (Five)
Blows per layer : 56 (fifty-six)
Use if +3/8 in. is >20% and +¾ in. is <30%

Particle-Size Distribution:

GR:SA:FI

Atterberg Limits:

LL,PL,PI



Appendix D
Seismic Hazard Analysis

Sharp Metropolitan Medical Campus/ Mary Birch Hospital Expansion

Latitude, Longitude: 32.7982, -117.1544

Date	12/8/2020, 3:30:29 PM
Design Code Reference Document	ASCE7-10
Risk Category	IV
Site Class	C - Very Dense Soil and Soft Rock

Type	Value	Description
S_S	1.08	MCE_R ground motion. (for 0.2 second period)
S_1	0.413	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.08	Site-modified spectral acceleration value
S_{M1}	0.573	Site-modified spectral acceleration value
S_{DS}	0.72	Numeric seismic design value at 0.2 second SA
S_{D1}	0.382	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	D	Seismic design category
F_a	1	Site amplification factor at 0.2 second
F_v	1.387	Site amplification factor at 1.0 second
PGA	0.461	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.461	Site modified peak ground acceleration
T_L	8	Long-period transition period in seconds
SsRT	1.08	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	1.222	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.81	Factored deterministic acceleration value. (0.2 second)
S1RT	0.413	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.442	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.754	Factored deterministic acceleration value. (1.0 second)
PGAd	0.7	Factored deterministic acceleration value. (Peak Ground Acceleration)
C_{RS}	0.884	Mapped value of the risk coefficient at short periods

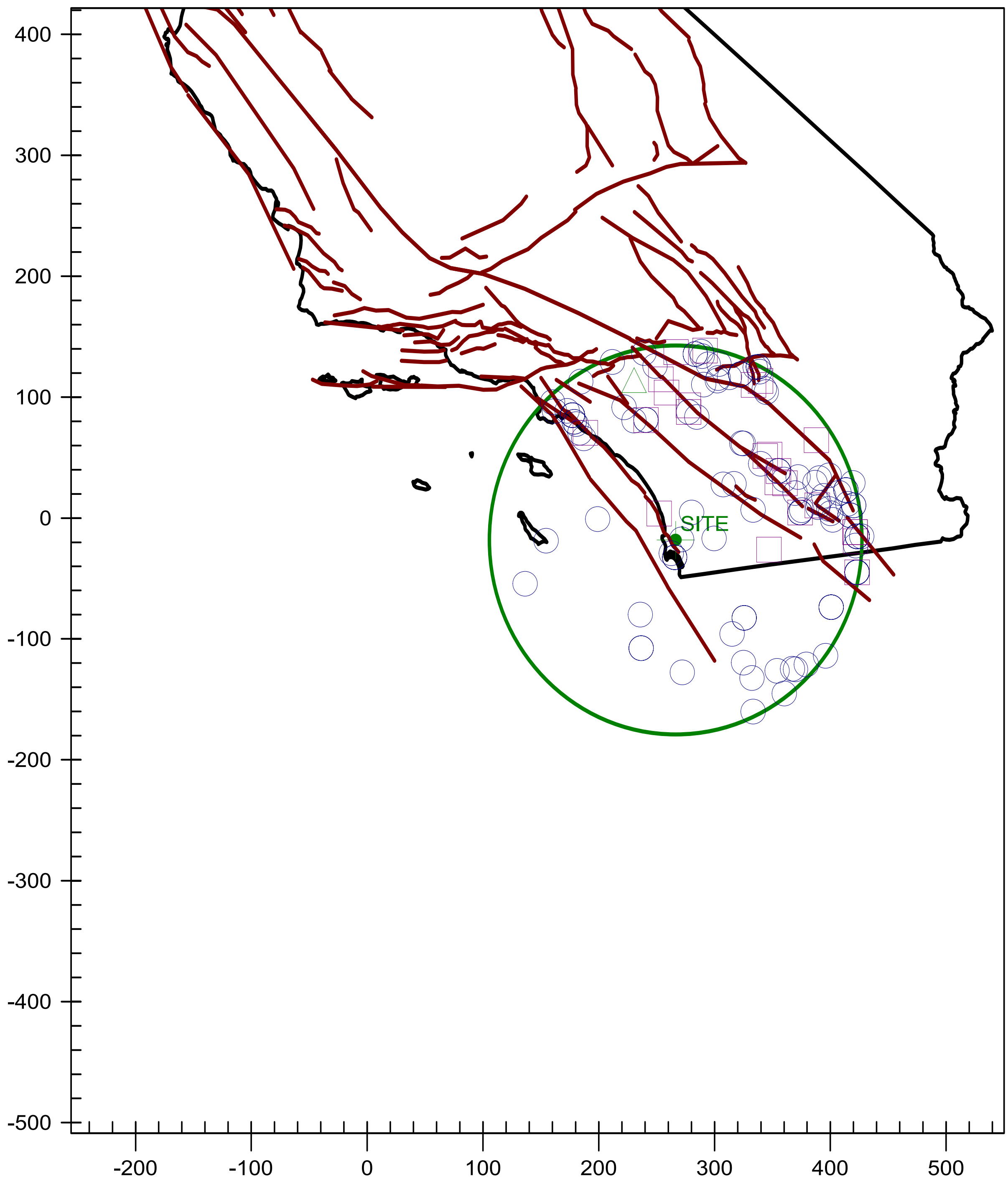
Type	Value	Description
C_{R1}	0.935	Mapped value of the risk coefficient at a period of 1 s

DISCLAIMER

While the information presented on this website is believed to be correct, SEAOC /OSHPD and its sponsors and contributors assume no responsibility or liability for its accuracy. The material presented in this web application should not be used or relied upon for any specific application without competent examination and verification of its accuracy, suitability and applicability by engineers or other licensed professionals. SEAOC / OSHPD do not intend that the use of this information replace the sound judgment of such competent professionals, having experience and knowledge in the field of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the results of the seismic data provided by this website. Users of the information from this website assume all liability arising from such use. Use of the output of this website does not imply approval by the governing building code bodies responsible for building code approval and interpretation for the building site described by latitude/longitude location in the search results of this website.

EARTHQUAKE EPICENTER MAP

Sharp MBH



```
*************************
*                       *
*    E Q S E A R C H    *
*                       *
*     Version 3.00      *
*                       *
*************************
```

ESTIMATION OF

PEAK ACCELERATION FROM

CALIFORNIA EARTHQUAKE CATALOGS

JOB NUMBER: 12764.001

DATE: 09-24-2020

JOB NAME: Sharp MBH

EARTHQUAKE-CATALOG-FILE NAME: ALLQUAKE.DAT

MAGNITUDE RANGE:

MINIMUM MAGNITUDE: 5.00

MAXIMUM MAGNITUDE: 9.00

SITE COORDINATES:

SITE LATITUDE: 32.7982

SITE LONGITUDE: 117.1554

SEARCH DATES:

START DATE: 1800

END DATE: 1999

SEARCH RADIUS:

100.0 mi

160.9 km

ATTENUATION RELATION: 2) Boore et al. (1997) Horiz. - NEHRP C (520)

UNCERTAINTY (M=Median, S=Sigma): M Number of Sigmas: 0.0

ASSUMED SOURCE TYPE: SS [SS=Strike-slip, DS=Reverse-slip, BT=Blind-thrust]

SCOND: 0 Depth Source: A

Basement Depth: 5.00 km Campbell SSR: Campbell SHR:

COMPUTE PEAK HORIZONTAL ACCELERATION

MINIMUM DEPTH VALUE (km): 0.0

EARTHQUAKE SEARCH RESULTS

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
MGI	32.8000	117.1000	05/25/1803	0 0 0.0	0.0	5.00	0.129	VIII	3.2(5.2)
DMG	32.7000	117.2000	05/27/1862	20 0 0.0	0.0	5.90	0.137	VIII	7.3(11.7)
T-A	32.6700	117.1700	10/21/1862	0 0 0.0	0.0	5.00	0.074	VII	8.9(14.3)
T-A	32.6700	117.1700	12/00/1856	0 0 0.0	0.0	5.00	0.074	VII	8.9(14.3)
T-A	32.6700	117.1700	05/24/1865	0 0 0.0	0.0	5.00	0.074	VII	8.9(14.3)
DMG	33.0000	117.3000	11/22/1800	2130 0.0	0.0	6.50	0.106	VII	16.3(26.2)
MGI	33.0000	117.0000	09/21/1856	730 0.0	0.0	5.00	0.048	VI	16.6(26.7)
DMG	32.8000	116.8000	10/23/1894	23 3 0.0	0.0	5.70	0.058	VI	20.6(33.2)
DMG	33.2000	116.7000	01/01/1920	235 0.0	0.0	5.00	0.025	V	38.3(61.6)
MGI	33.2000	116.6000	10/12/1920	1748 0.0	0.0	5.30	0.027	V	42.5(68.3)
T-A	32.2500	117.5000	01/13/1877	20 0 0.0	0.0	5.00	0.023	IV	42.8(68.9)
PAS	32.9710	117.8700	07/13/1986	1347 8.2	6.0	5.30	0.027	V	43.1(69.4)
DMG	33.0000	116.4330	06/04/1940	1035 8.3	0.0	5.10	0.024	IV	44.1(71.0)
DMG	32.7000	116.3000	02/24/1892	720 0.0	0.0	6.70	0.050	VI	50.1(80.7)
DMG	32.2000	116.5500	11/05/1949	43524.0	0.0	5.10	0.020	IV	54.3(87.4)
DMG	32.2000	116.5500	11/04/1949	204238.0	0.0	5.70	0.028	V	54.3(87.4)
DMG	32.0830	116.6670	11/25/1934	818 0.0	0.0	5.00	0.018	IV	57.0(91.7)
DMG	32.0000	117.5000	06/24/1939	1627 0.0	0.0	5.00	0.018	IV	58.7(94.4)
DMG	32.0000	117.5000	05/01/1939	2353 0.0	0.0	5.00	0.018	IV	58.7(94.4)
DMG	33.3430	116.3460	04/28/1969	232042.9	20.0	5.80	0.027	V	60.1(96.7)
PAS	33.5010	116.5130	02/25/1980	104738.5	13.6	5.50	0.023	IV	61.1(98.3)
DMG	33.5000	116.5000	09/30/1916	211 0.0	0.0	5.00	0.017	IV	61.5(99.0)
DMG	33.2000	116.2000	05/28/1892	1115 0.0	0.0	6.30	0.034	V	61.9(99.6)
DMG	33.7000	117.4000	04/11/1910	757 0.0	0.0	5.00	0.017	IV	63.8(102.7)
DMG	33.7000	117.4000	05/15/1910	1547 0.0	0.0	6.00	0.029	V	63.8(102.7)

DMG	33.7000	117.4000	05/13/1910	620 0.0	0.0	5.00	0.017	IV	63.8(102.7)
DMG	33.7100	116.9250	09/23/1963	144152.6	16.5	5.00	0.017	IV	64.3(103.5)
DMG	33.4000	116.3000	02/09/1890	12 6 0.0	0.0	6.30	0.033	V	64.6(104.0)
DMG	33.1900	116.1290	04/09/1968	22859.1	11.1	6.40	0.035	V	65.3(105.1)
DMG	33.2830	116.1830	03/19/1954	95429.0	0.0	6.20	0.031	V	65.5(105.4)
DMG	33.2830	116.1830	03/23/1954	41450.0	0.0	5.10	0.017	IV	65.5(105.4)
DMG	33.2830	116.1830	03/19/1954	102117.0	0.0	5.50	0.022	IV	65.5(105.4)
DMG	33.2830	116.1830	03/19/1954	95556.0	0.0	5.00	0.017	IV	65.5(105.4)
DMG	33.6990	117.5110	05/31/1938	83455.4	10.0	5.50	0.022	IV	65.5(105.4)
DMG	33.2170	116.1330	08/15/1945	175624.0	0.0	5.70	0.024	IV	65.9(106.0)
DMG	33.7500	117.0000	04/21/1918	223225.0	0.0	6.80	0.042	VI	66.3(106.7)
DMG	33.7500	117.0000	06/06/1918	2232 0.0	0.0	5.00	0.016	IV	66.3(106.7)
DMG	33.4080	116.2610	03/25/1937	1649 1.8	10.0	6.00	0.028	V	66.7(107.3)
DMG	32.9670	116.0000	10/22/1942	181326.0	0.0	5.00	0.016	IV	68.0(109.4)
DMG	32.9670	116.0000	10/21/1942	162213.0	0.0	6.50	0.036	V	68.0(109.4)
DMG	32.9670	116.0000	10/21/1942	162519.0	0.0	5.00	0.016	IV	68.0(109.4)
DMG	32.9670	116.0000	10/21/1942	162654.0	0.0	5.00	0.016	IV	68.0(109.4)
DMG	31.8110	117.1310	12/22/1964	205433.2	2.3	5.60	0.022	IV	68.2(109.7)
DMG	33.1130	116.0370	04/09/1968	3 353.5	5.0	5.20	0.018	IV	68.3(110.0)
DMG	32.9830	115.9830	05/23/1942	154729.0	0.0	5.00	0.016	IV	69.2(111.3)
DMG	32.8170	118.3500	12/26/1951	04654.0	0.0	5.90	0.026	V	69.3(111.6)
DMG	33.8000	117.0000	12/25/1899	1225 0.0	0.0	6.40	0.033	V	69.7(112.2)
DMG	33.5750	117.9830	03/11/1933	518 4.0	0.0	5.20	0.017	IV	71.9(115.6)
DMG	31.8670	116.5710	02/27/1937	12918.4	10.0	5.00	0.015	IV	72.8(117.1)
DMG	33.2310	116.0040	05/26/1957	155933.6	15.1	5.00	0.015	IV	73.0(117.6)
DMG	33.6170	117.9670	03/11/1933	154 7.8	0.0	6.30	0.030	V	73.4(118.2)
MGI	33.8000	117.6000	04/22/1918	2115 0.0	0.0	5.00	0.015	IV	73.8(118.7)
DMG	33.6170	118.0170	03/14/1933	19 150.0	0.0	5.10	0.016	IV	75.3(121.2)

EARTHQUAKE SEARCH RESULTS

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
DMG	33.9000	117.2000	12/19/1880	0 0 0.0	0.0	6.00	0.025	V	76.1(122.5)
PAS	33.0130	115.8390	11/24/1987	131556.5	2.4	6.00	0.025	V	77.7(125.1)
DMG	33.0000	115.8330	01/08/1946	185418.0	0.0	5.40	0.018	IV	77.9(125.4)
DMG	33.0330	115.8210	09/30/1971	224611.3	8.0	5.10	0.015	IV	79.0(127.2)
DMG	33.6830	118.0500	03/11/1933	658 3.0	0.0	5.50	0.018	IV	80.0(128.7)
DMG	33.1830	115.8500	04/25/1957	222412.0	0.0	5.10	0.015	IV	80.1(128.9)
DMG	33.9500	116.8500	09/28/1946	719 9.0	0.0	5.00	0.014	IV	81.4(131.1)
DMG	33.7000	118.0670	03/11/1933	85457.0	0.0	5.10	0.015	IV	81.5(131.2)
DMG	33.7000	118.0670	03/11/1933	51022.0	0.0	5.10	0.015	IV	81.5(131.2)
DMG	31.7500	116.5000	04/29/1935	20 8 0.0	0.0	5.00	0.014	IV	81.9(131.7)
PAS	33.0820	115.7750	11/24/1987	15414.5	4.9	5.80	0.021	IV	82.3(132.5)
DMG	34.0000	117.2500	07/23/1923	73026.0	0.0	6.25	0.027	V	83.2(133.8)
DMG	33.2160	115.8080	04/25/1957	215738.7	-0.3	5.20	0.015	IV	83.2(133.9)
DMG	32.9830	115.7330	01/24/1951	717 2.6	0.0	5.60	0.019	IV	83.4(134.3)
DMG	32.5000	118.5500	02/24/1948	81510.0	0.0	5.30	0.016	IV	83.6(134.6)
DMG	32.9500	115.7170	06/14/1953	41729.9	0.0	5.50	0.018	IV	84.1(135.3)
DMG	32.9000	115.7000	10/02/1928	19 1 0.0	0.0	5.00	0.014	III	84.7(136.3)
DMG	33.7500	118.0830	03/11/1933	910 0.0	0.0	5.10	0.014	IV	84.8(136.4)
DMG	33.7500	118.0830	03/13/1933	131828.0	0.0	5.30	0.016	IV	84.8(136.4)
DMG	33.7500	118.0830	03/11/1933	323 0.0	0.0	5.00	0.014	III	84.8(136.4)
DMG	33.7500	118.0830	03/11/1933	230 0.0	0.0	5.10	0.014	IV	84.8(136.4)
DMG	33.7500	118.0830	03/11/1933	2 9 0.0	0.0	5.00	0.014	III	84.8(136.4)
DMG	33.9760	116.7210	06/12/1944	104534.7	10.0	5.10	0.014	IV	85.1(136.9)
MGI	34.0000	117.5000	12/16/1858	10 0 0.0	0.0	7.00	0.039	V	85.3(137.3)
DMG	31.7960	116.2690	06/11/1963	152338.3	-2.0	5.80	0.020	IV	86.4(139.0)

DMG	33.9940	116.7120	06/12/1944	111636.0	10.0	5.30	0.016	IV	86.4(139.1)
DMG	33.7830	118.1330	10/02/1933	91017.6	0.0	5.40	0.016	IV	88.4(142.2)
DMG	33.2330	115.7170	10/22/1942	15038.0	0.0	5.50	0.017	IV	88.5(142.5)
PAS	33.9980	116.6060	07/08/1986	92044.5	11.7	5.60	0.018	IV	88.7(142.7)
DMG	33.9330	116.3830	12/04/1948	234317.0	0.0	6.50	0.029	V	90.1(145.0)
DMG	32.2500	115.7500	12/01/1958	6 2 0.0	0.0	5.50	0.017	IV	90.1(145.1)
DMG	32.2500	115.7500	12/01/1958	32118.0	0.0	5.80	0.020	IV	90.1(145.1)
DMG	32.2500	115.7500	12/01/1958	350 0.0	0.0	5.00	0.013	III	90.1(145.1)
MGI	34.1000	117.3000	07/15/1905	2041 0.0	0.0	5.30	0.015	IV	90.3(145.3)
GSP	33.8760	116.2670	06/29/1992	160142.8	1.0	5.20	0.014	IV	90.4(145.4)
PAS	33.0980	115.6320	04/26/1981	12 928.4	3.8	5.70	0.019	IV	90.7(145.9)
GSG	31.8060	116.1280	03/23/1994	025916.2	22.0	5.00	0.013	III	91.0(146.5)
T-A	33.5000	115.8200	05/00/1868	0 0 0.0	0.0	6.30	0.025	V	91.1(146.7)
GSP	33.9020	116.2840	07/24/1992	181436.2	9.0	5.00	0.013	III	91.3(146.9)
DMG	34.1000	116.8000	10/24/1935	1448 7.6	0.0	5.10	0.013	III	92.2(148.3)
DMG	34.0170	116.5000	07/25/1947	04631.0	0.0	5.00	0.013	III	92.2(148.4)
DMG	34.0170	116.5000	07/25/1947	61949.0	0.0	5.20	0.014	IV	92.2(148.4)
DMG	34.0170	116.5000	07/26/1947	24941.0	0.0	5.10	0.013	III	92.2(148.4)
DMG	34.0170	116.5000	07/24/1947	221046.0	0.0	5.50	0.017	IV	92.2(148.4)
DMG	31.8000	116.1000	10/10/1953	1849 6.0	0.0	5.00	0.013	III	92.4(148.7)
DMG	33.7830	118.2500	11/14/1941	84136.3	0.0	5.40	0.016	IV	92.8(149.4)
DMG	34.1000	116.7000	02/07/1889	520 0.0	0.0	5.30	0.015	IV	93.6(150.7)
GSP	33.9610	116.3180	04/23/1992	045023.0	12.0	6.10	0.022	IV	93.7(150.8)
PAS	33.0140	115.5550	10/16/1979	65842.8	9.1	5.50	0.016	IV	94.0(151.2)
PAS	32.9270	115.5400	10/16/1979	54910.2	10.4	5.10	0.013	III	94.1(151.4)
PAS	32.9280	115.5390	10/16/1979	61948.7	9.2	5.10	0.013	III	94.2(151.5)
DMG	33.1170	115.5670	07/29/1950	143632.0	0.0	5.50	0.016	IV	94.6(152.3)
DMG	33.1170	115.5670	07/28/1950	175048.0	0.0	5.40	0.015	IV	94.6(152.3)

EARTHQUAKE SEARCH RESULTS

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
DMG	31.8330	116.0000	05/10/1956	114854.0	0.0	5.00	0.012	III	94.8(152.5)
GSP	34.1630	116.8550	06/28/1992	144321.0	6.0	5.30	0.014	IV	95.8(154.2)
DMG	32.8000	115.5000	06/23/1915	456 0.0	0.0	6.25	0.024	IV	96.1(154.6)
DMG	32.8000	115.5000	06/23/1915	359 0.0	0.0	6.25	0.024	IV	96.1(154.6)
MGI	34.0000	118.0000	12/25/1903	1745 0.0	0.0	5.00	0.012	III	96.2(154.8)
DMG	32.7330	115.5000	05/19/1940	43640.9	0.0	6.70	0.030	V	96.2(154.8)
DMG	34.1800	116.9200	01/16/1930	034 3.6	0.0	5.10	0.013	III	96.4(155.1)
DMG	34.1800	116.9200	01/16/1930	02433.9	0.0	5.20	0.014	III	96.4(155.1)
MGI	32.7000	115.5000	01/01/1927	13 0 0.0	0.0	5.30	0.014	IV	96.4(155.1)
DMG	34.2000	117.1000	09/20/1907	154 0.0	0.0	6.00	0.021	IV	96.8(155.8)
DMG	33.8500	118.2670	03/11/1933	1425 0.0	0.0	5.00	0.012	III	96.9(155.9)
DMG	33.0000	115.5000	12/17/1955	6 729.0	0.0	5.40	0.015	IV	97.0(156.0)
DMG	33.0000	115.5000	02/26/1930	230 0.0	0.0	5.00	0.012	III	97.0(156.0)
DMG	32.7670	115.4830	05/19/1940	63540.0	0.0	5.50	0.016	IV	97.1(156.3)
DMG	32.7670	115.4830	05/19/1940	63320.0	0.0	5.00	0.012	III	97.1(156.3)
DMG	32.7670	115.4830	05/19/1940	55134.0	0.0	5.50	0.016	IV	97.1(156.3)
DMG	32.7670	115.4830	05/19/1940	455 0.0	0.0	5.50	0.016	IV	97.1(156.3)
DMG	31.5000	116.5000	10/17/1954	225718.0	0.0	5.70	0.018	IV	97.5(156.9)
GSP	34.0290	116.3210	08/21/1993	014638.4	9.0	5.00	0.012	III	97.6(157.1)
DMG	34.2000	117.4000	07/22/1899	046 0.0	0.0	5.50	0.016	IV	97.8(157.4)
GSP	34.1400	117.7000	02/28/1990	234336.6	5.0	5.20	0.014	III	97.8(157.4)
GSP	34.1950	116.8620	08/17/1992	204152.1	11.0	5.30	0.014	IV	97.9(157.6)
DMG	31.6250	116.2110	06/10/1969	34132.7	-2.0	5.00	0.012	III	98.0(157.7)
DMG	32.5000	115.5000	05/01/1918	432 0.0	0.0	5.00	0.012	III	98.4(158.4)

MGI	32.5000	115.5000	04/16/1925	330 0.0	0.0	5.00	0.012	III	98.4(158.4)
MGI	32.5000	115.5000	04/16/1925	520 0.0	0.0	5.30	0.014	IV	98.4(158.4)
DMG	32.5000	115.5000	11/07/1923	2357 0.0	0.0	5.50	0.016	IV	98.4(158.4)
DMG	32.5000	115.5000	04/19/1906	030 0.0	0.0	6.00	0.020	IV	98.4(158.4)
DMG	32.5000	115.5000	01/01/1927	81645.0	0.0	5.75	0.018	IV	98.4(158.4)
DMG	32.5000	115.5000	09/08/1921	1924 0.0	0.0	5.00	0.012	III	98.4(158.4)
DMG	32.5000	115.5000	01/01/1927	91330.0	0.0	5.50	0.016	IV	98.4(158.4)
DMG	32.5000	115.5000	11/05/1923	22 7 0.0	0.0	5.00	0.012	III	98.4(158.4)
GSP	34.0640	116.3610	09/15/1992	084711.3	9.0	5.20	0.013	III	98.7(158.8)
GSN	34.2030	116.8270	06/28/1992	150530.7	5.0	6.70	0.030	V	98.8(159.0)
DMG	33.1670	115.5000	12/20/1935	745 0.0	0.0	5.00	0.012	III	99.2(159.6)
PAS	32.7660	115.4410	10/15/1979	231930.0	9.3	5.20	0.013	III	99.5(160.2)
DMG	34.0670	116.3330	05/18/1940	55120.2	0.0	5.20	0.013	III	99.6(160.3)
DMG	34.0670	116.3330	05/18/1940	72132.7	0.0	5.00	0.012	III	99.6(160.3)
PAS	31.8900	115.8210	05/08/1985	234020.8	6.0	5.00	0.012	III	100.0(160.8)

****

-END OF SEARCH- 145 EARTHQUAKES FOUND WITHIN THE SPECIFIED SEARCH AREA.

TIME PERIOD OF SEARCH: 1800 TO 1999

LENGTH OF SEARCH TIME: 200 years

THE EARTHQUAKE CLOSEST TO THE SITE IS ABOUT 3.2 MILES (5.2 km) AWAY.

LARGEST EARTHQUAKE MAGNITUDE FOUND IN THE SEARCH RADIUS: 7.0

LARGEST EARTHQUAKE SITE ACCELERATION FROM THIS SEARCH: 0.137 g

COEFFICIENTS FOR GUTENBERG & RICHTER RECURRENCE RELATION:

a-value= 1.565

b-value= 0.388

beta-value= 0.893

TABLE OF MAGNITUDES AND EXCEEDANCES:

Earthquake Magnitude	Number of Times Exceeded	Cumulative No. / Year
4.0	145	0.72864
4.5	145	0.72864
5.0	145	0.72864
5.5	56	0.28141
6.0	25	0.12563
6.5	8	0.04020
7.0	1	0.00503

Appendix E
General Earthwork and Grading Specifications for Rough Grading

1.0 General

1.1 Intent

These General Earthwork and Grading Specifications are for the grading and earthwork shown on the approved grading plan(s) and/or indicated in the geotechnical report(s). These Specifications are a part of the recommendations contained in the geotechnical report(s). In case of conflict, the specific recommendations in the geotechnical report shall supersede these more general Specifications. Observations of the earthwork by the project Geotechnical Consultant during the course of grading may result in new or revised recommendations that could supersede these specifications or the recommendations in the geotechnical report(s).

1.2 The Geotechnical Consultant of Record

Prior to commencement of work, the owner shall employ the Geotechnical Consultant of Record (Geotechnical Consultant). The Geotechnical Consultants shall be responsible for reviewing the approved geotechnical report(s) and accepting the adequacy of the preliminary geotechnical findings, conclusions, and recommendations prior to the commencement of the grading.

Prior to commencement of grading, the Geotechnical Consultant shall review the "work plan" prepared by the Earthwork Contractor (Contractor) and schedule sufficient personnel to perform the appropriate level of observation, mapping, and compaction testing.

During the grading and earthwork operations, the Geotechnical Consultant shall observe, map, and document the subsurface exposures to verify the geotechnical design assumptions. If the observed conditions are found to be significantly different than the interpreted assumptions during the design phase, the Geotechnical Consultant shall inform the owner, recommend appropriate changes in design to accommodate the observed conditions, and notify the review agency where required. Subsurface areas to be geotechnically observed, mapped, elevations recorded, and/or tested include natural ground after it has been cleared for receiving fill but before fill is placed, bottoms of all "remedial removal" areas, all key bottoms, and benches made on sloping ground to receive fill.

The Geotechnical Consultant shall observe the moisture-conditioning and processing of the subgrade and fill materials and perform relative compaction testing of fill to determine the attained level of compaction. The Geotechnical Consultant shall provide the test results to the owner and the Contractor on a routine and frequent basis.

1.3 The Earthwork Contractor

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

The Contractor shall prepare and submit to the owner and the Geotechnical Consultant a work plan that indicates the sequence of earthwork grading, the number of "spreads" of work and the estimated quantities of daily earthwork contemplated for the site prior to commencement of grading. The Contractor shall inform the owner and the Geotechnical Consultant of changes in work schedules and updates to the work plan at least 24 hours in advance of such changes so that appropriate observations and tests can be planned and accomplished. The Contractor shall not assume that the Geotechnical Consultant is aware of all grading operations.

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

2.0 Preparation of Areas to be Filled

2.1 Clearing and Grubbing

Vegetation, such as brush, grass, roots, and other deleterious material shall be sufficiently removed and properly disposed of in a method acceptable to the owner, governing agencies, and the Geotechnical Consultant.

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

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

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

2.2 Processing

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

2.3 Overexcavation

In addition to removals and overexcavations recommended in the approved geotechnical report(s) and the grading plan, soft, loose, dry, saturated, spongy, organic-rich, highly fractured or otherwise unsuitable ground shall be overexcavated to competent ground as evaluated by the Geotechnical Consultant during grading.

2.4 Benching

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

Consultant. Fill placed on ground sloping flatter than 5:1 shall also be benched or otherwise overexcavated to provide a flat subgrade for the fill.

2.5 Evaluation/Acceptance of Fill Areas

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

3.0 Fill Material

3.1 General

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

3.2 Oversize

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

3.3 Import

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

4.0 Fill Placement and Compaction

4.1 Fill Layers

Approved fill material shall be placed in areas prepared to receive fill (per Section 3.0) in near-horizontal layers not exceeding 8 inches in loose thickness. The Geotechnical Consultant may accept thicker layers if testing indicates the grading procedures can adequately compact the thicker layers. Each layer shall be spread evenly and mixed thoroughly to attain relative uniformity of material and moisture throughout.

4.2 Fill Moisture Conditioning

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

4.3 Compaction of Fill

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

4.4 Compaction of Fill Slopes

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

4.5 Compaction Testing

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

4.6 Frequency of Compaction Testing

Tests shall be taken at intervals not exceeding 2 feet in vertical rise and/or 1,000 cubic yards of compacted fill soils embankment. In addition, as a guideline, at least one test shall be taken on slope faces for each 5,000 square feet of slope face and/or each 10 feet of vertical height of slope. The Contractor shall assure that fill construction is such that the testing schedule can be accomplished by the Geotechnical Consultant. The Contractor shall stop or slow down the earthwork construction if these minimum standards are not met.

4.7 Compaction Test Locations

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

5.0 Subdrain Installation

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

6.0 Excavation

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

7.0 Trench Backfills

7.1 Safety

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

7.2 Bedding and Backfill

All bedding and backfill of utility trenches shall be performed in accordance with the applicable provisions of Standard Specifications of Public Works Construction. Bedding material shall have a Sand Equivalent greater than 30 (SE>30). The bedding shall be placed to 1 foot over the top of the conduit and densified. Backfill shall be placed and densified to a minimum of 90 percent of relative compaction from 1 foot above the top of the conduit to the surface.

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

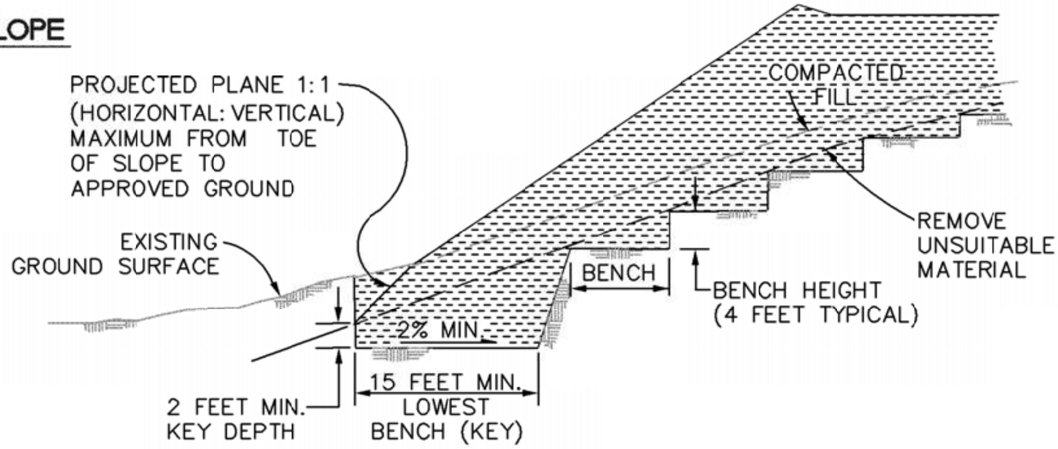
7.3 Lift Thickness

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

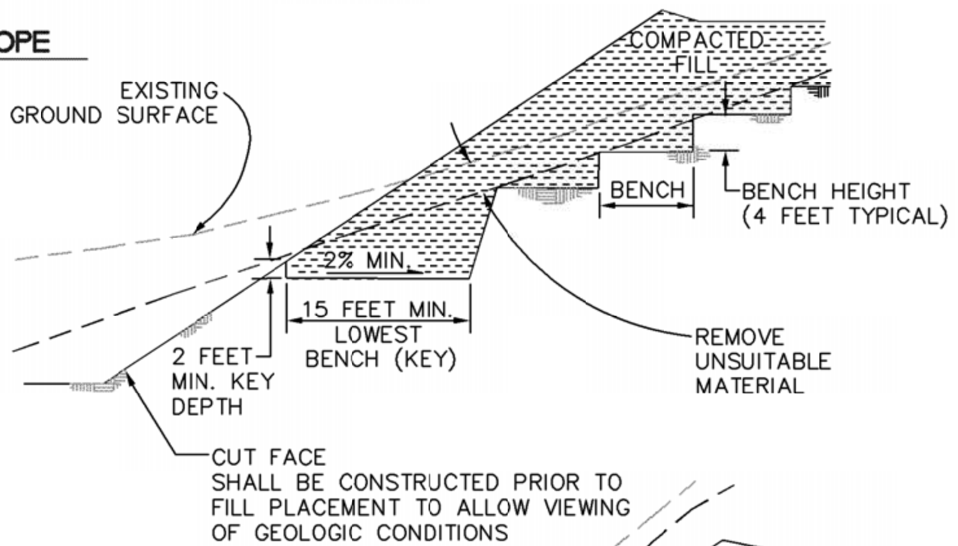
7.4 Observation and Testing

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

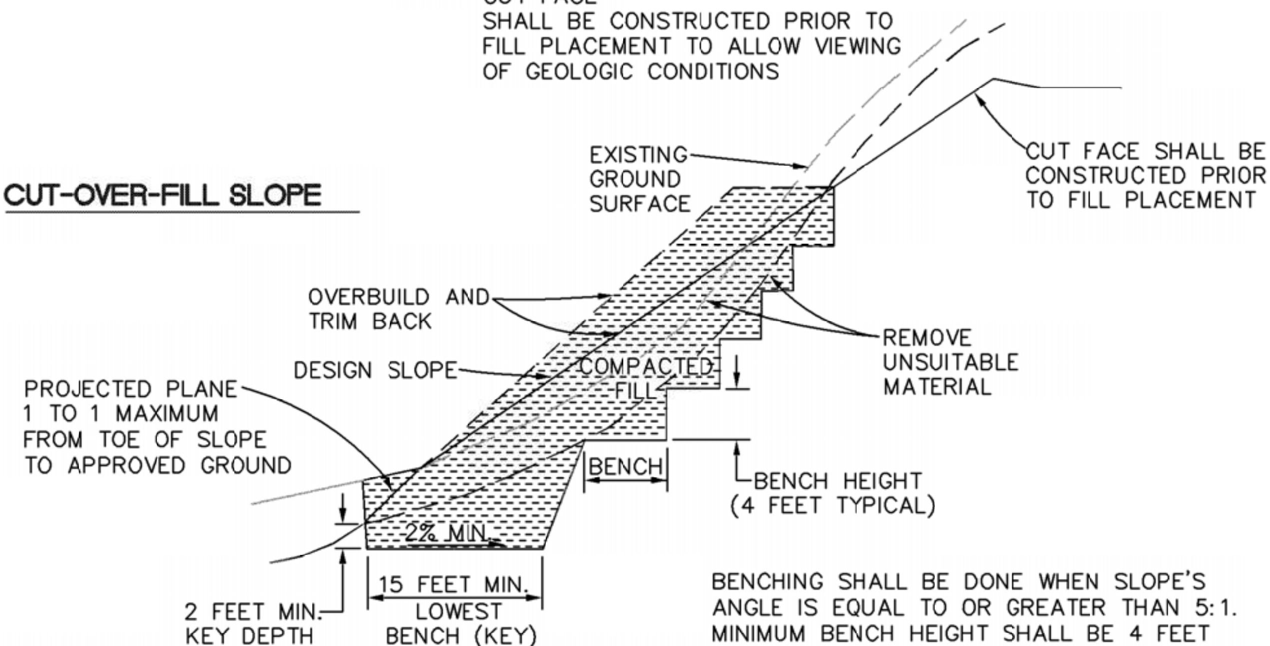
FILL SLOPE



FILL-OVER-CUT SLOPE



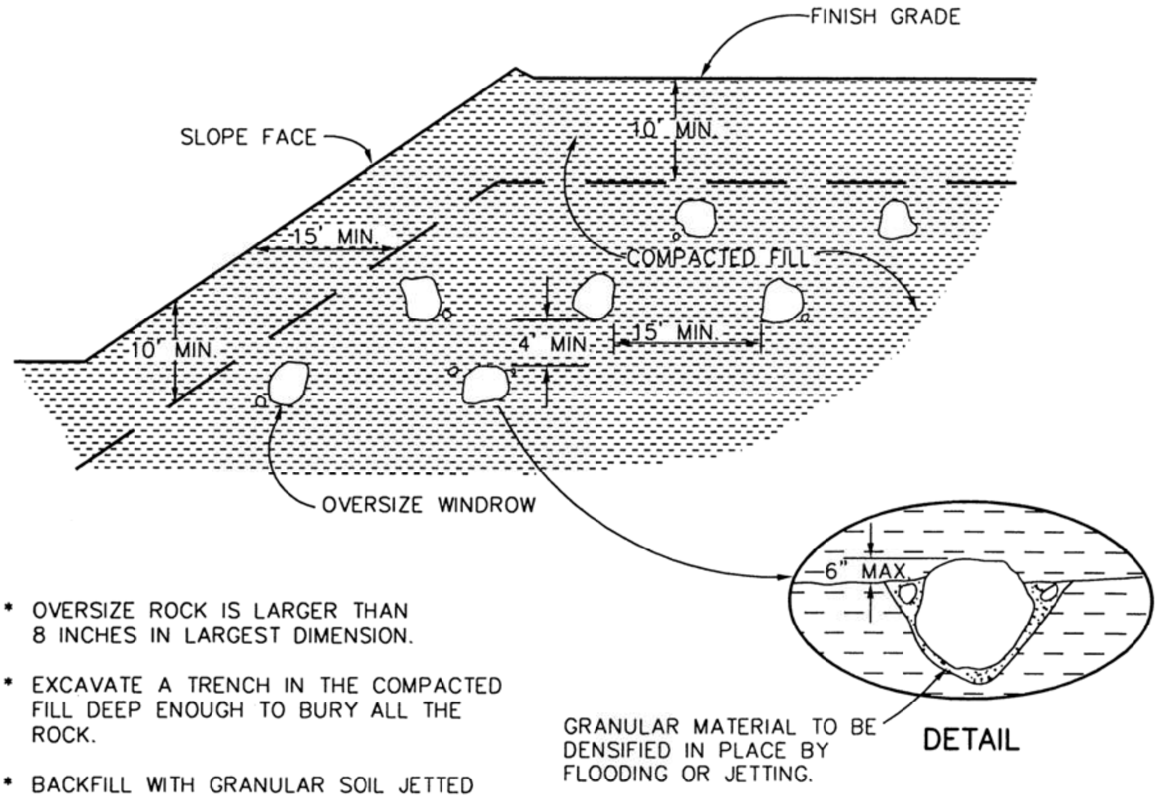
CUT-OVER-FILL SLOPE



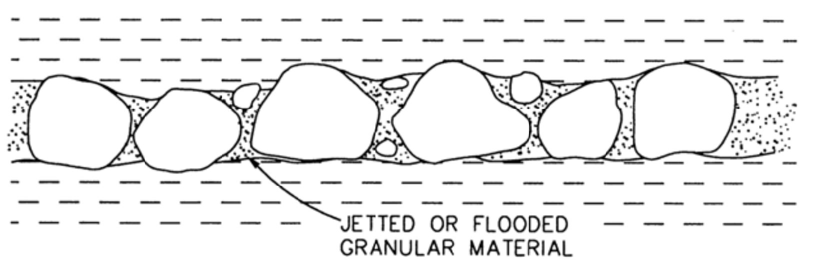
BENCHING SHALL BE DONE WHEN SLOPE'S ANGLE IS EQUAL TO OR GREATER THAN 5:1. MINIMUM BENCH HEIGHT SHALL BE 4 FEET AND MINIMUM FILL WIDTH SHALL BE 9 FEET.

KEYING AND BENCHING

GENERAL EARTHWORK AND GRADING SPECIFICATIONS
STANDARD DETAIL A



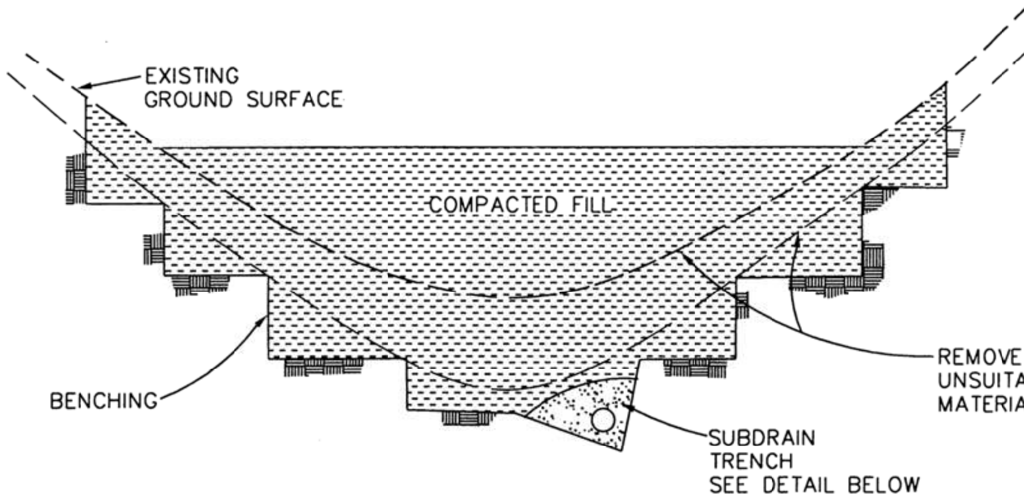
* OVERSIZE ROCK IS LARGER THAN 8 INCHES IN LARGEST DIMENSION.
* EXCAVATE A TRENCH IN THE COMPACTED FILL DEEP ENOUGH TO BURY ALL THE ROCK.
* BACKFILL WITH GRANULAR SOIL JETTED OR FLOODED IN PLACE TO FILL ALL THE VOIDS.
* DO NOT BURY ROCK WITHIN 10 FEET OF FINISH GRADE.
* WINDROW OF BURIED ROCK SHALL BE PARALLEL TO THE FINISHED SLOPE.

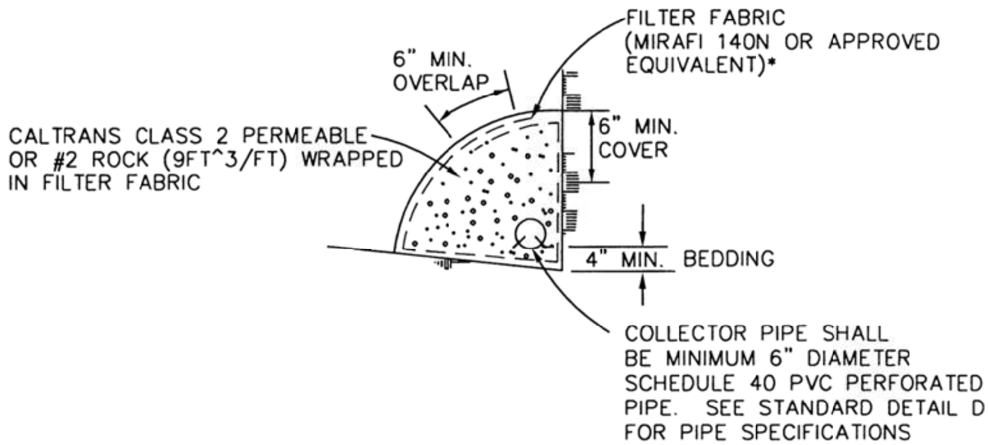


TYPICAL PROFILE ALONG WINDROW

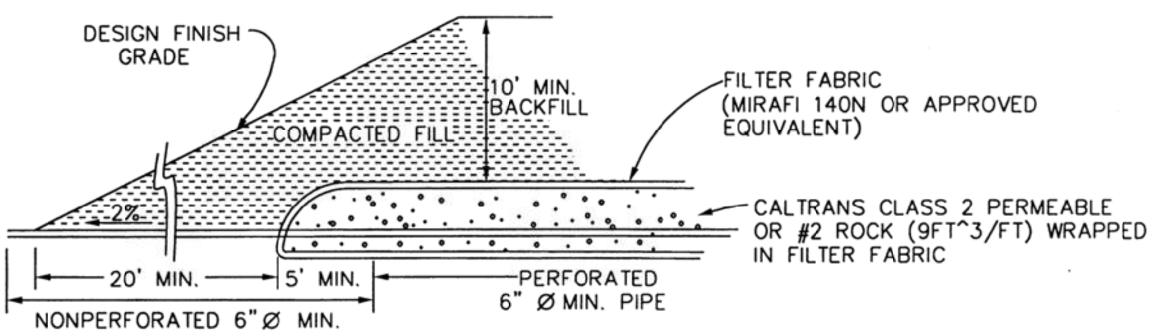
OVERSIZE ROCK DISPOSAL

GENERAL EARTHWORK AND GRADING SPECIFICATIONS
STANDARD DETAIL B



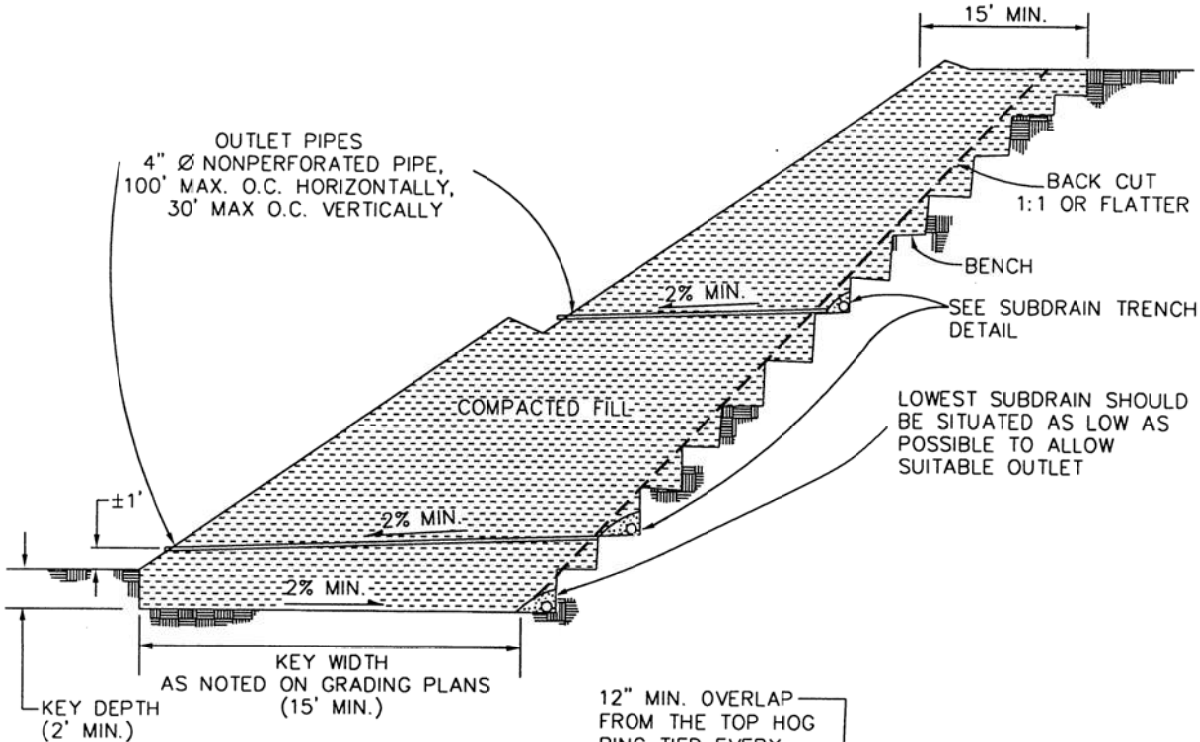


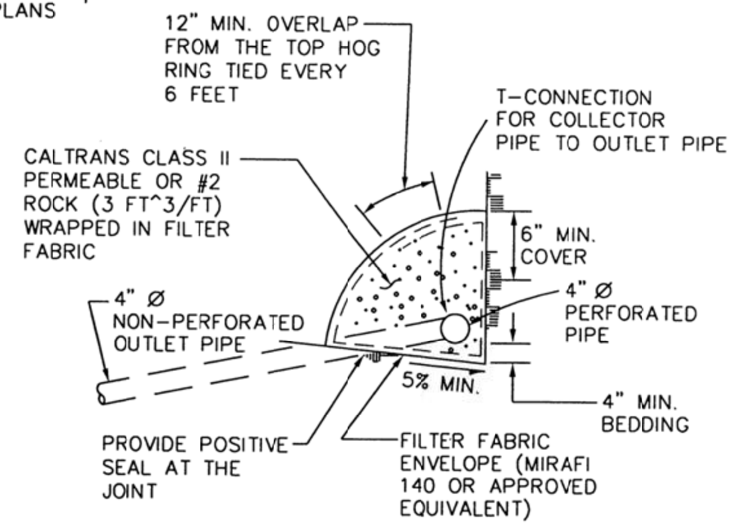
SUBDRAIN DETAIL



DETAIL OF CANYON SUBDRAIN OUTLET

CANYON SUBDRAINS	GENERAL EARTHWORK AND GRADING SPECIFICATIONS STANDARD DETAIL C





SUBDRAIN TRENCH DETAIL

SUBDRAIN INSTALLATION – subdrain collector pipe shall be installed with perforation down or, unless otherwise designated by the geotechnical consultant. Outlet pipes shall be non-perforated pipe. The subdrain pipe shall have at least 8 perforations uniformly spaced per foot. Perforation shall be 1/4" to 1/2" if drill holes are used. All subdrain pipes shall have a gradient of at least 2% towards the outlet.

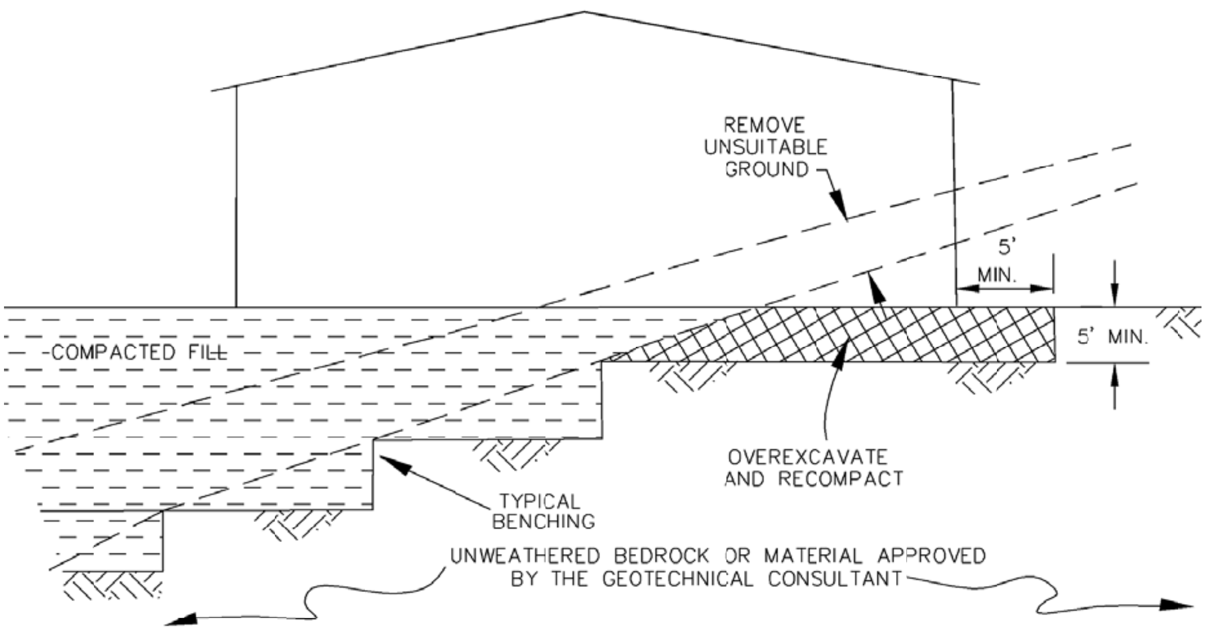
SUBDRAIN PIPE – Subdrain pipe shall be ASTM D2751, SDR 23.5 or ASTM D1527, Schedule 40, or ASTM D3034, SDR 23.5, Schedule 40 Polyvinyl Chloride Plastic (PVC) pipe.

All outlet pipe shall be placed in a trench no wider than twice the subdrain pipe.

BUTTRESS OR REPLACEMENT FILL SUBDRAINS

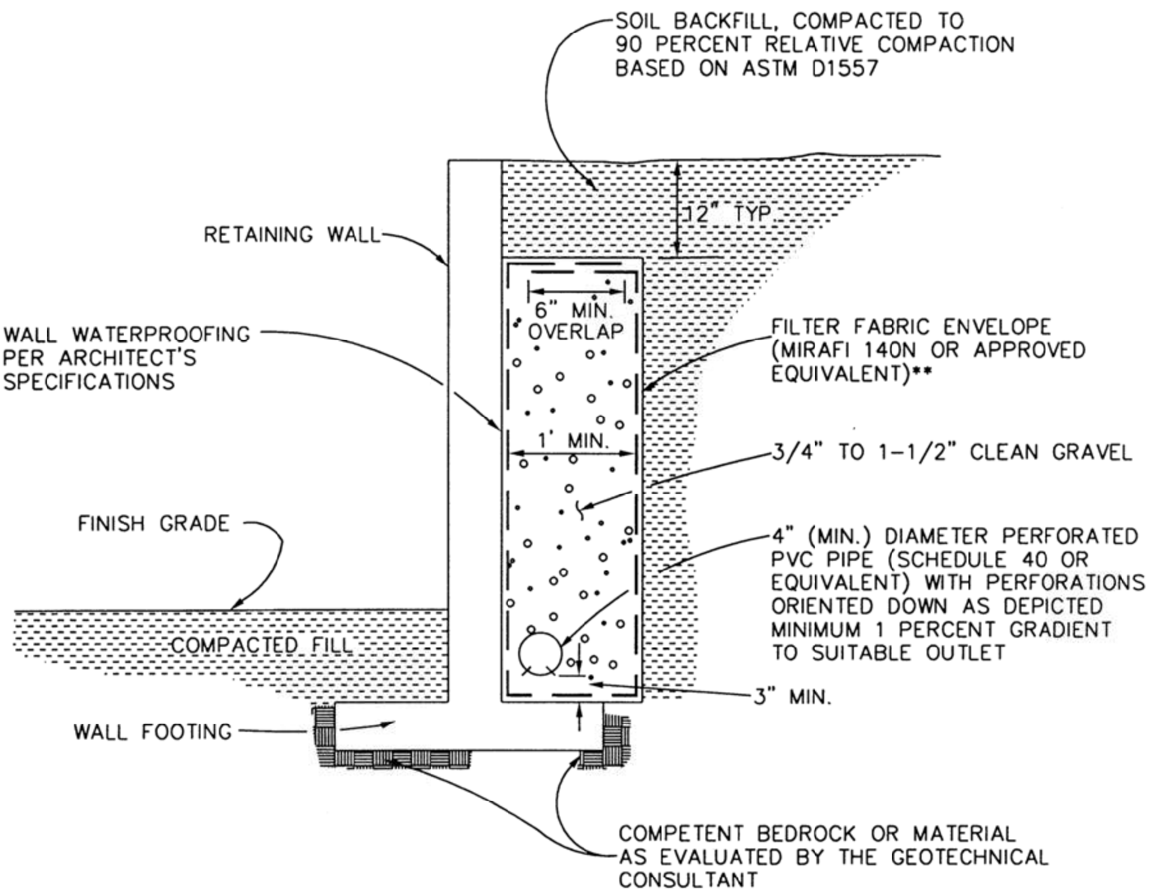
GENERAL EARTHWORK AND
GRADING SPECIFICATIONS
STANDARD DETAIL D

CUT-FILL TRANSITION LOT OVEREXCAVATION



TRANSITION LOT FILLS

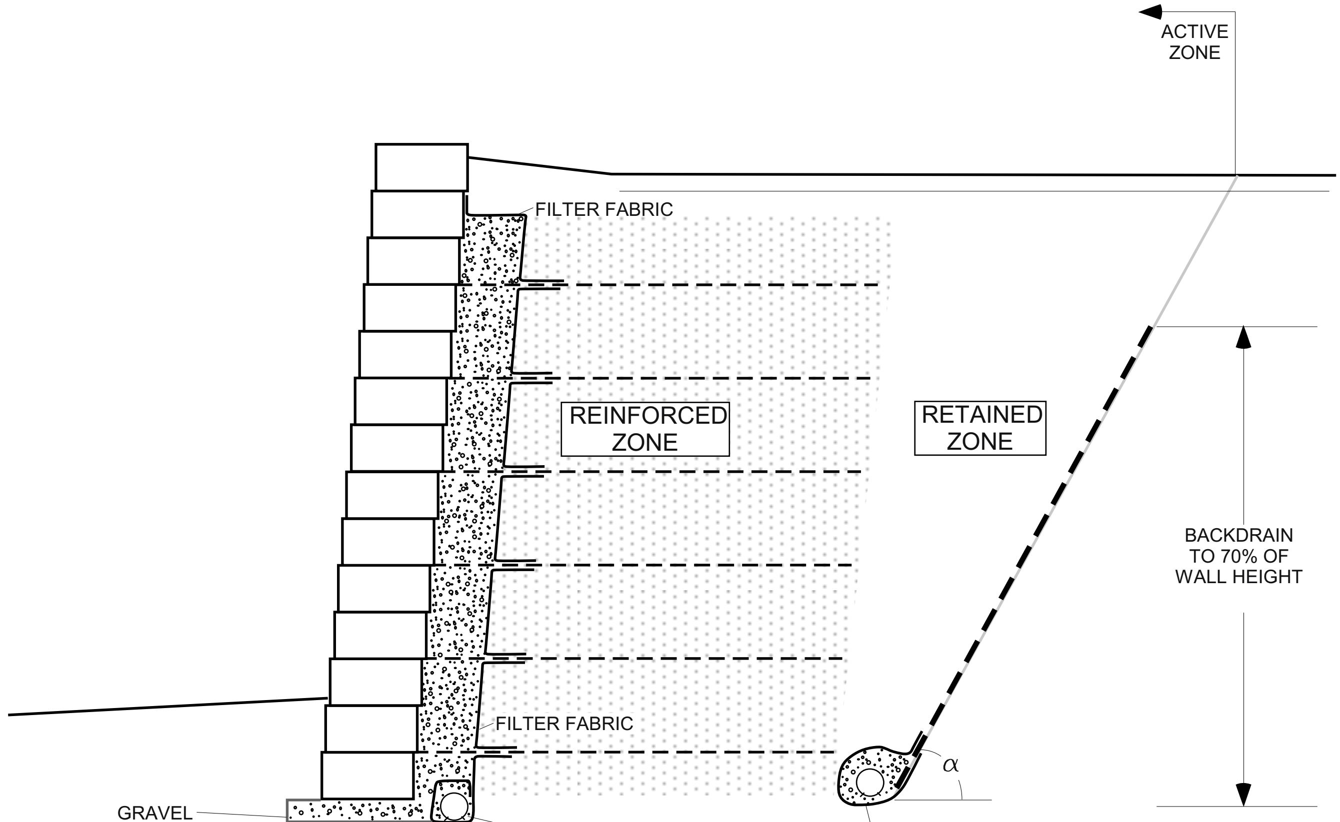
GENERAL EARTHWORK AND
GRADING SPECIFICATIONS
STANDARD DETAIL E



NOTE: UPON REVIEW BY THE GEOTECHNICAL CONSULTANT, COMPOSITE DRAINAGE PRODUCTS SUCH AS MIRADRAIN OR J-DRAIN MAY BE USED AS AN ALTERNATIVE TO GRAVEL OR CLASS 2 PERMEABLE MATERIAL. INSTALLATION SHOULD BE PERFORMED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

RETAINING WALL DRAINAGE

GENERAL EARTHWORK AND
GRADING SPECIFICATIONS
STANDARD DETAIL F



GRAVEL
DRAINAGE FILL
MIN 6" BELOW WALL
MIN 12" BEHIND UNITS AND 24" FROM FACE
WHERE WALL HEIGHT > 10'
SAME AS ABOVE, BUT BELOW UPPER 10'
INCREASE GRAVEL TO
MIN 24" BEHIND UNIT AND 36" FROM FACE
WHERE WALL HEIGHT > 20'
SAME AS ABOVE, BUT BELOW UPPER 20'
INCREASE GRAVEL TO
MIN 36" BEHIND UNIT AND 48" FROM FACE

REAR SUBDRAIN:
4" (MIN) DIAMETER PERFORATED PVC PIPE (SCHEDULE 40 OR EQUIVALENT) WITH PERFORATIONS DOWN. SURROUNDED BY 1 CU. FT/FT OF 3/4" GRAVEL WRAPPED IN FILTER FABRIC (MIRAFI 140N OR EQUIVALENT)

OUTLET SUBDRAINS EVERY 100 FEET, OR CLOSER, BY TIGHTLINE TO SUITABLE PROTECTED OUTLET

NOTES:

1) MATERIAL GRADATION AND PLASTICITY

REINFORCED ZONE:

SIEVE SIZE	% PASSING
1 INCH	100
NO. 4	20-100
NO. 40	0-60
NO. 200	0-35

FOR WALL HEIGHT < 10 FEET, PLASTICITY INDEX < 20 AND LIQUID LIMIT < 40
FOR WALL HEIGHT 10 FEET OR TALLER, PLASTICITY INDEX < 6
FOR TIERED WALLS, USE COMBINED WALL HEIGHTS
FOR WALL HEIGHT > 20 FEET, REDUCE ALLOWABLE RANGE % PASSING NO. 200 SIEVE TO 0-15

GRAVEL DRAINAGE FILL:

SIEVE SIZE	% PASSING
1 INCH	100
3/4 INCH	75-100
NO. 4	0-60
NO. 40	0-50
NO. 200	0-5

2) CONTRACTOR TO USE SOILS WITHIN THE RETAINED AND REINFORCED ZONES THAT MEET THE STRENGTH AND UNIT WEIGHT REQUIREMENTS OF WALL DESIGN.

3) GEOGRID REINFORCEMENT TO BE DESIGNED BY WALL DESIGNER CONSIDERING INTERNAL, EXTERNAL, AND COMPOUND STABILITY.

3) GEOGRID TO BE PRETENSIONED DURING INSTALLATION.

4) IMPROVEMENTS WITHIN THE ACTIVE ZONE ARE SUSCEPTIBLE TO POST-CONSTRUCTION SETTLEMENT. ANGLE $\alpha = 45 + \phi/2$, WHERE ϕ IS THE FRICTION ANGLE OF THE MATERIAL IN THE RETAINED ZONE.

5) BACKDRAIN SHOULD CONSIST OF J-DRAIN 302 (OR EQUIVALENT) OR 6-INCH THICK DRAINAGE FILL WRAPPED IN FILTER FABRIC. PERCENT COVERAGE OF BACKDRAIN TO BE PER GEOTECHNICAL REVIEW.

SEGMENTAL RETAINING WALLS

GENERAL EARTHWORK AND GRADING SPECIFICATIONS
STANDARD DETAIL G

REVISED 11/16

PACKAGE 7A SWQMP

Priority Development Project (PDP) Storm Water Quality Management Plan (SWQMP)

Sharp MMC - Package 7A (PK7A)

NEW TOWER

☐ **Check if electing for offsite alternative compliance**

Engineer of Work:

REGISTERED PROFESSIONAL ENGINEER
MICHAEL A. SLAWSON
No. C056127
Exp. 12-31-22
CIVIL
STATE OF CALIFORNIA
FOR REVIEW ONLY

Michael A. Slawson, PE # C056127

Provide Wet Signature and Stamp Above Line

Prepared For:

Sharp Healthcare

7901 Frost Street

San Diego, CA 92123

(858) 939-8323

Prepared By:

BWE Inc

9449 Balboa Ave, Suite 270

San Diego, CA 92123

(619) 299-5550

Date:

10/07/2022

Approved by: City of San Diego Date

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Project Name: Sharp MMC - Package 7A (PK7A)

Table of Contents

- Attachment 3: Structural BMP Maintenance Plan
    - Maintenance Agreement (Form DS-3247) (when applicable)
- Attachment 4: Copy of Plan Sheets Showing Permanent Storm Water BMPs
- Attachment 5: Project's Drainage Report
- Attachment 6: Project's Geotechnical and Groundwater Investigation Report

Acronyms

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

Project Name: Sharp MMC - Package 7A (PK7A)

Certification Page

Project Name:
Permit Application

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

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

Engineer of Work's Signature

C056127 | 12/31/2022

PE# | Expiration Date

Michael A. Slawson

Print Name

BWE Inc

Company

06/03/2022

Date

Engineer's Stamp

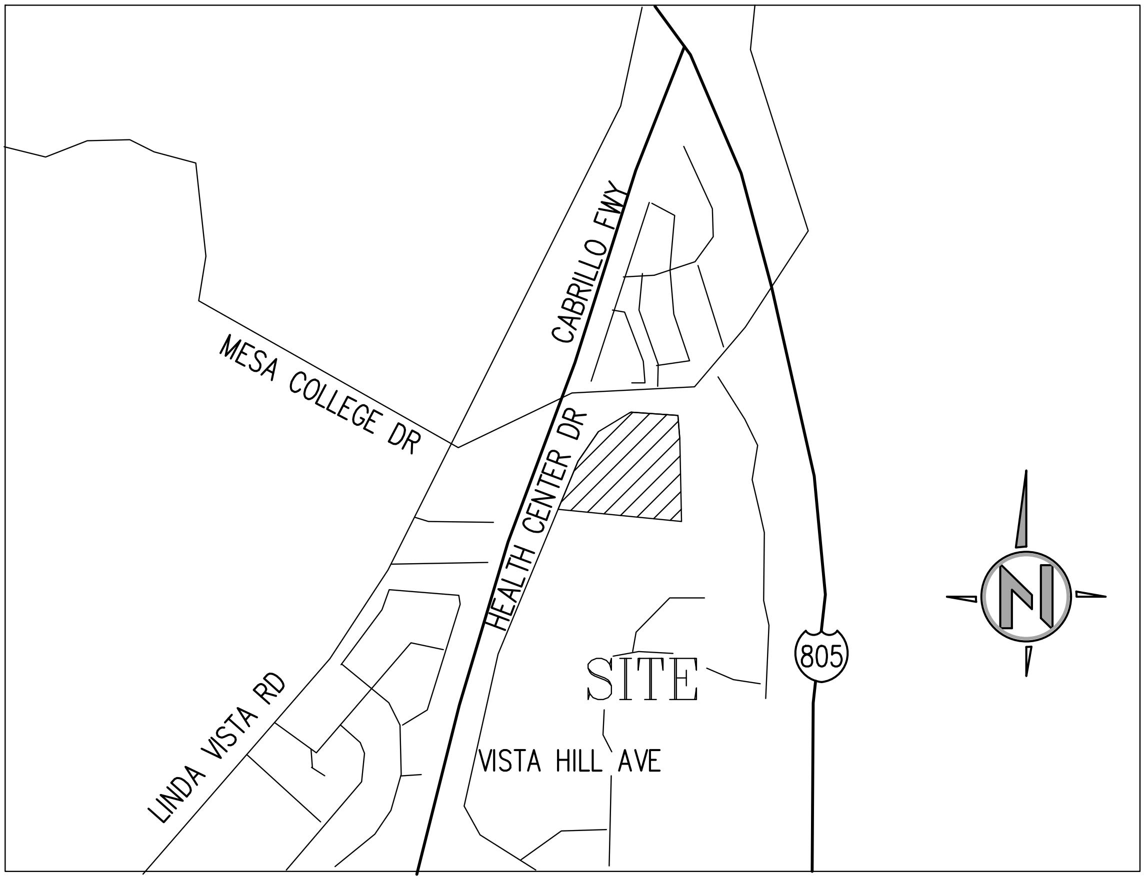
Submittal Record

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

Submittal Number	Date	Project Status	Changes
1	07/09/2021	☑ **Preliminary Design/Planning/CEQA** ☐ **Final Design**	**Initial Submittal**
2		☐ **Preliminary Design/Planning/CEQA** ☐ **Final Design**	
3		☐ **Preliminary Design/Planning/CEQA** ☐ **Final Design**	
4		☐ **Preliminary Design/Planning/CEQA** ☐ **Final Design**	

Project Vicinity Map

Project Name: Sharp MMC - Package 7A (PK7A)
Permit Application



City of San Diego Form DS-560 Storm Water Requirements Applicability Checklist

Attach DS-560 form.

Development Services

THE CITY OF SAN DIEGO

FORM
DS-560
September 2021

Stormwater Requirements Applicability Checklist

Project Address: 7901 Frost Street, San Diego, CA

Project Number:

SECTION 1: Construction Stormwater Best Management Practices (BMP) Requirements

All construction sites are required to implement construction BMPs per the performance standards in the Stormwater Standards Manual. Some sites are also required to obtain coverage under the State Construction General Permit (CGP)[1], administered by the California State Water Resources Control Board.

For all projects, complete Part A - If the project is required to submit a Stormwater Pollution Prevention Plan (SWPPP) or Water Pollution Control Plan (WPCP), continue to Part B.

PART A – Determine Construction Phase Stormwater Requirements

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

   ◉ Yes, SWPPP is required; skip questions 2-4. ○ No; proceed to the next question.

2. Does the project propose construction or demolition activity, including but not limited to, clearing, grading, grubbing, excavation, or any other activity resulting in ground disturbance and/or contact with stormwater?

   ○ Yes, WPCP is required; skip questions 3-4. ○ No; proceed to the next question.

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

   ○ Yes, WPCP is required; skip question 4. ○ No; proceed to the next question.

4. Does the project only include the following Permit types listed below?

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

   ☐ Yes, no document is required.

Check one of the boxes below and continue to Part B

◉ **If you checked "Yes" for question 1**, an SWPPP is REQUIRED – **continue to Part B**

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

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

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

CLEAR FORM

PART B – Determine Construction Site Priority

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

Complete Part B and continue to Section 2

☐ **1. ASBS**

A. Projects located in the ASBS watershed.

☑ **2. High Priority**

A. Projects that qualify as Risk Level 2 or Risk Level 3 per the Construction General Permit (CGP) and are not located in the ASBS watershed.
B. Projects that qualify as LUP Type 2 or LUP Type 3 per the CGP and are not located in the ASBS watershed.

☐ **3. Medium Priority**

A. Projects that are not located in an ASBS watershed or designated as a High priority site.
B. Projects that qualify as Risk Level 1 or LUP Type 1 per the CGP and are not located in an ASBS watershed.
C. WPCP projects (>5,000 square feet of ground disturbance) located within the Los Peñasquitos watershed management area.

☐ **4. Low Priority**

A. Projects not subject to a Medium or High site priority designation and are not located in an ASBS watershed.

Section 2: Construction Stormwater BMP Requirements

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

PART C – Determine if Not Subject to Permanent Stormwater Requirements

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

- **If "yes" is checked for any number in Part C**: Proceed to Part F and check "Not Subject to Permanent Stormwater BMP Requirements."
- **If "no" is checked for all the numbers in Part C:** Continue to Part D.

1. Does the project only include interior remodels and/or is the project entirely within an existing enclosed structure and does not have the potential to contact stormwater?

   ○ Yes ◉ No

2. Does the project only include the construction of overhead or underground utilities without creating new impervious surfaces?

   ○ Yes ◉ No

3. Does the project fall under routine maintenance? Examples include but are not limited to roof or exterior structure surface replacement, resurfacing or reconfiguring surface parking lots or existing roadways without expanding the impervious footprint, and routine replacement of damaged pavement (grinding, overlay and pothole repair).

   ○ Yes ◉ No

CLEAR FORM

PART D – PDP Exempt Requirements

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

- **If "yes" is checked for any questions in Part D**, continue to Part F and check the box labeled "PDP Exempt."
- **If "no" is checked for all questions in Part D**, continue to Part E.

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

   ○ Yes, PDP exempt requirements apply ◉ No, proceed to next question

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

   ○ Yes, PDP exempt requirements apply ◉ No, proceed to next question

PART E – Determine if Project is a Priority Development Project (PDP)

Projects that match one of the definitions below are subject to additional requirements, including preparation of a Stormwater Quality Management Plan (SWQMP).

- **If "yes" is checked for any number in Part E**, continue to Part F and check the box labeled "Priority Development Project."
- **If "no" is checked for every number in Part E**, continue to Part F and check the box labeled "Standard Development Project."

1. **New development that creates 10,000 square feet or more of impervious surfaces collectively over the project site.** This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land. ○ Yes ◉ No

2. **Redevelopment project that creates and/or replaces 5,000 square feet or more of impervious surfaces on an existing site of 10,000 square feet or more of impervious surfaces.** This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land. ◉ Yes ○ No

3. **New development or redevelopment of a restaurant.** Facilities that sell prepared foods and beverages for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (Standard Industrial Classification (SIC) 5812), and where the land development creates and/or replaces 5,000 square feet or more of impervious surface. ○ Yes ◉ No

4. **New development or redevelopment on a hillside.** The project creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site) and where the development will grade on any natural slope that is twenty-five percent or greater. ○ Yes ◉ No

5. **New development or redevelopment of a parking lot that creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site).** ○ Yes ◉ No

6. **New development or redevelopment of streets, roads, highways, freeways, and driveways.** The project creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site). ○ Yes ◉ No

CLEAR FORM

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

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

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

10. **Other Pollutant Generating Project.** These projects are not covered in any of the categories above but involve the disturbance of one or more acres of land and are expected to generate post-construction phase pollutants, including fertilizers and pesticides. This category does not include projects creating less than 5,000 square feet of impervious area and projects containing landscaping without a requirement for the regular use of fertilizers and pesticides (such as a slope stabilization project using native plants). Impervious area calculations need not include linear pathways for infrequent vehicle use, such as emergency maintenance access or bicycle and pedestrian paths if the linear pathways are built with pervious surfaces or if runoff from the pathway sheet flows to adjacent pervious areas. ○ Yes ◉ No

PART F – Select the appropriate category based on the outcomes of Part C through Part E

1. The project is **NOT SUBJECT TO PERMANENT STORMWATER REQUIREMENTS** ○ Yes ○ No

2. The project is a **STANDARD DEVELOPMENT PROJECT**. Site design and source control BMP requirements apply. See the Stormwater Standards Manual for guidance. ○ Yes ○ No

3. The Project is **PDP EXEMPT**. Site design and source control BMP requirements apply. Refer to the Stormwater Standards Manual for guidance. ○ Yes ○ No

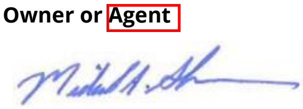
4. The project is a **PRIORITY DEVELOPMENT PROJECT**. Site design, source control and structural pollutant control BMP requirements apply. Refer to the Stormwater Standards Manual for guidance on determining if the project requires hydromodification plan management. ○ Yes ◉ No

Michael A. Slawson

Name of Owner or Agent

Principal

Title



Signature

06/03/2022

Date

CLEAR FORM

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

<table>
<tr><th colspan="2">Applicability of Permanent, Post-Construction Storm Water BMP Requirements</th><th>Form I-1</th></tr>
<tr><td colspan="3">Project Identification</td></tr>
<tr><td colspan="3">Project Name: Sharp MMC - Package 7A (PK7A)</td></tr>
<tr><td colspan="2">Permit Application Number:</td><td>Date: 07/09/2021</td></tr>
<tr><td colspan="3">Determination of Requirements</td></tr>
<tr><td colspan="3">The purpose of this form is to identify permanent, post-construction requirements that apply to the project. This form serves as a short <u>summary</u> of applicable requirements, in some cases referencing separate forms that will serve as the backup for the determination of requirements.

Answer each step below, starting with Step 1 and progressing through each step until reaching "Stop". Refer to the manual sections and/or separate forms referenced in each step below.</td></tr>
<tr><td>Step</td><td>Answer</td><td>Progression</td></tr>
<tr><td rowspan="2">Step 1: Is the project a "development project"? See Section 1.3 of the manual (Part 1 of Storm Water Standards) for guidance.</td><td>☑ Yes</td><td>Go to Step 2.</td></tr>
<tr><td>☐ No</td><td>Stop. Permanent BMP requirements do not apply. No SWQMP will be required. Provide discussion below.</td></tr>
<tr><td colspan="3">Discussion / justification if the project is <u>not</u> a "development project" (e.g., the project includes only interior remodels within an existing building):</td></tr>
<tr><td rowspan="3">Step 2: Is the project a Standard Project, PDP, or PDP Exempt?
To answer this item, see Section 1.4 of the manual in its entirety for guidance AND complete Form DS-560, Storm Water Requirements Applicability Checklist.</td><td>☐ Standard Project</td><td>Stop. Standard Project requirements apply</td></tr>
<tr><td>☑ PDP</td><td>PDP requirements apply, including PDP SWQMP. Go to Step 3.</td></tr>
<tr><td>☐ PDP Exempt</td><td>Stop. Standard Project requirements apply. Provide discussion and list any additional requirements below.</td></tr>
<tr><td colspan="3">Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:</td></tr>
</table>

Project Name: Sharp MMC - Package 7A (PK7A)

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

HMP Exemption Exhibit

Attach a HMP Exemption Exhibit that shows direct storm water runoff discharge from the project site to HMP exempt area. Include project area, applicable underground storm drain line and/or concrete lined channels, outfall information and exempt waterbody. Reference applicable drawing number(s).

Exhibit must be provided on 11"x17" or larger paper.

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Site Information Checklist For PDPs	Form I-3B
Project Summary Information	
Project Name	Sharp MMC - Package 7A (PK7A)
Project Address	7901 Frost Street, San Diego, CA 92123
Assessor's Parcel Number(s) (APN(s))	427-530-14-00
Permit Application Number	
Project Watershed	Select One: ☐ San Dieguito River ☐ Penasquitos ☐ Mission Bay ☑ San Diego River ☐ San Diego Bay ☐ Tijuana River
Hydrologic subarea name with Numeric Identifier up to two decimal places (9XX.XX)	Mission San Diego, 907.11
Project Area (total area of Assessor's Parcel(s) associated with the project or total area of the right-of-way)	20.49 Acres (892,544 Square Feet)
Area to be disturbed by the project (Project Footprint)	1.88 Acres (81,785 Square Feet)
Project Proposed Impervious Area (subset of Project Footprint)	1.76 Acres (76,458 Square Feet)
Project Proposed Pervious Area (subset of Project Footprint)	0.12 Acres (5,327 Square Feet)
Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Project Area.	
The proposed increase or decrease in impervious area in the proposed condition as compared to the pre-project condition	-3.6 %

Project Name: Sharp MMC - Package 7A (PK7A)

Form I-3B Page 2 of 11
Description of Existing Site Condition and Drainage Patterns
Current Status of the Site (select all that apply): ☑ Existing development ☐ Previously graded but not built out ☐ Agricultural or other non-impervious use ☐ Vacant, undeveloped/natural Description / Additional Information: The existing site is a medical facility with associated parking and pervious features.
Existing Land Cover Includes (select all that apply): ☑ Vegetative Cover ☐ Non-Vegetated Pervious Areas ☑ Impervious Areas Description / Additional Information: The majority of the existing land cover is impervious with the medical facility and associated parking and sidewalk areas. There is a small amount of pervious landscaping in the parking lot islands and near the buildings.
Underlying Soil belongs to Hydrologic Soil Group (select all that apply): ☐ NRCS Type A ☐ NRCS Type B ☐ NRCS Type C ☑ NRCS Type D
Approximate Depth to Groundwater: ☐ Groundwater Depth < 5 feet ☐ 5 feet < Groundwater Depth < 10 feet ☐ 10 feet < Groundwater Depth < 20 feet ☑ Groundwater Depth > 20 feet
Existing Natural Hydrologic Features (select all that apply): ☐ Watercourses ☐ Seeps ☐ Springs ☐ Wetlands ☑ None Description / Additional Information:

Form I-3B Page 3 of 11

Description of Existing Site Topography and Drainage

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

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

Descriptions/Additional Information

There are two discharge locations for runoff from the Package 7A project area. Existing drainage conveyance within the project area is urban.

Off-site runoff from northeast is collected by catch basins and private storm drains to the northeast of the project area. Runoff from the north portion of Package 7A project area is also collected by catch basins and storm drains and discharged to a 24" PVC private storm drain (POC #1) that flows west towards Mary Birch Lane and Health Center Drive, where it connects to the City's storm drain system and crosses under Health Center Drive and eventually to Tecolote Creek, Mission Bay, and ultimately the Pacific Ocean.

The southern portion of the Package 7A project area generally flows from northeast to southwest. Through a series of gutters, runoff sheet flows to an existing inlet located south of the project on Meadow Lark Dr. The existing 18" RCP pipe (POC #2) flows to the San Diego River and ultimately to the Pacific Ocean. See Attachment 5 for more detailed information.

Discharge Point #	Area (Acres) Total Area	Imp. Area (Ai)	Actual % Imperviousness	Calculated Revised Runoff Coeff. (C)	Used Runoff Coef. (C)
1 & 2	5.54	5.00	90%	0.96	0.85

Discharge Point(s) #	Drainage Area (acres) Existing Condition	100 Yr Flow (cfs) Existing Condition
1	3.34	15.40
2	2.20	8.45
Total	5.54	23.85

Form I-3B Page 4 of 11
Description of Proposed Site Development and Drainage Patterns
Project Description / Proposed Land Use and/or Activities: The proposed project includes the development of a medical facility, ramp, engineering shop building, parking, and associated hardscape and landscape.
List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features): The proposed impervious features include a medical building, ramp, parking area, and an engineering shop building.
List/describe proposed pervious features of the project (e.g., landscape areas): The pervious features is landscaping as well as permeable pavers.
Does the project include grading and changes to site topography? ☑ Yes ☐ No Description / Additional Information: There are minor changes to grading and site topography. Proposed storm drain changes the drainage patterns on-site to match historical drainage conditions. See Drainage Report in Attachment 5 for more information on historical drainage conditions.

Form I-3B Page 5 of 11

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

☑ Yes

☐ No

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

Description / Additional Information:

The northern portion of the roof drainage from the proposed New Tower building drains via roof drains to a Modular Wetland System (BMP #9) for pollutant control mitigation and underground vault storage system (BMP #10) for hydromodification mitigation and then is piped by private storm drains to city storm drain system at Birmingham Way (POC #2). Drainage from Package 7a project area to POC #1 to Health Center Drive is eliminated in proposed conditions.

The majority of the project area continues to sheet flow from northeast to southwest. Catch basins are proposed on the northern portion of the site to convey runoff to the biofiltration basin (BMP #2) along with an underground vault (BMP #3). The southern portion of the site sheet flows to the biofiltration basin through curb and gutters and curb cuts and then to the underground vault. The underground vault is connected to an outlet control structure for hydromodification control. The treated runoff is conveyed to the existing inlet along Birmingham Way (POC #2), leaving the site through an 18" RCP. See Attachment 5 for calculations and more detailed information.

Discharge Point #	Area (Acres)		Actual % Imperviousness	Calculated Revised Runoff Coeff. (C)	Used Runoff Coeff. (C)
	Total Area	Imp. Area (Ai)			
1 & 2	5.66	5.10	90%	0.96	0.85

	Drainage Area (acres)		100 Yr Flow (cfs)		
Discharge Point(s) #	Existing Condition	Proposed Condition	Existing Condition	Proposed Condition (Unmitigated)	% Change from Existing Condition
1	3.34		15.40		
2	2.20	5.66	8.45	26.10	
Total	5.54	5.66	23.85	26.10	9.43%

Project Name: Sharp MMC - Package 7A (PK7A)

Form I-3B Page 6 of 11
Identify whether any of the following features, activities, and/or pollutant source areas will be present (select all that apply): ☑ Onsite storm drain inlets ☐ Interior floor drains and elevator shaft sump pumps ☐ Interior parking garages ☐ Need for future indoor & structural pest control ☑ Landscape/outdoor pesticide use ☐ Pools, spas, ponds, decorative fountains, and other water features ☐ Food service ☐ Refuse areas ☐ Industrial processes ☐ Outdoor storage of equipment or materials ☐ Vehicle and equipment cleaning ☐ Vehicle/equipment repair and maintenance ☐ Fuel dispensing areas ☐ Loading docks ☑ Fire sprinkler test water ☑ Miscellaneous drain or wash water ☑ Plazas, sidewalks, and parking lots Description/Additional Information:

Form I-3B Page 7 of 11
Identification and Narrative of Receiving Water
Narrative describing flow path from discharge location(s), through urban storm conveyance system, to receiving creeks, rivers, and lagoons and ultimate discharge location to Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable) In proposed conditions, the runoff from the project area flows to the inlet located on Birmingham Way (POC 1), which drains to the San Diego River (~2 miles from the project site). The San Diego River ultimately drains to the Pacific Ocean (~8.3 miles from the project site).
Provide a summary of all beneficial uses of receiving waters downstream of the project discharge locations The beneficial uses of receiving waters are: cold freshwater habitat, industrial service supply, municipal and domestic supply, rare, threatened or endangered species, water contact recreation, non-contact water recreation, warm freshwater habitat, and wildlife habitat.
Identify all ASBS (areas of special biological significance) receiving waters downstream of the project discharge locations There are no ASBS receiving water downstream of the project discharge locations.
Provide distance from project outfall location to impaired or sensitive receiving waters The distance from the Lower San Diego River is approximately 2 miles from the project site.
Summarize information regarding the proximity of the permanent, post-construction storm water BMPs to the City's Multi-Habitat Planning Area and environmentally sensitive lands The proposed permanent, post-construction stormwater BMPs are approximately 0.1 miles from the closest Multi-Habitat Planning Area and approximately 0.6 miles to the closest environmentally sensitive lands.

Project Name: Sharp MMC - Package 7A (PK7A)

Form I-3B Page 8 of 11		
Identification of Receiving Water Pollutants of Concern		
List any 303(d) impaired water bodies within the path of storm water from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable), identify the pollutant(s)/stressor(s) causing impairment, and identify any TMDLs and/or Highest Priority Pollutants from the WQIP for the impaired water bodies:		
303(d) Impaired Water Body (Refer to Appendix K)	Pollutant(s)/Stressor(s) (Refer to Appendix K)	TMDLs/WQIP Highest Priority Pollutant (Refer to Table 1-4 in Chapter 1)
San Diego River (Lower)	Benthic community effects, Cadium	Indicator Bacteria
San Diego River (Lower)	Indicator Bacteria, Nitrogen, Toxicity	Indicator Bacteria
San Diego River (Lower)	Dissolved Oxygen, Phosphorus	Indicator Bacteria
San Diego River (Lower)	Total Dissolved Solids	Indicator Bacteria
Pacific Ocean Shoreline	Indicator Bacteria, Trash	Indicator Bacteria
Alvarado Creek	Nitrogen, Selenium	
Famosa, Slough and Channel	Eutropic	

Identification of Project Site Pollutants*			
*Identification of project site pollutants is only required if flow-thru treatment BMPs are implemented onsite in lieu of retention or biofiltration BMPs (note the project must also participate in an alternative compliance program unless prior lawful approval to meet earlier PDP requirements is demonstrated) Identify pollutants anticipated from the project site based on all proposed use(s) of the site (see Appendix B.6):			
Pollutant	Not Applicable to the Project Site	Anticipated from the Project Site	Also a Receiving Water Pollutant of Concern
Sediment	☐	☐	☐
Nutrients	☐	☐	☐
Heavy Metals	☐	☐	☐
Organic Compounds	☐	☐	☐
Trash & Debris	☐	☐	☐
Oxygen Demanding Substances	☐	☐	☐
Oil & Grease	☐	☐	☐
Bacteria & Viruses	☐	☐	☐
Pesticides	☐	☐	☐

Form I-3B Page 9 of 11

Hydromodification Management Requirements

Do hydromodification management requirements apply (see Section 1.6)?

☑ Yes, hydromodification management flow control structural BMPs required.

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

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

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

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

Note: If "No" answer has been selected the SWQMP must include an exhibit that shows the storm water conveyance system from the project site to an exempt water body. The exhibit should include details about the conveyance system and the outfall to the exempt water body.

Critical Coarse Sediment Yield Areas*
***This Section only required if hydromodification management requirements apply**

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

☐ Yes

☑ No

Discussion / Additional Information:

Per the Potential Critical Coarse Sediment Yield Area Map of the Watershed Management Area Analysis (WMAA), there are no CCSYAs located onsite or upstream of the project. See the Critical Coarse Yield Area Exhibit in Attachment 2.

Form I-3B Page 10 of 11
Flow Control for Post-Project Runoff*   ***This Section only required if hydromodification management requirements apply**
List and describe point(s) of compliance (POCs) for flow control for hydromodification management (see Section 6.3.1). For each POC, provide a POC identification name or number correlating to the project's HMP Exhibit and a receiving channel identification name or number correlating to the project's HMP Exhibit.   The point of compliance (POC#2) is located at the existing inlet along Birmingham Way. From POC #2, the run-off is conveyed to the San Diego River through an 18" RCP (~2 miles from the project site). The San Diego River ultimately drains to the Pacific Ocean (~8.3 miles from the project site).
Has a geomorphic assessment been performed for the receiving channel(s)?   ☑ No, the low flow threshold is $0.1Q_2$ (default low flow threshold)   ☐ Yes, the result is the low flow threshold is $0.1Q_2$ ☐ Yes, the result is the low flow threshold is $0.3Q_2$ ☐ Yes, the result is the low flow threshold is $0.5Q_2$ If a geomorphic assessment has been performed, provide title, date, and preparer:
Discussion / Additional Information: (optional)

Form I-3B Page 11 of 11
Other Site Requirements and Constraints
When applicable, list other site requirements or constraints that will influence storm water management design, such as zoning requirements including setbacks and open space, or local codes governing minimum street width, sidewalk construction, allowable pavement types, and drainage requirements. Not Applicable
Optional Additional Information or Continuation of Previous Sections As Needed
This space provided for additional information or continuation of information from previous sections as needed. Not Applicable

Source Control BMP Checklist for PDPs	Form I-4B
Source Control BMPs	
All development projects must implement source control BMPs where applicable and feasible. See Chapter 4 and Appendix E of the BMP Design Manual (Part 1 of the Storm Water Standards) for information to implement source control BMPs shown in this checklist. Answer each category below pursuant to the following. • "Yes" means the project will implement the source control BMP as described in Chapter 4 and/or Appendix E of the BMP Design Manual. Discussion / justification is not required. • "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided. • "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification may be provided.	
Source Control Requirement	**Applied?**
4.2.1 Prevention of Illicit Discharges into the MS4	☑ Yes ☐ No ☐ N/A
Discussion / justification if 4.2.1 not implemented:	
4.2.2 Storm Drain Stenciling or Signage	☑ Yes ☐ No ☐ N/A
Discussion / justification if 4.2.2 not implemented:	
4.2.3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes ☐ No ☑ N/A
Discussion / justification if 4.2.3 not implemented:	
4.2.4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes ☐ No ☑ N/A
Discussion / justification if 4.2.4 not implemented:	
4.2.5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes ☐ No ☑ N/A
Discussion / justification if 4.2.5 not implemented:	

Form I-4B Page 2 of 2			
Source Control Requirement	**Applied?**		
4.2.6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below)			
On-site storm drain inlets	☑ Yes	☐ No	☐ N/A
Interior floor drains and elevator shaft sump pumps	☐ Yes	☐ No	☑ N/A
Interior parking garages	☐ Yes	☐ No	☑ N/A
Need for future indoor & structural pest control	☐ Yes	☐ No	☑ N/A
Landscape/Outdoor Pesticide Use	☑ Yes	☐ No	☐ N/A
Pools, spas, ponds, decorative fountains, and other water features	☐ Yes	☐ No	☑ N/A
Food service	☐ Yes	☐ No	☑ N/A
Refuse areas	☐ Yes	☐ No	☑ N/A
Industrial processes	☐ Yes	☐ No	☑ N/A
Outdoor storage of equipment or materials	☐ Yes	☐ No	☑ N/A
Vehicle/Equipment Repair and Maintenance	☐ Yes	☐ No	☑ N/A
Fuel Dispensing Areas	☐ Yes	☐ No	☑ N/A
Loading Docks	☐ Yes	☐ No	☑ N/A
Fire Sprinkler Test Water	☑ Yes	☐ No	☐ N/A
Miscellaneous Drain or Wash Water	☑ Yes	☐ No	☐ N/A
Plazas, sidewalks, and parking lots	☑ Yes	☐ No	☐ N/A
SC-6A: Large Trash Generating Facilities	☐ Yes	☐ No	☑ N/A
SC-6B: Animal Facilities	☐ Yes	☐ No	☑ N/A
SC-6C: Plant Nurseries and Garden Centers	☐ Yes	☐ No	☑ N/A
SC-6D: Automotive Facilities	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.2.6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for all "No" answers shown above.			

Site Design BMP Checklist for PDPs			Form I-5B
Site Design BMPs			
All development projects must implement site design BMPs where applicable and feasible. See Chapter 4 and Appendix E of the BMP Design Manual (Part 1 of Storm Water Standards) for information to implement site design BMPs shown in this checklist. Answer each category below pursuant to the following. • "Yes" means the project will implement the site design BMP as described in Chapter 4 and/or Appendix E of the BMP Design Manual. Discussion / justification is not required. • "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided. • "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification may be provided. A site map with implemented site design BMPs must be included at the end of this checklist.			
Site Design Requirement	**Applied?**		
4.3.1 Maintain Natural Drainage Pathways and Hydrologic Features	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.3.1 not implemented: There are no natural drainage pathways or hydrologic features on-site.			
1-1 Are existing natural drainage pathways and hydrologic features mapped on the site map?	☐ Yes	☐ No	☑ N/A
1-2 Are trees implemented? If yes, are they shown on the site map?	☐ Yes	☐ No	☑ N/A
1-3 Implemented trees meet the design criteria in 4.3.1 Fact Sheet (e.g. soil volume, maximum credit, etc.)?	☐ Yes	☐ No	☑ N/A
1-4 Is tree credit volume calculated using Appendix B.2.2.1 and SD-1 Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A
4.3.2 Have natural areas, soils and vegetation been conserved?	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.3.2 not implemented: There are no natural areas, soils, or vegetation on-site.			

Form I-5B Page 2 of 4			
Site Design Requirement	**Applied?**		
4.3.3 Minimize Impervious Area	☐ Yes	☑ No	☐ N/A
Discussion / justification if 4.3.3 not implemented: Native soils have poor infiltration rates.			
4.3.4 Minimize Soil Compaction	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.4 not implemented:			
4.3.5 Impervious Area Dispersion	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.3.5 not implemented:			
5-1 Is the pervious area receiving runon from impervious area identified on the site map?	☐ Yes	☐ No	☑ N/A
5-2 Does the pervious area satisfy the design criteria in 4.3.5 Fact Sheet in Appendix E (e.g. maximum slope, minimum length, etc.)	☐ Yes	☐ No	☑ N/A
5-3 Is impervious area dispersion credit volume calculated using Appendix B.2.1.1 and 4.3.5 Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A

Form I-5B Page 3 of 4			
Site Design Requirement	**Applied?**		
4.3.6 Runoff Collection	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.3.6 not implemented:			
6a-1 Are green roofs implemented in accordance with design criteria in 4.3.6A Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☐ No	☑ N/A
6a-2 Is the green roof credit volume calculated using Appendix B.2.1.2 and 4.3.6A Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A
6b-1 Are permeable pavements implemented in accordance with design criteria in 4.3.6B Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☐ No	☑ N/A
6b-2 Is the permeable pavement credit volume calculated using Appendix B.2.1.3 and 4.3.6B Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A
4.3.7 Landscaping with Native or Drought Tolerant Species	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.7 not implemented:			
4.3.8 Harvest and Use Precipitation	☐ Yes	☑ No	☐ N/A
Discussion / justification if 4.3.8 not implemented: Due to the complex facility and master plan phasing, toilet and urinal flushing was excluded from harvest and use calculations. The anticipated 36 hour landscape irrigation demand is 5 CF. This is less than 0.25 DCV (0.25 x 3,350 CF = 838 CF). Harvest and Use is considered to be infeasible.			
8-1 Are rain barrels implemented in accordance with design criteria in 4.3.8 Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☐ No	☑ N/A
8-2 Is the rain barrel credit volume calculated using Appendix B.2.2.2 and 4.3.8 Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A

Project Name: Sharp MMC - Package 7A (PK7A)

Form I-5B Page 4 of 4
Insert Site Map with all site design BMPs identified:
See DMA exhibit in Attachment 1 for site design BMPs.

Summary of PDP Structural BMPs	Form I-6

PDP Structural BMPs

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

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

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

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

A combination of Source Control, Site Design, and Structural BMPs are proposed to mitigate the impacts of the proposed development. The design of each BMP follows the regulations set forth in the City of San Diego BMP design manual as well as provides treatment for the sites Design Capture Volume (DCV), defined as the 85th percentile, 24 hour storm event. Harvest and use BMPs were determined to be infeasible for our site, see calculations in Attachment 1.

The proposed development includes a medical facility, ramp, engineering shop building, parking, and associated hardscape and landscape. A biofiltration basin (BMP #2) is proposed for pollutant control for most of the project site, while an underground vault (BMP #3) is proposed for hydromodification control. A Modular Wetland System (BMP#9) is proposed for pollutant control for half of the medical facility and a underground vault (BMP #10) is proposed hydromodification control. The run-off from the BMPs drain to an existing inlet located on Birmingham Way (POC 2).

(Continue on page 2 as necessary.)

Form I-6 Page 2 of 10

(Continued from page 1)

DMAs 7A.1-7A.5 consists of the northern half of the medical facility's roof, fire lane, a ramp, an engineering shop building, permeable pavers, and associated hardscape and landscape. DMAs 7A.1-7A.5 drain to catch basin that are piped to BMP #2 for pollutant control and BMP #3 for hydromodification control.

DMA 7A.6 comprises of the northern half the medical facility's roof. DMA 7A.6 is piped to BMP#9 for pollutant control and BMP #10 for hydromodification control.

Project Name: Sharp MMC - Package 7A (PK7A)

Form I-6 Page 3 of 10 (Copy as many as needed)	
Structural BMP Summary Information	
Structural BMP ID No. BMP #2	
Construction Plan Sheet No.	
Type of Structural BMP: ☐ Retention by harvest and use (e.g. HU-1, cistern) ☐ Retention by infiltration basin (INF-1) ☐ Retention by bioretention (INF-2) ☐ Retention by permeable pavement (INF-3) ☐ Partial retention by biofiltration with partial retention (PR-1) ☑ Biofiltration (BF-1) ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☐ Detention pond or vault for hydromodification management ☐ Other (describe in discussion section below)	
Purpose: ☑ Pollutant control only ☐ Hydromodification control only ☐ Combined pollutant control and hydromodification control ☐ Pre-treatment/forebay for another structural BMP ☐ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification form DS-563	Ambrose Wong, BWE Inc. 9449 Balboa Ave, Suite 270 San Diego, CA 92123
Who will be the final owner of this BMP?	Sharp Healthcare 7901 Frost Street San Diego, CA 92123
Who will maintain this BMP into perpetuity?	Sharp Healthcare 7901 Frost Street San Diego, CA 92123
What is the funding mechanism for maintenance?	TBD

Project Name: Sharp MMC - Package 7A (PK7A)

Form I-6 Page 4 of 10 (Copy as many as needed)
Structural BMP ID No. BMP #2
Construction Plan Sheet No.
Discussion (as needed; must include worksheets showing BMP sizing calculations in the SWQMPs): BMP #2 is a biofiltration basin with a bottom surface area of 3,332 SF and has a ponding depth of 6 inches. BMP #2 is sized to provide pollutant control mitigation for Packages 7A and 3A.

Form I-6 Page 5 of 10 (Copy as many as needed)	
Structural BMP Summary Information	
Structural BMP ID No. BMP #3	
Construction Plan Sheet No.	
Type of Structural BMP: ☐ Retention by harvest and use (e.g. HU-1, cistern) ☐ Retention by infiltration basin (INF-1) ☐ Retention by bioretention (INF-2) ☐ Retention by permeable pavement (INF-3) ☐ Partial retention by biofiltration with partial retention (PR-1) ☐ Biofiltration (BF-1) ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☑ Detention pond or vault for hydromodification management ☐ Other (describe in discussion section below)	
Purpose: ☐ Pollutant control only ☑ Hydromodification control only ☐ Combined pollutant control and hydromodification control ☐ Pre-treatment/forebay for another structural BMP ☐ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification form DS-563	Ambrose Wong, BWE Inc. 9449 Balboa Ave, Suite 270 San Diego, CA 92123
Who will be the final owner of this BMP?	Sharp Healthcare 7901 Frost Street San Diego, CA 92123
Who will maintain this BMP into perpetuity?	Sharp Healthcare 7901 Frost Street San Diego, CA 92123
What is the funding mechanism for maintenance?	TBD

Form I-6 Page 6 of 10 (Copy as many as needed)
Structural BMP ID No. BMP #3
Construction Plan Sheet No.
Discussion (as needed; must include worksheets showing BMP sizing calculations in the SWQMPs): BMP #3 is an underground vault with a surface area of 4,118 SF and 4 feet in depth. The total provided hydromod volume is 13,691 CF and total volume is 16,470 CF. The low flow orifice is sized at 1.625" BMP #3 is sized to provide hydromodification mitigation for Packages 7A and 3A.

Project Name: Sharp MMC - PK7A

Form I-6 Page 7 of 10 (Copy as many as needed)	
Structural BMP Summary Information	
Structural BMP ID No. BMP #9	
Construction Plan Sheet No.	
Type of Structural BMP: ☐ Retention by harvest and use (e.g. HU-1, cistern) ☐ Retention by infiltration basin (INF-1) ☐ Retention by bioretention (INF-2) ☐ Retention by permeable pavement (INF-3) ☐ Partial retention by biofiltration with partial retention (PR-1) ☐ Biofiltration (BF-1) ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☐ Detention pond or vault for hydromodification management ☑ Other (describe in discussion section below)	
Purpose: ☑ Pollutant control only ☐ Hydromodification control only ☐ Combined pollutant control and hydromodification control ☐ Pre-treatment/forebay for another structural BMP ☐ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification form DS-563	Ambrose Wong, BWE Inc. 9449 Balboa Ave, Suite 270 San Diego, CA 92123
Who will be the final owner of this BMP?	Sharp Healthcare 7901 Frost Street San Diego, CA 92123
Who will maintain this BMP into perpetuity?	Sharp Healthcare 7901 Frost Street San Diego, CA 92123
What is the funding mechanism for maintenance?	TBD

Project Name: Sharp MMC - PK7A

Form I-6 Page 8 of 10 (Copy as many as needed)
Structural BMP ID No. BMP #9
Construction Plan Sheet No.
Discussion (as needed; must include worksheets showing BMP sizing calculations in the SWQMPs): BMP #9 is a Modular Wetland System L-8-8. The treatment flow rate 0.23 cfs exceeds the required design flow of 0.14 cfs.

Form I-6 Page 9 of 10 (Copy as many as needed)	
Structural BMP Summary Information	
Structural BMP ID No. BMP #10	
Construction Plan Sheet No.	
Type of Structural BMP: ☐ Retention by harvest and use (e.g. HU-1, cistern) ☐ Retention by infiltration basin (INF-1) ☐ Retention by bioretention (INF-2) ☐ Retention by permeable pavement (INF-3) ☐ Partial retention by biofiltration with partial retention (PR-1) ☐ Biofiltration (BF-1) ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☑ Detention pond or vault for hydromodification management ☐ Other (describe in discussion section below)	
Purpose: ☐ Pollutant control only ☑ Hydromodification control only ☐ Combined pollutant control and hydromodification control ☐ Pre-treatment/forebay for another structural BMP ☐ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification form DS-563	Ambrose Wong, BWE Inc. 9449 Balboa Ave, Suite 270 San Diego, CA 92123
Who will be the final owner of this BMP?	Sharp Healthcare 7901 Frost Street San Diego, CA 92123
Who will maintain this BMP into perpetuity?	Sharp Healthcare 7901 Frost Street San Diego, CA 92123
What is the funding mechanism for maintenance?	TBD

Form I-6 Page 10 of 10 (Copy as many as needed)
Structural BMP ID No. BMP #10
Construction Plan Sheet No.
Discussion (as needed; must include worksheets showing BMP sizing calculations in the SWQMPs): BMP #10 is an underground vault with a provided hydromod volume of 2846 CF and total volume of 3424 CF. The vault has a surface area of 856 SF and depth of 4 feet. The low flow orifice is sized at 0.6875 inches.

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Attachment 1
Backup For PDP Pollutant Control BMPs

This is the cover sheet for Attachment 1.

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Project Name: Sharp MMC - Package 7A (PK7A)

Indicate which Items are Included:

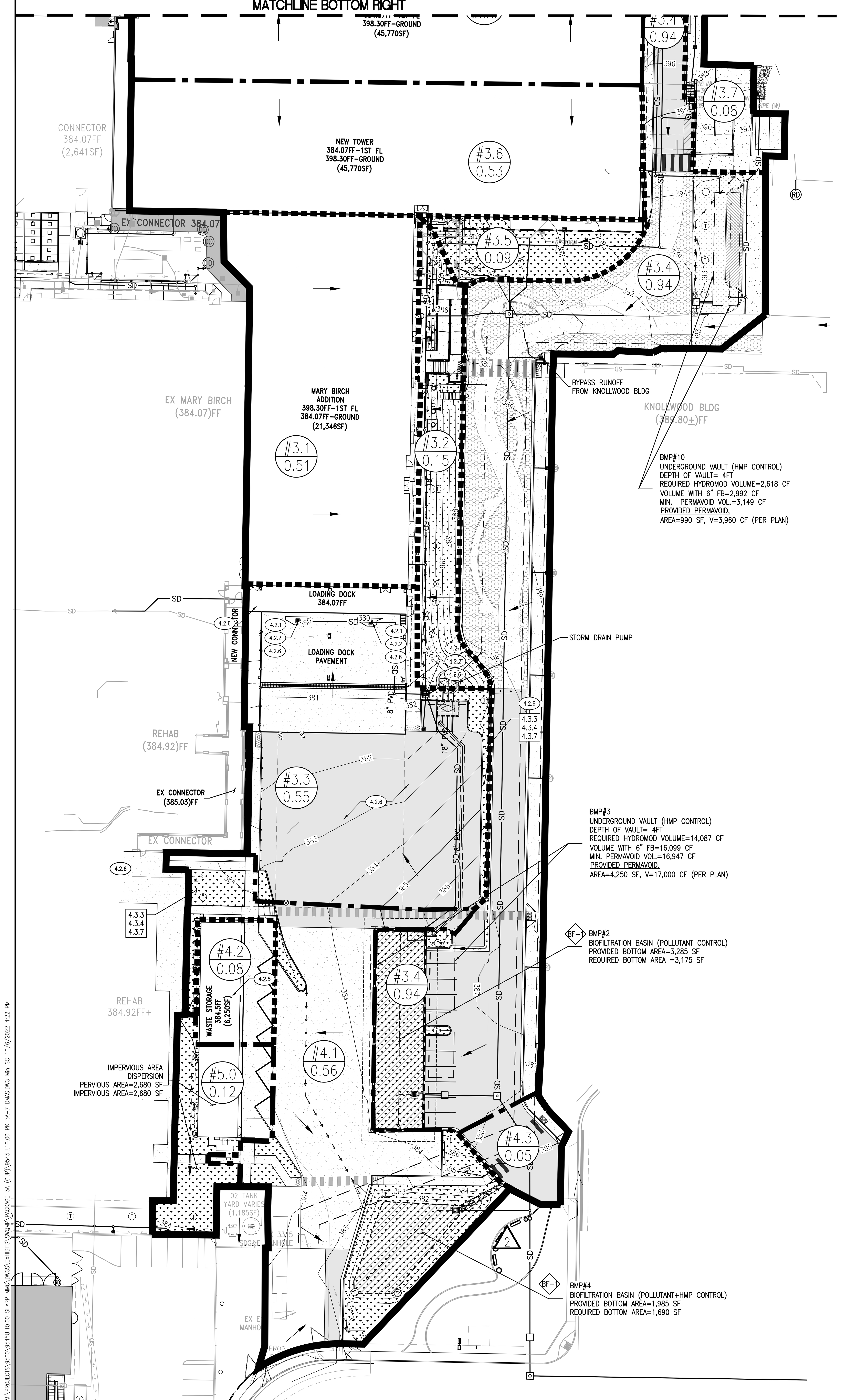
Attachment Sequence	Contents	Checklist
Attachment 1a	DMA Exhibit (Required) See DMA Exhibit Checklist.	☒ Included
Attachment 1b	Tabular Summary of DMAs Showing DMA ID matching DMA Exhibit, DMA Area, and DMA Type (Required)* *Provide table in this Attachment OR on DMA Exhibit in Attachment 1a	☑ Included on DMA Exhibit in Attachment 1a ☐ Included as Attachment 1b, separate from DMA Exhibit
Attachment 1c	Form I-7, Harvest and Use Feasibility Screening Checklist (Required unless the entire project will use infiltration BMPs) Refer to Appendix B.3-1 of the BMP Design Manual to complete Form I-7.	☑ Included ☐ Not included because the entire project will use infiltration BMPs
Attachment 1d	Infiltration Feasibility Information. Contents of Attachment 1d depend on the infiltration condition: • No Infiltration Condition: ○ Infiltration Feasibility Condition Letter (*Note: must be stamped and signed by licensed geotechnical engineer*) ○ Form I-8A (optional) ○ Form I-8B (optional) • Partial Infiltration Condition: ○ Infiltration Feasibility Condition Letter (*Note: must be stamped and signed by licensed geotechnical engineer*) ○ Form I-8A ○ Form I-8B • Full Infiltration Condition: ○ Form I-8A ○ Form I-8B ○ Worksheet C.4-3 ○ Form I-9 Refer to Appendices C and D of the BMP Design Manual for guidance.	☑ Included ☐ Not included because the entire project will use harvest and use BMPs
Attachment 1e	Pollutant Control BMP Design Worksheets / Calculations (Required) Refer to Appendices B and E of the BMP Design Manual for structural pollutant control BMP design guidelines and site design credit calculations	☑ Included

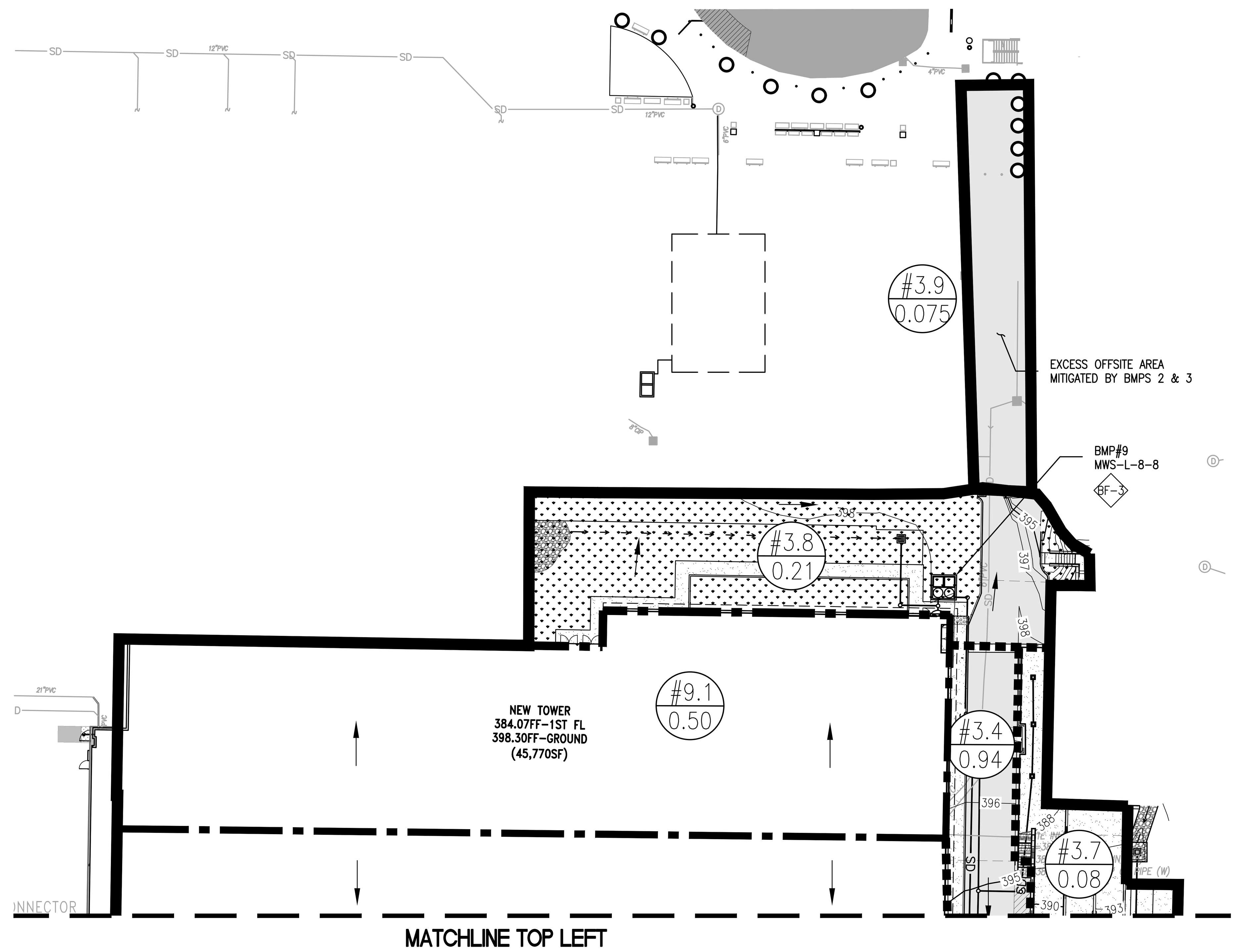
Use this checklist to ensure the required information has been included on the DMA Exhibit:

The DMA Exhibit must identify:

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

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING





LEGEND

LEGEND	SYMBOL
OUTER DMA BOUNDARY	
MAJOR DMA BOUNDARY	
MINOR DMA BOUNDARY	
EXISTING STORM DRAIN	SD
NEW STORM DRAIN	SD
EXISTING CONTOUR	
NEW CONTOUR	
FLOW DIRECTION	
FLOW PATH	
POINT OF COMPLIANCE (POC)	1
DRAINAGE MANAGEMENT AREA MARKER & AREA (AC)	B-X X.XX
CONCRETE PAVEMENT	
ASPHALT PAVEMENT	
LANDSCAPING	
BIOFILTRATION BMP	
BUILDING ROOF	

SWQMP NOTES

1. THE SITE IS COMPRISED OF HYDROLOGIC SOIL TYPE D.
2. NO CRITICAL COARSE SEDIMENT YIELD AREAS ARE PRESENT ON SITE.
3. THERE ARE NO NATURAL HYDROLOGIC FEATURES PRESENT ON SITE.
4. DEPTH TO GROUNDWATER GREATER THAN 20 FT.
5. BMP #2 AND BMP #3 ARE ALSO DESIGNED TO MITIGATE RUNOFF FROM DMAS THAT ARE ASSOCIATED WITH IMPROVEMENTS IN PACKAGE 7A.

STRUCTURAL BMPS:

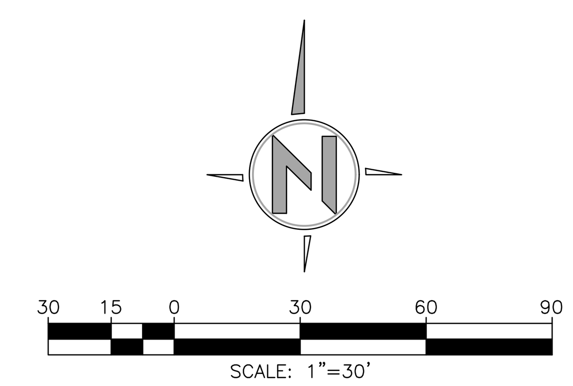
BF-1 BIOFILTRATION BMP

SOURCE CONTROL BMPS:

4.2.1 PREVENTION OF ILLICIT DISCHARGE INTO THE MS4
4.2.2 STORM DRAIN STENCILING OR SIGNAGE
4.2.5 PROTECT TRASH STORAGE AREAS FROM RAINFALL, RUN-ON, RUNOFF, AND WIND DISPERSAL
4.2.6 ADDITIONAL BMPS
- ONSITE STORM DRAIN INLETS
- INTERIOR FLOOR DRAINS AND ELEVATOR SHAFT SUMP PUMPS
- NEED FOR FUTURE INDOOR & STRUCTURAL PEST CONTROL
- LANDSCAPE/OUTDOOR PESTICIDE USE
- REFUSE AREAS
- LOADING DOCKS
- FIRE SPRINKLER TEST WATER
- MISCELLANEOUS DRAIN OR WASH WATER
- PLAZAS, SIDEWALKS, AND PARKING LOTS

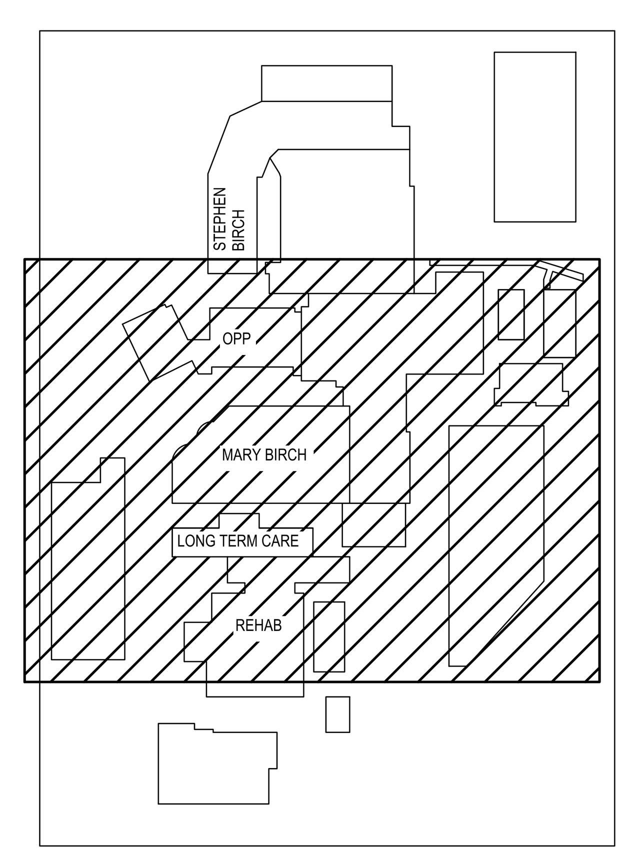
SITE DESIGN BMPS:

4.3.3 MINIMIZE IMPERVIOUS AREA
4.3.4 MINIMIZE SOIL COMPACTION
4.3.5 IMPERVIOUS AREA DISPERSION
4.3.7 LANDSCAPING WITH NATIVE OR DROUGHT TOLERANT SPECIES



PACKAGE 3A – 7A DMA AREA DETAILS

DMA ID	TOTAL AREA (AC)	TOTAL AREA (SF)	PERVIOUS AREA (SF)	IMPERVIOUS AREA (SF)	IMPERVIOUS RATIO %	NOTES
3.1	0.51	22132	0	22132	100	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.2	0.15	6739	4607	2132	32	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.3	0.55	23812	993	22819	96	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.4	0.94	40664	5893	34771	85	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.5	0.09	4044	3393	651	16	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.6	0.53	23177	0	23089	100	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.7	0.08	3432	0	3432	100	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.8	0.21	9092	6267	2825	31	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.9	0.075	3287	0	3287	100	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
9.1	0.50	22013	0	22013	100	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
4.1	0.53	23285	6498	16787	72	POLLUTANT AND HMP CONTROL MITIGATED BY BMP #4
4.2	0.08	3495	420	3075	88	POLLUTANT AND HMP CONTROL MITIGATED BY BMP #4
4.3	0.05	2318	0	2318	100	POLLUTANT AND HMP CONTROL MITIGATED BY BMP #4
5.0	0.12	5360	2687	2673	50	SELF RETAINING DMA (1:1 DISPERSION)



KEY PLAN

BWE
CIVIL·STRUCTURAL·SURVEY·PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

SYM	DESCRIPTION	DATE	APPR

BENCHMARK:
ISSUE DATE: 09/17/2021
DRAWN BY: MDS
CHECKED BY: MGC
B&W JOB NUMBER: 9545.10.00
CLIENT JOB NUMBER:

PROJECT
SHARP MMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

SHEET TITLE
DMA EXHIBIT

SHEET 1 OF 2

PLOT: W:\PROJECTS\9500\9545\10.00 SHARP MMC\DWGS\EXHIBITS\SWQMP\PACKAGE 3A (CUP)\9545\10.00 PK 3A-7 DMAS.DWG MH CC 10/6/2022 4:22 PM

Harvest and Use Feasibility Checklist		Worksheet B.3-1 : Form I-7
1. Is there a demand for harvested water (check all that apply) at the project site that is reliably present during the wet season? ☑ Toilet and urinal flushing ☐ Landscape irrigation ☐ Other:___________		
2. If there is a demand; estimate the anticipated average wet season demand over a period of 36 hours. Guidance for planning level demand calculations for toilet/urinal flushing and landscape irrigation is provided in Section B.3.2. [Provide a summary of calculations here] Due to the complex facility and master plan phasing, toilet and urinal flushing was excluded from harvest and use calculations. The anticipated 36 hour landscape irrigation demand is 5 CF.		
3. Calculate the DCV using worksheet B-2.1. DCV = 3350 (cubic feet) [Provide a summary of calculations here] Total DCV is 3,350 CF. Total DMA Area is 1.878 acres, impervious area is 1.754 acres, HSG D soils, area weighted runoff coefficient of 0.847 The 36 hr demand is 5 CF, which is less than 0.25 DCV (0.25 x 3,350 CF = 838 CF). Harvest and Use is considered to be infeasible.		
3a. Is the 36-hour demand greater than or equal to the DCV? ☐ Yes / ☑ No ⇨ ⇩	3b. Is the 36-hour demand greater than 0.25DCV but less than the full DCV? ☐ Yes / ☑ No ⇨ ⇩	3c. Is the 36-hour demand less than 0.25DCV? ☑ Yes ⇩
Harvest and use appears to be feasible. Conduct more detailed evaluation and sizing calculations to confirm that DCV can be used at an adequate rate to meet drawdown criteria.	Harvest and use may be feasible. Conduct more detailed evaluation and sizing calculations to determine feasibility. Harvest and use may only be able to be used for a portion of the site, or (optionally) the storage may need to be upsized to meet long term capture targets while draining in longer than 36 hours.	Harvest and use is considered to be infeasible.
Is harvest and use feasible based on further evaluation? ☐ Yes, refer to Appendix E to select and size harvest and use BMPs. ☑ No, select alternate BMPs.		

Modified Estimated Total Water Use Calculation

Modified ETWU = $(ET0_{wet})$ x [[∑(PF x HA)/IE] + SLA] x 0.015

where:

Modified ETWU	=	Estimated daily average water usage during wet season
ETo_{Wet}	=	Average reference evapotranspiration from November through April (use 2.7 inches per month, using CIMS Zone 4 from Table G.1-1)
PF	=	Plant Factor
HA	=	Hydrozone Area (sq-ft); A section or zone of the landscaped area having plants with similar water needs. Σ(PF x HA) = The sum of PF x HA for each individual Hydrozone (accounts for different landscaping zones).
IE	=	Irrigation Efficiency (assume 90 percent for demand calculations)
SLA	=	Special Landscape Area (sq-ft); Areas used for active and passive recreation areas, areas solely dedicated to the production of fruits and vegetables, and areas irrigated with reclaimed water.

Enter Irrigation Efficiency (IE)	0.90

Plant Water Use Type	Plant Factor
Low	0.1 - 0.2
Moderate	0.3 - 0.7
High	0.80
SLA	1.00

Hydrozone	Plant Water Use Type (s) (low, medium, high)	Plant Factor (PF)	Hydrozone Area (HA) (ft^2)	PF x HA (ft^2)
1	Low	0.10	5,327	533
				0
				533
	SLA	1	0	0
		Sum		**533**

Results

Modified ETWU=	24	**gal**
	3	**cf**
36 hr Demand=	**5**	**cf**

Total 36 hr Demand =	**5**	**cf**

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions[1]		Worksheet C.4–1: Form I–8A[2]
Part 1 - Full Infiltration Feasibility Screening Criteria		
DMA(s) Being Analyzed:		**Project Phase:**
Sharp Metropolitan Medical Campus Civil Improvements		Design
Criteria 1: Infiltration Rate Screening		
1A	Is the mapped hydrologic soil group according to the NRCS Web Soil Survey or UC Davis Soil Web Mapper Type A or B and corroborated by available site soil data[3]? ○ Yes; the DMA may feasibly support full infiltration. Answer "Yes" to Criteria 1 Result or continue to Step 1B if the applicant elects to perform infiltration testing. ● No; the mapped soil types are A or B but is not corroborated by available site soil data (continue to Step 1B). ○ No; the mapped soil types are C, D, or "urban/unclassified" and is corroborated by available site soil data. Answer "No" to Criteria 1 Result. ○ No; the mapped soil types are C, D, or "urban/unclassified" but is not corroborated by available site soil data (continue to Step 1B).	
1B	Is the reliable infiltration rate calculated using planning phase methods from Table D.3-1? ● Yes; Continue to Step 1C. ○ No; Skip to Step 1D.	
1C	Is the reliable infiltration rate calculated using planning phase methods from Table D.3–1 greater than 0.5 inches per hour? ○ Yes; the DMA may feasibly support full infiltration. Answer "Yes" to Criteria 1 Result. ● No; full infiltration is not required. Answer "No" to Criteria 1 Result.	
1D	**Infiltration Testing Method.** Is the selected infiltration testing method suitable during the design phase (see Appendix D.3)? Note: Alternative testing standards may be allowed with appropriate rationales and documentation. ● Yes; continue to Step 1E. ○ No; select an appropriate infiltration testing method.	

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

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

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

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

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

Based on our field percolation testing, the in-situ infiltration rates of the soils within the limits of proposed DMA's range from no percolation to 125 minutes per inch. The calculated infiltration rates via the Porchet Method and applied safety factor of 2 ranges from no infiltration to 0.006 inches per hour.

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

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

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

Summarize findings and basis; provide references to related reports or exhibits.

Based on our field percolation testing, the in-situ infiltration rates of the soils within the limits of proposed DMA's range from no percolation to 125 minutes per inch. The calculated infiltration rates via the Porchet Method and applied safety factor of 2 ranges from no infiltration to 0.006 inches per hour.

Part 1 Result – Full Infiltration Geotechnical Screening [4]	**Result**
If answers to both Criteria 1 and Criteria 2 are "Yes", a full infiltration design is potentially feasible based on Geotechnical conditions only. If either answer to Criteria 1 or Criteria 2 is "No", a full infiltration design is not required.	○ Full infiltration Condition ● Complete Part 2

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

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4–1: Form I–8A[2]
Part 2 – Partial vs. No Infiltration Feasibility Screening Criteria		
DMA(s) Being Analyzed:		**Project Phase:**
Sharp Metropolitan Medical Campus Civil Improvements		Design
Criteria 3 : Infiltration Rate Screening		
3A	**NRCS Type C, D, or "urban/unclassified":** Is the mapped hydrologic soil group according to the NRCS Web Soil Survey or UC Davis Soil Web Mapper is Type C, D, or "urban/unclassified" and corroborated by available site soil data? ○ Yes; the site is mapped as C soils and a reliable infiltration rate of 0.15 in/hr. is used to size partial infiltration BMPS. Answer "Yes" to Criteria 3 Result. ○ Yes; the site is mapped as D soils or "urban/unclassified" and a reliable infiltration rate of 0.05 in/hr. is used to size partial infiltration BMPS. Answer "Yes" to Criteria 3 Result. ● No; infiltration testing is conducted (refer to Table D.3–1), continue to Step 3B.	
3B	**Infiltration Testing Result:** Is the reliable infiltration rate (i.e. average measured infiltration rate/2) greater than 0.05 in/hr. and less than or equal to 0.5 in/hr? ○ Yes; the site may support partial infiltration. Answer "Yes" to Criteria 3 Result. ● No; the reliable infiltration rate (i.e. average measured rate/2) is less than 0.05 in/hr., partial infiltration is not required. Answer "No" to Criteria 3 Result.	
Criteria 3 Result	Is the estimated reliable infiltration rate (i.e., average measured infiltration rate/2) greater than or equal to 0.05 inches/hour and less than or equal to 0.5 inches/hour at any location within each DMA where runoff can reasonably be routed to a BMP? ○ Yes; Continue to Criteria 4. ● No: Skip to Part 2 Result.	
Summarize infiltration testing and/or mapping results (i.e. soil maps and series description used for infiltration rate). Based on our field percolation testing, the in-situ infiltration rates of the soils within the limits of proposed DMA's range from no percolation to 125 minutes per inch. The calculated infiltration rates via the Porchet Method and applied safety factor of 2 ranges from no infiltration to 0.006 inches per hour.		

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4–1: Form I–8A[2]	
4B-4	**Slope Stability**. If applicable, perform a slope stability analysis in accordance with the ASCE and Southern California Earthquake Center (2002) Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Landslide Hazards in California to determine minimum slope setbacks for full infiltration BMPs. See the City of San Diego's Guidelines for Geotechnical Reports (2011) to determine which type of slope stability analysis is required. Can partial infiltration BMPs be proposed within the DMA without increasing slope stability risks?	● Yes	○ No
4B-5	**Other Geotechnical Hazards.** Identify site-specific geotechnical hazards not already mentioned (refer to Appendix C.2.1). Can partial infiltration BMPs be proposed within the DMA without increasing risk of geologic or geotechnical hazards not already mentioned?	● Yes	○ No
4B-6	**Setbacks.** Establish setbacks from underground utilities, structures, and/or retaining walls. Reference applicable ASTM or other recognized standard in the geotechnical report. Can partial infiltration BMPs be proposed within the DMA using recommended setbacks from underground utilities, structures, and/or retaining walls?	○ Yes	● No
4C	**Mitigation Measures.** Propose mitigation measures for each geologic/geotechnical hazard identified in Step 4B. Provide a discussion on geologic/geotechnical hazards that would prevent partial infiltration BMPs that cannot be reasonably mitigated in the geotechnical report. See Appendix C.2.1.8 for a list of typically reasonable and typically unreasonable mitigation measures. Can mitigation measures be proposed to allow for partial infiltration BMPs? If the question in Step 4C is answered "Yes," then answer "Yes" to Criteria 4 Result. If the question in Step 4C is answered "No," then answer "No" to Criteria 4 Result.	○ Yes	● No
Criteria 4 Result	Can infiltration of greater than or equal to 0.05 inches/hour and less than or equal to 0.5 inches/hour be allowed without increasing the risk of geologic or geotechnical hazards that cannot be reasonably mitigated to an acceptable level?	○ Yes	● No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions	Worksheet C.4–1: Form I–8A[2]

Summarize findings and basis; provide references to related reports or exhibits.

Based on our field percolation testing, the in-situ infiltration rates of the soils within the limits of proposed DMA's range from no percolation to 125 minutes per inch. The calculated infiltration rates via the Porchet Method and applied safety factor of 2 ranges from no infiltration to 0.006 inches per hour.

Part 2 – Partial Infiltration Geotechnical Screening Result[5]	**Result**
If answers to both Criteria 3 and Criteria 4 are "Yes", a partial infiltration design is potentially feasible based on geotechnical conditions only. If answers to either Criteria 3 or Criteria 4 is "No", then infiltration of any volume is considered to be infeasible within the site.	○ Partial Infiltration Condition ● No Infiltration Condition

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

Project: Sharp MMC Pk 7A

DMA #9.1 (BMP #9)

Area Weighted Runoff Factor (C)

Surface Type	Area - A (sf)	C - Factor	C X A	Weighted C-Factor
Impervious	21,811	0.90	19,630	
Landscape	0	0.10	0	
Gravel/DG	0	0.30	0	
Total	**21,811**		**19,630**	**0.900**

0.50 Acres

Project: Sharp MMC Pk 7A
DMA #9.1 (BMP #9)

	Design Capture Volume	Worksheet	
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.58
2	Area tributary to BMP (s)	A=	0.50
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.900
4	Trees Credit Volume Note: In the SWQMP list the number of trees, size of each tree, amount of soil volume installed for each tree, contributing area to each tree and the inlet opening dimension for each tree.	TCV=	0
5	Rain barrels Credit Volume Note: In the SWQMP list the number of rain barrels, size of each rain barrel and the use of the captured storm water runoff.	RCV=	0
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	**DCV=**	**949**

MWS Flow Based BMP Sizing

I_{TREAT} = 0.2 in/hr (Intensity of rainfall)

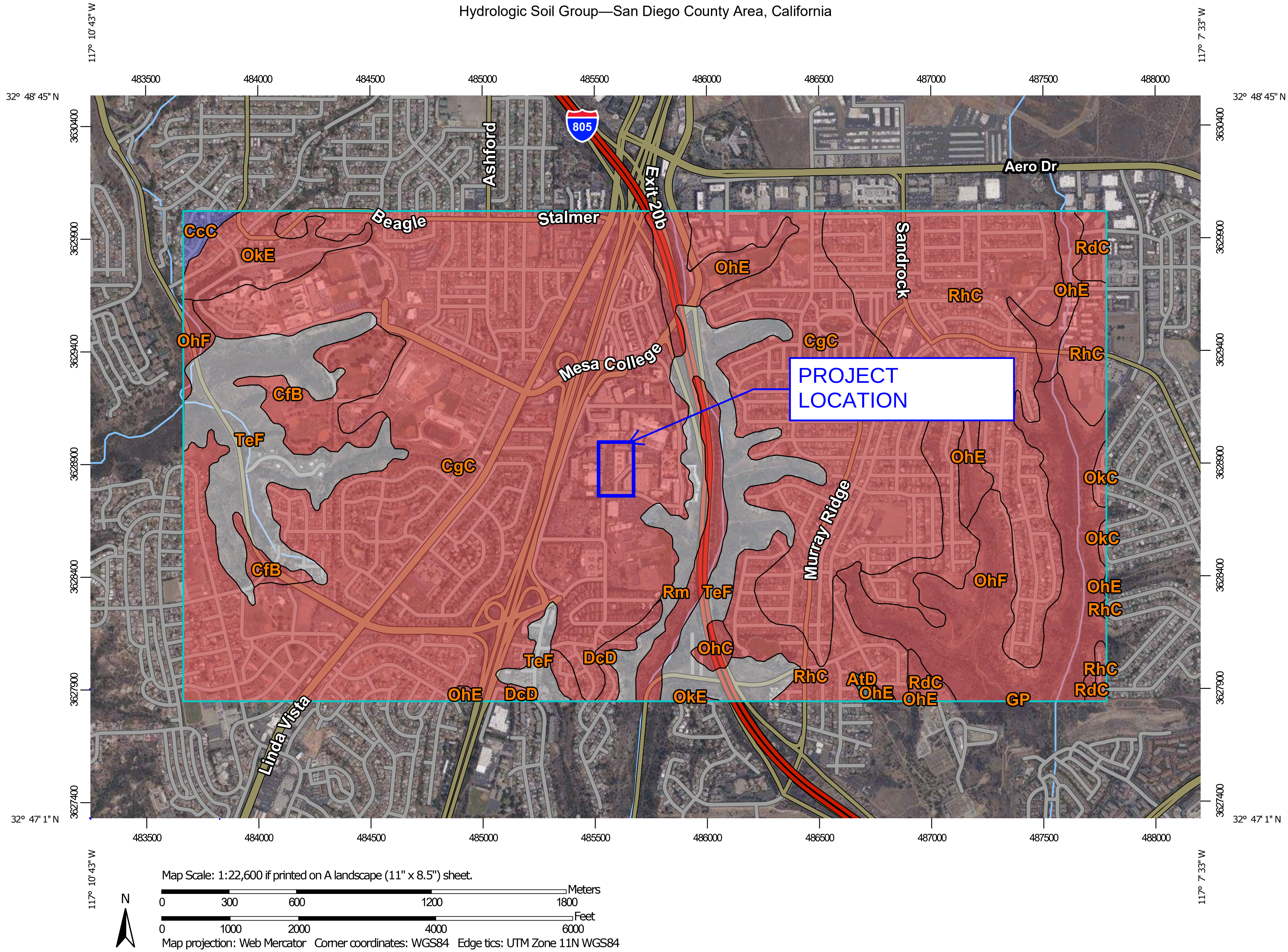
Q_{TREAT} = $C \times I_{TREAT} \times A$ cfs (Treatment flow rate)

Design Flow (cfs) = 1.5* Q_{Treat} (Per Section F.2.2 of Storm Water Standards)

BMP #	DMA		Runoff Coefficient (C)	Q_{TREAT} =	Design Flow (cfs)	BMP Sizing	
	ID #	Area (ac)				MWS Model	Selected BMP's Flow Rate (cfs)
9	9.1	0.50	0.90	0.09	0.135	MWS-L-8-8	0.230

Note: All selected modular wetlands treatment flow rates exceed the DMAs' design flow

MODEL #	DIMENSIONS	WETLANDMEDIA SURFACE AREA (sq. ft.)	TREATMENT FLOW RATE (cfs)
MWS-L-4-4	4' x 4'	23	0.052
MWS-L-4-6	4' x 6'	32	0.073
MWS-L-4-8	4' x 8'	50	0.115
MWS-L-4-13	4' x 13'	63	0.144
MWS-L-4-15	4' x 15'	76	0.175
MWS-L-4-17	4' x 17'	90	0.206
MWS-L-4-19	4' x 19'	103	0.237
MWS-L-4-21	4' x 21'	117	0.268
MWS-L-6-8	7' x 9'	64	0.147
MWS-L-8-8	8' x 8'	100	0.230
MWS-L-8-12	8' x 12'	151	0.346
MWS-L-8-16	8' x 16'	201	0.462
MWS-L-8-20	9' x 21'	252	0.577
MWS-L-8-24	9' x 25'	302	0.693
MWS-L-10-20	10' x 20'	302	0.693


117° 10' 43" W
117° 7' 33" W
32° 48' 45" N
32° 47' 1" N
483500
484000
484500
485000
485500
486000
486500
487000
487500
488000
3630400
3629900
3629400
3628900
3628400
3627900
3627400
805
Ashford
Exit 20b
Aero Dr
Beagle
Stalmer
Sandrock
Mesa College
Murray Ridge
Linda Vista
PROJECT LOCATION
CcC
OkE
OhE
RhC
RdC
OhF
CgC
CfB
TeF
OkC
Rm
OhC
DcD
OkE
AtD
GP
N
Map Scale: 1:22,600 if printed on A landscape (11" x 8.5") sheet.
Meters
0 300 600 1200 1800
Feet
0 1000 2000 4000 6000
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 Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

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.

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 Diego County Area, California
Survey Area Data: Version 15, May 27, 2020

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

Date(s) aerial images were photographed: Aug 22, 2018—Aug 31, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AtD	Altamont clay, 9 to 15 percent slopes, warm MAAT, MLRA 20	C	1.5	0.1%
CcC	Carlsbad-Urban land complex, 2 to 9 percent slopes	B	7.4	0.3%
CfB	Chesterton fine sandy loam, 2 to 5 percent slopes	D	53.4	2.4%
CgC	Chesterton-Urban land complex, 2 to 9 percent slopes	D	1,168.5	52.6%
DcD	Diablo-Urban land complex, 5 to 15 percent slopes	D	14.5	0.7%
GP	Gravel pits		0.2	0.0%
OhC	Olivenhain cobbly loam, 2 to 9 percent slopes	D	6.3	0.3%
OhE	Olivenhain cobbly loam, 9 to 30 percent slopes	D	72.8	3.3%
OhF	Olivenhain cobbly loam, 30 to 50 percent slopes	D	171.5	7.7%
OkC	Olivenhain-Urban land complex, 2 to 9 percent slopes	D	5.0	0.2%
OkE	Olivenhain-Urban land complex, 9 to 30 percent slopes	D	44.5	2.0%
RdC	Redding gravelly loam, 2 to 9 percent slopes	D	17.5	0.8%
RhC	Redding-Urban land complex, 2 to 9 percent slopes	D	358.7	16.1%
Rm	Riverwash	D	31.7	1.4%
TeF	Terrace escarpments		268.3	12.1%
Totals for Area of Interest			**2,221.9**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

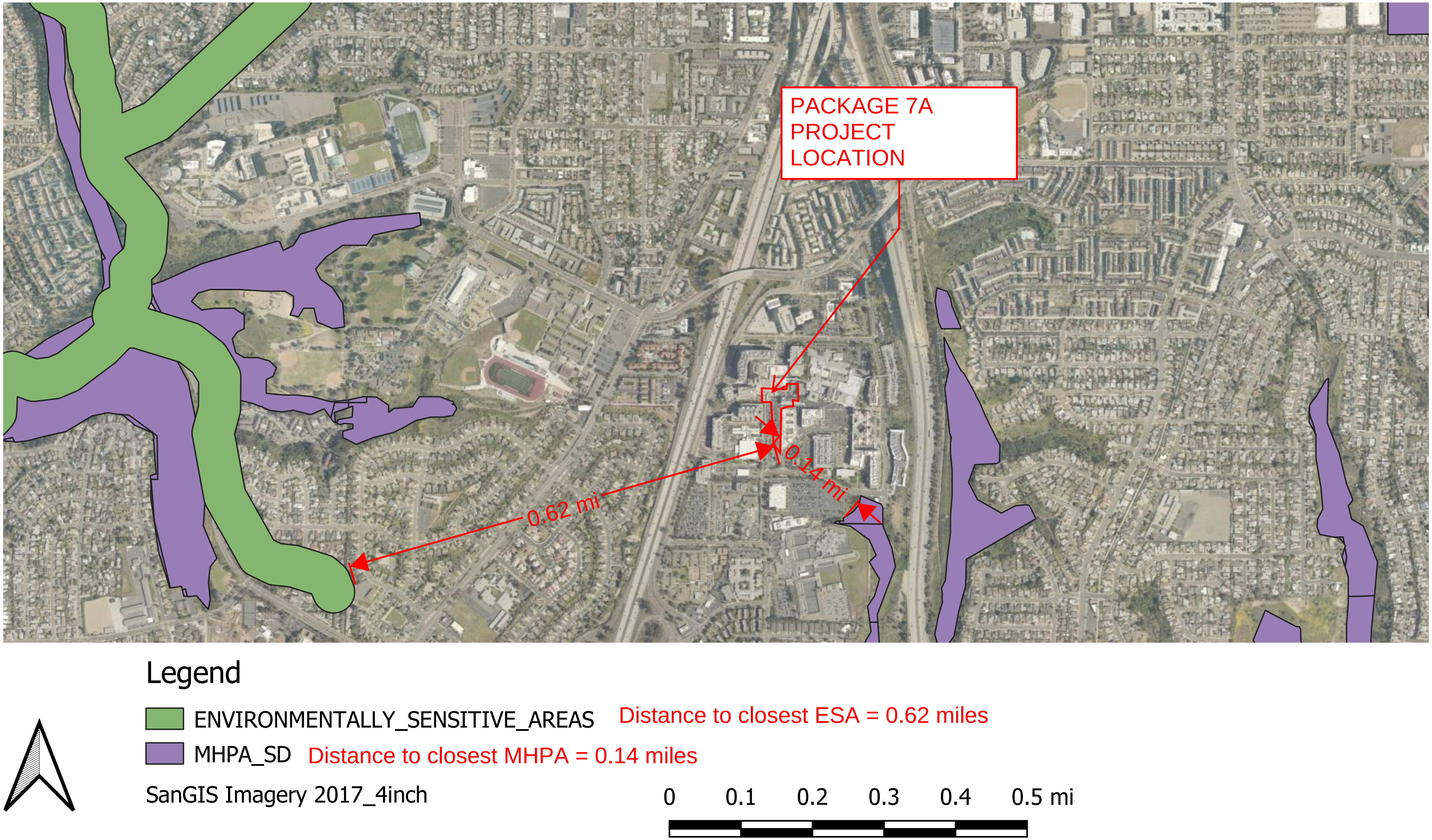
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Sharp MMC ESA AND MHPA Areas



Attachment 2
Backup for PDP Hydromodification Control Measures

This is the cover sheet for Attachment 2.

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

Project Name: Sharp MMC - Package 7A (PK7A)

Indicate which Items are Included:

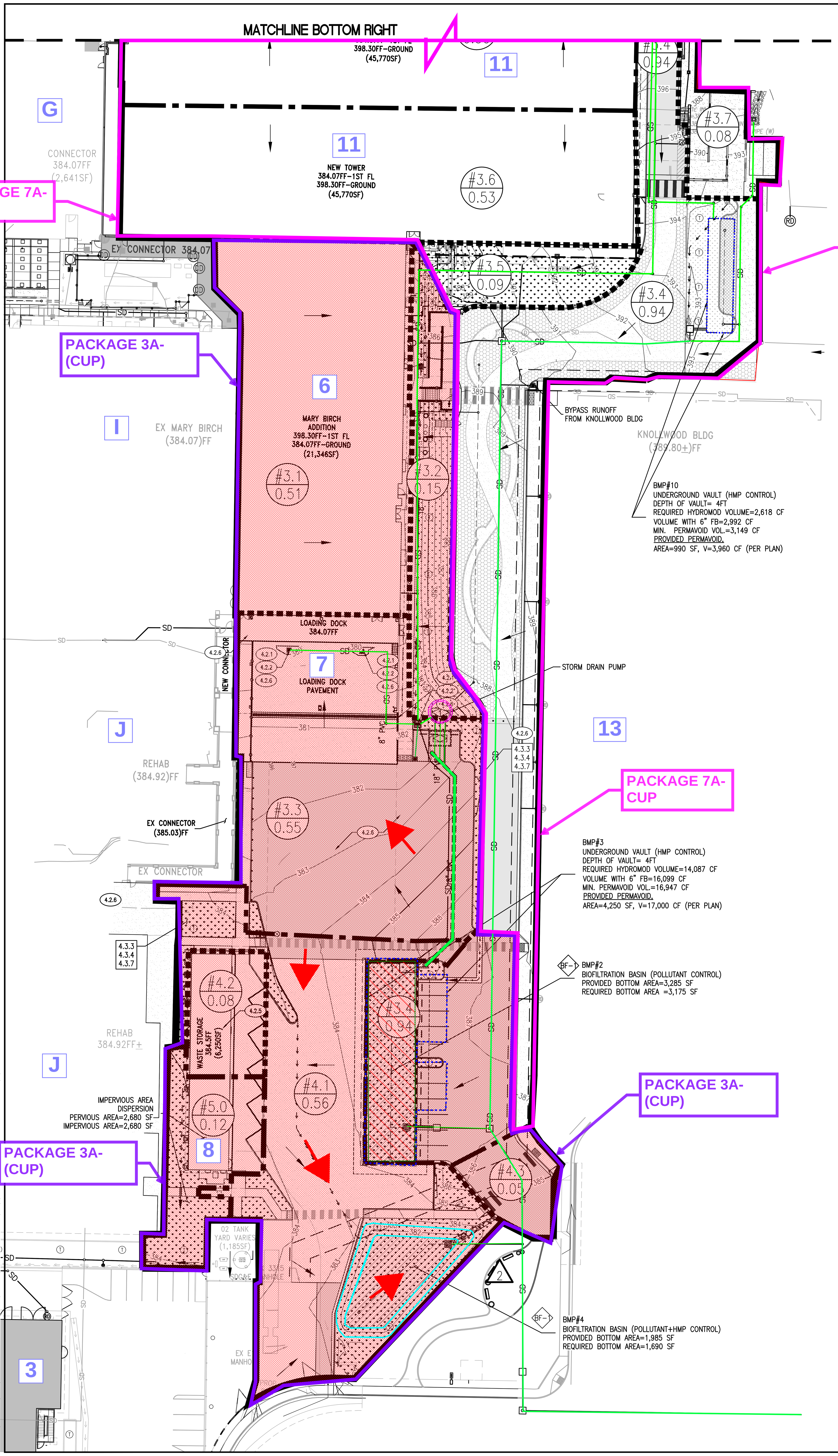
Attachment Sequence	Contents	Checklist
Attachment 2a	Hydromodification Management Exhibit (Required)	☑ Included See Hydromodification Management Exhibit Checklist.
Attachment 2b	Management of Critical Coarse Sediment Yield Areas (WMAA Exhibit is required, additional analyses are optional) See Section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

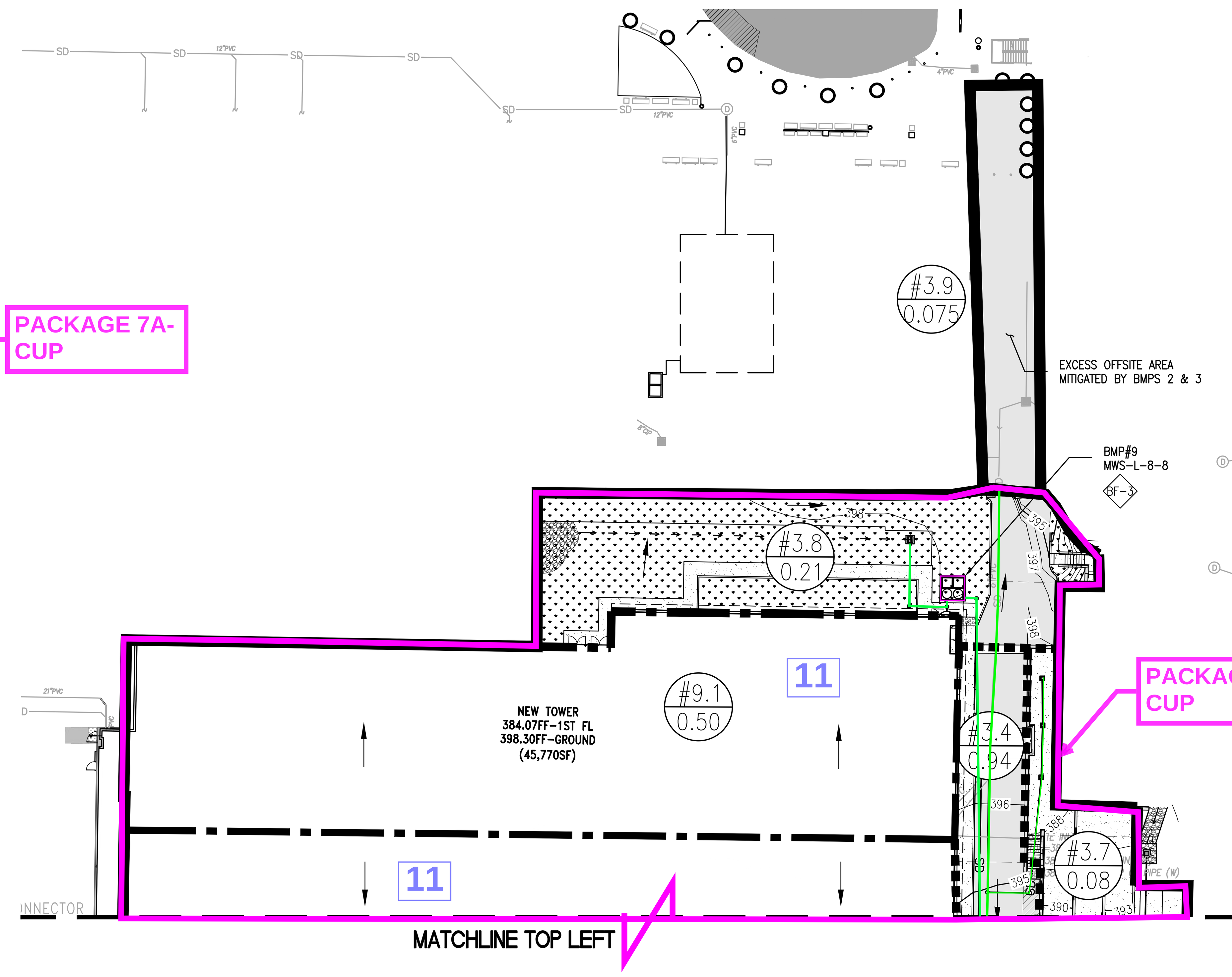
Use this checklist to ensure the required information has been included on the Hydromodification Management Exhibit:

The Hydromodification Management Exhibit must identify:

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

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING





LEGEND

LEGEND	SYMBOL
OUTER DMA BOUNDARY	
MAJOR DMA BOUNDARY	
MINOR DMA BOUNDARY	
EXISTING STORM DRAIN	SD
NEW STORM DRAIN	SD
EXISTING CONTOUR	
NEW CONTOUR	
FLOW DIRECTION	
FLOW PATH	
POINT OF COMPLIANCE (POC)	
DRAINAGE MANAGEMENT AREA MARKER & AREA (AC)	B-X X.XX
CONCRETE PAVEMENT	
ASPHALT PAVEMENT	
LANDSCAPING	
BIOFILTRATION BMP	
BUILDING ROOF	

SWQMP NOTES

1. THE SITE IS COMPRISED OF HYDROLOGIC SOIL TYPE D.
2. NO CRITICAL COARSE SEDIMENT YIELD AREAS ARE PRESENT ON SITE.
3. THERE ARE NO NATURAL HYDROLOGIC FEATURES PRESENT ON SITE.
4. DEPTH TO GROUNDWATER GREATER THAN 20 FT.
5. BMP #2 AND BMP #3 ARE ALSO DESIGNED TO MITIGATE RUNOFF FROM DMAS THAT ARE ASSOCIATED WITH IMPROVEMENTS IN PACKAGE 7A.

STRUCTURAL BMPS:

BF-1 BIOFILTRATION BMP

SOURCE CONTROL BMPS:

4.2.1 PREVENTION OF ILLICIT DISCHARGE INTO THE MS4

4.2.2 STORM DRAIN STENCILING OR SIGNAGE

4.2.5 PROTECT TRASH STORAGE AREAS FROM RAINFALL. RUN-ON, RUNOFF, AND WIND DISPERSAL

4.2.6 ADDITIONAL BMPS
- ONSITE STORM DRAIN INLETS
- INTERIOR FLOOR DRAINS AND ELEVATOR SHAFT SUMP PUMPS
- NEED FOR FUTURE INDOOR & STRUCTURAL PEST CONTROL
- LANDSCAPE/OUTDOOR PESTICIDE USE
- REFUSE AREAS
- LOADING DOCKS
- FIRE SPRINKLER TEST WATER
- MISCELLANEOUS DRAIN OR WASH WATER
- PLAZAS, SIDEWALKS, AND PARKING LOTS

SITE DESIGN BMPS:

4.3.3 MINIMIZE IMPERVIOUS AREA

4.3.4 MINIMIZE SOIL COMPACTION

4.3.5 IMPERVIOUS AREA DISPERSION

4.3.7 LANDSCAPING WITH NATIVE OR DROUGHT TOLERANT SPECIES

DMA-PACKAGE 3A

DMA-PACKAGE 7A

DMA-PACKAGE 8

BUILDING NO. XX

SD FLOW DIRECTION OR

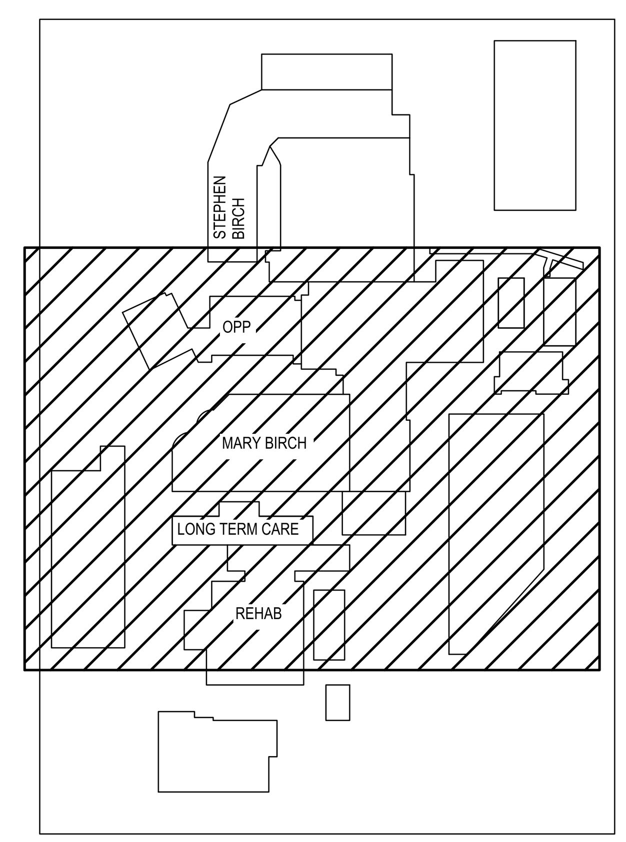
UG-VAULT

STORM DRAIN

SCALE: 1"=30'

PACKAGE 3A – 7A DMA AREA DETAILS

DMA ID	TOTAL AREA (AC)	TOTAL AREA (SF)	PERVIOUS AREA (SF)	IMPERVIOUS AREA (SF)	IMPERVIOUS RATIO %	NOTES
3.1	0.51	22132	0	22132	100	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.2	0.15	6739	4607	2132	32	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.3	0.55	23812	993	22819	96	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.4	0.94	40664	5893	34771	85	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.5	0.09	4044	3393	651	16	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.6	0.53	23177	0	23089	100	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.7	0.08	3432	0	3432	100	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.8	0.21	9092	6267	2825	31	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
3.9	0.075	3287	0	3287	100	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
9.1	0.50	22013	0	22013	100	POLLUTANT CONTROL BY BMP#2, HMP CONTROL BY BMP #3
4.1	0.53	23285	6498	16787	72	POLLUTANT AND HMP CONTROL MITIGATED BY BMP #4
4.2	0.08	3495	420	3075	88	POLLUTANT AND HMP CONTROL MITIGATED BY BMP #4
4.3	0.05	2318	0	2318	100	POLLUTANT AND HMP CONTROL MITIGATED BY BMP #4
5.0	0.12	5360	2687	2673	50	SELF RETAINING DMA (1:1 DISPERSION)



KEY PLAN

BWE
CIVIL • STRUCTURAL • SURVEY • PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123
619.299.5550

APPR	DATE	DESCRIPTION	SYM

BENCHMARK:

ISSUE DATE:	09/17/2021
DRAWN BY:	MDS
CHECKED BY:	MGC
B&W JOB NUMBER:	9545.10.00
CLIENT JOB NUMBER:	

PROJECT

SHARP MMC CAMPUS REDEVELOPMENT

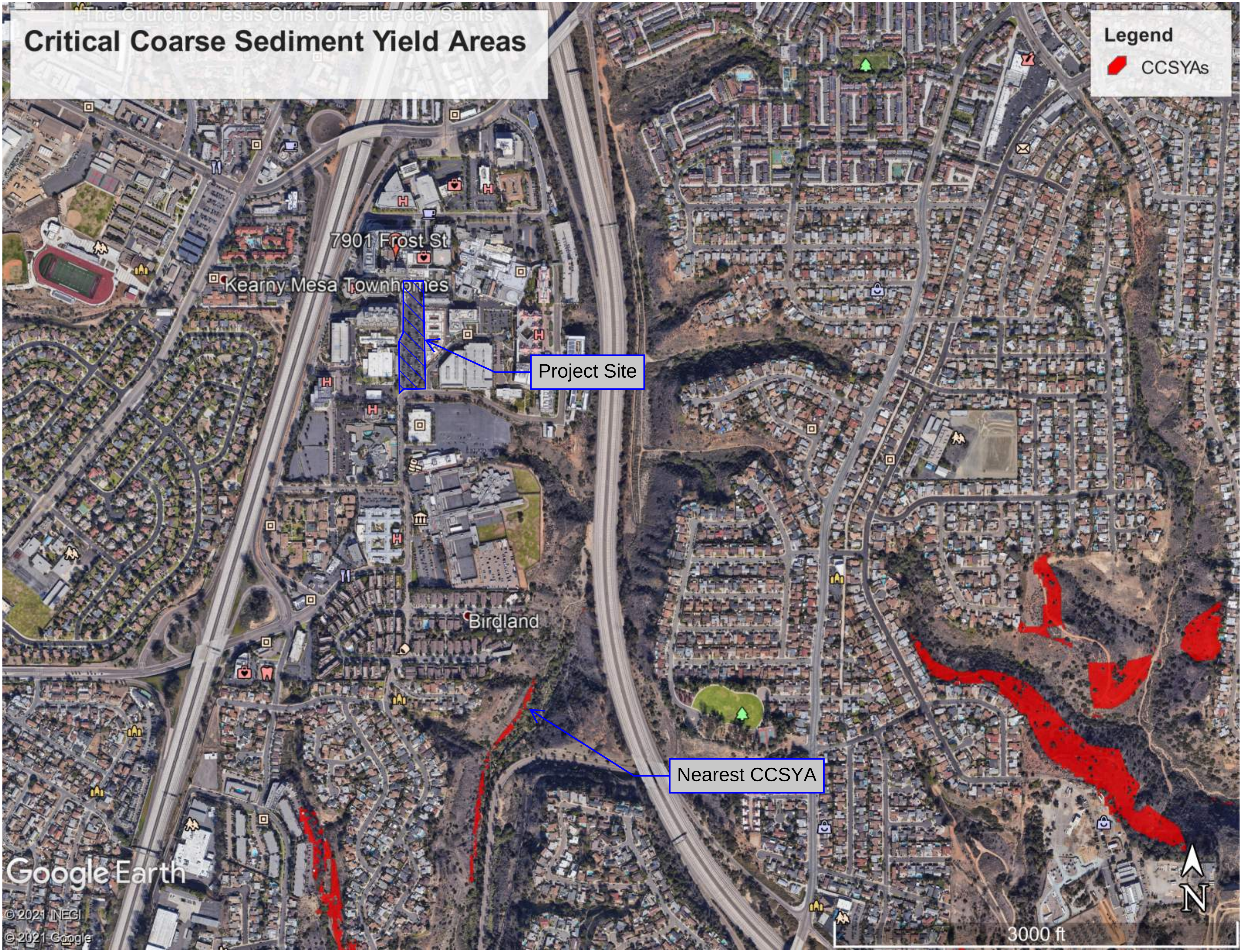
7901 FROST STREET
SAN DIEGO, CA 92123

SHEET TITLE

DMA EXHIBIT

SHEET 1 OF 2

PLOT: W:\PROJECTS\9500\9545\10.00 SHARP MMC\DWGS\EXHIBITS\SWQMP\PACKAGE 3A (CUP)\9545\10.00 PK 3A - DMAS.DWG MH GC 10/6/2022 4:22 PM


Critical Coarse Sediment Yield Areas
Legend
CCSYAs
7901 Frost St
Kearny Mesa Townhomes
Project Site
Birdland
Nearest CCSYA
N
3000 ft
Google Earth
© 2021 INEGI
© 2021 Google

BMP Sizing Spreadsheet V3.1

Project Name:	Sharp MMC - PK 7A
Project Applicant:	BWE Inc
Jurisdiction:	City of San Diego
Parcel (APN):	
Hydrologic Unit:	San Diego
Rain Gauge:	Oceanside
Total Project Area (sf):	21,815
Channel Susceptibility:	High

BMP Sizing Spreadsheet V3.1			
Project Name:	Sharp MMC - PK 7A	Hydrologic Unit:	San Diego
Project Applicant:	BWE Inc	Rain Gauge:	Oceanside
Jurisdiction:	City of San Diego	Total Project Area:	21,815
Parcel (APN):	0	Low Flow Threshold:	0.1Q2
BMP Name:	BMP #10	BMP Type:	Cistern
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	NA

Areas Draining to BMP						HMP Sizing Factors	Minimum BMP Size
DMA Name	Area (sf)	Pre Project Soil Type	Pre-Project Slope	Post Project Surface Type	Area Weighted Runoff Factor (Table G.2-1)[1]	Volume	Volume (CF)
9.1	21,815	D	Flat	Roofs	1.0	0.12	2618
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
BMP Tributary Area	21,815					Minimum BMP Size	2618
						Proposed BMP Size*	2992

* Assumes standard configuration

Standard Cistern Depth (Overflow Elevation)	3.5	ft
Provided Cistern Depth (Overflow Elevation)	3.5	ft
Minimum Required Cistern Footprint)	748	CF

Notes:

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

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

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

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

BMP Sizing Spreadsheet V3.1			
Project Name:	Sharp MMC - PK 7A	Hydrologic Unit:	San Diego
Project Applicant:	BWE Inc	Rain Gauge:	Oceanside
Jurisdiction:	City of San Diego	Total Project Area:	21,815
Parcel (APN):	0	Low Flow Threshold:	0.1Q2
BMP Name	BMP #10	BMP Type:	Cistern

DMA Name	Rain Gauge	Pre-developed Condition		Unit Runoff Ratio	DMA Area (ac)	Orifice Flow - $\%Q_2$	Orifice Area
		Soil Type	Slope	(cfs/ac)		(cfs)	(in^2)
9.1	Oceanside	D	Flat	0.571	0.501	0.029	**0.42**

3.50	**0.029**	**0.42**	**0.73**
Max Orifice Head (feet)	**Max Tot. Allowable Orifice Flow (cfs)**	**Max Tot. Allowable Orifice Area (in^2)**	**Max Orifice Diameter (in)**

Provide Hand Calc.	**0.026**	**0.38**	**0.700**
Average outflow during surface drawdown (cfs)	Max Orifice Outflow (cfs)	Actual Orifice Area (in^2)	Selected Orifice Diameter (in)

Drawdown (Hrs)	Provide Hand Calculation

Project Name:	Sharp MMC - Package 7A
Project Applicant:	BWE Inc.
BMP Name:	**BMP #10**

From HMP Analysis (hand calculation method)

Sizing calculations assuming 100% voids

Storage Depth, d (ft)	**4**	Per standard
HMP Volume Depth, d_{hmp} (ft) = d*7/8	**3.5**	
Required HMP Volume @ 3.5' depth, (CF) - V	**2,618**	From HMP Analysis
Void Ratio (100%)	1	
Required Surface area A, (sf) = V/d_{hmp}	**748**	
Required Volume @ 4' depth including 0.5' Freeboard	**2,992**	

Permavoid Sizing

Void ratio	0.95	Per Manufacturer
Required gross PV Volume for HMP Control @ 3.5' depth, V1 (cf) = V/0.95	2,756	
Required PV Surface area for HMP control @ 3.5' depth, A1 (sf)=	787	
Required gross volume at 4' depth (including 0.5' Freeboard), V2 (cf) = A1*d	**3,149**	
Volume of single unit (cf) = 2.32'*1.16'*0.49'	1.32	
Total units required =	2,388	
Permavoid Area per plan	**990**	
Net Vol. provided at 3.5' and 0.95 void ratio (cf)	**3,292**	
Gross Volume of Permavoid at 4' (cf)	**3,960**	

Attachment 3
Structural BMP Maintenance Information

This is the cover sheet for Attachment 3.

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Project Name: Sharp MMC - Package 7A (PK7A)

Indicate which Items are Included:

Attachment Sequence	Contents	Checklist
Attachment 3	Maintenance Agreement (Form DS-3247) (when applicable)	☑ Included ☐ Not applicable

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

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

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

THE CITY OF SAN DIEGO

RECORDING REQUESTED BY:
THE CITY OF SAN DIEGO
AND WHEN RECORDED MAIL TO:

____

____

____

(THIS SPACE IS FOR RECORDER'S USE ONLY)

STORM WATER MANAGEMENT AND DISCHARGE CONTROL MAINTENANCE AGREEMENT

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

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

____;

the owner or duly authorized representative of the owner [Property Owner] of property located at

____
(PROPERTY ADDRESS)

and more particularly described as:

____
(LEGAL DESCRIPTION OF PROPERTY)

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

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

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

Continued on Page 2

NOW, THEREFORE, the parties agree as follows:

1. Property Owner shall have prepared, or if qualified, shall prepare an Operation and Maintenance Procedure [OMP] for Permanent Storm Water BMPs, satisfactory to the City, according to the attached exhibit(s), consistent with the Grading and/or Improvement Plan Drawing No(s), or Building Plan Project No(s): ______________________________.

2. Property Owner shall install, maintain, and repair or replace all Permanent Storm Water BMPs within the property, according to the OMP guidelines as described in the attached exhibit(s), the project's SWQMP, and Grading and/or Improvement Plan Drawing No(s), or Building Plan Project No(s) ______________________________.

3. Property Owner shall maintain operation and maintenance records for at least five (5) years. These records shall be made available to the City for inspection upon request at any time.

This Maintenance Agreement shall commence upon execution of this document by all parties named hereon, and shall run with the land.

Executed by the City of San Diego and by Property Owner in San Diego, California.

See Attached Exhibit(s): ______________________________

THE CITY OF SAN DIEGO

APPROVED:

____
(DEPUTY CITY ENGINEER SIGNATURE)

____
(PRINT NAME)

____
(DATE)

____
(PROPERTY OWNER SIGNATURE)

____
(PRINT NAME AND TITLE)

____
(COMPANY/ORGANIZATION NAME)

____
(DATE)

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

SITE DESIGN, SOURCE CONTROL AND POLLUTANT CONTROL BMP OPERATION + MAINTENANCE PROCEDURE

STORM WATER MANAGEMENT AND DISCHARGE CONTROL MAINTENANCE AGREEMENT APPROVAL NO.: TBD

O&M RESPONSIBLE PARTY DESIGNEE: TBD

BMP DESCRIPTION	INSPECTION FREQUENCY	MAINTENANCE FREQUENCY	MAINTENANCE METHOD	QUANTITY	INCLUDED IN O&M MANUAL			SHEET NUMBER(S)
SITE DESIGN ELEMENTS					YES		NO	
LANDSCAPING W/ NATIVE OR DROUGHT TOLERANT SPECIES (4.3.7)	SEMI-ANNUALLY	AS-NEEDED	RE-SEED, RE-PLANT VEGETATION IN ERODED AREAS	N/A				C.3.4.4.A C.3.4.4.B
SOURCE CONTROL ELEMENTS					YES		NO	
PREVENTION OF ILLICIT DISCHARGES INTO THE MS4 (4.2.1)	N/A	AS NEEDED	ELIMINATE NON-STORM WATER DISCHARGE REPAIR/REPLACE IRRIGATION SYSTEM	N/A				C.3.4.4.A C.3.4.4.B
ON-SITE STORM DRAIN INLETS (4.2.6)	AFTER RAIN EVENT	AS NEEDED	REMOVE ACCUMULATED SEDIMENT, TRASH, DEBRIS	5				C.3.4.4.A C.3.4.4.B
PLAZAS, SIDEWALKS, AND PARKING LOTS (4.2.6)	BASED ON DIRT ACCUMULATION	AS NEEDED	REMOVE ACCUMULATED DIRT USING APPROPRIATE SWEEPING	N/A				C.3.4.4.A C.3.4.4.B
POLLUTANT CONTROL BMP(S)					YES		NO	
BIOFILTRATION BASIN (BMP #2)	QUARTERLY	AS NEEDED	CLEAR ANY OBSTRUCTIONS FROM OUTLET CONTROL STRUCTURE/ORIFICE	1				C.3.4.4.B
PROPRIETARY/COMPACT UNDERGROUND BIOFILTRATION MODULAR WETLAND SYSTEM (BMP #9)	SEE MANUFACTURER'S RECOMMENDATIONS FOR MORE INFORMATION (SWQMP ATTACHMENT 3)			1				C.3.4.4.A
HYDROMODIFICATION CONTROL BMP					YES		NO	
PERMAVOID UNDERGROUND VAULT (BMP #8)	QUARTERLY	AS NEEDED	CLEAR ANY OBSTRUCTIONS FROM OUTLET CONTROL STRUCTURE ORIFICE	2				C.3.4.4.A C.3.4.4.B

Attachment 4
Copy of Plan Sheets Showing Permanent Storm Water BMPs

This is the cover sheet for Attachment 4.

Project Name: Sharp MMC - Package 7A (PK7A)

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

The plans must identify:

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

GENERAL NOTES

1. APPROVAL OF THESE PLANS BY THE CITY ENGINEER DOES NOT AUTHORIZE ANY WORK TO BE PERFORMED UNTIL A PERMIT HAS BEEN ISSUED.

2. UPON ISSUANCE OF A PERMIT, NO WORK WILL BE PERMITTED ON WEEKENDS OR HOLIDAYS UNLESS APPROVED BY TRAFFIC CONTROL PERMIT FROM THE DEVELOPMENT SERVICES DEPARTMENT.

3. THE APPROVAL OF THIS PLAN OR ISSUANCE OF A PERMIT BY THE CITY OF SAN DIEGO DOES NOT AUTHORIZE THE PERMIT HOLDER OR OWNER TO VIOLATE ANY FEDERAL, STATE OR CITY LAWS, ORDINANCES, REGULATIONS, OR POLICIES.

4. IMPORTANT NOTICE: SECTION 4216 OF THE GOVERNMENT CODE REQUIRES A DIG ALERT IDENTIFICATION NUMBER ISSUED BEFORE A "PERMIT TO EXCAVATE" WILL BE VALID. FOR YOUR DIG ALERT I.D. NUMBER, CALL UNDERGROUND SERVICE ALERT, TOLL FREE (800) 422-4133, TWO DAYS BEFORE YOU DIG.

5. CONTRACTOR SHALL BE RESPONSIBLE FOR POTHOLING AND LOCATING ALL EXISTING UTILITIES THAT CROSS THE PROPOSED TRENCH LINE WHILE MAINTAINING A 1 FOOT VERTICAL CLEARANCE.

6. "PUBLIC IMPROVEMENT SUBJECT TO DESUETUDE OR DAMAGE." IF REPAIR OR REPLACEMENT OF SUCH PUBLIC IMPROVEMENTS IS REQUIRED, CONTRACTOR SHALL OBTAIN THE REQUIRED PERMITS FOR WORK IN THE PUBLIC RIGHT-OF-WAY, SATISFACTORY TO THE PERMIT ISSUING AUTHORITY.

7. DEVIATIONS FROM THESE SIGNED PLANS WILL NOT BE ALLOWED UNLESS A CONSTRUCTION CHANGE IS APPROVED BY THE CITY ENGINEER OR THE CHANGE IS REQUIRED BY THE RESIDENT ENGINEER.

8. CONTRACTOR SHALL REPLACE OR REPAIR ALL TRAFFIC SIGNAL LOOPS, CONDUITS, AND LANE STRIPING DAMAGED DURING CONSTRUCTION.

9. PRIOR TO SITE DISTURBANCE, CONTRACTOR SHALL MAKE ARRANGEMENTS FOR A PRECONSTRUCTION MEETING WITH THE CITY OF SAN DIEGO, CONSTRUCTION MANAGEMENT AND FIELD SERVICES DIVISION (858) 627-3200.

10. CONTRACTOR SHALL ONLY PERFORM SITE SURVEY AND UTILITY MARK OUT SERVICES PRIOR TO THE PRECONSTRUCTION MEETING.

11. CONTRACTOR SHALL IMPLEMENT AN EROSION CONTROL PROGRAM DURING THE PROJECT CONSTRUCTION ACTIVITIES. THE PROGRAM SHALL COMPLY WITH ALL APPLICABLE REQUIREMENTS OF THE STATE WATER RESOURCE CONTROL BOARD.

12. CONTRACTOR SHALL HAVE EMERGENCY MATERIAL AND EQUIPMENT ON HAND FOR UNFORESEEN SITUATIONS, SUCH AS DAMAGE TO UNDERGROUND WATER, SEWER, AND STORM DRAIN FACILITIES WHERE FLOW MAY GENERATE EROSION AND SEDIMENT POLLUTION.

13. AN AS-GRADED GEOTECHNICAL REPORT AND SET OF THE REDLINE "AS-BUILT" GRADING PLANS SHALL BE SUBMITTED TO AREA 3 ON THE THIRD FLOOR OF DEVELOPMENT SERVICES WITHIN 30 CALENDAR DAYS OF THE COMPLETION OF GRADING. AN ADDITIONAL SET SHALL BE PROVIDED TO THE RESIDENT ENGINEER OF THE CONSTRUCTION MANAGEMENT & FIELD SERVICES DIVISION AT 9573 CHESAPEAKE DRIVE, SAN DIEGO, CA 92123.

14. "AS-BUILT" DRAWINGS MUST BE SUBMITTED TO THE RESIDENT ENGINEER PRIOR TO ACCEPTANCE OF THIS PROJECT BY THE CITY OF SAN DIEGO.

15. MANHOLES AND PULL BOX COVER SHALL BE LABELED WITH NAME OF COMPANY.

16. CONTRACTOR SHALL PROVIDE RED-LINES DRAWINGS IN ACCORDANCE WITH 2-5.4 OF THE WHITEBOOK, "RED-LINES AND RECORD DOCUMENTS."

17. CONTRACTOR SHALL MAINTAIN A MINIMUM OF 1 FOOT VERTICAL SEPARATION TO ALL UTILITIES UNLESS OTHERWISE SPECIFIED ON THE PLANS.

18. CONTRACTOR SHALL REMOVE AND REPLACE ALL UTILITY BOXES SERVING AS HANDHOLES THAT ARE NOT IN "AS-NEW" CONDITION IN PROPOSED SIDEWALK, DAMAGED BOXES, OR THOSE THAT ARE NOT IN COMPLIANCE WITH CURRENT CODE SHALL BE REMOVED AND REPLACED WITH NEW BOXES, INCLUDING WATER, SEWER, TRAFFIC SIGNALS, STREET LIGHTS, DRY UTILITIES-SDG&E, COX, ETC. ALL NEW METAL LIDS SHALL BE SLIP RESISTANT AND INSTALLED FLUSH WITH PROPOSED SIDEWALK GRADE. IF A SLIP RESISTANT METAL LID IS NOT COMMERCIALLY AVAILABLE FOR THAT USE, NEW BOXES AND LIDS SHALL BE INSTALLED.

19. THE AREA WHICH IS DEFINED AS A NON GRADING AREA AND WHICH IS NOT TO BE DISTURBED SHALL BE STAKED PRIOR TO START OF THE WORK. THE PERMIT APPLICANT AND ALL OF THEIR REPRESENTATIVES OR CONTRACTORS SHALL COMPLY WITH THE REQUIREMENTS FOR PROTECTION OF THIS AREA AS REQUIRED BY ANY APPLICABLE AGENCY. ISSUANCE OF THE CITY'S GRADING PERMIT SHALL NOT RELIEVE THE APPLICANT OR ANY OF THEIR REPRESENTATIVES OR CONTRACTORS FROM COMPLYING WITH ANY STATE OR FEDERAL REQUIREMENTS BY AGENCIES INCLUDING BUT NOT LIMITED TO CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, CALIFORNIA DEPARTMENT OF FISH AND GAME. COMPLIANCE MAY INCLUDE OBTAINING PERMITS, OTHER AUTHORIZATIONS, OR COMPLIANCE WITH MANDATES BY ANY APPLICABLE STATE OR FEDERAL AGENCY.

20. PRIOR TO CONSTRUCTION, SURVEY MONUMENTS (HORIZONTAL AND VERTICAL) THAT ARE LOCATED IN THE CONSTRUCTION AREA SHALL BE TIED-OUT AND REFERENCED BY A LAND SURVEYOR.

21. UPON COMPLETION OF CONSTRUCTION, ALL DESTROYED SURVEY MONUMENTS ARE REQUIRED TO BE REPLACED, AND A CORNER RECORD OR RECORD OF SURVEY SHALL BE PREPARED AND FILED WITH THE COUNTY SURVEYOR AS REQUIRED BY THE PROFESSIONAL LAND SURVEYOR ACT, SECTION 8771 OF THE BUSINESS AND PROFESSIONS CODE OF THE STATE OF CALIFORNIA.

MONUMENT PRESERVATION CERTIFICATION

THE PERMITTEE SHALL BE RESPONSIBLE FOR THE COST OF REPLACING ALL SURVEY MONUMENTS DESTROYED BY CONSTRUCTION. IF A VERTICAL CONTROL MONUMENT IS TO BE DISTURBED OR DESTROYED, THE CITY OF SAN DIEGO FIELD SURVEY SECTION SHALL BE NOTIFIED IN WRITING AT LEAST 7 DAYS PRIOR TO DEMOLITION/CONSTRUCTION.

☐ THE TYPE OF CONSTRUCTION WILL NOT AFFECT ANY SURVEY MONUMENTS (THIS LINE IS FOR PROJECTS THAT ARE PROPOSING NO DEMOLITION, TRENCHING, ASSOCIATED WITH A CIP, ETC)

NAME DATE

PRIOR TO PERMIT ISSUANCE, THE PERMITTEE SHALL RETAIN THE SERVICE OF A PROFESSIONAL LAND SURVEYOR OR CIVIL ENGINEER AUTHORIZED TO PRACTICE LAND SURVEYING WHO WILL BE RESPONSIBLE FOR MONUMENT PRESERVATION AND SHALL PROVIDE A CORNER RECORD OR RECORD OF SURVEY TO THE COUNTY SURVEYOR AS REQUIRED BY THE PROFESSIONAL LAND SURVEYORS ACT, IF APPLICABLE. (SECTION 8771 OF THE BUSINESS AND PROFESSIONS CODE OF THE STATE OF CALIFORNIA)

I HAVE INSPECTED THE SITE AND DETERMINED THAT:

☐ NO SURVEY MONUMENTS WERE FOUND WITHIN THE LIMITS OF WORK
☐ SURVEY MONUMENTS EXISTING IN OR NEAR LIMITS OF WORK WILL BE PROTECTED IN PLACE
☐ SURVEY MONUMENTS HAVE BEEN TIED OUT AND A FINAL OR PARCEL MAP WILL BE FILED (NO CORNER RECORD OR RECORD OF SURVEY WILL BE REQUIRED)
☐ OTHER AGENCY SURVEY MONUMENT (CORNER RECORD OR RECORD OF SURVEY MAY NOT BE REQUIRED). AGENCY HAS BEEN NOTIFIED OF POSSIBLE MONUMENT DESTRUCTION AND A LETTER PROVIDED TO CITY
☐ A PRE-CONSTRUCTION CORNER RECORD (OR RECORD OF SURVEY) FOR SURVEY MONUMENTS FOUND WITHIN THE LIMITS OF WORK HAS BEEN FILED.

CORNER RECORD #____________ OR RECORD OF SURVEY #____________

NAME P.L.S. / R.C.E. NO. XXXXX EXP. XX-XX-XX DATE

POST CONSTRUCTION CORNER RECORD (AS-BUILT ITEM)

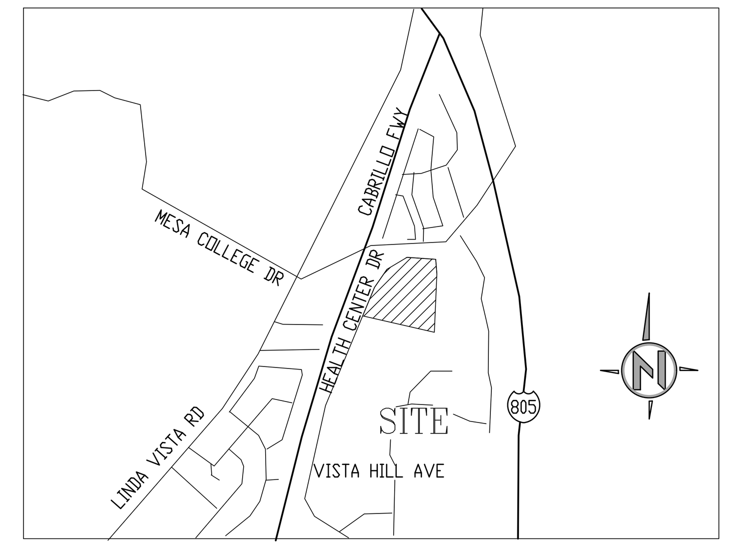
☐ POST CONSTRUCTION CORNER RECORD FOR SURVEY MONUMENTS DESTROYED DURING CONSTRUCTION AND REPLACED AFTER CONSTRUCTION.

CORNER RECORD #____________ OR RECORD OF SURVEY #____________

NAME P.L.S. / R.C.E. NO. XXXXX EXP. XX-XX-XX DATE

GRADING PLANS FOR:

SMMC CAMPUS REDEVELOPMENT PACKAGE 7A NEW TOWER



VICINITY MAP

NO SCALE

GRADING + GEOTECHNICAL SPECIFICATIONS

1. ALL GRADING SHALL BE CONDUCTED UNDER THE OBSERVATION AND TESTING BY A QUALIFIED PROFESSIONAL ENGINEER AND, IF REQUIRED, A QUALIFIED PROFESSIONAL GEOLOGIST. ALL GRADING MUST BE PERFORMED IN ACCORDANCE WITH APPLICABLE CITY ORDINANCE AND THE RECOMMENDATIONS AND SPECIFICATIONS SET FORTH IN THE PRELIMINARY GEOTECHNICAL INVESTIGATION REPORT(S) ENTITLED:

REPORT TITLE, PROJECT NAME, PROJECT LOCATION, PREPARED BY (COMPANY NAME), DATED (THEIR COMPANY PROJECT NO.)

THESE DOCUMENTS WILL BE FILED IN THE RECORDS SECTION OF DEVELOPMENT SERVICES UNDER THE PROJECT NUMBER INDICATED IN THE TITLE BLOCK OF THESE PLANS.

2. ALL FILL SOIL SHALL BE COMPACTED TO A MINIMUM OF 90% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY THE MOST RECENT VERSION OF A.S.T.M. D-1557 OR AN APPROVED ALTERNATIVE STANDARD.

3. AT THE COMPLETION OF THE GRADING OPERATIONS FOR THE EARTHWORK SHOWN ON THIS PLAN, AN AS-GRADED GEOTECHNICAL REPORT SHALL BE PREPARED IN ACCORDANCE WITH THE MOST RECENT EDITION OF THE CITY OF SAN DIEGO GUIDELINES FOR GEOTECHNICAL REPORTS. THE FINAL "AS-GRADED" GEOTECHNICAL REPORT SHALL BE SUBMITTED IN ACCORDANCE WITH THE GENERAL NOTES ON THESE PLANS WITHIN 30 DAYS OF THE COMPLETION OF GRADING. WHERE GEOLOGIC INSPECTION IS INDICATED IN THE PERMIT, PLANS, SPECIFICATIONS, OR GEOTECHNICAL REPORT(S), THE FINAL "AS-GRADED" GEOTECHNICAL REPORT MUST ALSO BE REVIEWED AND SIGNED BY A QUALIFIED PROFESSIONAL GEOLOGIST.

4. THE COMPANY OR COMPANIES REPRESENTED BY THE INDIVIDUALS SIGNING ITEM NO. 5 OF THIS CERTIFICATE IS/ARE THE GEOTECHNICAL CONSULTANT(S) OF RECORD. IF THE GEOTECHNICAL CONSULTANT OF RECORD IS CHANGED FOR THE PROJECT, THE WORK SHALL BE STOPPED UNTIL THE REPLACEMENT HAS SUBMITTED AN ACCEPTABLE TRANSFER OF GEOTECHNICAL CONSULTANT OF RECORD DECLARATION PREPARED IN ACCORDANCE WITH THE MOST RECENT EDITION OF THE CITY OF SAN DIEGO GUIDELINES FOR GEOTECHNICAL REPORTS. IT SHALL BE THE DUTY OF THE PERMITTEE TO NOTIFY THE RESIDENT ENGINEER AND THE GEOLOGY SECTION OF DEVELOPMENT SERVICES IN WRITING OF SUCH CHANGE PRIOR TO THE RECOMMENCEMENT OF GRADING.

5. THESE GRADING PLANS HAVE BEEN REVIEWED BY THE UNDERSIGNED AND FOUND TO BE IN CONFORMANCE WITH THE RECOMMENDATIONS AND SPECIFICATIONS CONTAINED IN THE REFERENCED GEOTECHNICAL REPORT(S) PREPARED FOR THIS PROJECT.

(SIGNATURE)
ENGINEER'S NAME P.E. OR G.E. DATE

(SIGNATURE)
GEOLOGIST'S NAME P.G. OR C.E.G. DATE

COMPANY NAME:
ADDRESS:
TELEPHONE NUMBER:

DECLARATION OF RESPONSIBLE CHARGE

I HEREBY DECLARE THAT I AM THE ENGINEER OF WORK FOR THIS PROJECT, THAT I HAVE EXERCISED RESPONSIBLE CHARGE OVER THE DESIGN OF THE PROJECT AS DEFINED IN SECTION 6703 OF THE BUSINESS AND PROFESSIONS CODE, AND THAT THE DESIGN IS CONSISTENT WITH CURRENT STANDARDS.

I UNDERSTAND THAT THE CHECK OF PROJECT DRAWINGS AND SPECIFICATIONS BY THE CITY OF SAN DIEGO IS CONFINED TO A REVIEW ONLY AND DOES NOT RELIEVE ME, AS ENGINEER OF WORK, OF MY RESPONSIBILITIES FOR PROJECT DESIGN.

AMBROSE T. WONG R.C.E. NO. C68965 EXP. XX-XX-XX DATE

BWE
9449 BALBOA AVE, SUITE 270
SAN DIEGO, CA 92123
(619) 299-5550
awong@bwesd.com

REGISTERED PROFESSIONAL ENGINEER AMBROSE T. WONG No. C68965 CIVIL STATE OF CALIFORNIA

OWNER/APPLICANT

SHARP HEALTHCARE
7901 FROST STREET, SAN DIEGO, CA 92123
DAVID CROSS
SENIOR PROJECT MANAGER, FACILITIES MANAGEMENT & DEVELOPMENT
David.Cross@SHARP.com
858.939.8323

REFERENCE DRAWINGS

SEWER 10462-3-D WATER 13629-4-D, 10462-2-D

SITE ADDRESS

INTERSECTION OF VISTA HILL AVE & HEALTH CENTER DRIVE, SAN DIEGO, CA 92123

TOPOGRAPHY SOURCE

GEOFFREY V. HOWLAND, LS NO. 9011
BWE
9449 BALBOA AVE. SUITE 270
SAN DIEGO CA 92123
PH# (619) 299-5550

THE CONTOURS/TOPO/ELEVATIONS SHOWN ON THESE PLANS ARE BASED ON FIELD SURVEY AND MEASUREMENTS PERFORMED ON 09/18/2020, BY GEOFFREY V. HOWLAND, LS NO. 9011.

BENCHMARK

THE BASIS OF ELEVATION FOR THIS SURVEY IS THE CITY OF SAN DIEGO BENCHMARK DESCRIBED AS A BRASS PLUG IN THE TOP OF CURB LOCATED AT THE SOUTHWEST CURB RETURN OF THE INTERSECTION OF VISTA HILL AVENUE AND MEADOW LARK DRIVE.
INDEX # 2298-17223
ELEVATION = 360.328 M.S.L.

ASSESSORS PARCEL NUMBER

427-530-02-00

EXISTING LEGAL DESCRIPTION

PARCEL 1 OF PARCEL MAP NO. 5131 IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, FILLED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, SEPTEMBER 24, 1976.

SHEET INDEX

SHEET NUMBER	DESCRIPTION
1	TITLE SHEET
2	NOTES
3-4	DEMOLITION PLAN
5-6	OVER EXCAVATION PLAN
7-9	GRADING & DRAINAGE PLAN
10-11	UTILITY PLAN
12	PROFILES
13-14	EROSION CONTROL PLAN
15-16	HORIZONTAL CONTROL PLAN
17	DETAILS

GRADING QUANTITIES

GRADED AREA 1.90 [ACRES] MAX. CUT DEPTH 8.7 [FT]
CUT QUANTITIES 5,940 [CYD] MAX CUT SLOPE RATIO (2:1MAX) _____
FILL QUANTITIES 1,080 [CYD] MAX. FILL DEPTH 6.5 [FT]
EXPORT 4,860 [CYD] MAX FILL SLOPE RATIO (2:1MAX) _____

THIS PROJECT PROPOSES TO EXPORT 4,860 CUBIC YARDS OF MATERIAL FROM THIS SITE. ALL EXPORT MATERIAL SHALL BE DISCHARGED TO A LEGAL DISPOSAL SITE. THE APPROVAL OF THIS PROJECT DOES NOT ALLOW PROCESSING AND SALE OF THE MATERIAL. ALL SUCH ACTIVITIES REQUIRE A SEPARATE CONDITIONAL USE PERMIT.

CONSTRUCTION STORM WATER PROTECTION NOTES

1. TOTAL SITE DISTURBANCE AREA (ACRES) ____________
WATERSHED: ____________
HYDRAULIC SUB AREA NAME AND NUMBER: ____________

2. THE PROJECT SHALL COMPLY WITH THE REQUIREMENTS OF THE
☐ WPCP
THE PROJECT IS SUBJECT TO MUNICIPAL STORM WATER PERMIT NUMBER R9-2013-0001 AND SUBSEQUENT AMENDMENTS..
☐ SWPPP
THE PROJECT IS SUBJECT TO MUNICIPAL STORM WATER PERMIT NUMBER R9-2013-0001 AND CONSTRUCTION GENERAL PERMIT ORDER NUMBER 2009-009-DWQ AS AMENDED BY ORDER 2010-0014 DWQ AND 2012-0006-DWQ

TRADITIONAL: RISK LEVEL 1☐ 2☐ 3☐
LUP RISK LEVEL 1☐ 2☐ 3☐
WDID NO: ____________

3. CONSTRUCTION SITE PRIORITY
ASBS☐ HIGH☐ MEDIUM☐ LOW☐

FOR STORMWATER BMP TABLES, SEE SHEET 2

WORK TO BE DONE

THE PUBLIC IMPROVEMENTS SHOWN ON THESE PLANS SHALL BE CONSTRUCTED ACCORDING TO THE FOLLOWING STANDARD SPECIFICATIONS AND STANDARD DRAWINGS OF THE CITY OF SAN DIEGO.

STANDARD SPECIFICATIONS:

DOCUMENT NO.	DESCRIPTION
PWPI010119-01	STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (GREENBOOK), 2018 EDITION
PWPI010119-02	CITY OF SAN DIEGO STANDARD SPECIFICATIONS FOR PUBLICWORKS CONSTRUCTION (WHITEBOOK), 2018 EDITION
PWPI010119-04	CITYWIDE COMPUTER AIDED DESIGN AND DRAFTING (CADD) STANDARDS, 2018 EDITION
PWPI030119-08	CALIFORNIA DEPARTMENT OF TRANSPORTATION MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (REVISION 4), 2014 EDITION
PWPI030119-05	CALIFORNIA DEPARTMENT OF TRANSPORTATION U.S. CUSTOMARY STANDARD SPECIFICATIONS, 2018 EDITION

STANDARD DRAWINGS:

DOCUMENT NO.	DESCRIPTION
PWPI010119-03	CITY OF SAN DIEGO STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION, 2018 EDITION
PWPI030119-06	CALIFORNIA DEPARTMENT OF TRANSPORTATION U.S CUSTOMARY STANDARD PLANS, 2018 EDITION

LEGEND

PROPOSED IMPROVEMENTS

IMPROVEMENT	STANDARD DWGS.	SYMBOL
6" CURB & GUTTER	SDG-151	
36"x36" FLOW CONTROL STRUCTURE	D/C-004	
ATRIUM DRAIN	C/C-004	
6" CURB	SDG-150	
TREE	PER LANDSCAPE DWGS	T
MODULAR WETLAND	C/C-003 & E/C-004	
RETAINING WALL	PER STRUCTURAL DWGS	
SIDEWALK CONCRETE PAVEMENT	B/C-003	
ASPHALT PAVEMENT	E/C-003	
GRIND AND OVERLAY		
TRUNCATED DOMES		
TRENCH RESURFACING	SDG-107 & SDG-117	
PERMEABLE PAVERS		
CHAIN LINK FENCE	PER LANDSCAPE DWGS	x
DOMESTIC WATER SERVICE	SIZE & TYPE PER PLAN	W
STORM DRAIN	SIZE & TYPE PER PLAN	SD
ELEC CONDUIT	PER ELECTRICAL DWGS	E
WATER GATE VALVE		
FIRE HYDRANT	SDW-104	
1" BACKFLOW PREVENTER	SDW-150	
STORM DRAIN CLEANOUT	SIZE & TYPE PER PLAN	

EXISTING IMPROVEMENTS

ITEM	SYMBOL
PROPERTY LINE / RIGHT OF WAY	
CENTER LINE	
EX UNDERGROUND ELECTRIC LINE	E
EX GAS VALVE	GV
EX STORM DRAIN MANHOLE	SDMH
EX DROP INLET	DI
EX STORM DRAIN LINE	SD
EX WATER METER	WM
EX WATER VALVE	
EX WATER LINE	W
EX SEWER MANHOLE	SMH
EX SEWER LINE	S
EX COMMUNICATION LINE	COM
EX FENCE	X
EX CURB & GUTTER	
EX ELECTRIC PULL BOX	EPB
EX ELECTRIC TRANSFORMER	ET
EX STREET LIGHT	ST
DECIDUOUS TREE WITH DIAMETER INDICATED	12"
EX FIRE HYDRANT	FH
EX SEWER CLEANOUT	SCO

ENGINEERING PERMIT NO:____________ RETAINING WALL PROJECT NO:____________
DISCRETIONARY PERMIT NO:____________
PRIVATE CONTRACT

C.0.4.4A

TITLE SHEET

SMMC CAMPUS REDEVELOPMENT
PACKAGE 7A NEW TOWER
7901 FROST STREET

CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET 1 OF 17 SHEETS

PROJECT NO.________
V.T.M.________

FOR CITY ENGINEER DATE

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	BWE			
AS-BUILTS				

CONTRACTOR________ DATE STARTED________
INSPECTOR________ DATE COMPLETED________

XXXX-XXXX NAD83 COORDINATES
XXX-XXXX LAMBERT COORDINATES

XXXXX-1-D

CONSTRUCTION CHANGE TABLE

CHANGE	DATE	EFFECTED OR ADDED SHEET NUMBERS	APPROVAL NO.	PROJECT NO.

WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

The City of SAN DIEGO
DEVELOPMENT SERVICES DEPARTMENT

STREET DATA TABLE

STREET NAME	CLASSIFICATION	SPEED (MPH)	ADT (VEHICLES)	R/W (FT)

SHARP
SMMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

McCARTHY
MCCARTHY BUILDING COMPANIES, INC.
9275 SKY PARK COURT, SUITE 200
SAN DIEGO, CA 92123

HDR
HDR ARCHITECTURE, INC.
350 SOUTH GRAND AVENUE, SUITE 2900
LOS ANGELES, CA 90071-3406

TAYLOR design
17850 FITCH
IRVINE, CA 92614

BWE
CIVIL • STRUCTURAL • SURVEY • PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

SITE PLAN
PACKAGE 2A.7A
NEW TOWER

CONSTRUCTION DOCUMENTS - 100%

Project Manager	Thomas Onnen
Project Designer	HDR/ Taylor Design
Project Architect	HDR/ Taylor Design
Landscape Architect	Schmidt Design Group
Civil Engineer	BWE Engineering
Structural Engineer	KPFF
Mechanical Engineer	TK1SC
Electrical Engineer	TK1SC
Plumbing Engineer	TK1SC
Interior Designer	HDR/ Taylor Design Group
Equipment Planner	Criterion

Sheet Reviewer Author

MARK DATE DESCRIPTION

Current Print Description

Project Number 10204365
Original Issue 06/18/20

Agency Number I210874-37-00
Agency Approval

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
INIT DATE
Office of Statewide Health Planning and Development
FACILITIES DEVELOPMENT DIVISION

Sheet Name
TITLE SHEET
AREA 4

Sheet Number
C.0.4.4A

Project Status
CONSTRUCTION DOCUMENTS 100%

FOR OSHPD REFERENCE ONLY

PRIVATE CONTRACT

C.0.4.4B

NOTES

SMMC CAMPUS REDEVELOPMENT
PACKAGE 7A NEW TOWER
7901 FROST STREET

CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET # OF 17 SHEETS

I.O. NO.
PROJECT NO.
V.T.M.

FOR CITY ENGINEER — DATE

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	BWE			
AS-BUILTS				

XXXX-XXXX
NAD83 COORDINATES
XXX-XXXX
LAMBERT COORDINATES

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

XXXXX-#-D

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

REGISTERED PROFESSIONAL ENGINEER — AMBROSE T. WONG — No. C68965 — CIVIL — STATE OF CALIFORNIA

AMBROSE T. WONG RCE NO. C68965

M:\PROJECTS\9500\9545U.10.00 SHARP MMC\DWGS\SHEET_DWGS\PK7A NEW TOWER\9545U.10.00 PK7A-00-TITL.DWG (07-07-21 11:09:21AM)

(REV 4/13/2018)

FOR OSHPD REFERENCE ONLY

SHARP
SMMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

McCARTHY
MCCARTHY BUILDING COMPANIES, INC.
9275 SKY PARK COURT, SUITE 200
SAN DIEGO, CA 92123

HDR
HDR ARCHITECTURE, INC.
350 SOUTH GRAND AVENUE, SUITE 2900
LOS ANGELES, CA 90071-3406

TAYLOR design
17850 FITCH
IRVINE, CA 92614

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

SITE PLAN
PACKAGE 2A.7A
NEW TOWER

CONSTRUCTION DOCUMENTS - 100%

Project Manager	Thomas Onnen
Project Designer	HDR/ Taylor Design
Project Architect	HDR/ Taylor Design
Landscape Architect	Schmidt Design Group
Civil Engineer	BWE Engineering
Structural Engineer	KPFF
Mechanical Engineer	TK1SC
Electrical Engineer	TK1SC
Plumbing Engineer	TK1SC
Interior Designer	HDR/ Taylor Design Group
Equipment Planner	Criterion

Sheet Reviewer: Author

MARK	DATE	DESCRIPTION

Current Print Description

Project Number	10204365
Original Issue	06/18/20
Agency Number	I210874-37-00
Agency Approval	

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
INIT DATE
Office of Statewide Health Planning and Development
FACILITIES DEVELOPMENT DIVISION

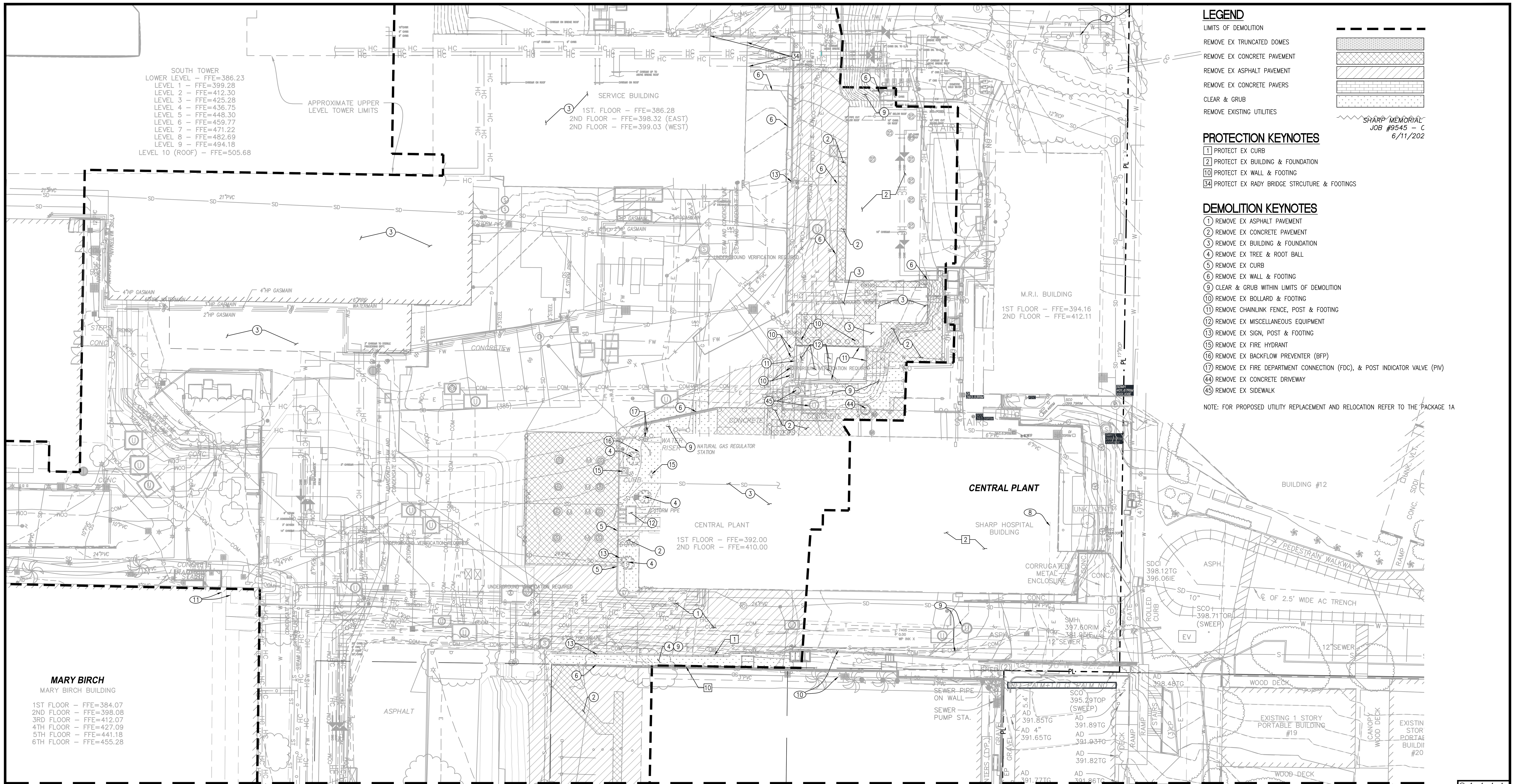
REGISTERED PROFESSIONAL ENGINEER — AMBROSE T. WONG — PRELIMINARY — CIVIL — STATE OF CALIFORNIA

Sheet Name
NOTES
AREA 4

Sheet Number
########

Project Status
CONSTRUCTION DOCUMENTS 100%

6/10/2020 2:29:41 PM BIM 360://10204365 - Sharp Metro Campus/SMMC-A-MAS.rvt



LEGEND

LIMITS OF DEMOLITION
REMOVE EX TRUNCATED DOMES
REMOVE EX CONCRETE PAVEMENT
REMOVE EX ASPHALT PAVEMENT
REMOVE EX CONCRETE PAVERS
CLEAR & GRUB
REMOVE EXISTING UTILITIES

SHARP MEMORIAL
JOB #9545 – C
6/11/202

PROTECTION KEYNOTES

1 PROTECT EX CURB
2 PROTECT EX BUILDING & FOUNDATION
10 PROTECT EX WALL & FOOTING
34 PROTECT EX RADY BRIDGE STRCUTURE & FOOTINGS

DEMOLITION KEYNOTES

1 REMOVE EX ASPHALT PAVEMENT
2 REMOVE EX CONCRETE PAVEMENT
3 REMOVE EX BUILDING & FOUNDATION
4 REMOVE EX TREE & ROOT BALL
5 REMOVE EX CURB
6 REMOVE EX WALL & FOOTING
9 CLEAR & GRUB WITHIN LIMITS OF DEMOLITION
10 REMOVE EX BOLLARD & FOOTING
11 REMOVE CHAINLINK FENCE, POST & FOOTING
12 REMOVE EX MISCELLANEOUS EQUIPMENT
13 REMOVE EX SIGN, POST & FOOTING
15 REMOVE EX FIRE HYDRANT
16 REMOVE EX BACKFLOW PREVENTER (BFP)
17 REMOVE EX FIRE DEPARTMENT CONNECTION (FDC), & POST INDICATOR VALVE (PIV)
44 REMOVE EX CONCRETE DRIVEWAY
45 REMOVE EX SIDEWALK

NOTE: FOR PROPOSED UTILITY REPLACEMENT AND RELOCATION REFER TO THE PACKAGE 1A

MATCHLINE SEE SHEET C.1.4.4.A

EXISTING EASEMENT KEYNOTES

7 EXISTING EASEMENT FOR WATER METER VAULT RECORDED 7–29–1958 AS DOC. # 121966 IN BOOK 7187, PAGE 465 O.R.
8 EXISTING SDGE EASEMENT (NO WIDTH GIVEN) RECORDED 9–29–1954 AS DOC. #129840, BOOK 5379, PAGE 419 O.R.
9 EXISTING 12'–WIDE SDGE EASEMENT RECORDED 9–21–1962 IN F/P 163692, SERIES 3, BOOK 1962 O.R.
10 EXISTING 12'–WIDE SDGE EASEMENT RECORDED 1–4–1960, F/P 433, SERIES 1, BOOK 1960 O.R.
11 EXISTING 4'–WIDE SDGE EASEMENT RECORDED 9–21–1962 IN F/P 163692, SERIES 3, BOOK 1962 O.R.

SCALE: 1"=20'

AMBROSE T. WONG RCE NO. C68965

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

C.1.4.4.A

PRIVATE CONTRACT

DEMOLITION PLAN

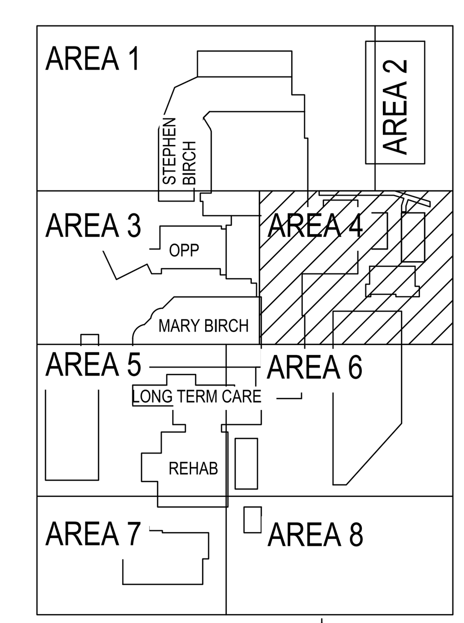
SMMC CAMPUS REDEVELOPMENT
PACKAGE 7A NEW TOWER
7901 FROST STREET

CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET 3 OF 17 SHEETS

FOR CITY ENGINEER			DATE		I.O. NO.
DESCRIPTION	BY	APPROVED	DATE	FILMED	PROJECT NO.
ORIGINAL	BWE				V.T.M.
					XXXX–XXXX NAD83 COORDINATES
					XXX–XXXX LAMBERT COORDINATES
AS–BUILTS					
CONTRACTOR		DATE STARTED			XXXXX–3–D
INSPECTOR		DATE COMPLETED			

M:\PROJECTS\9500\9545U.10.00 SHARP MMC\DWGS\SHEET_DWGS\PK7A NEW TOWER\9545U.10.00 PK7A–01–DEMO.DWG (07–07–21 11:10:15AM)
(REV 4/12/2018)

FOR OSHPD REFERENCE ONLY



KEY PLAN

SHARP

SMMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

McCARTHY
MCCARTHY BUILDING COMPANIES, INC.
9275 SKY PARK COURT, SUITE 200
SAN DIEGO, CA 92123

HDR
HDR ARCHITECTURE, INC.
350 SOUTH GRAND AVENUE, SUITE 2900
LOS ANGELES, CA 90071-3406

TAYLOR design
17850 FITCH
IRVINE, CA 92614

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

SITE PLAN
PACKAGE 2A.7A
NEW TOWER

CONSTRUCTION DOCUMENTS - 100%

Project Manager	Thomas Onnen
Project Designer	HDR/ Taylor Design
Project Architect	HDR/ Taylor Design
Landscape Architect	Schmidt Design Group
Civil Engineer	BWE Engineering
Structural Engineer	KPFF
Mechanical Engineer	TK1SC
Electrical Engineer	TK1SC
Plumbing Engineer	TK1SC
Interior Designer	HDR/ Taylor Design Group
Equipment Planner	Criterion

Sheet Reviewer Author

MARK DATE DESCRIPTION

Current Print Description

Project Number 10204365
Original Issue 06/18/20

Agency Number I210874-37-00
Agency Approval

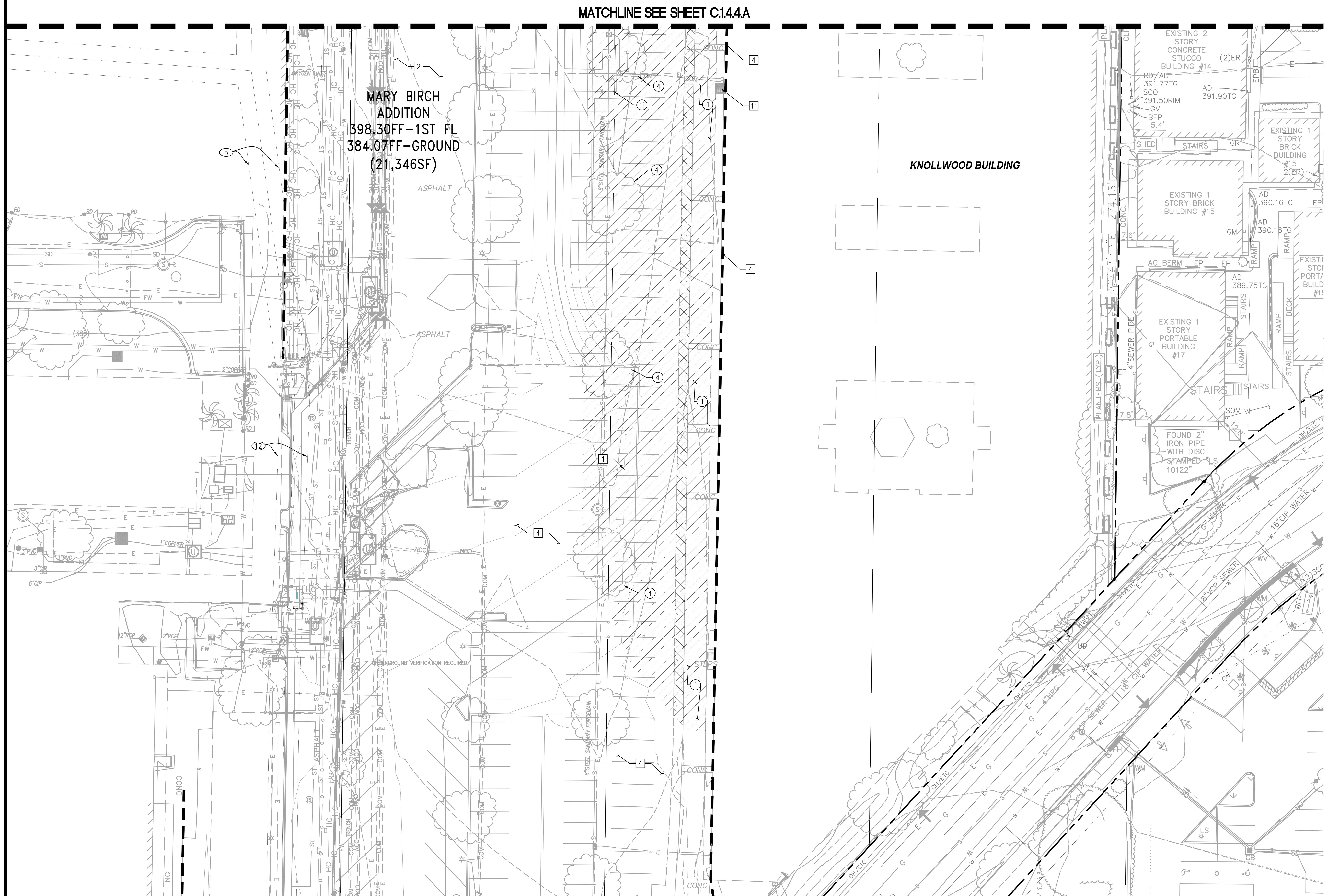
REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
INIT DATE
Office of Statewide Health Planning and Development
FACILITIES DEVELOPMENT DIVISION

Sheet Name
DEMOLITION PLAN
AREA 4

Sheet Number
C.1.4.4.A

Project Status
CONSTRUCTION DOCUMENTS 100%

6/10/2020 2:29:41 PM BIM 360://10204365 - Sharp Metro Campus/SMMC-A-MAS.rvt



LEGEND

LIMITS OF DEMOLITION
REMOVE EX TRUNCATED DOMES
REMOVE EX CONCRETE PAVEMENT
REMOVE EX ASPHALT PAVEMENT
REMOVE EX CONCRETE PAVERS
CLEAR & GRUB
REMOVE EXISTING UTILITIES

PROTECTION KEYNOTES

1 PROTECT EX CURB
2 PROTECT EX BUILDING & FOUNDATION
4 PROTECT EX ASPHALT PAVEMENT
11 PROTECT EX CATCH BASIN

DEMOLITION KEYNOTES

1 REMOVE EX ASPHALT PAVEMENT
4 REMOVE EX TREE & ROOT BALL
11 REMOVE CHAINLINK FENCE, POST & FOOTING

NOTE: FOR PROPOSED UTILITY REPLACEMENT AND RELOCATION REFER TO THE PACKAGE 1A

EXISTING EASEMENT KEYNOTES

5 EXISTING 12'-WIDE SDGE EASEMENT RECORDED 1-4-1960, F/P 433, SERIES 1, BOOK 1960 O.R.
12 EXISTING 12'-WIDE SDGE EASEMENT RECORDED 5-22-1961 IN F/P 87927, SERIES 2, BOOK 1961 O.R.

PRIVATE CONTRACT C.1.4.4.B

DEMOLITION PLAN

SMMC CAMPUS REDEVELOPMENT
PACKAGE 7A NEW TOWER
7901 FROST STREET

CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET 4 OF 17 SHEETS

I.O. NO. ______
PROJECT NO. ______
V.T.M. ______

FOR CITY ENGINEER ______ DATE ______

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	BWE			
AS-BUILTS				

XXXX-XXXX NAD83 COORDINATES
XXX-XXXX LAMBERT COORDINATES

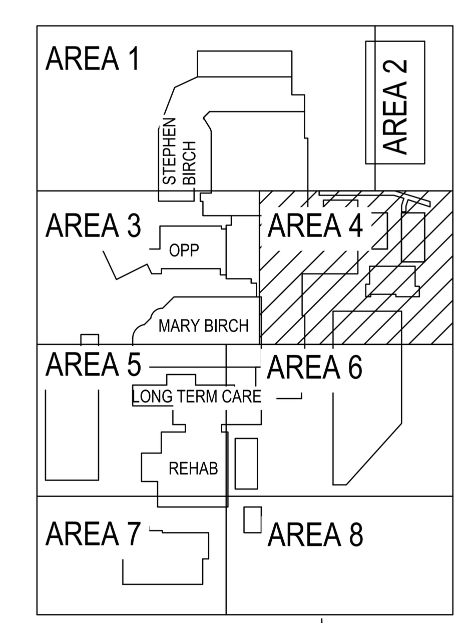
CONTRACTOR ______ DATE STARTED ______
INSPECTOR ______ DATE COMPLETED ______

XXXXX-4-D

AMBROSE T. WONG RCE NO. C68965

REGISTERED PROFESSIONAL ENGINEER AMBROSE T. WONG No. C68965 CIVIL STATE OF CALIFORNIA

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550



KEY PLAN

FOR OSHPD REFERENCE ONLY

M:\PROJECTS\9500\9545U.10.00 SHARP MMC\DWGS\SHEET_DWGS\PK7A NEW TOWER\9545U.10.00 PK7A-01-DEMO.DWG (07-07-21 11:10:26AM)
(REV 4/13/2018)

6/10/2020 2:29:41 PM BIM 360://10204365 - Sharp Metro Campus/SMMC-A-MAS.rvt

SHARP
SMMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

McCARTHY
McCARTHY BUILDING COMPANIES, INC.
9275 SKY PARK COURT, SUITE 200
SAN DIEGO, CA 92123

HDR
HDR ARCHITECTURE, INC.
350 SOUTH GRAND AVENUE, SUITE 2900
LOS ANGELES, CA 90071-3406

TAYLOR design
17850 FITCH
IRVINE, CA 92614

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

SITE PLAN
PACKAGE 2A.7A
NEW TOWER

CONSTRUCTION DOCUMENTS - 100%

Project Manager	Thomas Onnen
Project Designer	HDR/ Taylor Design
Project Architect	HDR/ Taylor Design
Landscape Architect	Schmidt Design Group
Civil Engineer	BWE Engineering
Structural Engineer	KPFF
Mechanical Engineer	TK1SC
Electrical Engineer	TK1SC
Plumbing Engineer	TK1SC
Interior Designer	HDR/ Taylor Design Group
Equipment Planner	Criterion

Sheet Reviewer: Author

MARK DATE DESCRIPTION

Current Print Description

Project Number: 10204365
Original Issue: 06/18/20

Agency Number: I210874-37-00
Agency Approval

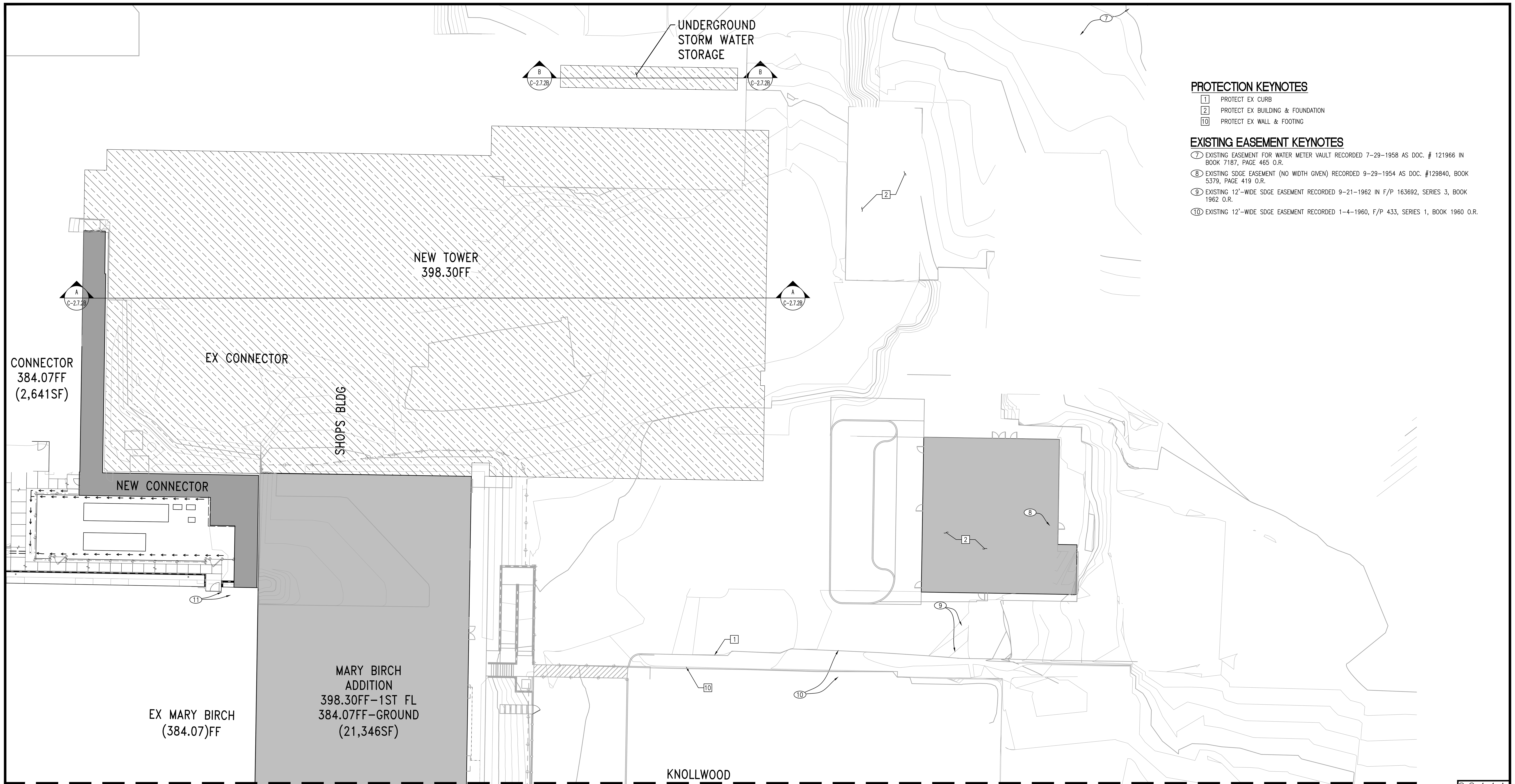
REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
INIT DATE
Office of Statewide Health Planning and Development
FACILITIES DEVELOPMENT DIVISION

REGISTERED PROFESSIONAL ENGINEER AMBROSE T. WONG PRELIMINARY CIVIL STATE OF CALIFORNIA

Sheet Name
DEMOLITION PLAN
AREA 4

Sheet Number
C.1.4.4.B

Project Status
CONSTRUCTION DOCUMENTS 100%



PROTECTION KEYNOTES

1 PROTECT EX CURB

2 PROTECT EX BUILDING & FOUNDATION

10 PROTECT EX WALL & FOOTING

EXISTING EASEMENT KEYNOTES

7 EXISTING EASEMENT FOR WATER METER VAULT RECORDED 7-29-1958 AS DOC. # 121966 IN BOOK 7187, PAGE 465 O.R.

8 EXISTING SDGE EASEMENT (NO WIDTH GIVEN) RECORDED 9-29-1954 AS DOC. #129840, BOOK 5379, PAGE 419 O.R.

9 EXISTING 12'-WIDE SDGE EASEMENT RECORDED 9-21-1962 IN F/P 163692, SERIES 3, BOOK 1962 O.R.

10 EXISTING 12'-WIDE SDGE EASEMENT RECORDED 1-4-1960, F/P 433, SERIES 1, BOOK 1960 O.R.

C.2.4.4.A

PRIVATE CONTRACT

OVER EXCAVATION PLAN

SMMC CAMPUS REDEVELOPMENT
PACKAGE 7A NEW TOWER
7901 FROST STREET

CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET 5 OF 17 SHEETS

I.O. NO. ____
PROJECT NO. ____
V.T.M. ____

FOR CITY ENGINEER ____ DATE ____

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	BWE			
AS-BUILTS				

XXXX–XXXX NAD83 COORDINATES

XXX–XXXX LAMBERT COORDINATES

CONTRACTOR ____ DATE STARTED ____
INSPECTOR ____ DATE COMPLETED ____

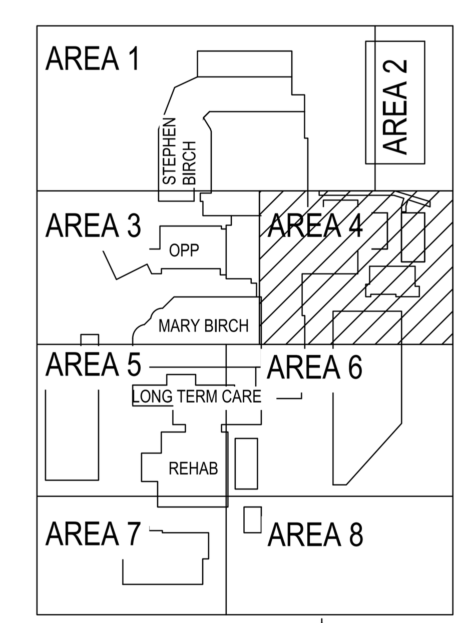
XXXXX–5–D

AMBROSE T. WONG RCE NO. C68965

REGISTERED PROFESSIONAL ENGINEER AMBROSE T. WONG No. C68965 CIVIL STATE OF CALIFORNIA

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

M:\PROJECTS\9500\9545U.10.00 SHARP MMC\DWGS\SHEET_DWGS\PK7A NEW TOWER\9545U.10.00 PK7A–02–OVER EXCAVATION.DWG (07–07–21 11:10:58AM)
(REV 4/13/2018)



KEY PLAN

FOR OSHPD REFERENCE ONLY

SHARP
SMMC CAMPUS
REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

McCARTHY
McCARTHY BUILDING COMPANIES, INC.
9275 SKY PARK COURT, SUITE 200
SAN DIEGO, CA 92123

HDR
HDR ARCHITECTURE, INC.
350 SOUTH GRAND AVENUE, SUITE 2900
LOS ANGELES, CA 90071-3406

TAYLOR design
17850 FITCH
IRVINE, CA 92614

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

SITE PLAN
PACKAGE 2A.7A
NEW TOWER

CONSTRUCTION DOCUMENTS - 100%

Project Manager	Thomas Onnen
Project Designer	HDR/ Taylor Design
Project Architect	HDR/ Taylor Design
Landscape Architect	Schmidt Design Group
Civil Engineer	BWE Engineering
Structural Engineer	KPFF
Mechanical Engineer	TK1SC
Electrical Engineer	TK1SC
Plumbing Engineer	TK1SC
Interior Designer	HDR/ Taylor Design Group
Equipment Planner	Criterion

Sheet Reviewer Author

MARK	DATE	DESCRIPTION

Current Print Description

Project Number 10204365
Original Issue 06/18/20

Agency Number I210874-37-00
Agency Approval

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
INIT DATE
Office of Statewide Health Planning and Development
FACILITIES DEVELOPMENT DIVISION

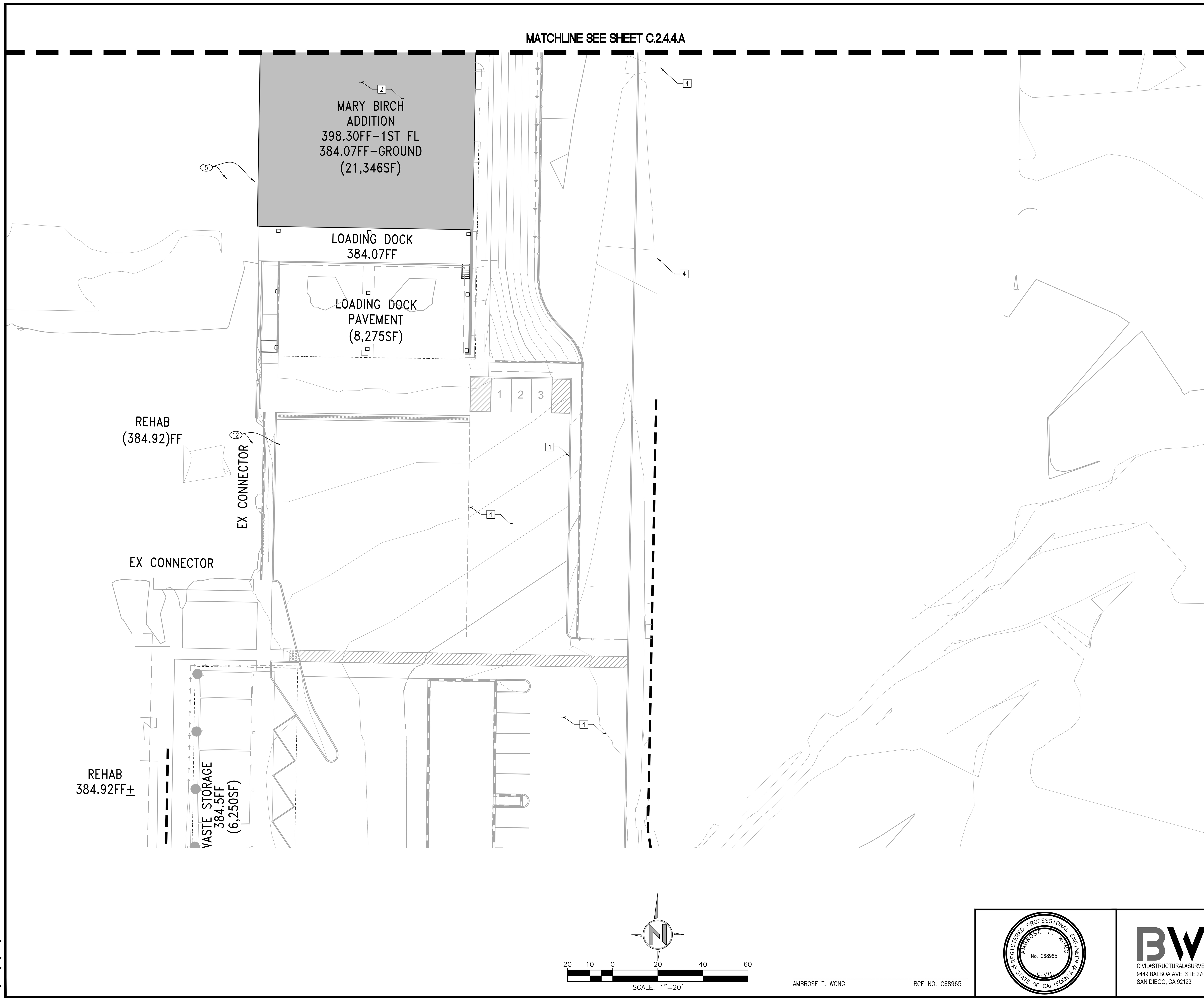
REGISTERED PROFESSIONAL ENGINEER AMBROSE T. WONG CIVIL STATE OF CALIFORNIA PRELIMINARY

Sheet Name
OVER EXCAVATION PLAN
AREA 4

Sheet Number
C.2.4.4.A

Project Status
CONSTRUCTION DOCUMENTS 100%

6/10/2020 2:29:41 PM BIM 360://10204365 - Sharp Metro Campus/SMMC-A-MAS.rvt



PROTECTION KEYNOTES

1 PROTECT EX CURB
2 PROTECT EX BUILDING & FOUNDATION
4 PROTECT EX ASPHALT PAVEMENT

EXISTING EASEMENT KEYNOTES

5 EXISTING 12'-WIDE SDGE EASEMENT RECORDED 1-4-1960, F/P 433, SERIES 1, BOOK 1960 O.R.
12 EXISTING 12'-WIDE SDGE EASEMENT RECORDED 5-22-1961 IN F/P 87927, SERIES 2, BOOK 1961 O.R.

PRIVATE CONTRACT

C.2.4.4.B

OVER EXCAVATION PLAN

SMMC CAMPUS REDEVELOPMENT
PACKAGE 7A NEW TOWER
7901 FROST STREET

CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET 6 OF 17 SHEETS

I.O. NO.
PROJECT NO.
V.T.M.

FOR CITY ENGINEER			DATE	
DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	BWE			

XXXX-XXXX NAD83 COORDINATES
XXX-XXXX LAMBERT COORDINATES

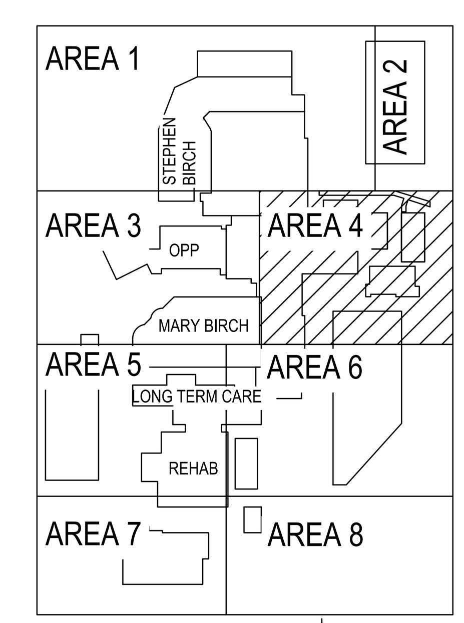
AS-BUILTS
CONTRACTOR ___ DATE STARTED ___
INSPECTOR ___ DATE COMPLETED ___

XXXXX-6-D

AMBROSE T. WONG RCE NO. C68965

REGISTERED PROFESSIONAL ENGINEER AMBROSE T. WONG No. C68965 CIVIL STATE OF CALIFORNIA

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550



KEY PLAN

FOR OSHPD REFERENCE ONLY

M:\PROJECTS\9500\9545U.10.00 SHARP MMC\DWGS\SHEET_DWGS\PK7A NEW TOWER\9545U.10.00 PK7A-02-OVER EXCAVATION.DWG (07-07-21 11:11:01AM)
(REV 4/12/2018)

6/10/2020 2:29:41 PM BIM 360://10204365 - Sharp Metro Campus/SMMC-A-MAS.rvt

SHARP
SMMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

McCARTHY
McCARTHY BUILDING COMPANIES, INC.
9275 SKY PARK COURT, SUITE 200
SAN DIEGO, CA 92123

HDR
HDR ARCHITECTURE, INC.
350 SOUTH GRAND AVENUE, SUITE 2900
LOS ANGELES, CA 90071-3406

TAYLOR design
17850 FITCH
IRVINE, CA 92614

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

SITE PLAN
PACKAGE 2A.7A
NEW TOWER

CONSTRUCTION DOCUMENTS - 100%

Project Manager	Thomas Onnen
Project Designer	HDR/ Taylor Design
Project Architect	HDR/ Taylor Design
Landscape Architect	Schmidt Design Group
Civil Engineer	BWE Engineering
Structural Engineer	KPFF
Mechanical Engineer	TK1SC
Electrical Engineer	TK1SC
Plumbing Engineer	TK1SC
Interior Designer	HDR/ Taylor Design Group
Equipment Planner	Criterion

Sheet Reviewer: Author

MARK	DATE	DESCRIPTION

Current Print Description

Project Number: 10204365
Original Issue: 06/18/20

Agency Number: I210874-37-00
Agency Approval

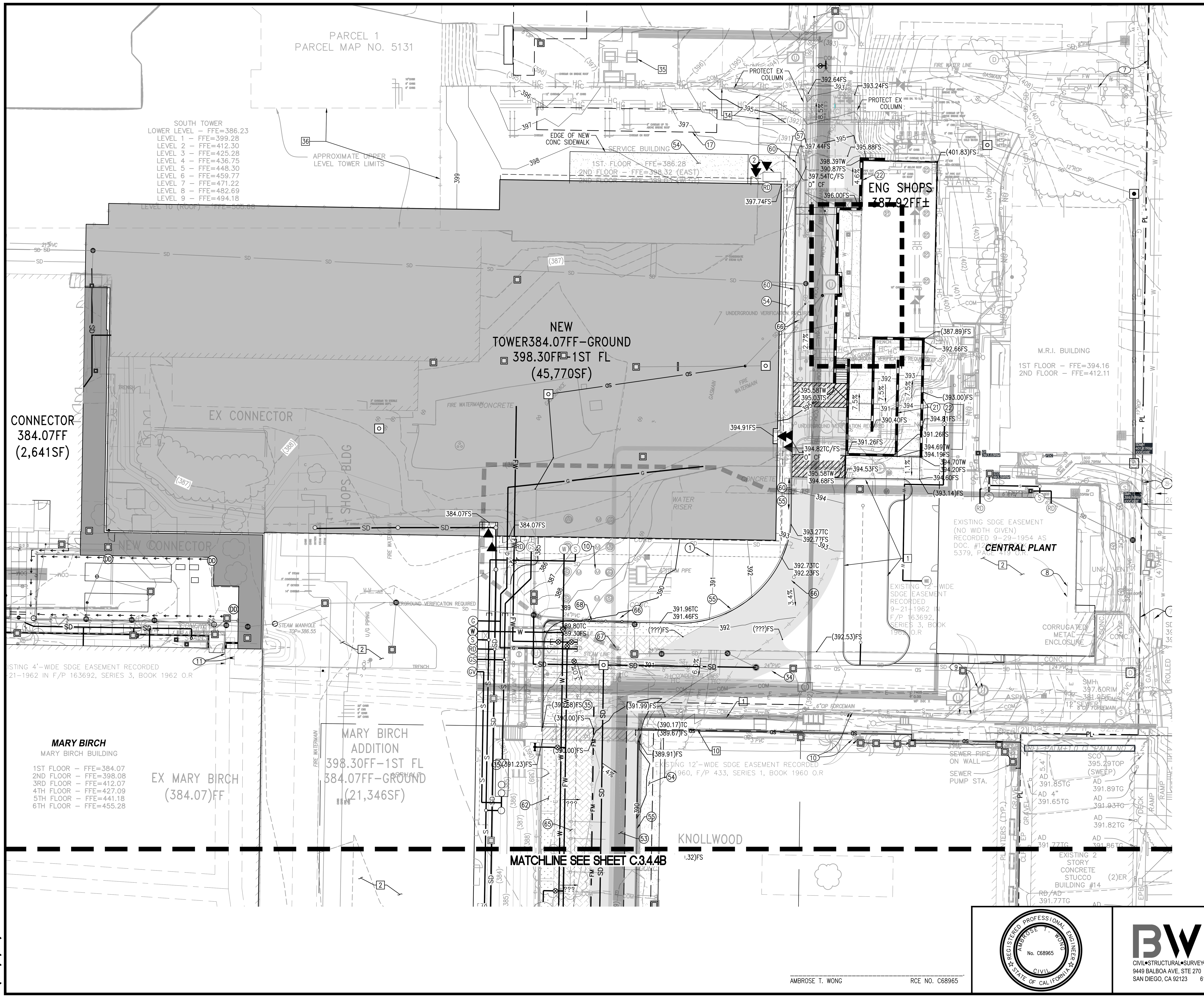
REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
INIT DATE
Office of Statewide Health Planning and Development
FACILITIES DEVELOPMENT DIVISION

REGISTERED PROFESSIONAL ENGINEER AMBROSE T. WONG PRELIMINARY CIVIL STATE OF CALIFORNIA

Sheet Name
OVER EXCAVATION PLAN
AREA 4

Sheet Number
C.2.4.4.B

Project Status
CONSTRUCTION DOCUMENTS 100%



GRADING NOTES

1. PRELIMINARY EARTHWORK QUANTITIES FOR PHASES 0 THROUGH 6 COMBINED ARE 20,080CY CUT AND 4850CY FILL FOR A TOTAL OF 15,230CY OF EXPORT. CALCULATIONS ASSUME 12" THICK PAVEMENT SECTIONS, 6' BUILDING SLABS, AND 4" SIDEWALK THICKNESSES. QUANTITIES HAVE NOT YET BEEN BROKEN OUT INTO SEPARATE PHASES.
2. FOR PROPOSED UTILITY REPLACEMENT AND RELOCATION REFER TO THE PACKAGE 1A

PROTECTION KEYNOTES

1 PROTECT EX CURB
2 PROTECT EX BUILDING & FOUNDATION
10 PROTECT EX WALL & FOOTING
34 PROTECT EX RADY BRIDGE STRCUTURE & FOOTINGS
35 PROTECT EX ELECTRICAL STRUCTURE
36 PROTECT EX TOWER BUILDING

CONSTRUCTION KEYNOTES

RD ROOF DRAIN POINT OF CONNECTION 5' OUTSIDE OF BUILDING. CONTINUATION PER PLUMBING DRAWINGS
1 CONSTRUCT MODULAR WETLAND MWS–L–4–13
2 CONSTRUCT MODULAR WETLAND MWS–L–4–13
10 CONSTRUCT 3194CF OF UNDERGROUND STORM WATER STORAGE FOR 1/2 OF NEW TOWER
17 CONSTRUCT 3109CF OF UNDERGROUND STORM WATER STORAGE FOR 1/2 OF NEW TOWER
21 CONSTRUCT RAMP
22 CONSTRUCT RETAINING WALL PER STRUCTURAL DWGS
34 MATCH EX PAVEMENT ELEVATIONS
35 MATCH EX TC/FS ELEVATIONS
53 CONSTRUCT AC PAVEMENT PER TABLE 5/C–112
54 CONSTRUCT CONCRETE 4" WALKWAY
55 CONSTRUCT 6" CURB
57 CONSTRUCT DETECTABLE WARNING TILES
60 CONSTRUCT 0" CURB
62 PROPOSED GROUNDCOVER PER LANDSCAPE
65 TURF BLOCK PER LANDSCAPE DWGS
66 CONSTRUCT NEW 18" PVC STORM DRAIN
67 PUMP SYSTEM PER PACKAGE 3A
68 GUARD RAIL PER LANDSCAPE DWGS

EXISTING EASEMENT KEYNOTES

7 EXISTING EASEMENT FOR WATER METER VAULT RECORDED 7–29–1958 AS DOC. # 121966 IN BOOK 7187, PAGE 465 O.R.
8 EXISTING SDGE EASEMENT (NO WIDTH GIVEN) RECORDED 9–29–1954 AS DOC. #129840, BOOK 5379, PAGE 419 O.R.
9 EXISTING 12'–WIDE SDGE EASEMENT RECORDED 9–21–1962 IN F/P 163692, SERIES 3, BOOK 1962 O.R.
10 EXISTING 12'–WIDE SDGE EASEMENT RECORDED 1–4–1960, F/P 433, SERIES 1, BOOK 1960 O.R.

PRIVATE CONTRACT

C.3.4.4.A

GRADING AND DRAINAGE PLAN
SMMC CAMPUS REDEVELOPMENT
PACKAGE 7A NEW TOWER
7901 FROST STREET

CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET 7 OF 17 SHEETS

I.O. NO.
PROJECT NO.
V.T.M.

FOR CITY ENGINEER			DATE	
DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	BWE			
AS-BUILTS				

XXXX–XXXX NAD83 COORDINATES
XXX–XXXX LAMBERT COORDINATES

CONTRACTOR ____ DATE STARTED ____
INSPECTOR ____ DATE COMPLETED ____

XXXXX–7–D

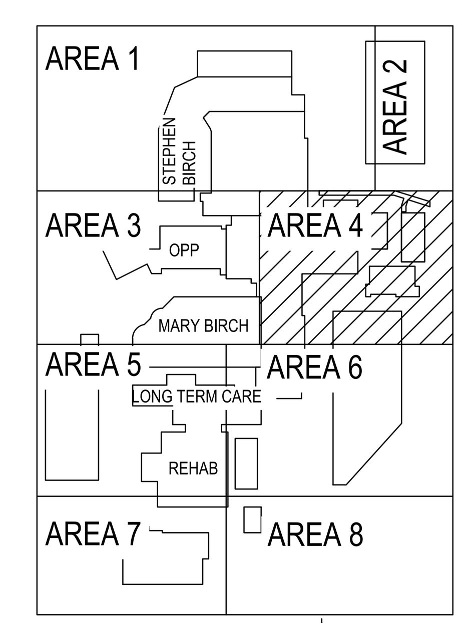
AMBROSE T. WONG RCE NO. C68965

REGISTERED PROFESSIONAL ENGINEER AMBROSE T. WONG No. C68965 CIVIL STATE OF CALIFORNIA

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

M:\PROJECTS\9500\9545U.10.00 SHARP MMC\DWGS\SHEET_DWGS\PK7A NEW TOWER\9545U.10.00 PK7A-03-GRAD.DWG (07-07-21 11:12:42AM)
(REV 4/13/2018)

FOR OSHPD REFERENCE ONLY



KEY PLAN

SHARP
SMMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

McCARTHY
McCARTHY BUILDING COMPANIES, INC.
9275 SKY PARK COURT, SUITE 200
SAN DIEGO, CA 92123

HDR
HDR ARCHITECTURE, INC.
350 SOUTH GRAND AVENUE, SUITE 2900
LOS ANGELES, CA 90071-3406

TAYLOR design
17850 FITCH
IRVINE, CA 92614

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

SITE PLAN
PACKAGE 2A.7A
NEW TOWER

CONSTRUCTION DOCUMENTS - 100%

Project Manager	Thomas Onnen
Project Designer	HDR/ Taylor Design
Project Architect	HDR/ Taylor Design
Landscape Architect	Schimdt Design Group
Civil Engineer	BWE Engineering
Structural Engineer	KPFF
Mechanical Engineer	TK1SC
Electrical Engineer	TK1SC
Plumbing Engineer	TK1SC
Interior Designer	HDR/ Taylor Design Group
Equipment Planner	Criterion
Sheet Reviewer	Author

MARK	DATE	DESCRIPTION

Current Print Description

Project Number 10204365
Original Issue 06/18/20

Agency Number I210874-37-00
Agency Approval

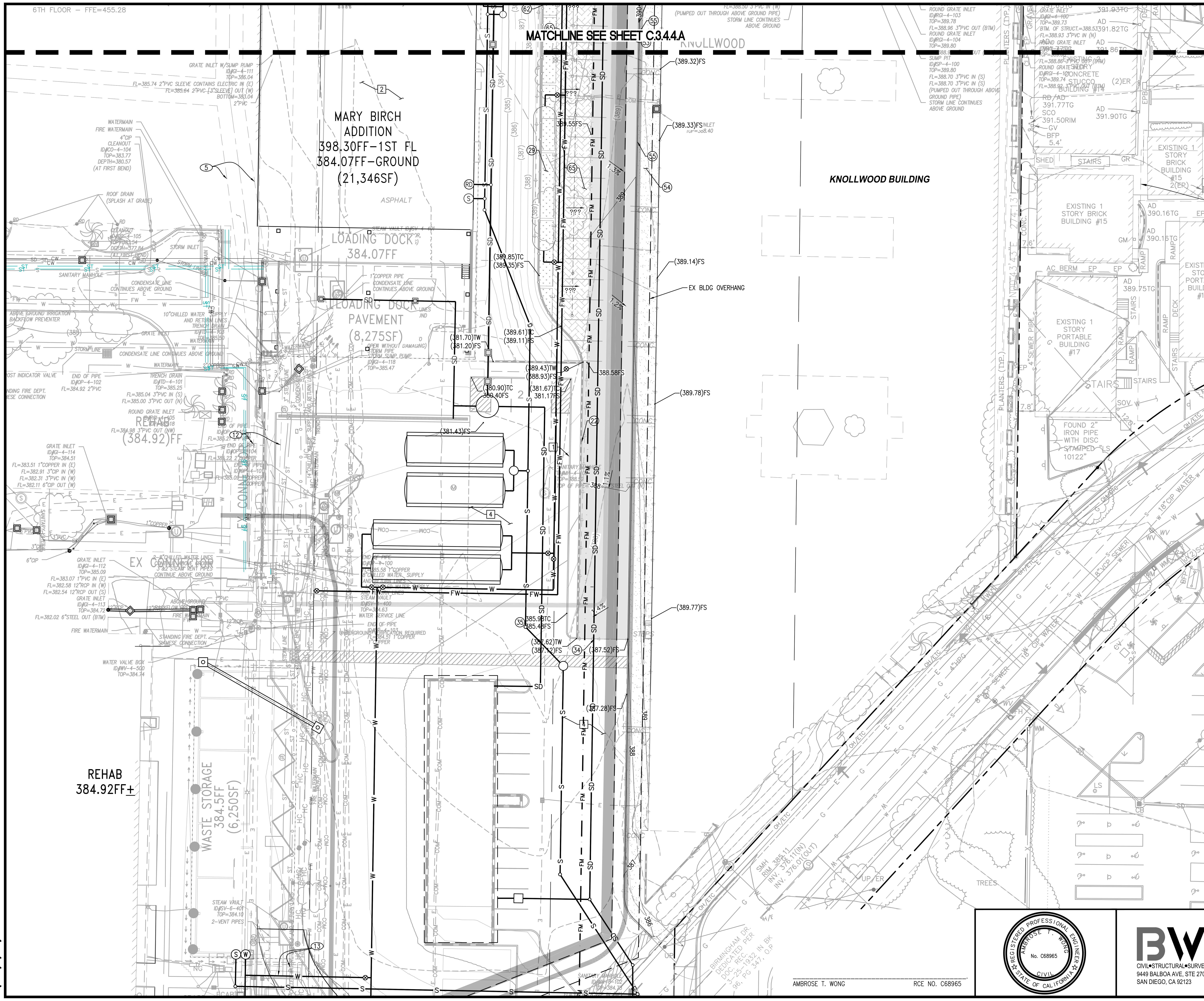
REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
INIT DATE
Office of Statewide Health Planning and Development
FACILITIES DEVELOPMENT DIVISION

Sheet Name
GRADING AND DRAINAGE PLAN AREA 4

Sheet Number
C.3.4.4.A

Project Status
CONSTRUCTION DOCUMENTS 100%

6/10/2020 2:29:41 PM BIM 360://10204365 - Sharp Metro Campus/SMMC-A-MAS.rvt



GRADING NOTES

1. PRELIMINARY EARTHWORK QUANTITIES FOR PHASES 0 THROUGH 6 COMBINED ARE 20,080CY CUT AND 4850CY FILL FOR A TOTAL OF 15,230CY OF EXPORT. CALCULATIONS ASSUME 12" THICK PAVEMENT SECTIONS, 6' BUILDING SLABS, AND 4" SIDEWALK THICKNESSES. QUANTITIES HAVE NOT YET BEEN BROKEN OUT INTO SEPARATE PHASES.
2. FOR PROPOSED UTILITY REPLACEMENT AND RELOCATION REFER TO THE PACKAGE 1A

PROTECTION KEYNOTES

1 PROTECT EX CURB
2 PROTECT EX BUILDING & FOUNDATION
4 PROTECT EX ASPHALT PAVEMENT

CONSTRUCTION KEYNOTES

22 CONSTRUCT RETAINING WALL PER STRUCTURAL DWGS
29 CONSTRUCT VEGETATED SWALE PER C/C9.3.2A
34 MATCH EX PAVEMENT ELEVATIONS
35 MATCH EX TC/FS ELEVATIONS
53 CONSTRUCT AC PAVEMENT PER TABLE 5/C-112
54 CONSTRUCT CONCRETE 4" WALKWAY
55 CONSTRUCT 6" CURB
62 PROPOSED GROUNDCOVER PER LANDSCAPE
65 TURF BLOCK PER LANDSCAPE DWGS

EXISTING EASEMENT KEYNOTES

5 EXISTING 12'-WIDE SDGE EASEMENT RECORDED 1-4-1960, F/P 433, SERIES 1, BOOK 1960 O.R.
12 EXISTING 12'-WIDE SDGE EASEMENT RECORDED 5-22-1961 IN F/P 87927, SERIES 2, BOOK 1961 O.R.

PRIVATE CONTRACT

C.3.4.4.B

GRADING AND DRAINAGE PLAN

SMMC CAMPUS REDEVELOPMENT
PACKAGE 7A NEW TOWER
7901 FROST STREET

CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET 8 OF 17 SHEETS

I.O. NO. ____
PROJECT NO. ____
V.T.M. ____

FOR CITY ENGINEER			DATE	
DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	BWE			

AS-BUILTS
CONTRACTOR ____ DATE STARTED ____
INSPECTOR ____ DATE COMPLETED ____

XXXX-XXXX NAD83 COORDINATES
XXX-XXXX LAMBERT COORDINATES
XXXXX-8-D

AMBROSE T. WONG RCE NO. C68965

REGISTERED PROFESSIONAL ENGINEER AMBROSE T. WONG No. C68965 CIVIL STATE OF CALIFORNIA

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

KEY PLAN
AREA 1, AREA 2, AREA 3, AREA 4, AREA 5, AREA 6, AREA 7, AREA 8, STEPHEN BIRCH, OPP, MARY BIRCH, LONG TERM CARE, REHAB

FOR OSHPD REFERENCE ONLY

M:\PROJECTS\9500\9545U.10.00 SHARP MMC\DWGS\SHEET_DWGS\PK7A NEW TOWER\9545U.10.00 PK7A-03-GRAD.DWG (07-07-21 11:12:53AM)
(REV 4/13/2018)

6/10/2020 2:29:41 PM BIM 360://10204365 - Sharp Metro Campus/SMMC-A-MAS.rvt

SHARP
SMMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

McCARTHY
McCARTHY BUILDING COMPANIES, INC.
9275 SKY PARK COURT, SUITE 200
SAN DIEGO, CA 92123

HDR
HDR ARCHITECTURE, INC.
350 SOUTH GRAND AVENUE, SUITE 2900
LOS ANGELES, CA 90071-3406

TAYLOR design
17850 FITCH
IRVINE, CA 92614

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

SITE PLAN
PACKAGE 2A.7A
NEW TOWER

CONSTRUCTION DOCUMENTS - 100%

Project Manager	Thomas Onnen
Project Designer	HDR/ Taylor Design
Project Architect	HDR/ Taylor Design
Landscape Architect	Schmidt Design Group
Civil Engineer	BWE Engineering
Structural Engineer	KPFF
Mechanical Engineer	TK1SC
Electrical Engineer	TK1SC
Plumbing Engineer	TK1SC
Interior Designer	HDR/ Taylor Design Group
Equipment Planner	Criterion

Sheet Reviewer: Author

MARK	DATE	DESCRIPTION

Current Print Description

Project Number: 10204365
Original Issue: 06/18/20
Agency Number: I210874-37-00
Agency Approval

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
INIT DATE
Office of Statewide Health Planning and Development
FACILITIES DEVELOPMENT DIVISION

REGISTERED PROFESSIONAL ENGINEER AMBROSE T. WONG PRELIMINARY CIVIL STATE OF CALIFORNIA

Sheet Name
GRADING AND DRAINAGE PLAN
AREA 4

Sheet Number
C.3.4.4.B

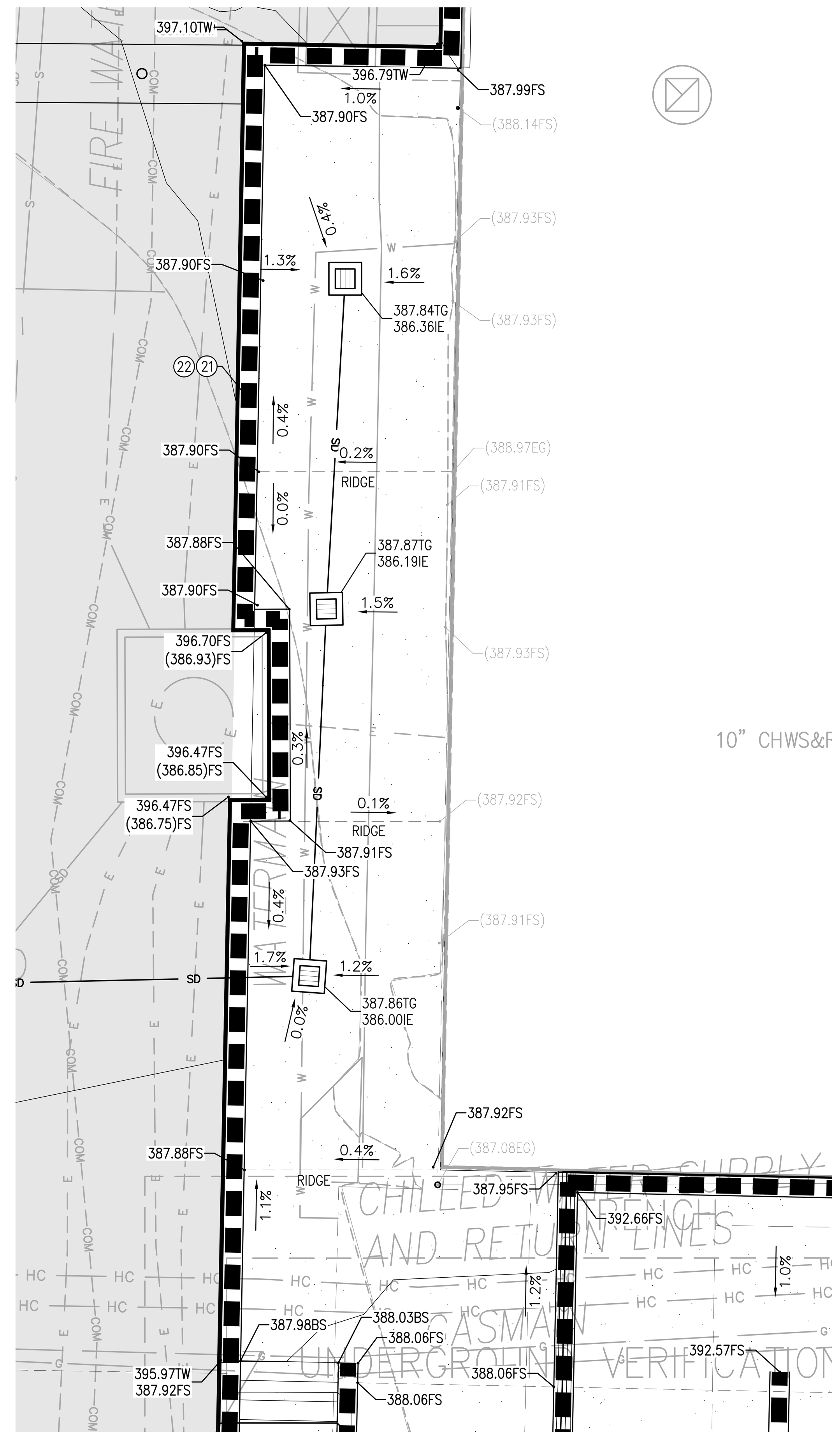
Project Status
CONSTRUCTION DOCUMENTS 100%

GRADING NOTES

1. PRELIMINARY EARTHWORK QUANTITIES FOR PHASES 0 THROUGH 6 COMBINED ARE 20,080CY CUT AND 4850CY FILL FOR A TOTAL OF 15,230CY OF EXPORT. CALCULATIONS ASSUME 12" THICK PAVEMENT SECTIONS, 6" BUILDING SLABS, AND 4" SIDEWALK THICKNESSES. QUANTITIES HAVE NOT YET BEEN BROKEN OUT INTO SEPARATE PHASES.
2. FOR PROPOSED UTILITY REPLACEMENT AND RELOCATION REFER TO THE PACKAGE 1A

CONSTRUCTION KEYNOTES

(21) CONSTRUCT RAMP
(22) CONSTRUCT RETAINING WALL PER STRUCTURAL DWGS



5 2.5 0 5 10 15

SCALE: 1"=5'

AMBROSE T. WONG RCE NO. C68965

PRIVATE CONTRACT C.3.4.4.C

GRADING ENLARGEMENT

SMMC CAMPUS REDEVELOPMENT
PACKAGE 7A NEW TOWER
7901 FROST STREET

CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET 9 OF 17 SHEETS

I.O. NO. ____
PROJECT NO. ____
V.T.M. ____

FOR CITY ENGINEER ____ DATE ____

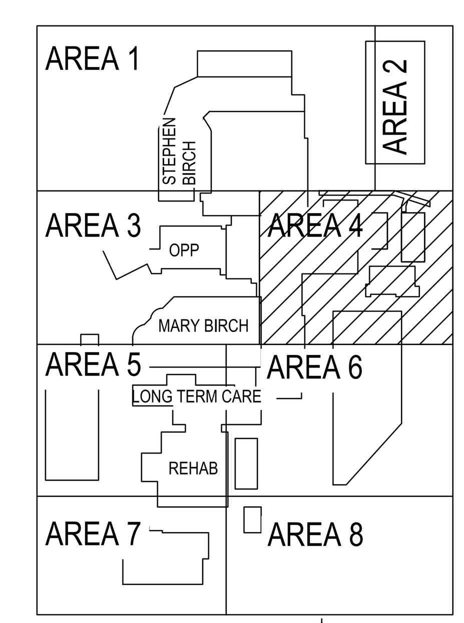
DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	BWE			

AS-BUILTS
CONTRACTOR ____ DATE STARTED ____
INSPECTOR ____ DATE COMPLETED ____

XXXX-XXXX NAD83 COORDINATES
XXX-XXXX LAMBERT COORDINATES
XXXXX-9-D

REGISTERED PROFESSIONAL ENGINEER AMBROSE T. WONG No. C68965 CIVIL STATE OF CALIFORNIA

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550



KEY PLAN

FOR OSHPD REFERENCE ONLY

SHARP
SMMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

McCARTHY
McCARTHY BUILDING COMPANIES, INC.
9275 SKY PARK COURT, SUITE 200
SAN DIEGO, CA 92123

HDR
HDR ARCHITECTURE, INC.
350 SOUTH GRAND AVENUE, SUITE 2900
LOS ANGELES, CA 90071-3406

TAYLOR design
17850 FITCH
IRVINE, CA 92614

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

SITE PLAN
PACKAGE 2A.7A
NEW TOWER

CONSTRUCTION DOCUMENTS - 100%

Project Manager	Thomas Onnen
Project Designer	HDR/ Taylor Design
Project Architect	HDR/ Taylor Design
Landscape Architect	Schmidt Design Group
Civil Engineer	BWE Engineering
Structural Engineer	KPFF
Mechanical Engineer	TK1SC
Electrical Engineer	TK1SC
Plumbing Engineer	TK1SC
Interior Designer	HDR/ Taylor Design Group
Equipment Planner	Criterion

Sheet Reviewer: Author

MARK	DATE	DESCRIPTION

Current Print Description

Project Number 10204365
Original Issue 06/18/20

Agency Number I210874-37-00
Agency Approval

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
INIT DATE
Office of Statewide Health Planning and Development
FACILITIES DEVELOPMENT DIVISION

REGISTERED PROFESSIONAL ENGINEER AMBROSE T. WONG PRELIMINARY NOT FOR CONSTRUCTION CIVIL STATE OF CALIFORNIA

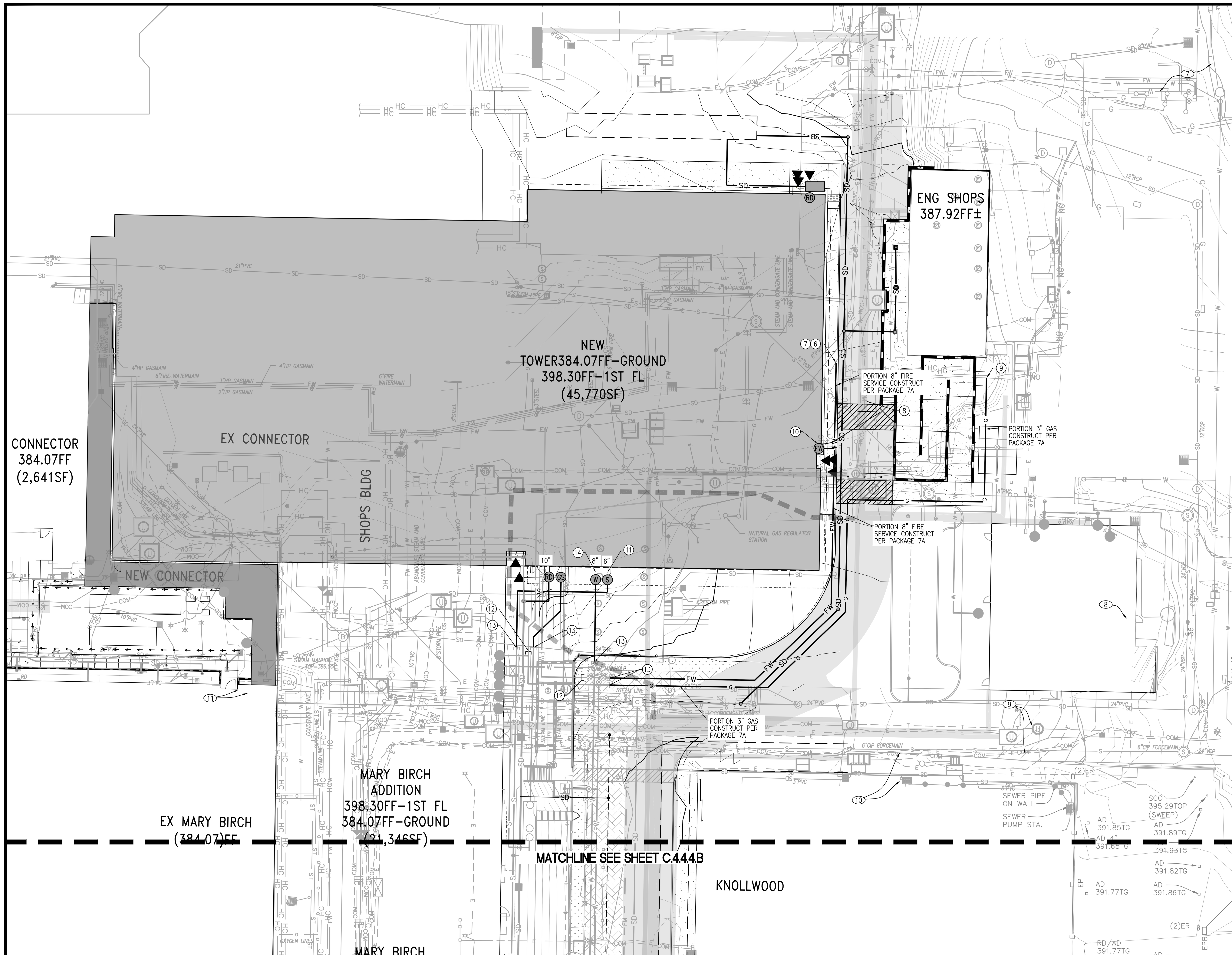
Sheet Name
GRADING ENLARGEMENT AREA 4

Sheet Number
C.3.4.4.C

Project Status
CONSTRUCTION DOCUMENTS 100%

M:\PROJECTS\9500\9545U.10.00 SHARP MMC\DWGS\SHEET_DWGS\PK7A NEW TOWER\9545U.10.00 PK7A-03-GRAD-ENL.DWG (07-07-21 11:14:21AM)
(REV 4/13/2018)

6/10/2020 2:29:41 PM BIM 360://10204365 - Sharp Metro Campus/SMMC-A-MAS.rvt



UTILITY LEGEND

- S — SEWER PIPE PER PACKAGE 1A
- FW — FIRE WATER PIPE PER PACKAGE 1A
- W — DOMESTIC WATER PIPE PER PACKAGE 1A
- ST — STEAM WATER PIPE PER PACKAGE 1A
- CW — CHILLED WATER PIPE PER PACKAGE 1A
- E — ELECTRIC TRENCH PER PACKAGE 1A

UTILITY NOTES:
1. THE PROPOSED ELECTRIC, GAS, CHILLED WATER, AND STEAM LINES SHOWN ON THIS SHEET ARE FOR REFERENCE ONLY. CONSTRUCT PER SEPARATE MEP DRAWINGS.

UTILITY KEYNOTES

- (RD) ROOF DRAIN POINT OF CONNECTION 5' OUTSIDE OF BUILDING. CONTINUATION PER PLUMBING DRAWINGS
- (S) SEWER POC. CONTINUATION PER PLUMBING DRAWINGS
- (W) WATER POC. CONTINUATION PER PLUMBING DRAWINGS
- (FW) FIRE WATER POC. CONTINUATION PER PLUMBING DRAWINGS
- (G) GAS POC. CONTINUATION PER PLUMBING DRAWINGS

EXISTING EASEMENT KEYNOTES

- (7) EXISTING EASEMENT FOR WATER METER VAULT RECORDED 7-29-1958 AS DOC. # 121966 IN BOOK 7187, PAGE 465 O.R.
- (8) EXISTING SDGE EASEMENT (NO WIDTH GIVEN) RECORDED 9-29-1954 AS DOC. #129840, BOOK 5379, PAGE 419 O.R.
- (9) EXISTING 12'-WIDE SDGE EASEMENT RECORDED 9-21-1962 IN F/P 163692, SERIES 3, BOOK 1962 O.R.
- (10) EXISTING 12'-WIDE SDGE EASEMENT RECORDED 1-4-1960, F/P 433, SERIES 1, BOOK 1960 O.R.

PRIVATE CONTRACT — C.4.4.4

UTILITY PLAN

SMMC CAMPUS REDEVELOPMENT
PACKAGE 7A NEW TOWER
7901 FROST STREET

CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET 10 OF 17 SHEETS

I.O. NO. ____
PROJECT NO. ____
V.T.M. ____

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	BWE			
AS-BUILTS				

FOR CITY ENGINEER — DATE

XXXX-XXXX NAD83 COORDINATES
XXX-XXXX LAMBERT COORDINATES

CONTRACTOR ____ DATE STARTED ____
INSPECTOR ____ DATE COMPLETED ____

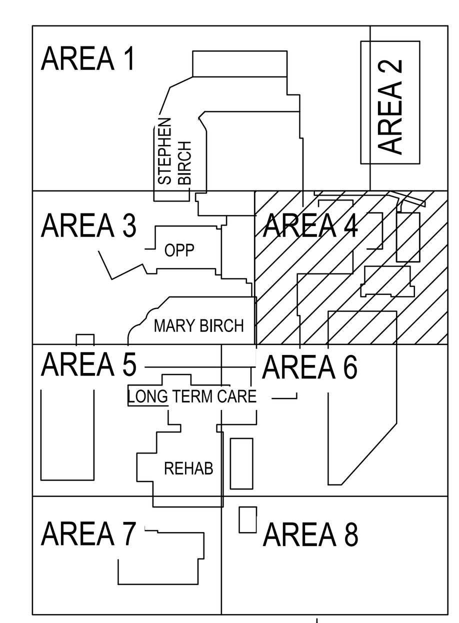
XXXXX-10-D

AMBROSE T. WONG — RCE NO. C68965

REGISTERED PROFESSIONAL ENGINEER — AMBROSE T. WONG — No. C68965 — CIVIL — STATE OF CALIFORNIA

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

M:\PROJECTS\9500\9545U.10.00 SHARP MMC\DWGS\SHEET_DWGS\PK7A NEW TOWER\9545U.10.00 PK7A-04-UTIL.DWG (07-07-21 11:15:31AM)
(REV 4/13/2018)



KEY PLAN

FOR OSHPD REFERENCE ONLY

SHARP
SMMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

McCARTHY
McCARTHY BUILDING COMPANIES, INC.
9275 SKY PARK COURT, SUITE 200
SAN DIEGO, CA 92123

HDR
HDR ARCHITECTURE, INC.
350 SOUTH GRAND AVENUE, SUITE 2900
LOS ANGELES, CA 90071-3406

TAYLOR design
17850 FITCH
IRVINE, CA 92614

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

SITE PLAN
PACKAGE 2A.7A
NEW TOWER

CONSTRUCTION DOCUMENTS - 100%

Project Manager	Thomas Onnen
Project Designer	HDR/ Taylor Design
Project Architect	HDR/ Taylor Design
Landscape Architect	Schmidt Design Group
Civil Engineer	BWE Engineering
Structural Engineer	KPFF
Mechanical Engineer	TK1SC
Electrical Engineer	TK1SC
Plumbing Engineer	TK1SC
Interior Designer	HDR/ Taylor Design Group
Equipment Planner	Criterion

Sheet Reviewer — Author

MARK	DATE	DESCRIPTION

Current Print Description

Project Number 10204365
Original Issue 06/18/20

Agency Number I210874-37-00
Agency Approval

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
INIT DATE
Office of Statewide Health Planning and Development
FACILITIES DEVELOPMENT DIVISION

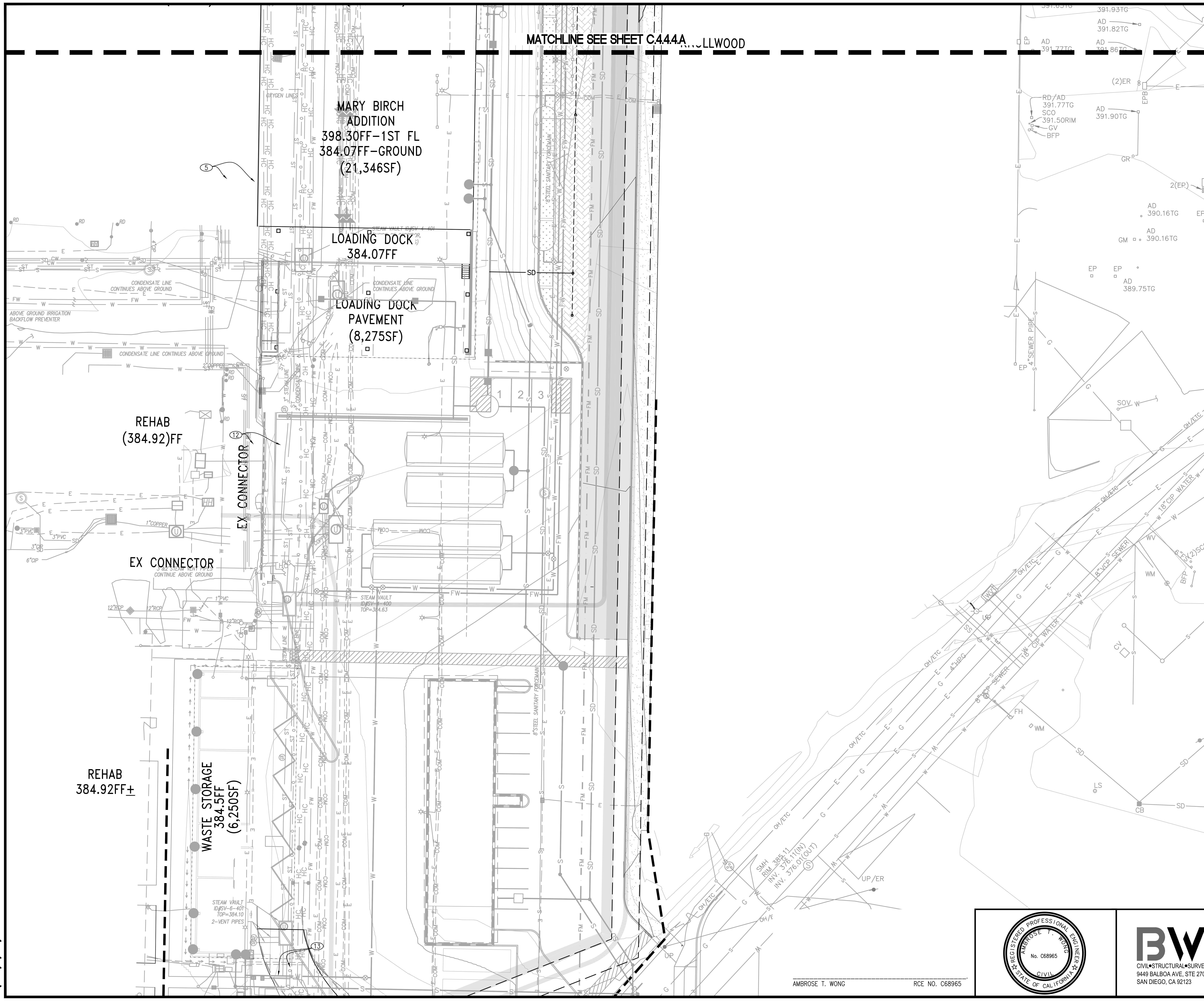
REGISTERED PROFESSIONAL ENGINEER — AMBROSE T. WONG — PRELIMINARY — CIVIL — STATE OF CALIFORNIA

Sheet Name
UTILITY PLAN
AREA 4

Sheet Number
C.4.4.4

Project Status
CONSTRUCTION DOCUMENTS 100%

6/10/2020 2:29:41 PM BIM 360://10204365 - Sharp Metro Campus/SMMC-A-MAS.rvt



UTILITY LEGEND

S	SEWER PIPE PER PACKAGE 1A
FW	FIRE WATER PIPE PER PACKAGE 1A
W	DOMESTIC WATER PIPE PER PACKAGE 1A
ST	STEAM WATER PIPE PER PACKAGE 1A
CW	CHILLED WATER PIPE PER PACKAGE 1A
E	ELECTRIC TRENCH PER PACKAGE 1A

UTILITY NOTES:
1. THE PROPOSED ELECTRIC, GAS, CHILLED WATER, AND STEAM LINES SHOWN ON THIS SHEET ARE FOR REFERENCE ONLY. CONSTRUCT PER SEPARATE MEP DRAWINGS.

UTILITY KEYNOTES

- (RD) ROOF DRAIN POINT OF CONNECTION 5' OUTSIDE OF BUILDING. CONTINUATION PER PLUMBING DRAWINGS
- (S) SEWER POC. CONTINUATION PER PLUMBING DRAWINGS
- (W) WATER POC. CONTINUATION PER PLUMBING DRAWINGS
- (FW) FIRE WATER POC. CONTINUATION PER PLUMBING DRAWINGS
- (G) GAS POC. CONTINUATION PER PLUMBING DRAWINGS

EXISTING EASEMENT KEYNOTES

- (5) EXISTING 12'-WIDE SDGE EASEMENT RECORDED 1-4-1960, F/P 433, SERIES 1, BOOK 1960 O.R.
- (12) EXISTING 12'-WIDE SDGE EASEMENT RECORDED 5-22-1961 IN F/P 87927, SERIES 2, BOOK 1961 O.R.

SCALE: 1"=20'

PRIVATE CONTRACT

C.2.4.4.B

UTILITY PLAN

SMMC CAMPUS REDEVELOPMENT
PACKAGE 7A NEW TOWER
7901 FROST STREET

CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET 11 OF 17 SHEETS

I.O. NO. ____
PROJECT NO. ____
V.T.M. ____

FOR CITY ENGINEER — DATE

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	BWE			
AS-BUILTS				

XXXX-XXXX NAD83 COORDINATES
XXX-XXXX LAMBERT COORDINATES

CONTRACTOR ____ DATE STARTED ____
INSPECTOR ____ DATE COMPLETED ____

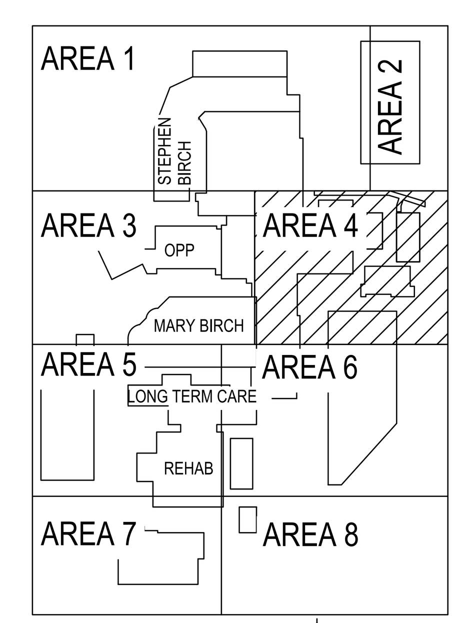
XXXXX-11-D

AMBROSE T. WONG — RCE NO. C68965

REGISTERED PROFESSIONAL ENGINEER AMBROSE T. WONG No. C68965 CIVIL STATE OF CALIFORNIA

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

M:\PROJECTS\9500\9545U.10.00 SHARP MMC\DWGS\SHEET_DWGS\PK7A NEW TOWER\9545U.10.00 PK7A-04-UTIL.DWG (07-07-21 11:15:37AM)
(REV 4/12/2018)



KEY PLAN

FOR OSHPD REFERENCE ONLY

SHARP

SMMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

McCARTHY
McCARTHY BUILDING COMPANIES, INC.
9275 SKY PARK COURT, SUITE 200
SAN DIEGO, CA 92123

HDR
HDR ARCHITECTURE, INC.
350 SOUTH GRAND AVENUE, SUITE 2900
LOS ANGELES, CA 90071-3406

TAYLOR design
17850 FITCH
IRVINE, CA 92614

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

SITE PLAN
PACKAGE 2A.7A
NEW TOWER

CONSTRUCTION DOCUMENTS - 100%

Project Manager	Thomas Onnen
Project Designer	HDR/ Taylor Design
Project Architect	HDR/ Taylor Design
Landscape Architect	Schmidt Design Group
Civil Engineer	BWE Engineering
Structural Engineer	KPFF
Mechanical Engineer	TK1SC
Electrical Engineer	TK1SC
Plumbing Engineer	TK1SC
Interior Designer	HDR/ Taylor Design Group
Equipment Planner	Criterion
Sheet Reviewer	Author

MARK	DATE	DESCRIPTION

Current Print Description

Project Number	10204365
Original Issue	06/18/20
Agency Number	I210874-37-00
Agency Approval	

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
INIT — DATE
Office of Statewide Health Planning and Development
FACILITIES DEVELOPMENT DIVISION

REGISTERED PROFESSIONAL ENGINEER AMBROSE T. WONG PRELIMINARY CIVIL STATE OF CALIFORNIA

Sheet Name
UTILITY PLAN
AREA 4

Sheet Number
C.2.4.4.B

Project Status
CONSTRUCTION DOCUMENTS 100%

6/10/2020 2:29:41 PM BIM 360://10204365 - Sharp Metro Campus/SMMC-A-MAS.rvt

PRIVATE CONTRACT

C.5.4.4

PROFILES

SMMC CAMPUS REDEVELOPMENT

7901 FROST STREET

CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET 12 OF 17 SHEETS

I.O. NO.
PROJECT NO.
V.T.M.

FOR CITY ENGINEER — DATE

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	BWE			

AS-BUILTS
CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

XXXX-XXXX NAD83 COORDINATES
XXX-XXXX LAMBERT COORDINATES

XXXXX-12-D

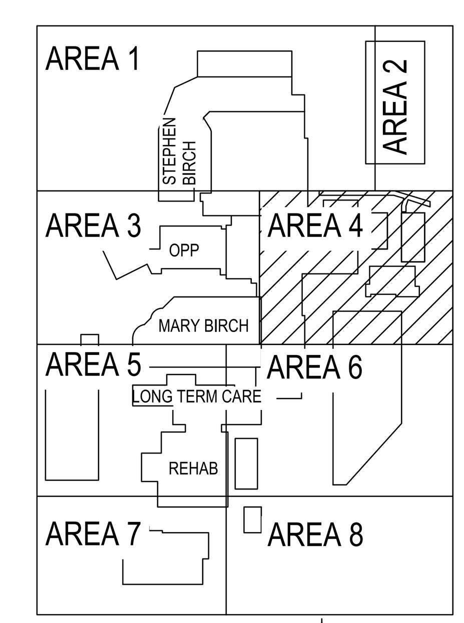
AMBROSE T. WONG — RCE NO. C68965

REGISTERED PROFESSIONAL ENGINEER AMBROSE T. WONG No. C68965 CIVIL STATE OF CALIFORNIA

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

M:\PROJECTS\9500\9545U.10.00 SHARP MMC\DWGS\SHEET_DWGS\PK7A NEW TOWER\9545U.10.00 PK7A-05-PROF.DWG (07-07-21 11:15:49AM)

(REV 4/13/2018)



KEY PLAN

FOR OSHPD REFERENCE ONLY

SHARP

SMMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

McCARTHY

MCCARTHY BUILDING COMPANIES, INC.
9275 SKY PARK COURT, SUITE 200
SAN DIEGO, CA 92123

HDR

HDR ARCHITECTURE, INC.
350 SOUTH GRAND AVENUE, SUITE 2900
LOS ANGELES, CA 90071-3406

TAYLOR design
17850 FITCH
IRVINE, CA 92614

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

SITE PLAN
PACKAGE 2A.7A
NEW TOWER

CONSTRUCTION DOCUMENTS - 100%

Project Manager	Thomas Onnen
Project Designer	HDR/ Taylor Design
Project Architect	HDR/ Taylor Design
Landscape Architect	Schmidt Design Group
Civil Engineer	BWE Engineering
Structural Engineer	KPFF
Mechanical Engineer	TK1SC
Electrical Engineer	TK1SC
Plumbing Engineer	TK1SC
Interior Designer	HDR/ Taylor Design Group
Equipment Planner	Criterion
Sheet Reviewer	Author

MARK	DATE	DESCRIPTION

Current Print Description

Project Number	10204365
Original Issue	06/18/20
Agency Number	I210874-37-00
Agency Approval	

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
INIT DATE
Office of Statewide Health Planning and Development
FACILITIES DEVELOPMENT DIVISION

REGISTERED PROFESSIONAL ENGINEER AMBROSE T. WONG CIVIL STATE OF CALIFORNIA PRELIMINARY

Sheet Name
PROFILES
AREA 4

Sheet Number
C.5.4.4

Project Status
CONSTRUCTION DOCUMENTS 100%

6/10/2020 2:29:41 PM BIM 360://10204365 - Sharp Metro Campus/SMMC-A-MAS.rvt

SMMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

McCARTHY BUILDING COMPANIES, INC.
9275 SKY PARK COURT, SUITE 200
SAN DIEGO, CA 92123

HDR ARCHITECTURE, INC.
350 SOUTH GRAND AVENUE, SUITE 2900
LOS ANGELES, CA 90071-3406

TAYLOR design
17850 FITCH
IRVINE, CA 92614

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

SITE PLAN
PACKAGE 2A.7A
NEW TOWER

CONSTRUCTION DOCUMENTS - 100%

Project Manager	Thomas Onnen
Project Designer	HDR/ Taylor Design
Project Architect	HDR/ Taylor Design
Landscape Architect	Schmidt Design Group
Civil Engineer	BWE Engineering
Structural Engineer	KPFF
Mechanical Engineer	TK1SC
Electrical Engineer	TK1SC
Plumbing Engineer	TK1SC
Interior Designer	HDR/ Taylor Design Group
Equipment Planner	Criterion

Sheet Reviewer: Author

MARK	DATE	DESCRIPTION

Current Print Description

Project Number: 10204365
Original Issue: 06/18/20

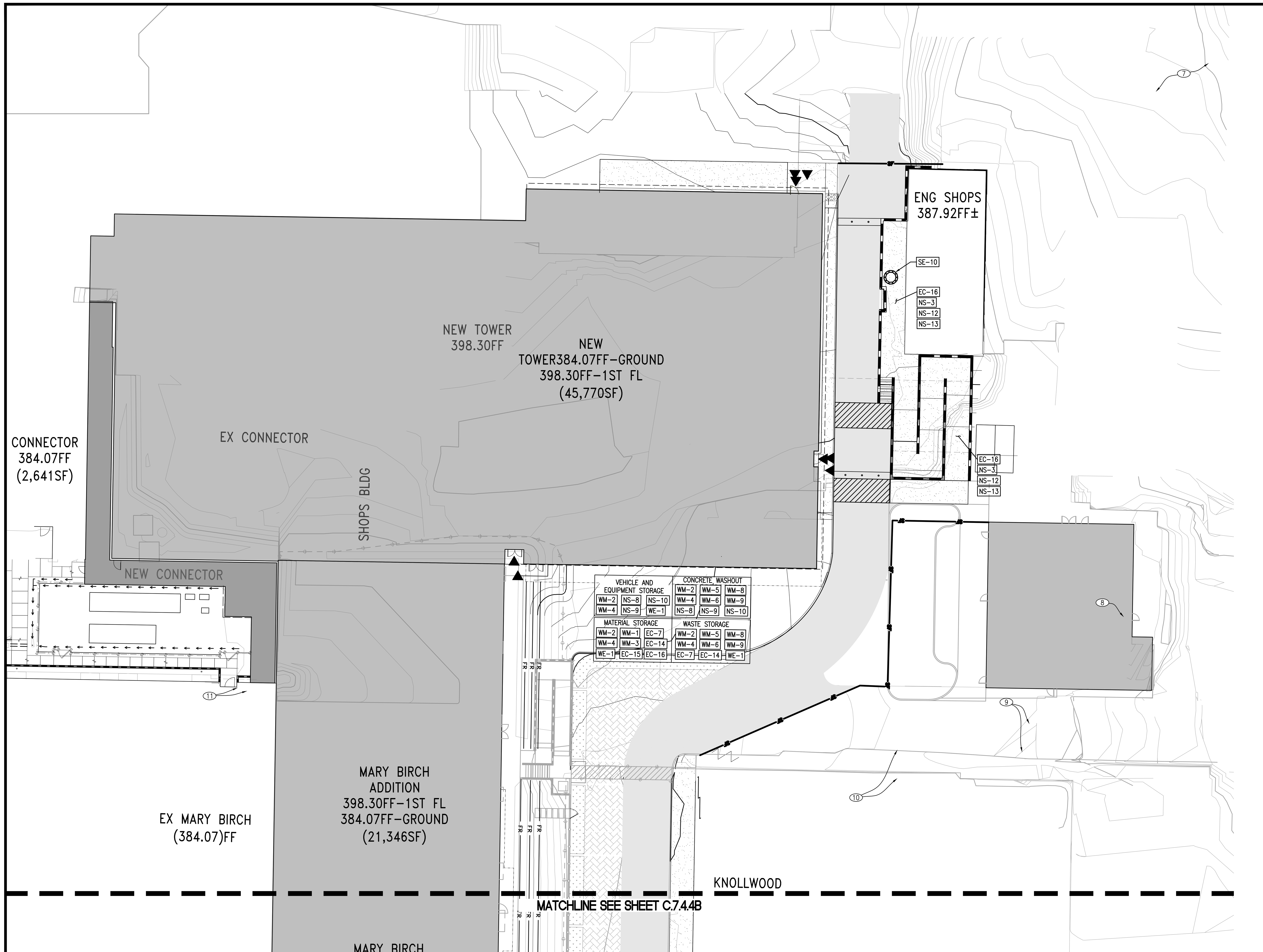
Agency Number: I210874-37-00
Agency Approval

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
INIT DATE
Office of Statewide Health Planning and Development
FACILITIES DEVELOPMENT DIVISION

Sheet Name: EROSION CONTROL PLAN AREA 4

Sheet Number: C.7.4.4.A

Project Status: CONSTRUCTION DOCUMENTS 100%



EROSION + SEDIMENT CONTROL KEYNOTES

INSTALL AT POINTS OF INGRESS/EGRESS FROM ALL CONSTRUCTION AREAS:
TC-1 STABILIZED CONSTRUCTION ENTRANCE/EXIT INSTALL AROUND

DISTURBED SOIL AREAS OR CONSTRUCTION STOCKPILES:
SE-1 SILT FENCE

USED ON EXPOSED & DISTURBED SOIL SURFACES REQUIRING TEMPORARY STABILIZATION:
SE-5 FIBER ROLLS OR
SE-7 STREET SWEEPING & VACUUMING

INSTALL FILTER FABRIC & GRAVEL BAGS AT ALL STORM DRAIN INLETS ANTICIPATED TO RECEIVE RUNOFF FROM THE CONSTRUCTION SITE:
SE-10 STORM DRAIN INLET PROTECTION

INSTALL AT POINTS OF INGRESS/EGRESS FROM ALL CONSTRUCTION AREAS:
NS-3 PAVING & GRINDING OPERATIONS

VEHICLES & EQUIPMENT MAINTENANCE SHALL BE IN DESIGNATED CONTAINED AREAS ONLY:
NS-8 VEHICLE & EQUIPMENT CLEANING
NS-9 VEHICLE & EQUIPMENT FUELING
NS-10 VEHICLE & EQUIPMENT MAINTENANCE

IMPLEMENT AT ALL LOCATIONS WHERE CONCRETE IS USED:
NS-12 CONCRETE CURING
NS-13 CONCRETE FINISHING

SEGREGATE CONSTRUCTION MATERIALS IN BERMED/COVERED AREA:
WM-1 MATERIAL DELIVERY &
WM-2 STORAGE & MATERIAL USE
WM-3 STOCKPILE MANAGEMENT

AREA OF NON-DISTURBED SOIL ACTIVITIES WITH THE POTENTIAL TO IMPACT STORM WATER QUALITY (I.E. EXTERIOR PAINTING):
WM-4 SPILL PREVENTION & CONTROL

PLACE WASTE IN A COVERED AREA OR SECONDARY CONTAINMENT RECOMMEND A MINIMUM OF 50' FROM DRAIN INLETS OR WATERCOURSES:
WM-5 SOLID WASTE
WM-6 HAZARDOUS WASTE
WM-8 CONCRETE WASTE &
WM-9 SANITARY/SEPTIC WASTE MANAGEMENT

IMPLEMENT AT SOIL STOCKPILES & AT ALL AREAS OF DISTURBED SOIL:
WE-1 WIND EROSION CONTROL

USE PLASTIC COVERS ON STOCKPILES. USE ON EXPOSED AND DISTURBED SOILS DURING RAIN EVENTS.
EC-7 GEOTEXTILES & MATS
MAY USE:
EC-14 COMPOST BLANKETS

SOIL PREPARATION FOR VEGETATIVE ESTABLISHMENT IN CONJUNCTION WITH RECOMMENDED EROSION & SEDIMENT CONTROL BMPs. SOIL ROUGHENING ON ANY DISTURBED SLOPES OR SOIL STOCKPILES IN CONJUNCTION WITH (EC-7):
EC-15 SOIL PREPARATION/ROUGHENING

PLACE ON AREAS OF DISTURBED SOIL WHERE VEGETATION WILL NOT BE ESTABLISHED AND ON MATERIAL STOCKPILES REQUIRING STABILIZATION FROM WATER OR WIND EROSION:
EC-16 NON-VEGETATIVE STABILIZATION

EXISTING EASEMENT KEYNOTES

7 EXISTING EASEMENT FOR WATER METER VAULT RECORDED 7-29-1958 AS DOC. # 121966 IN BOOK 7187, PAGE 465 O.R.

8 EXISTING SDGE EASEMENT (NO WIDTH GIVEN) RECORDED 9-29-1954 AS DOC. #129840, BOOK 5379, PAGE 419 O.R.

9 EXISTING 12'-WIDE SDGE EASEMENT RECORDED 9-21-1962 IN F/P 163692, SERIES 3, BOOK 1962 O.R.

10 EXISTING 12'-WIDE SDGE EASEMENT RECORDED 1-4-1960, F/P 433, SERIES 1, BOOK 1960 O.R.

LEGEND

PROPERTY LINE — PL —
SILT FENCE (CASQA SE-1) — SF —
FIBER ROLL (CASQA SE-5) — FR —
DIRECTION OF FLOW
GRAVEL BAGS (CASQA SE-10, TYPE 3)
INLET PROTECTION (CASQA SE-10)

STABILIZED CONSTRUCTION ENTRANCE (CASQA TC-1/DETAIL C-THIS SHEET)

20 10 0 20 40 60
SCALE: 1"=20'

PRIVATE CONTRACT
C.7.4.4.A

EROSION CONTROL PLAN
SMMC CAMPUS REDEVELOPMENT
PACKAGE 7A NEW TOWER
7901 FROST STREET

CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET 13 OF 17 SHEETS

I.O. NO.
PROJECT NO.
V.T.M.

FOR CITY ENGINEER DATE

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	BWE			
AS-BUILTS				

XXXX-XXXX NAD83 COORDINATES
XXX-XXXX LAMBERT COORDINATES

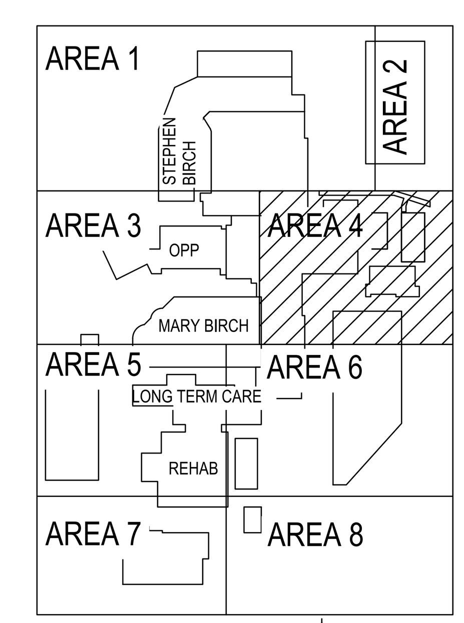
CONTRACTOR ____ DATE STARTED ____
INSPECTOR ____ DATE COMPLETED ____

XXXXX-13-D

AMBROSE T. WONG RCE NO. C68965

REGISTERED PROFESSIONAL ENGINEER AMBROSE T. WONG No. C68965 CIVIL STATE OF CALIFORNIA

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

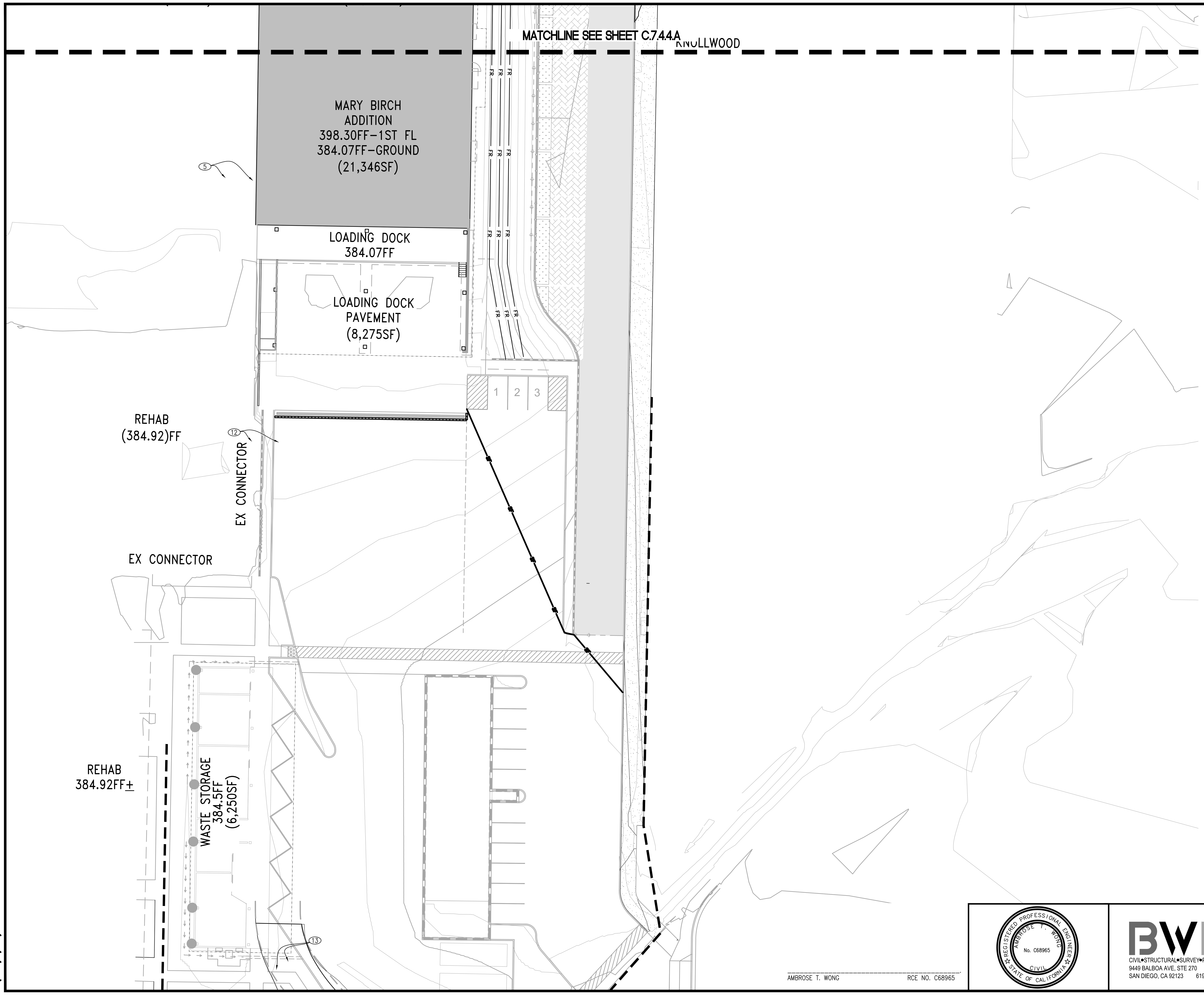


KEY PLAN

FOR OSHPD REFERENCE ONLY

M:\PROJECTS\9500\9545U.10.00 SHARP MMC\DWGS\SHEET_DWGS\PK7A NEW TOWER\9545U.10.00 PK7A-07-EROSION.DWG (07-07-21 11:16:27AM)
(REV 4/12/2018)

6/10/2020 2:29:41 PM BIM 360://10204365 - Sharp Metro Campus/SMMC-A-MAS.rvt



EROSION + SEDIMENT CONTROL KEYNOTES

INSTALL AT POINTS OF INGRESS/EGRESS FROM ALL CONSTRUCTION AREAS:
TC-1 STABILIZED CONSTRUCTION ENTRANCE/EXIT INSTALL AROUND

DISTURBED SOIL AREAS OR CONSTRUCTION STOCKPILES:
SE-1 SILT FENCE

USED ON EXPOSED & DISTURBED SOIL SURFACES REQUIRING TEMPORARY STABILIZATION:
SE-5 FIBER ROLLS OR
SE-7 STREET SWEEPING & VACUUMING

INSTALL FILTER FABRIC & GRAVEL BAGS AT ALL STORM DRAIN INLETS ANTICIPATED TO RECEIVE RUNOFF FROM THE CONSTRUCTION SITE:
SE-10 STORM DRAIN INLET PROTECTION

INSTALL AT POINTS OF INGRESS/EGRESS FROM ALL CONSTRUCTION AREAS:
NS-3 PAVING & GRINDING OPERATIONS

VEHICLES & EQUIPMENT MAINTENANCE SHALL BE IN DESIGNATED CONTAINED AREAS ONLY:
NS-8 VEHICLE & EQUIPMENT CLEANING
NS-9 VEHICLE & EQUIPMENT FUELING
NS-10 VEHICLE & EQUIPMENT MAINTENANCE

IMPLEMENT AT ALL LOCATIONS WHERE CONCRETE IS USED:
NS-12 CONCRETE CURING
NS-13 CONCRETE FINISHING

SEGREGATE CONSTRUCTION MATERIALS IN BERMED/COVERED AREA:
WM-1 MATERIAL DELIVERY &
WM-2 STORAGE & MATERIAL USE
WM-3 STOCKPILE MANAGEMENT

AREA OF NON-DISTURBED SOIL ACTIVITIES WITH THE POTENTIAL TO IMPACT STORM WATER QUALITY (I.E. EXTERIOR PAINTING):
WM-4 SPILL PREVENTION & CONTROL

PLACE WASTE IN A COVERED AREA OR SECONDARY CONTAINMENT RECOMMEND A MINIMUM OF 50' FROM DRAIN INLETS OR WATERCOURSES:
WM-5 SOLID WASTE
WM-6 HAZARDOUS WASTE
WM-8 CONCRETE WASTE &
WM-9 SANITARY/SEPTIC WASTE MANAGEMENT

IMPLEMENT AT SOIL STOCKPILES & AT ALL AREAS OF DISTURBED SOIL:
WE-1 WIND EROSION CONTROL

USE PLASTIC COVERS ON STOCKPILES. USE ON EXPOSED AND DISTURBED SOILS DURING RAIN EVENTS.
EC-7 GEOTEXTILES & MATS
MAY USE:
EC-14 COMPOST BLANKETS

SOIL PREPARATION FOR VEGETATIVE ESTABLISHMENT IN CONJUNCTION WITH RECOMMENDED EROSION & SEDIMENT CONTROL BMPs. SOIL ROUGHENING ON ANY DISTURBED SLOPES OR SOIL STOCKPILES IN CONJUNCTION WITH (EC-7):
EC-15 SOIL PREPARATION/ROUGHENING

PLACE ON AREAS OF DISTURBED SOIL WHERE VEGETATION WILL NOT BE ESTABLISHED AND ON MATERIAL STOCKPILES REQUIRING STABILIZATION FROM WATER OR WIND EROSION:
EC-16 NON-VEGETATIVE STABILIZATION

EXISTING EASEMENT KEYNOTES

(5) EXISTING 12'-WIDE SDGE EASEMENT RECORDED 1-4-1960, F/P 433, SERIES 1, BOOK 1960 O.R.
(12) EXISTING 12'-WIDE SDGE EASEMENT RECORDED 5-22-1961 IN F/P 87927, SERIES 2, BOOK 1961 O.R.

LEGEND

PROPERTY LINE — PL —
SILT FENCE (CASQA SE-1)
FIBER ROLL (CASQA SE-5) — FR —
DIRECTION OF FLOW
GRAVEL BAGS (CASQA SE-10, TYPE 3)
INLET PROTECTION (CASQA SE-10)

STABILIZED CONSTRUCTION ENTRANCE (CASQA TC-1/DETAIL C-THIS SHEET)

N

20 10 0 20 40 60
SCALE: 1"=20'

PRIVATE CONTRACT
C.7.4.4.B

EROSION CONTROL PLAN
SMMC CAMPUS REDEVELOPMENT
PACKAGE 7A NEW TOWER
7901 FROST STREET

CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET 14 OF 17 SHEETS

I.O. NO. ______
PROJECT NO. ______
V.T.M. ______

FOR CITY ENGINEER			DATE	
DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	BWE			
AS-BUILTS				

CONTRACTOR ______ DATE STARTED ______
INSPECTOR ______ DATE COMPLETED ______

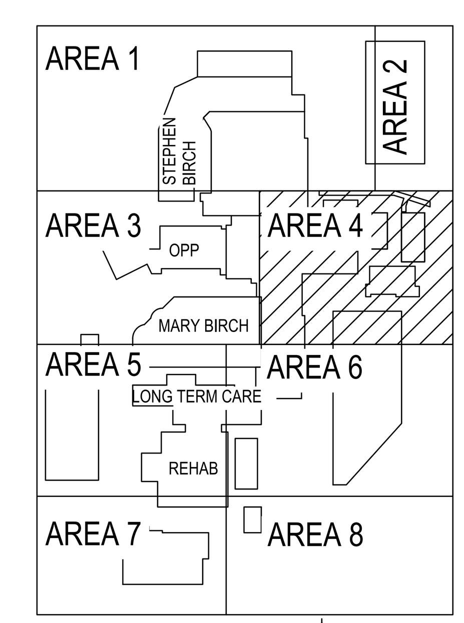
XXXX-XXXX
NAD83 COORDINATES
XXX-XXXX
LAMBERT COORDINATES
XXXXX-14-D

AMBROSE T. WONG RCE NO. C68965

REGISTERED PROFESSIONAL ENGINEER AMBROSE T. WONG No. C68965 CIVIL STATE OF CALIFORNIA

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

M:\PROJECTS\9500\9545U.10.00 SHARP MMC\DWGS\SHEET_DWGS\PK7A NEW TOWER\9545U.10.00 PK7A-07-EROSION.DWG (07-07-21 11:16:31AM)
(REV 4/13/2018)



KEY PLAN

FOR OSHPD REFERENCE ONLY

SHARP
SMMC CAMPUS
REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

McCARTHY
McCARTHY BUILDING COMPANIES, INC.
9275 SKY PARK COURT, SUITE 200
SAN DIEGO, CA 92123

HDR
HDR ARCHITECTURE, INC.
350 SOUTH GRAND AVENUE, SUITE 2900
LOS ANGELES, CA 90071-3406

TAYLOR design
17850 FITCH
IRVINE, CA 92614

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

SITE PLAN
PACKAGE 2A.7A
NEW TOWER

CONSTRUCTION DOCUMENTS - 100%

Project Manager	Thomas Onnen
Project Designer	HDR/ Taylor Design
Project Architect	HDR/ Taylor Design
Landscape Architect	Schmidt Design Group
Civil Engineer	BWE Engineering
Structural Engineer	KPFF
Mechanical Engineer	TK1SC
Electrical Engineer	TK1SC
Plumbing Engineer	TK1SC
Interior Designer	HDR/ Taylor Design Group
Equipment Planner	Criterion

Sheet Reviewer Author

MARK	DATE	DESCRIPTION

Current Print Description

Project Number 10204365
Original Issue 06/18/20

Agency Number I210874-37-00
Agency Approval

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
INIT DATE
Office of Statewide Health Planning and Development
FACILITIES DEVELOPMENT DIVISION

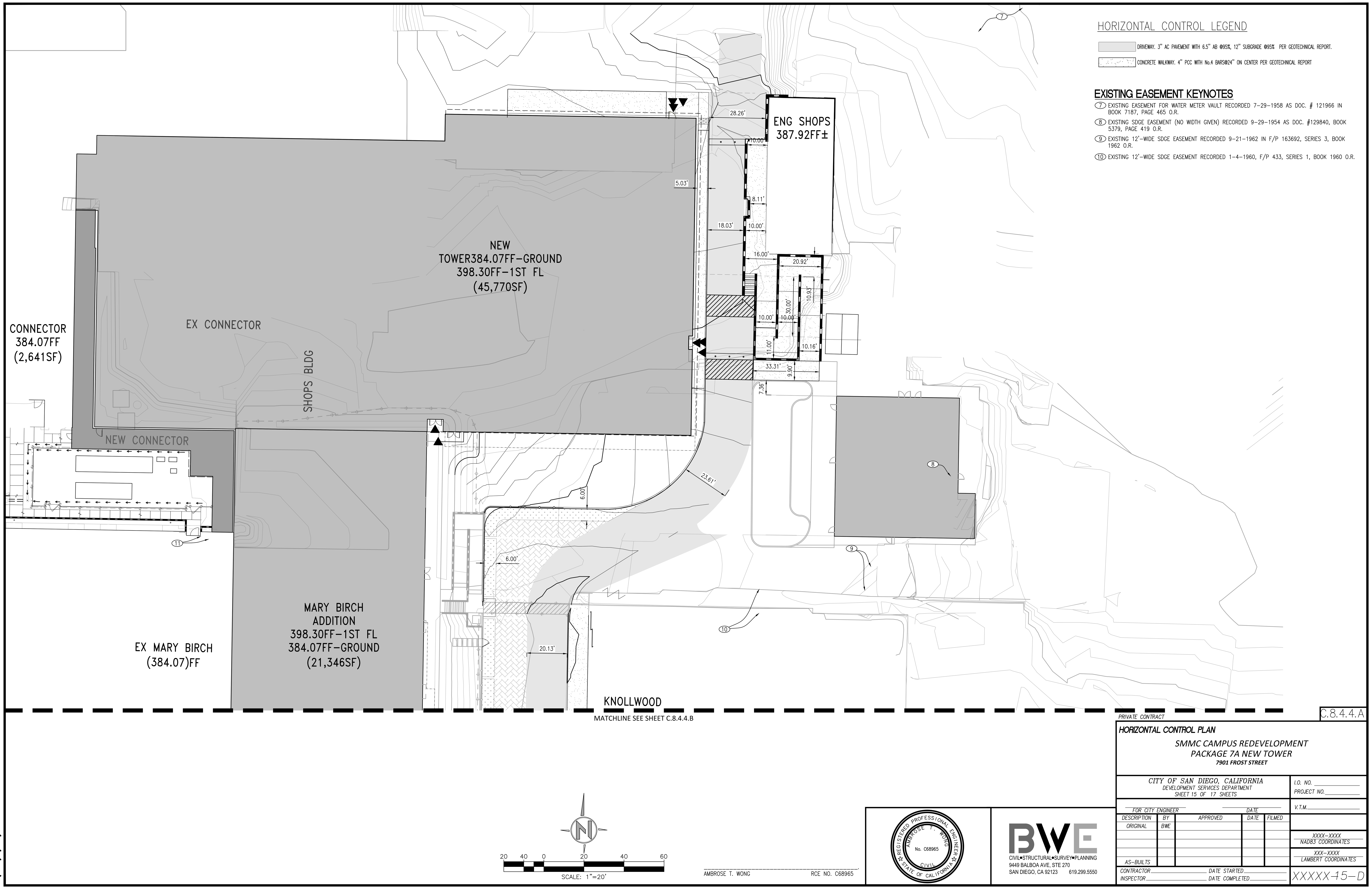
REGISTERED PROFESSIONAL ENGINEER AMBROSE T. WONG PRELIMINARY NOT FOR CONSTRUCTION CIVIL STATE OF CALIFORNIA

Sheet Name
EROSION CONTROL PLAN
AREA 4

Sheet Number
C.7.4.4.B

Project Status
CONSTRUCTION DOCUMENTS 100%

6/10/2020 2:29:41 PM BIM 360://10204365 - Sharp Metro Campus/SMMC-A-MAS.rvt



HORIZONTAL CONTROL LEGEND

DRIVEWAY. 3" AC PAVEMENT WITH 6.5" AB @95%, 12" SUBGRADE @95% PER GEOTECHNICAL REPORT.

CONCRETE WALKWAY. 4" PCC WITH No.4 BARS@24" ON CENTER PER GEOTECHNICAL REPORT

EXISTING EASEMENT KEYNOTES

7. EXISTING EASEMENT FOR WATER METER VAULT RECORDED 7–29–1958 AS DOC. # 121966 IN BOOK 7187, PAGE 465 O.R.
8. EXISTING SDGE EASEMENT (NO WIDTH GIVEN) RECORDED 9–29–1954 AS DOC. #129840, BOOK 5379, PAGE 419 O.R.
9. EXISTING 12"–WIDE SDGE EASEMENT RECORDED 9–21–1962 IN F/P 163692, SERIES 3, BOOK 1962 O.R.
10. EXISTING 12"–WIDE SDGE EASEMENT RECORDED 1–4–1960, F/P 433, SERIES 1, BOOK 1960 O.R.

PRIVATE CONTRACT

HORIZONTAL CONTROL PLAN

SMMC CAMPUS REDEVELOPMENT
PACKAGE 7A NEW TOWER
7901 FROST STREET

CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET 15 OF 17 SHEETS

FOR CITY ENGINEER			DATE	
DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	BWE			
AS–BUILTS				

CONTRACTOR ____ DATE STARTED ____
INSPECTOR ____ DATE COMPLETED ____

I.O. NO. ____
PROJECT NO. ____
V.T.M. ____
XXXX–XXXX NAD83 COORDINATES
XXX–XXXX LAMBERT COORDINATES
XXXXX–15–D

AMBROSE T. WONG RCE NO. C68965

REGISTERED PROFESSIONAL ENGINEER AMBROSE T. WONG No. C68965 CIVIL STATE OF CALIFORNIA

BWE CIVIL•STRUCTURAL•SURVEY•PLANNING 9449 BALBOA AVE, STE 270 SAN DIEGO, CA 92123 619.299.5550

C.8.4.4.A

M:\PROJECTS\9500\9545U.10.00 SHARP MMC\DWGS\SHEET_DWGS\PK7A NEW TOWER\9545U.10.00 PK7A–08–HORIZONTAL.DWG (07–07–21 11:17:14AM)
(REV 4/13/2018)

KEY PLAN: AREA 1, AREA 2, AREA 3, AREA 4, AREA 5, AREA 6, AREA 7, AREA 8, STEPHEN BIRCH, OPP, MARY BIRCH, LONG TERM CARE, REHAB

KEY PLAN

FOR OSHPD REFERENCE ONLY

SHARP
SMMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

McCARTHY
MCCARTHY BUILDING COMPANIES, INC.
9275 SKY PARK COURT, SUITE 200
SAN DIEGO, CA 92123

HDR
HDR ARCHITECTURE, INC.
350 SOUTH GRAND AVENUE, SUITE 2900
LOS ANGELES, CA 90071-3406

TAYLOR design
17850 FITCH
IRVINE, CA 92614

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

SITE PLAN
PACKAGE 2A.7A
NEW TOWER

CONSTRUCTION DOCUMENTS - 100%

Project Manager	Thomas Onnen
Project Designer	HDR/ Taylor Design
Project Architect	HDR/ Taylor Design
Landscape Architect	Schmidt Design Group
Civil Engineer	BWE Engineering
Structural Engineer	KPFF
Mechanical Engineer	TK1SC
Electrical Engineer	TK1SC
Plumbing Engineer	TK1SC
Interior Designer	HDR/ Taylor Design Group
Equipment Planner	Criterion

Sheet Reviewer: Author

MARK	DATE	DESCRIPTION

Current Print Description

Project Number	10204365
Original Issue	06/18/20
Agency Number	I210874-37-00
Agency Approval	

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
INIT DATE
Office of Statewide Health Planning and Development
FACILITIES DEVELOPMENT DIVISION

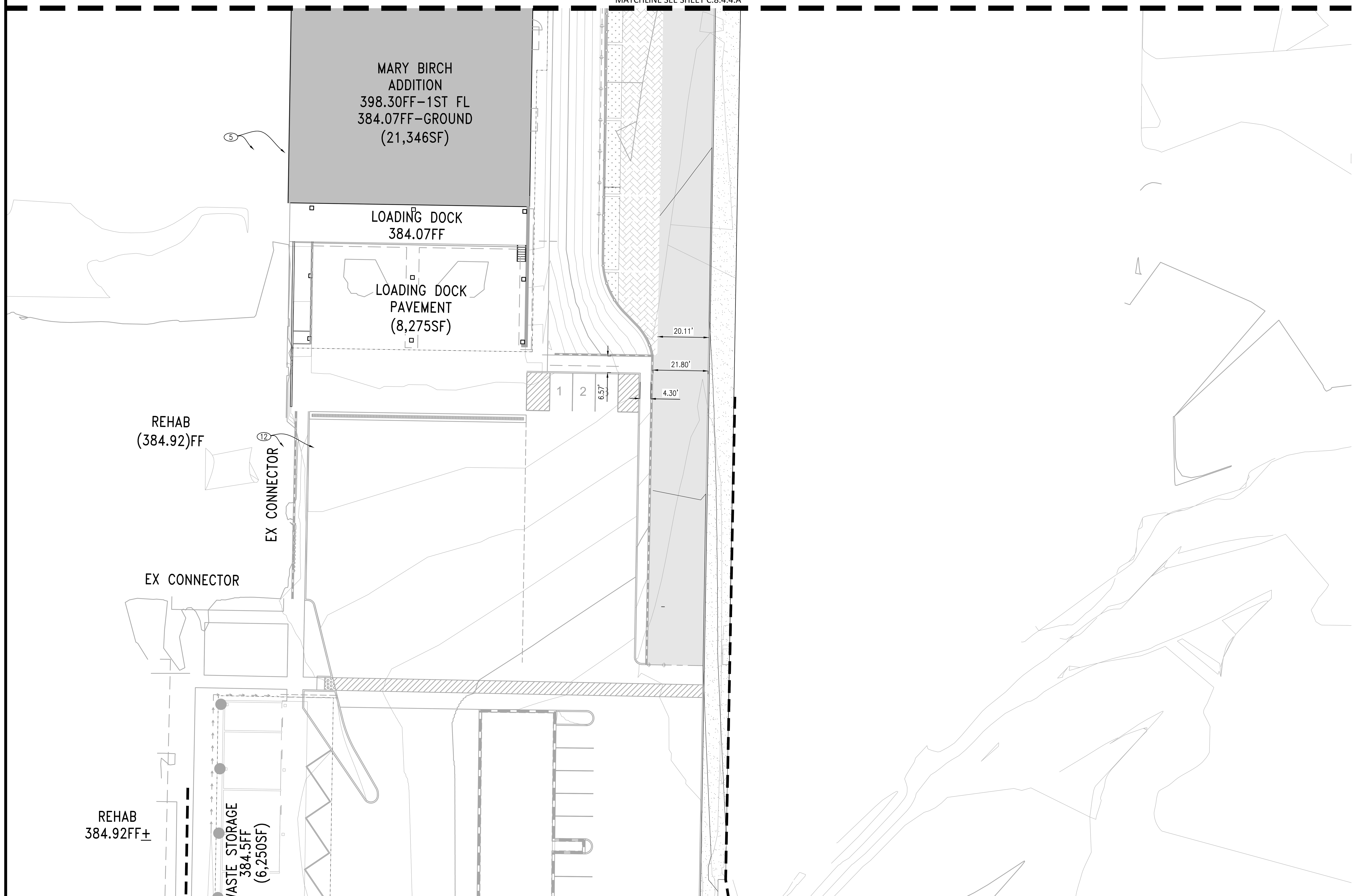
REGISTERED PROFESSIONAL ENGINEER AMBROSE T. WONG PRELIMINARY CIVIL STATE OF CALIFORNIA

Sheet Name
HORIZONTAL CONTROL PLAN
AREA 4

Sheet Number
C.8.4.4.A

Project Status
CONSTRUCTION DOCUMENTS 100%

MATCHLINE SEE SHEET C.8.4.4.A



HORIZONTAL CONTROL LEGEND

- DRIVEWAY. 3" AC PAVEMENT WITH 6.5" AB @95%, 12" SUBGRADE @95% PER GEOTECHNICAL REPORT.
- CONCRETE WALKWAY. 4" PCC WITH No.4 BARS@24" ON CENTER PER GEOTECHNICAL REPORT

EXISTING EASEMENT KEYNOTES

5 EXISTING 12'-WIDE SDGE EASEMENT RECORDED 1-4-1960, F/P 433, SERIES 1, BOOK 1960 O.R.

12 EXISTING 12'-WIDE SDGE EASEMENT RECORDED 5-22-1961 IN F/P 87927, SERIES 2, BOOK 1961 O.R.

N

20 10 0 20 40 60

SCALE: 1"=20'

AMBROSE T. WONG RCE NO. C68965

REGISTERED PROFESSIONAL ENGINEER
AMBROSE T. WONG
No. C68965
CIVIL
STATE OF CALIFORNIA

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

PRIVATE CONTRACT

C.8.4.4.B

HORIZONTAL CONTROL PLAN

SMMC CAMPUS REDEVELOPMENT
PACKAGE 7A NEW TOWER
7901 FROST STREET

CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET 16 OF 17 SHEETS

I.O. NO. ______
PROJECT NO. ______
V.T.M. ______

FOR CITY ENGINEER ______ DATE ______

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	BWE			
AS-BUILTS				

XXXX-XXXX
NAD83 COORDINATES

XXX-XXXX
LAMBERT COORDINATES

CONTRACTOR ______ DATE STARTED ______
INSPECTOR ______ DATE COMPLETED ______

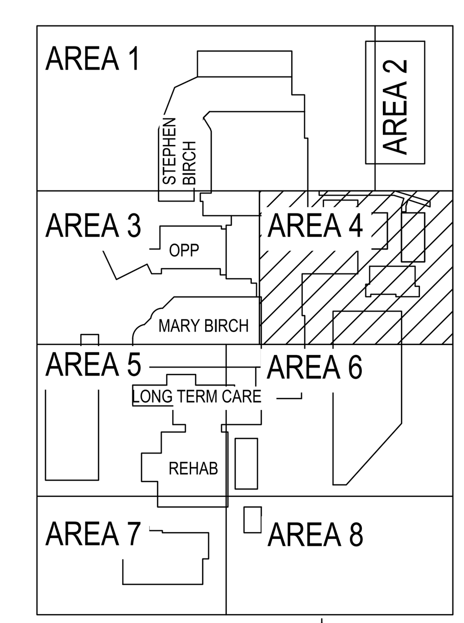
XXXXX-16-D

M:\PROJECTS\9500\9545U.10.00 SHARP MMC\DWGS\SHEET_DWGS\PK7A NEW TOWER\9545U.10.00 PK7A-08-HORIZONTAL.DWG (07-07-21 11:17:17AM)

(REV 4/13/2018)

6/10/2020 2:29:41 PM BIM 360://10204365 - Sharp Metro Campus/SMMC-A-MAS.rvt

FOR OSHPD REFERENCE ONLY



KEY PLAN

SHARP

SMMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

McCARTHY

MCCARTHY BUILDING COMPANIES, INC.
9275 SKY PARK COURT, SUITE 200
SAN DIEGO, CA 92123

HDR

HDR ARCHITECTURE, INC.
350 SOUTH GRAND AVENUE, SUITE 2900
LOS ANGELES, CA 90071-3406

TAYLOR design

17850 FITCH
IRVINE, CA 92614

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

SITE PLAN
PACKAGE 2A.7A
NEW TOWER

CONSTRUCTION DOCUMENTS - 100%

Project Manager	Thomas Onnen
Project Designer	HDR/ Taylor Design
Project Architect	HDR/ Taylor Design
Landscape Architect	Schmidt Design Group
Civil Engineer	BWE Engineering
Structural Engineer	KPFF
Mechanical Engineer	TK1SC
Electrical Engineer	TK1SC
Plumbing Engineer	TK1SC
Interior Designer	HDR/ Taylor Design Group
Equipment Planner	Criterion

Sheet Reviewer Author

MARK	DATE	DESCRIPTION

Current Print Description

Project Number 10204365
Original Issue 06/18/20

Agency Number I210874-37-00
Agency Approval

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR

INIT DATE

Office of Statewide Health Planning and Development
FACILITIES DEVELOPMENT DIVISION

REGISTERED PROFESSIONAL ENGINEER
AMBROSE T. WONG
PRELIMINARY
CIVIL
STATE OF CALIFORNIA

Sheet Name
HORIZONTAL CONTROL PLAN
AREA 4

Sheet Number
C.8.4.4.B

Project Status
CONSTRUCTION DOCUMENTS 100%

M:\PROJECTS\9500\9545U.10.00 SHARP MMC\DWGS\SHEET_DWGS\PK7A NEW TOWER\9545U.10.00 PK7A-09-DETAILS.DWG (07-07-21 11:17:29AM)
(REV 4/13/2018)

AMBROSE T. WONG RCE NO. C68965

REGISTERED PROFESSIONAL ENGINEER AMBROSE T. WONG No. C68965 CIVIL STATE OF CALIFORNIA

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

PRIVATE CONTRACT C.9.4.4A

DETAILS

SMMC CAMPUS REDEVELOPMENT

7901 FROST STREET

CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET 17 OF 17 SHEETS

I.O. NO.
PROJECT NO.
V.T.M.

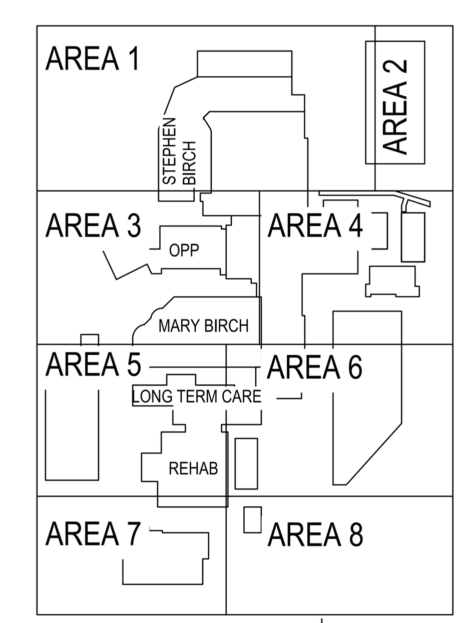
FOR CITY ENGINEER DATE

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	BWE			
AS-BUILTS				

XXXX-XXXX NAD83 COORDINATES
XXX-XXXX LAMBERT COORDINATES

CONTRACTOR DATE STARTED
INSPECTOR DATE COMPLETED

XXXXX-17-D



FOR OSHPD REFERENCE ONLY

KEY PLAN

SHARP
SMMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

McCARTHY
MCCARTHY BUILDING COMPANIES, INC.
9275 SKY PARK COURT, SUITE 200
SAN DIEGO, CA 92123

HDR
HDR ARCHITECTURE, INC.
350 SOUTH GRAND AVENUE, SUITE 2900
LOS ANGELES, CA 90071-3406

TAYLOR design
17850 FITCH
IRVINE, CA 92614

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123 619.299.5550

SITE PLAN
PACKAGE 2A.7A
NEW TOWER

CONSTRUCTION DOCUMENTS - 100%

Project Manager	Thomas Onnen
Project Designer	HDR/ Taylor Design
Project Architect	HDR/ Taylor Design
Landscape Architect	Schmidt Design Group
Civil Engineer	BWE Engineering
Structural Engineer	KPFF
Mechanical Engineer	TK1SC
Electrical Engineer	TK1SC
Plumbing Engineer	TK1SC
Interior Designer	HDR/ Taylor Design Group
Equipment Planner	Criterion

Sheet Reviewer Author

MARK	DATE	DESCRIPTION

Current Print Description

Project Number 10204365
Original Issue 06/18/20

Agency Number I210874-37-00
Agency Approval

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
INIT DATE
Office of Statewide Health Planning and Development
FACILITIES DEVELOPMENT DIVISION

REGISTERED PROFESSIONAL ENGINEER AMBROSE T. WONG CIVIL STATE OF CALIFORNIA PRELIMINARY

Sheet Name
DETAILS
AREA 4

Sheet Number
C.9.4.4A

Project Status
CONSTRUCTION DOCUMENTS 100%

6/10/2020 2:29:41 PM BIM 360://10204365 - Sharp Metro Campus/SMMC-A-MAS.rvt

Attachment 5
Drainage Report

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

REFER TO ATTACHMENT 5 OF PACKAGE 3A FOR DRAINAGE REPORT

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Attachment 6
Geotechnical and Groundwater Investigation Report

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

REFER TO ATTACHMENT 6 OF PACKAGE 3A FOR GEOTECHNICAL REPORT

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

PACKAGE 8 SWQMP

Priority Development Project (PDP)
Storm Water Quality Management Plan (SWQMP)

Sharp MMC - Package 8 (PK 8)

Concourse Addition

☐ **Check if electing for offsite alternative compl**

Engineer of Work:

REGISTERED PROFESSIONAL ENGINEER
MICHAEL A. SLAWSON
C 056127
Exp. 12-31-22
CIVIL
STATE OF CALIFORNIA
FOR REVIEW ONLY

Michael A. Slawson, PE # C056127

Provide Wet Signature and Stamp Above Line

Prepared For:

Sharp Healthcare

7901 Frost Street

San Diego, CA 92123

(858) 939-8323

Prepared By:

BWE Inc

9449 Balboa Ave, Suite 270

San Diego, CA 92123

(619) 299-5550

Date:

10/07/2022

Approved by: City of San Diego Date

The City of SAN DIEGO

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Project Name: Sharp MMC - Package 8 (PK 8)

Table of Contents

- Attachment 3: Structural BMP Maintenance Plan
  - Maintenance Agreement (Form DS-3247) (when applicable)
- Attachment 4: Copy of Plan Sheets Showing Permanent Storm Water BMPs
- Attachment 5: Project's Drainage Report
- Attachment 6: Project's Geotechnical and Groundwater Investigation Report

Acronyms

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

Certification Page

Project Name:
Permit Application

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

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

Engineer of Work's Signature

C056127

PE#

12/31/2022

Expiration Date

Michael A. Slawson

Print Name

BWE Inc

Company

06/03/2022

Date

Engineer's Stamp

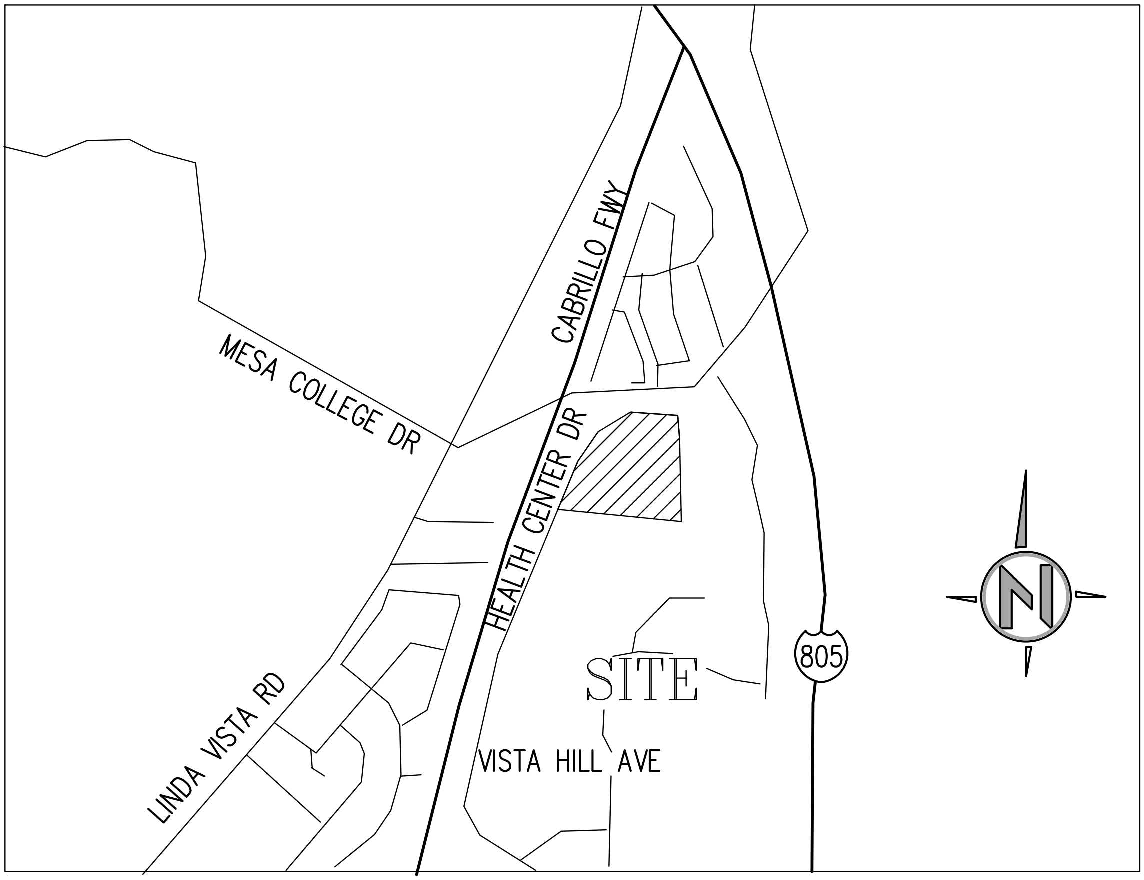
Submittal Record

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

Submittal Number	Date	Project Status	Changes
1	07/09/2021	☑ Preliminary Design/Planning/CEQA ☐ Final Design	Initial Submittal
2		☐ Preliminary Design/Planning/CEQA ☐ Final Design	
3		☐ Preliminary Design/Planning/CEQA ☐ Final Design	
4		☐ Preliminary Design/Planning/CEQA ☐ Final Design	

Project Vicinity Map

Project Name: Sharp MMC - Package 8 (PK 8)
Permit Application



City of San Diego Form DS-560 Storm Water Requirements Applicability Checklist

Attach DS-560 form.

Development Services

THE CITY OF SAN DIEGO

FORM
DS-560
September 2021

Stormwater Requirements Applicability Checklist

Project Address: 7901 Frost Street, San Diego, CA

Project Number:

SECTION 1: Construction Stormwater Best Management Practices (BMP) Requirements

All construction sites are required to implement construction BMPs per the performance standards in the Stormwater Standards Manual. Some sites are also required to obtain coverage under the State Construction General Permit (CGP)[1], administered by the California State Water Resources Control Board.

For all projects, complete Part A - If the project is required to submit a Stormwater Pollution Prevention Plan (SWPPP) or Water Pollution Control Plan (WPCP), continue to Part B.

PART A – Determine Construction Phase Stormwater Requirements

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

   ◉ Yes, SWPPP is required; skip questions 2-4. ○ No; proceed to the next question.

2. Does the project propose construction or demolition activity, including but not limited to, clearing, grading, grubbing, excavation, or any other activity resulting in ground disturbance and/or contact with stormwater?

   ○ Yes, WPCP is required; skip questions 3-4. ○ No; proceed to the next question.

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

   ○ Yes, WPCP is required; skip question 4. ○ No; proceed to the next question.

4. Does the project only include the following Permit types listed below?

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

   ☐ Yes, no document is required.

Check one of the boxes below and continue to Part B

◉ **If you checked "Yes" for question 1**, an SWPPP is REQUIRED – **continue to Part B**

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

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

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

CLEAR FORM

PART B – Determine Construction Site Priority

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

Complete Part B and continue to Section 2

☐ **1. ASBS**

A. Projects located in the ASBS watershed.

☑ **2. High Priority**

A. Projects that qualify as Risk Level 2 or Risk Level 3 per the Construction General Permit (CGP) and are not located in the ASBS watershed.
B. Projects that qualify as LUP Type 2 or LUP Type 3 per the CGP and are not located in the ASBS watershed.

☐ **3. Medium Priority**

A. Projects that are not located in an ASBS watershed or designated as a High priority site.
B. Projects that qualify as Risk Level 1 or LUP Type 1 per the CGP and are not located in an ASBS watershed.
C. WPCP projects (>5,000 square feet of ground disturbance) located within the Los Peñasquitos watershed management area.

☐ **4. Low Priority**

A. Projects not subject to a Medium or High site priority designation and are not located in an ASBS watershed.

Section 2: Construction Stormwater BMP Requirements

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

PART C – Determine if Not Subject to Permanent Stormwater Requirements

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

- **If "yes" is checked for any number in Part C**: Proceed to Part F and check "Not Subject to Permanent Stormwater BMP Requirements."
- **If "no" is checked for all the numbers in Part C:** Continue to Part D.

1. Does the project only include interior remodels and/or is the project entirely within an existing enclosed structure and does not have the potential to contact stormwater?

   ○ Yes ◉ No

2. Does the project only include the construction of overhead or underground utilities without creating new impervious surfaces?

   ○ Yes ◉ No

3. Does the project fall under routine maintenance? Examples include but are not limited to roof or exterior structure surface replacement, resurfacing or reconfiguring surface parking lots or existing roadways without expanding the impervious footprint, and routine replacement of damaged pavement (grinding, overlay and pothole repair).

   ○ Yes ◉ No

CLEAR FORM

PART D – PDP Exempt Requirements

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

- **If "yes" is checked for any questions in Part D**, continue to Part F and check the box labeled "PDP Exempt."
- **If "no" is checked for all questions in Part D**, continue to Part E.

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

   ○ Yes, PDP exempt requirements apply ◉ No, proceed to next question

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

   ○ Yes, PDP exempt requirements apply ◉ No, proceed to next question

PART E – Determine if Project is a Priority Development Project (PDP)

Projects that match one of the definitions below are subject to additional requirements, including preparation of a Stormwater Quality Management Plan (SWQMP).

- **If "yes" is checked for any number in Part E**, continue to Part F and check the box labeled "Priority Development Project."
- **If "no" is checked for every number in Part E**, continue to Part F and check the box labeled "Standard Development Project."

1. **New development that creates 10,000 square feet or more of impervious surfaces collectively over the project site.** This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land. ○ Yes ◉ No

2. **Redevelopment project that creates and/or replaces 5,000 square feet or more of impervious surfaces on an existing site of 10,000 square feet or more of impervious surfaces.** This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land. ◉ Yes ○ No

3. **New development or redevelopment of a restaurant.** Facilities that sell prepared foods and beverages for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (Standard Industrial Classification (SIC) 5812), and where the land development creates and/or replaces 5,000 square feet or more of impervious surface. ○ Yes ◉ No

4. **New development or redevelopment on a hillside.** The project creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site) and where the development will grade on any natural slope that is twenty-five percent or greater. ○ Yes ◉ No

5. **New development or redevelopment of a parking lot that creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site).** ○ Yes ◉ No

6. **New development or redevelopment of streets, roads, highways, freeways, and driveways.** The project creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site). ○ Yes ◉ No

CLEAR FORM

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

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

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

10. **Other Pollutant Generating Project.** These projects are not covered in any of the categories above but involve the disturbance of one or more acres of land and are expected to generate post-construction phase pollutants, including fertilizers and pesticides. This category does not include projects creating less than 5,000 square feet of impervious area and projects containing landscaping without a requirement for the regular use of fertilizers and pesticides (such as a slope stabilization project using native plants). Impervious area calculations need not include linear pathways for infrequent vehicle use, such as emergency maintenance access or bicycle and pedestrian paths if the linear pathways are built with pervious surfaces or if runoff from the pathway sheet flows to adjacent pervious areas. ○ Yes ◉ No

PART F – Select the appropriate category based on the outcomes of Part C through Part E

1. The project is **NOT SUBJECT TO PERMANENT STORMWATER REQUIREMENTS** ○ Yes ○ No

2. The project is a **STANDARD DEVELOPMENT PROJECT**. Site design and source control BMP requirements apply. See the Stormwater Standards Manual for guidance. ○ Yes ○ No

3. The Project is **PDP EXEMPT**. Site design and source control BMP requirements apply. Refer to the Stormwater Standards Manual for guidance. ○ Yes ○ No

4. The project is a **PRIORITY DEVELOPMENT PROJECT**. Site design, source control and structural pollutant control BMP requirements apply. Refer to the Stormwater Standards Manual for guidance on determining if the project requires hydromodification plan management. ○ Yes ◉ No

Michael A. Slawson

Name of Owner or Agent

Principal

Title

Signature

06/03/2022

Date

CLEAR FORM

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Applicability of Permanent, Post-Construction Storm Water BMP Requirements			Form I-1
Project Identification			
Project Name: Sharp MMC - Package 8 (PK 8)			
Permit Application Number:			Date: 07/09/2021
Determination of Requirements			
The purpose of this form is to identify permanent, post-construction requirements that apply to the project. This form serves as a short summary of applicable requirements, in some cases referencing separate forms that will serve as the backup for the determination of requirements. Answer each step below, starting with **Step 1** and progressing through each step until reaching "Stop". Refer to the manual sections and/or separate forms referenced in each step below.			
Step	**Answer**	**Progression**	
Step 1: Is the project a "development project"? See Section 1.3 of the manual (Part 1 of Storm Water Standards) for guidance.	☑ Yes	Go to **Step 2**.	
	☐ No	**Stop**. Permanent BMP requirements do not apply. No SWQMP will be required. Provide discussion below.	
Discussion / justification if the project is not a "development project" (e.g., the project includes *only* interior remodels within an existing building):			
Step 2: Is the project a Standard Project, PDP, or PDP Exempt? To answer this item, see Section 1.4 of the manual in its entirety for guidance AND complete Form DS-560, Storm Water Requirements Applicability Checklist.	☐ Standard Project	**Stop.** Standard Project requirements apply	
	☑ PDP	PDP requirements apply, including PDP SWQMP. Go to **Step 3**.	
	☐ PDP Exempt	**Stop.** Standard Project requirements apply. Provide discussion and list any additional requirements below.	
Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:			

Project Name: Sharp MMC - Package 8 (PK 8)

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

HMP Exemption Exhibit

Attach a HMP Exemption Exhibit that shows direct storm water runoff discharge from the project site to HMP exempt area. Include project area, applicable underground storm drain line and/or concrete lined channels, outfall information and exempt waterbody. Reference applicable drawing number(s).

Exhibit must be provided on 11"x17" or larger paper.

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Site Information Checklist For PDPs	Form I-3B
Project Summary Information	
Project Name	Sharp MMC - Package 8 (PK 8)
Project Address	7901 Frost Street, San Diego, CA 92123
Assessor's Parcel Number(s) (APN(s))	427-530-02-00
Permit Application Number	
Project Watershed	Select One: ☐ San Dieguito River ☐ Penasquitos ☑ Mission Bay ☐ San Diego River ☐ San Diego Bay ☐ Tijuana River
Hydrologic subarea name with Numeric Identifier up to two decimal places (9XX.XX)	Telocolote, 906.50
Project Area (total area of Assessor's Parcel(s) associated with the project or total area of the right-of-way)	20.49 Acres (892,544 Square Feet)
Area to be disturbed by the project (Project Footprint)	0.91 Acres (39,554 Square Feet)
Project Proposed Impervious Area (subset of Project Footprint)	0.73 Acres (31,749 Square Feet)
Project Proposed Pervious Area (subset of Project Footprint)	0.18 Acres (7,805 Square Feet)
Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Project Area.	
The proposed increase or decrease in impervious area in the proposed condition as compared to the pre-project condition	-19.3 %

Project Name: Sharp MMC - Package 8 (PK 8)

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

Form I-3B Page 3 of 11
Description of Existing Site Topography and Drainage
How is storm water runoff conveyed from the site? At a minimum, this description should answer: 1. Whether existing drainage conveyance is natural or urban; 2. If runoff from offsite is conveyed through the site? If yes, quantification of all offsite drainage areas, design flows, and locations where offsite flows enter the project site and summarize how such flows are conveyed through the site; 3. Provide details regarding existing project site drainage conveyance network, including storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, and natural and constructed channels; 4. Identify all discharge locations from the existing project along with a summary of the conveyance system size and capacity for each of the discharge locations. Provide summary of the pre-project drainage areas and design flows to each of the existing runoff discharge locations.
Descriptions/Additional Information
The existing drainage pattern is urban where offsite runoff is not anticipated. The existing site consists mostly of buildings with associated hardscape and landscape. Through roof drains, runoff is piped east to an existing inlet located on Health Center Drive, exiting the site with a peak 100 year flow rate of 2.60 cfs. From the inlet on Health Center Drive, the existing 24" RCP pipe flows to Tecolote Creek, followed by Mission Bay, and ultimately to the Pacific Ocean. See Attachment 5 for more detailed information.

Project Name: Sharp MMC - Package 8 (PK 8)

Form I-3B Page 4 of 11
Description of Proposed Site Development and Drainage Patterns
Project Description / Proposed Land Use and/or Activities: The proposed project includes the development of a medical facility, driveway entrance, and loading zone with associated hardscape and pervious features.
List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features): The proposed impervious features include a medical building, sidewalk, loading zone, and other hardscape.
List/describe proposed pervious features of the project (e.g., landscape areas): The pervious features is landscaping as well as permeable pavers.
Does the project include grading and changes to site topography? ☐ Yes ☑ No Description / Additional Information:

Project Name: Sharp MMC - Package 8 (PK 8)

Form I-3B Page 5 of 11

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

☑ Yes

☐ No

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

Description / Additional Information:

The proposed drainage generally flows from north to south. The roof drain is piped to an above ground Modular Wetland System, which then goes to an underground vault for hydromodification. The rest of the site sheet flows to the permeable pavers through curb and gutters and then to the underground vault. The treated runoff is conveyed east to the existing inlet along Health Center Drive (POC #4), leaving the site through a 24" RCP.

See Attachment 5 for calculations and more detailed information.

Discharge Point #4

Drainage Area (acres)		**100 Yr Flow (cfs)**		
Existing Condition	**Proposed Condition**	**Existing Condition**	**Proposed Condition (Unmitigated)**	**% Change from Existing Condition**
0.46	0.52	2.60	2.90	**11.54%**

Form I-3B Page 6 of 11
Identify whether any of the following features, activities, and/or pollutant source areas will be present (select all that apply): ☑Onsite storm drain inlets ☑Interior floor drains and elevator shaft sump pumps ☐Interior parking garages ☑Need for future indoor & structural pest control ☑Landscape/outdoor pesticide use ☐Pools, spas, ponds, decorative fountains, and other water features ☐Food service ☐Refuse areas ☐Industrial processes ☐Outdoor storage of equipment or materials ☐Vehicle and equipment cleaning ☐Vehicle/equipment repair and maintenance ☐Fuel dispensing areas ☐Loading docks ☑Fire sprinkler test water ☑Miscellaneous drain or wash water ☑Plazas, sidewalks, and parking lots Description/Additional Information:

Form I-3B Page 7 of 11
Identification and Narrative of Receiving Water
Narrative describing flow path from discharge location(s), through urban storm conveyance system, to receiving creeks, rivers, and lagoons and ultimate discharge location to Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable) From the inlet located on Health Center drive (POC #4), the existing 24" RCP drains to the Tecolote Creek (~0.4 miles from the project site). The Tecolote Creek ultimately drains to the Pacific Ocean (~8.3 miles from the project site).
Provide a summary of all beneficial uses of receiving waters downstream of the project discharge locations Tecolote Creek: REC1, REC2, WARM, WILD Mission Bay: COMM, EST, IND, MAR, MIGR, RARE, REC1, REC2, SHELL, WILD Pacific Ocean: AQUA, BIOL, COMM, IND, MAR, MIGR, NAV, RARE, REC1, REC2, SHELL, SPWN, WILD
Identify all ASBS (areas of special biological significance) receiving waters downstream of the project discharge locations There are no ASBS receiving water downstream of the project discharge locations.
Provide distance from project outfall location to impaired or sensitive receiving waters The distance from the Tecolote Creek is approximately 0.4 miles from the project site.
Summarize information regarding the proximity of the permanent, post-construction storm water BMPs to the City's Multi-Habitat Planning Area and environmentally sensitive lands The project site is located approximately 0.3 miles from the City's Multi-Habitat Planning Area and approximately 0.6 miles from environmentally sensitive lands. See Attachment 1 for exhibit.

Form I-3B Page 8 of 11

Identification of Receiving Water Pollutants of Concern

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

303(d) Impaired Water Body (Refer to Appendix K)	Pollutant(s)/Stressor(s) (Refer to Appendix K)	TMDLs/WQIP Highest Priority Pollutant (Refer to Table 1-4 in Chapter 1)
Tecolote Creek	Cadmium, Copper, Indicator Bacteria	Indicator Bacteria
Tecolote Creek	Lead, Nitrogen, Phosphorus	Indicator Bacteria
Tecolote Creek	Selenium, Toxicity, Turbidity, Zinc	Indicator Bacteria
Mission Bay	Enterococcus, Total Coliform	Indicator Bacteria

Identification of Project Site Pollutants*

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

Identify pollutants anticipated from the project site based on all proposed use(s) of the site (see Appendix B.6):

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

Form I-3B Page 9 of 11

Hydromodification Management Requirements

Do hydromodification management requirements apply (see Section 1.6)?

☑ Yes, hydromodification management flow control structural BMPs required.

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

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

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

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

Note: If “No” answer has been selected the SWQMP must include an exhibit that shows the storm water conveyance system from the project site to an exempt water body. The exhibit should include details about the conveyance system and the outfall to the exempt water body.

Critical Coarse Sediment Yield Areas*

***This Section only required if hydromodification management requirements apply**

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

☐ Yes

☑ No

Discussion / Additional Information:

Per the Potential Critical Coarse Sediment Yield Area Map of the Watershed Management Area Analysis (WMAA), there are no CCSYAs located onsite or upstream of the project. See the Critical Coarse Yield Area Exhibit in Attachment 2.

Form I-3B Page 10 of 11
Flow Control for Post-Project Runoff* ***This Section only required if hydromodification management requirements apply**
List and describe point(s) of compliance (POCs) for flow control for hydromodification management (see Section 6.3.1). For each POC, provide a POC identification name or number correlating to the project's HMP Exhibit and a receiving channel identification name or number correlating to the project's HMP Exhibit. From the inlet located on Health Center Drive (POC #4), the existing 24" RCP drains to the Tecolote Creek (~0.4 miles from the project site). The Tecolote Creek ultimately drains to the Pacific Ocean (~8.3 miles from the project site).
Has a geomorphic assessment been performed for the receiving channel(s)? ☑ No, the low flow threshold is $0.1Q_2$ (default low flow threshold) ☐ Yes, the result is the low flow threshold is $0.1Q_2$ ☐ Yes, the result is the low flow threshold is $0.3Q_2$ ☐ Yes, the result is the low flow threshold is $0.5Q_2$ If a geomorphic assessment has been performed, provide title, date, and preparer:
Discussion / Additional Information: (optional)

Form I-3B Page 11 of 11
Other Site Requirements and Constraints
When applicable, list other site requirements or constraints that will influence storm water management design, such as zoning requirements including setbacks and open space, or local codes governing minimum street width, sidewalk construction, allowable pavement types, and drainage requirements. Not Applicable
Optional Additional Information or Continuation of Previous Sections As Needed
This space provided for additional information or continuation of information from previous sections as needed. Not Applicable

Source Control BMP Checklist for PDPs			Form I-4B
Source Control BMPs			
All development projects must implement source control BMPs where applicable and feasible. See Chapter 4 and Appendix E of the BMP Design Manual (Part 1 of the Storm Water Standards) for information to implement source control BMPs shown in this checklist. Answer each category below pursuant to the following. • "Yes" means the project will implement the source control BMP as described in Chapter 4 and/or Appendix E of the BMP Design Manual. Discussion / justification is not required. • "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided. • "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification may be provided.			
Source Control Requirement	**Applied?**		
4.2.1 Prevention of Illicit Discharges into the MS4	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.2.1 not implemented:			
4.2.2 Storm Drain Stenciling or Signage	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.2.2 not implemented:			
4.2.3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.2.3 not implemented:			
4.2.4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.2.4 not implemented:			
4.2.5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.2.5 not implemented:			

Project Name: Sharp MMC - Package 8 (PK 8)

Form I-4B Page 2 of 2			
Source Control Requirement	**Applied?**		
4.2.6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below)			
On-site storm drain inlets	☑ Yes	☐ No	☐ N/A
Interior floor drains and elevator shaft sump pumps	☑ Yes	☐ No	☐ N/A
Interior parking garages	☐ Yes	☐ No	☑ N/A
Need for future indoor & structural pest control	☑ Yes	☐ No	☐ N/A
Landscape/Outdoor Pesticide Use	☑ Yes	☐ No	☐ N/A
Pools, spas, ponds, decorative fountains, and other water features	☐ Yes	☐ No	☑ N/A
Food service	☐ Yes	☐ No	☑ N/A
Refuse areas	☐ Yes	☐ No	☑ N/A
Industrial processes	☐ Yes	☐ No	☑ N/A
Outdoor storage of equipment or materials	☐ Yes	☐ No	☑ N/A
Vehicle/Equipment Repair and Maintenance	☐ Yes	☐ No	☑ N/A
Fuel Dispensing Areas	☐ Yes	☐ No	☑ N/A
Loading Docks	☐ Yes	☐ No	☑ N/A
Fire Sprinkler Test Water	☑ Yes	☐ No	☐ N/A
Miscellaneous Drain or Wash Water	☑ Yes	☐ No	☐ N/A
Plazas, sidewalks, and parking lots	☑ Yes	☐ No	☐ N/A
SC-6A: Large Trash Generating Facilities	☐ Yes	☐ No	☑ N/A
SC-6B: Animal Facilities	☐ Yes	☐ No	☑ N/A
SC-6C: Plant Nurseries and Garden Centers	☐ Yes	☐ No	☑ N/A
SC-6D: Automotive Facilities	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.2.6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for all "No" answers shown above.			

Site Design BMP Checklist for PDPs			Form I-5B
Site Design BMPs			
All development projects must implement site design BMPs where applicable and feasible. See Chapter 4 and Appendix E of the BMP Design Manual (Part 1 of Storm Water Standards) for information to implement site design BMPs shown in this checklist. Answer each category below pursuant to the following. • "Yes" means the project will implement the site design BMP as described in Chapter 4 and/or Appendix E of the BMP Design Manual. Discussion / justification is not required. • "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided. • "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification may be provided. A site map with implemented site design BMPs must be included at the end of this checklist.			
Site Design Requirement	**Applied?**		
4.3.1 Maintain Natural Drainage Pathways and Hydrologic Features	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.3.1 not implemented:			
1-1 Are existing natural drainage pathways and hydrologic features mapped on the site map?	☐ Yes	☐ No	☑ N/A
1-2 Are trees implemented? If yes, are they shown on the site map?	☐ Yes	☐ No	☑ N/A
1-3 Implemented trees meet the design criteria in 4.3.1 Fact Sheet (e.g. soil volume, maximum credit, etc.)?	☐ Yes	☐ No	☑ N/A
1-4 Is tree credit volume calculated using Appendix B.2.2.1 and SD-1 Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A
4.3.2 Have natural areas, soils and vegetation been conserved?	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.3.2 not implemented:			

Project Name: Sharp MMC - Package 8 (PK 8)

Form I-5B Page 2 of 4			
Site Design Requirement	**Applied?**		
4.3.3 Minimize Impervious Area	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.3 not implemented:			
4.3.4 Minimize Soil Compaction	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.4 not implemented:			
4.3.5 Impervious Area Dispersion	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.3.5 not implemented:			
5-1 Is the pervious area receiving runon from impervious area identified on the site map?	☐ Yes	☐ No	☑ N/A
5-2 Does the pervious area satisfy the design criteria in 4.3.5 Fact Sheet in Appendix E (e.g. maximum slope, minimum length, etc.)	☐ Yes	☐ No	☑ N/A
5-3 Is impervious area dispersion credit volume calculated using Appendix B.2.1.1 and 4.3.5 Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A

Project Name: Sharp MMC - Package 8 (PK 8)

Form I-5B Page 3 of 4			
Site Design Requirement	**Applied?**		
4.3.6 Runoff Collection	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.6 not implemented:			
6a-1 Are green roofs implemented in accordance with design criteria in 4.3.6A Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☐ No	☑ N/A
6a-2 Is the green roof credit volume calculated using Appendix B.2.1.2 and 4.3.6A Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A
6b-1 Are permeable pavements implemented in accordance with design criteria in 4.3.6B Fact Sheet? If yes, are they shown on the site map?	☑ Yes	☐ No	☐ N/A
6b-2 Is the permeable pavement credit volume calculated using Appendix B.2.1.3 and 4.3.6B Fact Sheet in Appendix E?	☑ Yes	☐ No	☐ N/A
4.3.7 Landscaping with Native or Drought Tolerant Species	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.7 not implemented:			
4.3.8 Harvest and Use Precipitation	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.3.8 not implemented:			
8-1 Are rain barrels implemented in accordance with design criteria in 4.3.8 Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☐ No	☑ N/A
8-2 Is the rain barrel credit volume calculated using Appendix B.2.2.2 and 4.3.8 Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A

Form I-5B Page 4 of 4
Insert Site Map with all site design BMPs identified:
See DMA exhibit in Attachment 1 for site design BMPs.

Project Name: Sharp MMC - Package 8 (PK 8)

Summary of PDP Structural BMPs	Form I-6
PDP Structural BMPs	
All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the BMP Design Manual, Part 1 of Storm Water Standards). Selection of PDP structural BMPs for storm water pollutant control must be based on the selection process described in Chapter 5. PDPs subject to hydromodification management requirements must also implement structural BMPs for flow control for hydromodification management (see Chapter 6 of the BMP Design Manual). Both storm water pollutant control and flow control for hydromodification management can be achieved within the same structural BMP(s). PDP structural BMPs must be verified by the City at the completion of construction. This includes requiring the project owner or project owner's representative to certify construction of the structural BMPs (complete Form DS-563). PDP structural BMPs must be maintained into perpetuity (see Chapter 7 of the BMP Design Manual). Use this form to provide narrative description of the general strategy for structural BMP implementation at the project site in the box below. Then complete the PDP structural BMP summary information sheet (page 3 of this form) for each structural BMP within the project (copy the BMP summary information page as many times as needed to provide summary information for each individual structural BMP).	
Describe the general strategy for structural BMP implementation at the site. This information must describe how the steps for selecting and designing storm water pollutant control BMPs presented in Section 5.1 of the BMP Design Manual were followed, and the results (type of BMPs selected). For projects requiring hydromodification flow control BMPs, indicate whether pollutant control and flow control BMPs are integrated or separate. A combination of Source Control, Site Design, and Structural BMPs are proposed to mitigate the impacts of the proposed development. The design of each BMP follows the regulations set forth in the City of San Diego BMP design manual as well as provides treatment for the sites Design Capture Volume (DCV), defined as the 85th percentile, 24 hour storm event. Harvest and use BMPs were determined to be infeasible for our site, see calculations in Attachment 1. The proposed development includes a medical facility, driveway entrance, with associated hardscape and pervious features. An above ground Modular Wetland System (BMP #11) is proposed for pollutant control for the medical building roof, while an underground vault (BMP #12) is proposed for hydromodification control. Permeable pavers (BMP#13) is proposed for pollutant control for the rest of the project site, which conveys runoff to BMP #12 for hydromodification control. The run-off from the BMPs drain to an existing 12" PVC pipe that discharges to an existing inlet located on Health Center Drive (POC #4). (Continue on page 2 as necessary.)	

Form I-6 Page 2 of 8

(Continued from page 1)

DMA 8.1 consists of the medical facility building. DMA 8.1 drains to BMP #11 through roof drains for pollutant control and BMP #12 for hydromodification control.

DMA 8.2 comprises of a loading zone, sidewalk, landscaping, and a driveway entrance to an existing parking garage. DMA 8.2 sheet flows to BMP #13 for pollutant control and BMP #12 for hydromodification control.

DMA 8.3 and 8.4 contain the paving leading to a proposed driveway entrance as well as an existing driveway entrance and exit for the existing parking garage. DMA 8.3 is excess area that is treated with hydromodification control by BMPs #5 and #6 in package 4, offsetting the required area in DMA 8.4.

DMA 8.5 is less than 250 sf and is hydraulically disconnected from the other DMAs. DMA 8.5 is considered to be de minimis.

Project Name: Sharp MMC - Package 8 (PK 8)

Form I-6 Page 3 of 8 (Copy as many as needed)	
Structural BMP Summary Information	
Structural BMP ID No. BMP #11	
Construction Plan Sheet No.	
Type of Structural BMP: ☐ Retention by harvest and use (e.g. HU-1, cistern) ☐ Retention by infiltration basin (INF-1) ☐ Retention by bioretention (INF-2) ☐ Retention by permeable pavement (INF-3) ☐ Partial retention by biofiltration with partial retention (PR-1) ☐ Biofiltration (BF-1) ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☐ Detention pond or vault for hydromodification management ☑ Other (describe in discussion section below)	
Purpose: ☑ Pollutant control only ☐ Hydromodification control only ☐ Combined pollutant control and hydromodification control ☐ Pre-treatment/forebay for another structural BMP ☐ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification form DS-563	Ambrose Wong, BWE Inc. 9449 Balboa Ave, Suite 270 San Diego, CA 92123
Who will be the final owner of this BMP?	Sharp Healthcare 7901 Frost Street San Diego, CA 92123
Who will maintain this BMP into perpetuity?	Sharp Healthcare 7901 Frost Street San Diego, CA 92123
What is the funding mechanism for maintenance?	TBD

Form I-6 Page 4 of 8 (Copy as many as needed)
Structural BMP ID No. BMP #11
Construction Plan Sheet No.
Discussion (as needed; must include worksheets showing BMP sizing calculations in the SWQMPs):
BMP #11 is a compact biofiltration basin (BF-3). A Modular Wetland System L-4-8-V is proposed to provide pollutant control for DMA 8.1. BMP sizing calculations are available in Attachment 1e.

Form I-6 Page 5 of 8 (Copy as many as needed)	
Structural BMP Summary Information	
Structural BMP ID No. BMP #12	
Construction Plan Sheet No.	
Type of Structural BMP: ☐ Retention by harvest and use (e.g. HU-1, cistern) ☐ Retention by infiltration basin (INF-1) ☐ Retention by bioretention (INF-2) ☐ Retention by permeable pavement (INF-3) ☐ Partial retention by biofiltration with partial retention (PR-1) ☐ Biofiltration (BF-1) ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☑ Detention pond or vault for hydromodification management ☐ Other (describe in discussion section below)	
Purpose: ☐ Pollutant control only ☑ Hydromodification control only ☐ Combined pollutant control and hydromodification control ☐ Pre-treatment/forebay for another structural BMP ☐ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification form DS-563	Ambrose Wong, BWE Inc. 9449 Balboa Ave, Suite 270 San Diego, CA 92123
Who will be the final owner of this BMP?	Sharp Healthcare 7901 Frost Street San Diego, CA 92123
Who will maintain this BMP into perpetuity?	Sharp Healthcare 7901 Frost Street San Diego, CA 92123
What is the funding mechanism for maintenance?	TBD

Form I-6 Page 6 of 8 (Copy as many as needed)
Structural BMP ID No. BMP #12
Construction Plan Sheet No.
Discussion (as needed; must include worksheets showing BMP sizing calculations in the SWQMPs):

Project Name: Sharp MMC - PK7A

Form I-6 Page 7 of 8 (Copy as many as needed)	
Structural BMP Summary Information	
Structural BMP ID No. BMP #13	
Construction Plan Sheet No.	
Type of Structural BMP: ☐ Retention by harvest and use (e.g. HU-1, cistern) ☐ Retention by infiltration basin (INF-1) ☐ Retention by bioretention (INF-2) ☑ Retention by permeable pavement (INF-3) ☐ Partial retention by biofiltration with partial retention (PR-1) ☐ Biofiltration (BF-1) ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☐ Detention pond or vault for hydromodification management ☐ Other (describe in discussion section below)	
Purpose: ☑ Pollutant control only ☐ Hydromodification control only ☐ Combined pollutant control and hydromodification control ☐ Pre-treatment/forebay for another structural BMP ☐ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification form DS-563	Ambrose Wong, BWE Inc. 9449 Balboa Ave, Suite 270 San Diego, CA 92123
Who will be the final owner of this BMP?	Sharp Healthcare 7901 Frost Street San Diego, CA 92123
Who will maintain this BMP into perpetuity?	Sharp Healthcare 7901 Frost Street San Diego, CA 92123
What is the funding mechanism for maintenance?	TBD

Project Name: Sharp MMC - PK7A

Form I-6 Page 8 of 8 (Copy as many as needed)
Structural BMP ID No. BMP #13
Construction Plan Sheet No.
Discussion (as needed; must include worksheets showing BMP sizing calculations in the SWQMPs):

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Attachment 1
Backup For PDP Pollutant Control BMPs

This is the cover sheet for Attachment 1.

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Project Name: Sharp MMC - Package 8 (PK 8)

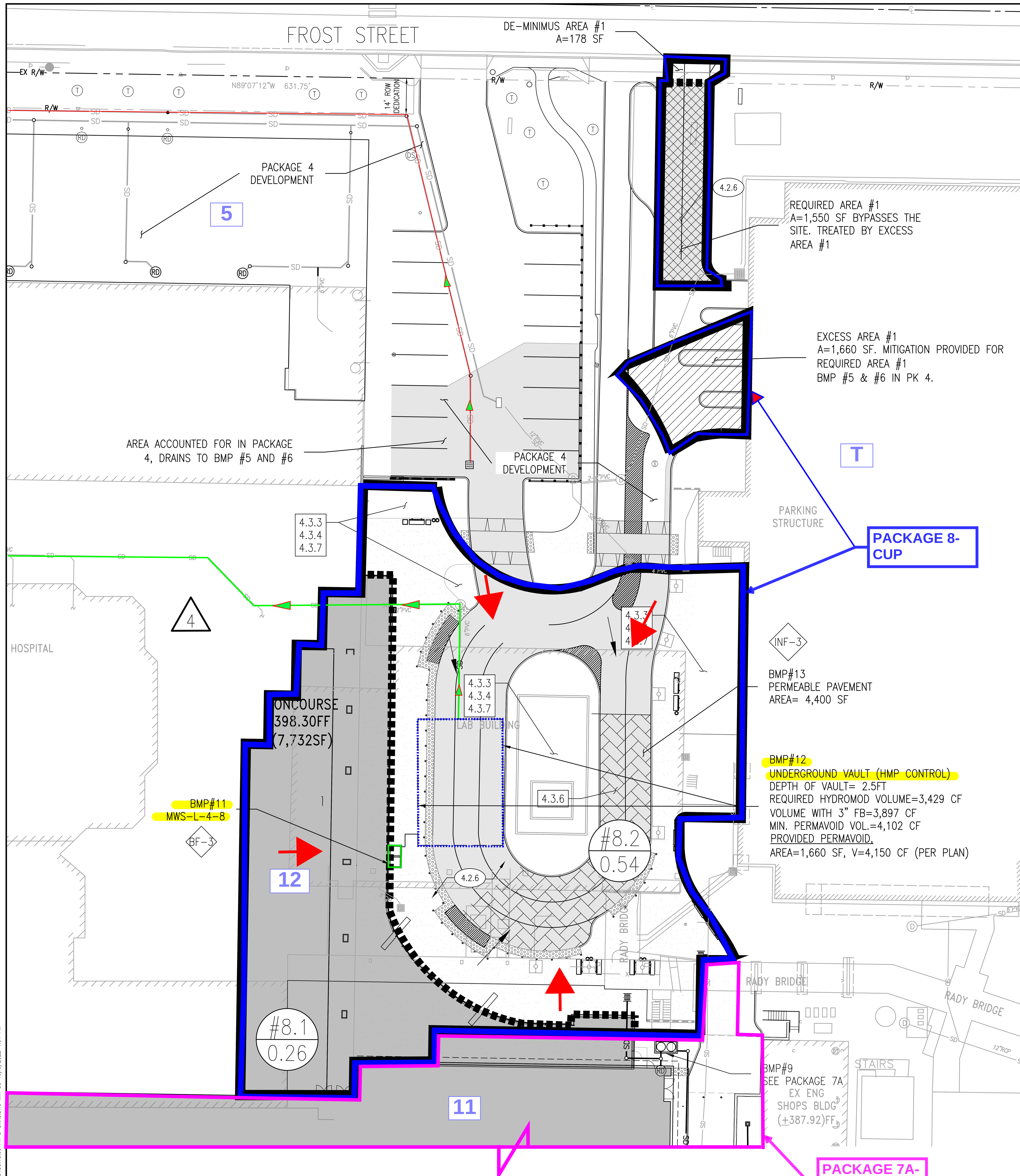
Indicate which Items are Included:

Attachment Sequence	Contents	Checklist
Attachment 1a	DMA Exhibit (Required) See DMA Exhibit Checklist.	☒ Included
Attachment 1b	Tabular Summary of DMAs Showing DMA ID matching DMA Exhibit, DMA Area, and DMA Type (Required)* *Provide table in this Attachment OR on DMA Exhibit in Attachment 1a	☑ Included on DMA Exhibit in Attachment 1a ☐ Included as Attachment 1b, separate from DMA Exhibit
Attachment 1c	Form I-7, Harvest and Use Feasibility Screening Checklist (Required unless the entire project will use infiltration BMPs) Refer to Appendix B.3-1 of the BMP Design Manual to complete Form I-7.	☑ Included ☐ Not included because the entire project will use infiltration BMPs
Attachment 1d	Infiltration Feasibility Information. Contents of Attachment 1d depend on the infiltration condition: • No Infiltration Condition: ○ Infiltration Feasibility Condition Letter (*Note: must be stamped and signed by licensed geotechnical engineer*) ○ Form I-8A (optional) ○ Form I-8B (optional) • Partial Infiltration Condition: ○ Infiltration Feasibility Condition Letter (*Note: must be stamped and signed by licensed geotechnical engineer*) ○ Form I-8A ○ Form I-8B • Full Infiltration Condition: ○ Form I-8A ○ Form I-8B ○ Worksheet C.4-3 ○ Form I-9 Refer to Appendices C and D of the BMP Design Manual for guidance.	☐ Included ☐ Not included because the entire project will use harvest and use BMPs
Attachment 1e	Pollutant Control BMP Design Worksheets / Calculations (Required) Refer to Appendices B and E of the BMP Design Manual for structural pollutant control BMP design guidelines and site design credit calculations	☑ Included

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

The DMA Exhibit must identify:

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



PACKAGE 8 DMA AREA DETAILS

DMA ID	TOTAL AREA (AC)	TOTAL AREA (SF)	PERVIOUS AREA (SF)	IMPERVIOUS AREA (SF)	IMPERVIOUS RATIO (%)	NOTES
8.1	0.26	11473	0	11473	100	POLLUTANT CONTROL MITIGATED BY BMP#11. HMP CONTROL MITIGATED BY BMP#12
8.2	0.53	23057	7633	16061	68	POLLUTANT CONTROL BY PERMEABLE PAVERS AND HMP CONTROL MITIGATED BY BMP#12

LEGEND / SYMBOL

- OUTER DMA BOUNDARY
- MAJOR DMA BOUNDARY
- MINOR DMA BOUNDARY
- EXISTING STORM DRAIN
- NEW STORM DRAIN
- FLOW DIRECTION
- POINT OF COMPLIANCE (POC)
- DRAINAGE MANAGEMENT AREA MARKER & AREA (AC)
- CONCRETE PAVEMENT
- ASPHALT PAVEMENT
- PERMEABLE PAVERS
- EXCESS MITIGATED AREA TO OFFSET REQUIRED AREA FOR FUTURE DRIVEWAY
- REQUIRED AREA FOR FUTURE DRIVEWAY (NOT INCLUDED IN PACKAGE 4)
- PERVIOUS AREA — LANDSCAPE/DIRT AREA

- **DMA-PACKAGE 3A**
- **DMA-PACKAGE 7A**
- **DMA-PACKAGE 8**
- **BUILDING NO.** XX
- **SD FLOW DIRECTION** OR
- **UG-VAULT**
- **STORM DRAIN**

SWQMP NOTES

1. THE SITE IS COMPRISED OF HYDROLOGIC SOIL TYPE D.
2. NO CRITICAL COARSE SEDIMENT YIELD AREAS ARE PRESENT ON SITE.
3. THERE ARE NO NATURAL HYDROLOGIC FEATURES PRESENT ON SITE.
4. DEPTH TO GROUNDWATER IS GREATER THAN 20 FT.

STRUCTURAL BMPS:

- BF-3 COMPACT BIOFILTRATION BMP
- INF-3 PERMEABLE PAVEMENT

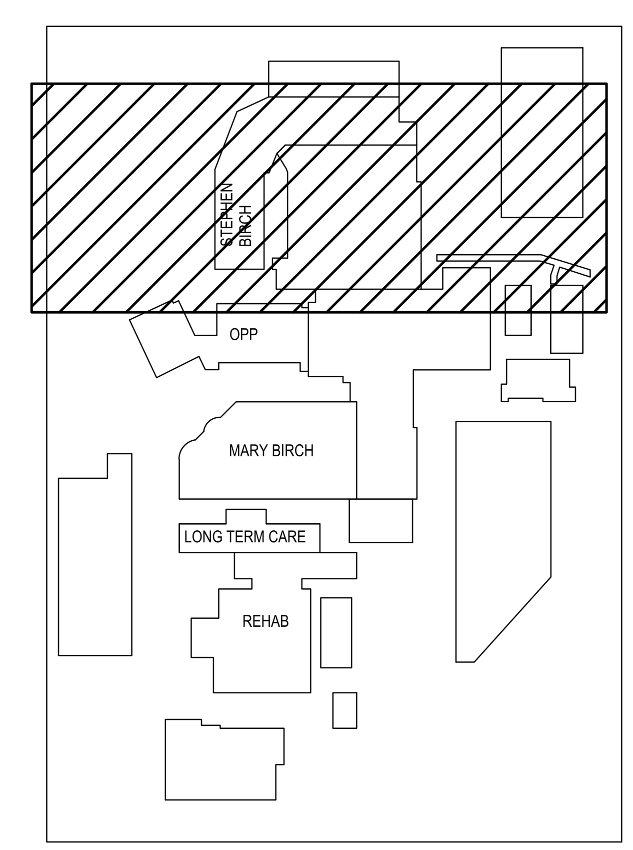
SOURCE CONTROL BMPS:

- 4.2.1 PREVENTION OF ILLICIT DISCHARGE INTO THE MS4
- 4.2.2 STORM DRAIN STENCILING OR SIGNAGE
- 4.2.6 ADDITIONAL BMPS
  - ONSITE STORM DRAIN INLETS
  - INTERIOR FLOOR DRAINS AND ELEVATOR SHAFT SUMP PUMPS
  - NEED FOR FUTURE INDOOR & STRUCTURAL PEST CONTROL
  - LANDSCAPE/OUTDOOR PESTICIDE USE
  - FIRE SPRINKLER TEST WATER
  - MISCELLANEOUS DRAIN OR WASH WATER
  - PLAZAS, SIDEWALKS, AND PARKING LOTS

SITE DESIGN BMPS:

- 4.3.3 MINIMIZE IMPERVIOUS AREA
- 4.3.4 MINIMIZE SOIL COMPACTION
- 4.3.6 RUNOFF COLLECTION
- 4.3.7 LANDSCAPING WITH NATIVE OR DROUGHT TOLERANT SPECIES

SCALE: 1"=20'



KEY PLAN

BWE
CIVIL • STRUCTURAL • SURVEY • PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123
619.299.5550

BENCHMARK:	
ISSUE DATE:	09/17/2021
DRAWN BY:	MDS
CHECKED BY:	MGC
B&W JOB NUMBER:	9545.10.00
CLIENT JOB NUMBER:	

PROJECT: SHARP MMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

SHEET TITLE: DMA EXHIBIT

SHEET 1 OF 1

PLOT: W:\PROJECTS\9500\9545\10.00 SHARP MMC\DWGS\EXHIBITS\SWQMP\PACKAGE 8 (CUP)\9545\10.00 PK 8-DMAS.DWG MH: GC 10/6/2022 4:01 PM

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

85th % Rainfall Depth= 0.58 inch

Tabular Summary of DMAs								Worksheet B-1	
DMA Unique Identifier	Area (acres)	Impervious Area (acres)	% Imp	HSG	Area Weighted Runoff Coefficient (C)	DCV (cubic feet)	Migated By (BMP ID)	Pollutant Control Type	Drains to (POC ID)
#8.1	0.26	0.26	100.0%	D	0.900	499	BMP #11	Compact Biofiltration, BF-3	4
#8.2	0.53	0.32	59.8%	D	0.579	645	BMP #13	Permeable Pavers, INF-3	4
#8.3	0.04	0.04	98.4%	D	0.887	68	BMP #5 per Package 4	Excess Area	3
#8.4	0.04	0.03	89.3%	D	0.814	61	Required Area	Bypass	3
#8.5	0.01	0.01	100.0%	D	0.900	9	De Minimis	De Minimis	3
Summary of DMA Information (Must match project description and SWQMP Narrative)									
No. of DMAs	Total DMA Area (acres)	Total Impervious Area (acres)	% Imp	HSG	Area Weighted Runoff Coefficient	Total DCV (cubic feet)	Total Area Treated (acres)		No. of POCs
5	0.870	0.653	75.1%	D	0.700	1282	0.871		2

Where: DMA = Drainage Management Area; Imp = Imperviousness; HSG = Hydrologic Soil Group; DCV= Design Capture Volume; BMP = Best Management Practice; POC = Point of Compliance; ID = identifier; No. = Number

Harvest and Use Feasibility Checklist	Worksheet B.3-1 : Form I-7	
1. Is there a demand for harvested water (check all that apply) at the project site that is reliably present during the wet season? ☑ Toilet and urinal flushing ☑ Landscape irrigation ☐ Other:___________		
2. If there is a demand; estimate the anticipated average wet season demand over a period of 36 hours. Guidance for planning level demand calculations for toilet/urinal flushing and landscape irrigation is provided in Section B.3.2. [Provide a summary of calculations here] See calculations attached.		
3. Calculate the DCV using worksheet B-2.1. DCV = 1471 (cubic feet) [Provide a summary of calculations here] Calculations for the entire site DCV is shown in the summary table. 1471 x 0.25 = 367.75 CF		
3a. Is the 36-hour demand greater than or equal to the DCV? ☐ Yes / ☐ No ⇨ ⇩	3b. Is the 36-hour demand greater than 0.25DCV but less than the full DCV? ☐ Yes / ☐ No ⇨ ⇩	3c. Is the 36-hour demand less than 0.25DCV? ☑ Yes ⇩
Harvest and use appears to be feasible. Conduct more detailed evaluation and sizing calculations to confirm that DCV can be used at an adequate rate to meet drawdown criteria.	Harvest and use may be feasible. Conduct more detailed evaluation and sizing calculations to determine feasibility. Harvest and use may only be able to be used for a portion of the site, or (optionally) the storage may need to be upsized to meet long term capture targets while draining in longer than 36 hours.	Harvest and use is considered to be infeasible.
Is harvest and use feasible based on further evaluation? ☐ Yes, refer to Appendix E to select and size harvest and use BMPs. ☑ No, select alternate BMPs.		

Modified Estimated Total Water Use Calculation

Modified ETWU = $(ET0_{wet})$ x [[∑(PF x HA)/IE] + SLA] x 0.015

where:

Modified ETWU	=	Estimated daily average water usage during wet season
ETo_{Wet}	=	Average reference evapotranspiration from November through April (use 2.7 inches per month, using CIMS Zone 4 from Table G.1-1)
PF	=	Plant Factor
HA	=	Hydrozone Area (sq-ft); A section or zone of the landscaped area having plants with similar water needs. Σ(PF x HA) = The sum of PF x HA for each individual Hydrozone (accounts for different landscaping zones).
IE	=	Irrigation Efficiency (assume 90 percent for demand calculations)
SLA	=	Special Landscape Area (sq-ft); Areas used for active and passive recreation areas, areas solely dedicated to the production of fruits and vegetables, and areas irrigated with reclaimed water.

Enter Irrigation Efficiency (IE)	0.90

Plant Water Use Type	Plant Factor
Low	0.1 - 0.2
Moderate	0.3 - 0.7
High	0.80
SLA	1.00

Hydrozone	Plant Water Use Type (s) (low, medium, high)	Plant Factor (PF)	Hydrozone Area (HA) (ft^2)	PF x HA (ft^2)
1	Low	0.10	10,384	1,038
2	Moderate	0.30	0	0
3	High	0.80	0	0
				1,038
	SLA	1	0	0
		Sum		**1,038**

Results

Modified ETWU=	47	**gal**
	6	**cf**
36 hr Demand=	**9**	**cf**

Toilet & Urinal Water Usage Calculation

Land Use Type: Medical Building

Total Toilets = 8

Total Urinals = 2

Item	Flushes/Day (gallons/day)	Daily Water Use (gal)
Toilet Flushing	18.5	148
Urinals	16	32
	Total Daily Volume	180

	36 Hours Damand	**540**	**gal**
		72	**cf**

Total 36 hr Demand =	**82**	**cf**

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[2]
Part 2 – Partial vs. No Infiltration Feasibility Screening Criteria		
DMA(s) Being Analyzed:		Project Phase:
#8.1 through #8.5		Preliminary
Criteria 3 : Infiltration Rate Screening		
3A	**NRCS Type C, D, or "urban/unclassified":** Is the mapped hydrologic soil group according to the NRCS Web Soil Survey or UC Davis Soil Web Mapper is Type C, D, or "urban/unclassified" and corroborated by available site soil data? ○ Yes; the site is mapped as C soils and a reliable infiltration rate of 0.15 in/hr. is used to size partial infiltration BMPS. Answer "Yes" to Criteria 3 Result. ◉ Yes; the site is mapped as D soils or "urban/unclassified" and a reliable infiltration rate of 0.05 in/hr. is used to size partial infiltration BMPS. Answer "Yes" to Criteria 3 Result. ○ No; infiltration testing is conducted (refer to Table D.3-1), continue to Step 3B.	
3B	**Infiltration Testing Result:** Is the reliable infiltration rate (i.e. average measured infiltration rate/2) greater than 0.05 in/hr. and less than or equal to 0.5 in/hr? ○ Yes; the site may support partial infiltration. Answer "Yes" to Criteria 3 Result. ○ No; the reliable infiltration rate (i.e. average measured rate/2) is less than 0.05 in/hr., partial infiltration is not required. Answer "No" to Criteria 3 Result.	
Criteria 3 Result	Is the estimated reliable infiltration rate (i.e., average measured infiltration rate/2) greater than or equal to 0.05 inches/hour and less than or equal to 0.5 inches/hour at any location within each DMA where runoff can reasonably be routed to a BMP? ○ Yes; Continue to Criteria 4. ○ No: Skip to Part 2 Result.	
Summarize infiltration testing and/or mapping results (i.e. soil maps and series description used for infiltration rate). NRCS Web Soil Survey Map shows soils are HSG D, and has been used to size partial infiltration BMPs.		

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[2]	
Criteria 4: Geologic/Geotechnical Screening			
4A	If all questions in Step 4A are answered "Yes," continue to Step 2B. For any "No" answer in Step 4A answer "No" to Criteria 4 Result, and submit an "Infiltration Feasibility Condition Letter" that meets the requirements in Appendix C.1.1. The geologic/geotechnical analyses listed in Appendix C.2.1 do not apply to the DMA because one of the following setbacks cannot be avoided and therefore result in the DMA being in a no infiltration condition. The setbacks must be the closest horizontal radial distance from the surface edge (at the overflow elevation) of the BMP.		
4A-1	Can the proposed partial infiltration BMP(s) avoid areas with existing fill materials greater than 5 feet thick?	○ Yes	○ No
4A-2	Can the proposed partial infiltration BMP(s) avoid placement within 10 feet of existing underground utilities, structures, or retaining walls?	○ Yes	○ No
4A-3	Can the proposed partial infiltration BMP(s) avoid placement within 50 feet of a natural slope (>25%) or within a distance of 1.5H from fill slopes where H is the height of the fill slope?	○ Yes	○ No
4B	When full infiltration is determined to be feasible, a geotechnical investigation report must be prepared that considers the relevant factors identified in Appendix C.2.1. If all questions in Step 4B are answered "Yes," then answer "Yes" to Criteria 4 Result. If there are any "No" answers continue to Step 4C.		
4B-1	**Hydroconsolidation.** Analyze hydroconsolidation potential per approved ASTM standard due to a proposed full infiltration BMP. Can partial infiltration BMPs be proposed within the DMA without increasing hydroconsolidation risks?	○ Yes	○ No
4B-2	**Expansive Soils.** Identify expansive soils (soils with an expansion index greater than 20) and the extent of such soils due to proposed full infiltration BMPs. Can partial infiltration BMPs be proposed within the DMA without increasing expansive soil risks?	○ Yes	○ No
4B-3	**Liquefaction**. If applicable, identify mapped liquefaction areas. Evaluate liquefaction hazards in accordance with Section 6.4.2 of the City of San Diego's Guidelines for Geotechnical Reports (2011). Liquefaction hazard assessment shall take into account any increase in groundwater elevation or groundwater mounding that could occur as a result of proposed infiltration or percolation facilities. Can partial infiltration BMPs be proposed within the DMA without increasing liquefaction risks?	○ Yes	○ No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[2]	
4B-4	**Slope Stability**. If applicable, perform a slope stability analysis in accordance with the ASCE and Southern California Earthquake Center (2002) Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Landslide Hazards in California to determine minimum slope setbacks for full infiltration BMPs. See the City of San Diego's Guidelines for Geotechnical Reports (2011) to determine which type of slope stability analysis is required. Can partial infiltration BMPs be proposed within the DMA without increasing slope stability risks?	○ Yes	○ No
4B-5	**Other Geotechnical Hazards.** Identify site-specific geotechnical hazards not already mentioned (refer to Appendix C.2.1). Can partial infiltration BMPs be proposed within the DMA without increasing risk of geologic or geotechnical hazards not already mentioned?	○ Yes	○ No
4B-6	**Setbacks.** Establish setbacks from underground utilities, structures, and/or retaining walls. Reference applicable ASTM or other recognized standard in the geotechnical report. Can partial infiltration BMPs be proposed within the DMA using recommended setbacks from underground utilities, structures, and/or retaining walls?	○ Yes	○ No
4C	**Mitigation Measures.** Propose mitigation measures for each geologic/geotechnical hazard identified in Step 4B. Provide a discussion on geologic/geotechnical hazards that would prevent partial infiltration BMPs that cannot be reasonably mitigated in the geotechnical report. See Appendix C.2.1.8 for a list of typically reasonable and typically unreasonable mitigation measures. Can mitigation measures be proposed to allow for partial infiltration BMPs? If the question in Step 4C is answered "Yes," then answer "Yes" to Criteria 4 Result. If the question in Step 4C is answered "No," then answer "No" to Criteria 4 Result.	○ Yes	○ No
Criteria 4 Result	Can infiltration of greater than or equal to 0.05 inches/hour and less than or equal to 0.5 inches/hour be allowed without increasing the risk of geologic or geotechnical hazards that cannot be reasonably mitigated to an acceptable level?	○ Yes	○ No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[2]
Summarize findings and basis; provide references to related reports or exhibits.		
Part 2 – Partial Infiltration Geotechnical Screening Result[5]		**Result**
If answers to both Criteria 3 and Criteria 4 are "Yes", a partial infiltration design is potentially feasible based on geotechnical conditions only. If answers to either Criteria 3 or Criteria 4 is "No", then infiltration of any volume is considered to be infeasible within the site.		◯ Partial Infiltration Condition ◯ No Infiltration Condition

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

Project: Sharp MMC Pk 8
DMA 8.1 (BMP #11)

Area Weighted Runoff Factor (C)

Surface Type	Area - A (sf)	C - Factor	C X A	Weighted C-Factor
Impervious	11,473	0.90	10,326	
Landscape	0	0.10	0	
Permeable Pavement	0	0.30	0	
Total	**11,473**		**10,326**	**0.900**

0.26 Acres

Project: Sharp MMC Pk 8
DMA 8.1 (BMP #11)

	Design Capture Volume	Worksheet B.2-1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.58	inches
2	Area tributary to BMP (s)	A=	0.26	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.900	unitless
4	Trees Credit Volume Note: In the SWQMP list the number of trees, size of each tree, amount of soil volume installed for each tree, contributing area to each tree and the inlet opening dimension for each tree.	TCV=	0	cubic-feet
5	Rain barrels Credit Volume Note: In the SWQMP list the number of rain barrels, size of each rain barrel and the use of the captured storm water runoff.	RCV=	0	cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	**DCV=**	**499**	cubic-feet

MWS Flow Based BMP Sizing

I_{TREAT} = 0.2 in/hr (Intensity of rainfall)

Q_{TREAT} = $C \times I_{TREAT} \times A$ cfs (Treatment flow rate)

Design Flow (cfs) = 1.5* Q_{Treat} (Per Section F.2.2 of Storm Water Standards)

BMP #	DMA		Runoff Coefficient (C)	Q_{TREAT} =	Design Flow (cfs)	BMP Sizing	
	ID #	Area (ac)				MWS Model	Selected BMP's Flow Rate (cfs)
11	8.1	0.26	0.90	0.05	0.071	MWS-L-4-8	0.115

Note: All selected modular wetlands treatment flow rates exceed the DMAs' design flow

MODEL #	DIMENSIONS	WETLANDMEDIA SURFACE AREA (sq. ft.)	TREATMENT FLOW RATE (cfs)
MWS-L-4-4	4' x 4'	23	0.052
MWS-L-4-6	4' x 6'	32	0.073
MWS-L-4-8	4' x 8'	50	0.115
MWS-L-4-13	4' x 13'	63	0.144
MWS-L-4-15	4' x 15'	76	0.175
MWS-L-4-17	4' x 17'	90	0.206
MWS-L-4-19	4' x 19'	103	0.237
MWS-L-4-21	4' x 21'	117	0.268
MWS-L-6-8	7' x 9'	64	0.147
MWS-L-8-8	8' x 8'	100	0.230
MWS-L-8-12	8' x 12'	151	0.346
MWS-L-8-16	8' x 16'	201	0.462
MWS-L-8-20	9' x 21'	252	0.577
MWS-L-8-24	9' x 25'	302	0.693
MWS-L-10-20	10' x 20'	302	0.693

Compact (high rate) Biofiltration BMP Checklist	Form I-10

Compact (high rate) biofiltration BMPs have a media filtration rate greater than 5 in/hr. and a media surface area smaller than 3% of contributing area times adjusted runoff factor. Compact biofiltration BMPs are typically proprietary BMPs that may qualify as biofiltration.

A compact biofiltration BMP may satisfy the pollutant control requirements for a DMA onsite in some cases. This depends on the characteristics of the DMA **and** the performance certification/data of the BMP. If the pollutant control requirements for a DMA are met onsite, then the DMA is not required to participate in an offsite storm water alternative compliance program to meet its pollutant control obligations.

An applicant using a compact biofiltration BMP to meet the pollutant control requirements onsite must complete Section 1 of this form and include it in the PDP SWQMP. A separate form must be completed for each DMA. In instances where the City Engineer does not agree with the applicant's determination, Section 2 of this form will be completed by the City and returned to the applicant.

Section 1: Biofiltration Criteria Checklist (Appendix F)

Refer to Part 1 of the Storm Water Standards to complete this section. When separate forms/worksheets are referenced below, the applicant must also complete these separate forms/worksheets (as applicable) and include in the PDP SWQMP. The criteria numbers below correspond to the criteria numbers in Appendix F.

Criteria	Answer	Progression
Criteria 1 and 3: What is the infiltration condition of the DMA? Refer to Section 5.4.2 and Appendix C of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance. Applicant must complete and include the following in the PDP SWQMP submittal to support the feasibility determination: • Infiltration Feasibility Condition Letter; or • Worksheet C.4-1: Form I-8A and Worksheet C.4-2: Form I-8B. Applicant must complete and include all applicable sizing worksheets in the SWQMP submittal	○ Full Infiltration Condition	**Stop**. Compact biofiltration BMP is not allowed.
	○ Partial Infiltration Condition	Compact biofiltration BMP is only allowed, if the target volume retention is met onsite (Refer to Table B.5-1 in Appendix B.5). Use Worksheet B.5-2 in Appendix B.5 to estimate the target volume retention (Note: retention in this context means reduction). If the required volume reduction is achieved **proceed to Criteria 2**. If the required volume reduction is not achieved, compact biofiltration BMP is not allowed. **Stop**.
	◉ No Infiltration Condition	Compact biofiltration BMP is allowed if volume retention criteria in Table B.5-1 in Appendix B.5 for the no infiltration condition is met. Compliance with this criterion must be documented in the PDP SWQMP. If the criteria in Table B.5-1 is met **proceed to Criteria 2**. If the criteria in Table B.5-1 is not met, compact biofiltration BMP is not allowed. **Stop**.

Compact (high rate) Biofiltration BMP Checklist	Form I-10

Provide basis for Criteria 1 and 3:

Feasibility Analysis:

Summarize findings and include either infiltration feasibility condition letter or Worksheet C.4-1: Form I-8A and Worksheet C.4-2: Form I-8B in the PDP SWQMP submittal.

If Partial Infiltration Condition:

Provide documentation that target volume retention is met (include Worksheet B.5-2 in the PDP SWQMP submittal). Worksheet B.5-7 in Appendix B.5 can be used to estimate volume retention benefits from landscape areas.

If No Infiltration Condition:

Provide documentation that the volume retention performance standard is met (include Worksheet B.5-2 in the PDP SWQMP submittal) in the PDP SWQMP submittal. Worksheet B.5-6 in Appendix B.5 can be used to document that the performance standard is met.

Volume retention requirements have been met through landscape areas with amended soil and storage below the underground storage vault outlet (BMP #8). Worksheets have been provided in this Attachment.

Criteria	Answer	Progression
Criteria 2: Is the compact biofiltration BMP sized to meet the performance standard from the MS4 Permit? Refer to Appendix B.5 and Appendix F.2 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	◉ Meets Flow based Criteria	Use guidance from **Appendix F.2.2** to size the compact biofiltration BMP to meet the flow based criteria. Include the calculations in the PDP SWQMP. Use parameters for sizing consistent with manufacturer guidelines and conditions of its third party certifications (i.e. a BMP certified at a loading rate of 1 gpm/sq. ft. cannot be designed using a loading rate of 1.5 gpm/sq. ft.) **Proceed to Criteria 4.**
	○ Meets Volume based Criteria	Provide documentation that the compact biofiltration BMP has a total static (i.e. non-routed) storage volume, including pore-spaces and pre-filter detention volume (Refer to Appendix B.5 for a schematic) of at least 0.75 times the portion of the DCV not reliably retained onsite. **Proceed to Criteria 4.**
	○ Does not Meet either criteria	**Stop**. Compact biofiltration BMP is not allowed.

Compact (high rate) Biofiltration BMP Checklist	Form I-10

Provide basis for Criteria 2:

Provide documentation that the BMP meets the numeric criteria and is designed consistent with the manufacturer guidelines and conditions of its third-party certification (i.e., loading rate, etc., as applicable).

MWS Linear BMPs are designed by utilizing the treatment flow sizing table given in the manufacturer's guidelines. These proprietary BMPs are designed as flow based BMPs according to the section F.2.2 of the storm water standards as follows;

• The treatment runoff rate is determined by using 0.2 in/hr uniform intensity precipitation event.
• The calculated flow rate is multiplied by 1.5 to compute the design flow rate for the BMP.
• Appropriate size is selected from the sizing table to treat the design flow rate.

Criteria	Answer	Progression
Criteria 4: Does the compact biofiltration BMP meet the pollutant treatment performance standard for the projects most significant pollutants of concern? Refer to Appendix B.6 and Appendix F.1 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	◉ Yes, meets the TAPE certification.	Provide documentation that the compact BMP has an appropriate TAPE certification for the projects most significant pollutants of concern. **Proceed to Criteria 5.**
	○ Yes, through other third-party documentation	Acceptance of third-party documentation is at the discretion of the City Engineer. The City engineer will consider, (a) the data submitted; (b) representativeness of the data submitted; and (c) consistency of the BMP performance claims with pollutant control objectives in Table F.1-2 and Table F.1-1 while making this determination. If a compact biofiltration BMP is not accepted, a written explanation/ reason will be provided in Section 2. **Proceed to Criteria 5.**
	○ No	**Stop**. Compact biofiltration BMP is not allowed.

Provide basis for Criteria 4:

Provide documentation that identifies the projects most significant pollutants of concern and TAPE certification or other third party documentation that shows that the compact biofiltration BMP meets the pollutant treatment performance standard for the projects most significant pollutants of concern.

Refer to the attached performance summary and TAPE certification for details.

Compact (high rate) Biofiltration BMP Checklist		Form I-10
Criteria	**Answer**	**Progression**
<u>Criteria 5</u>: Is the compact biofiltration BMP designed to promote appropriate biological activity to support and maintain treatment process? Refer to Appendix F of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	◉ Yes	Provide documentation that the compact biofiltration BMP support appropriate biological activity. Refer to Appendix F for guidance. **Proceed to Criteria 6.**
	○ No	**Stop**. Compact biofiltration BMP is not allowed.

Provide basis for Criteria 5:

Provide documentation that appropriate biological activity is supported by the compact biofiltration BMP to maintain treatment process.

See attached TAPE certification for details.

Criteria	**Answer**	**Progression**
<u>Criteria 6</u>: Is the compact biofiltration BMP designed with a hydraulic loading rate to prevent erosion, scour and channeling within the BMP?	◉ Yes	Provide documentation that the compact biofiltration BMP is used in a manner consistent with manufacturer guidelines and conditions of its third-party certification. **Proceed to Criteria 7.**
	○ No	**Stop**. Compact biofiltration BMP is not allowed.

Provide basis for Criteria 6:

Provide documentation that the BMP meets the numeric criteria and is designed consistent with the manufacturer guidelines and conditions of its third-party certification (i.e., maximum tributary area, maximum inflow velocities, etc., as applicable).

Refer to loading Rates in TAPE certification. Rates are given based on a per gallon flow rate. It is a self-contained bio filter that has a controlled discharge thus there is no scouring and channeling within the BMP. Refer to basis for criteria 2 for design guidelines.

Compact (high rate) Biofiltration BMP Checklist		Form I-10
Criteria	**Answer**	**Progression**
Criteria 7: Is the compact biofiltration BMP maintenance plan consistent with manufacturer guidelines and conditions of its third-party certification (i.e., maintenance activities, frequencies)?	◉ Yes, and the compact BMP is privately owned, operated and not in the public right of way.	Submit a maintenance agreement that will also include a statement that the BMP will be maintained in accordance with manufacturer guidelines and conditions of third-party certification. **Stop**. The compact biofiltration BMP meets the required criteria.
	○ Yes, and the BMP is either owned or operated by the City or in the public right of way.	Approval is at the discretion of the City Engineer. The city engineer will consider maintenance requirements, cost of maintenance activities, relevant previous local experience with operation and maintenance of the BMP type, ability to continue to operate the system in event that the vending company is no longer operating as a business or other relevant factors while making the determination. **Stop**. Consult the City Engineer for a determination.
	○ No	**Stop**. Compact biofiltration BMP is not allowed.

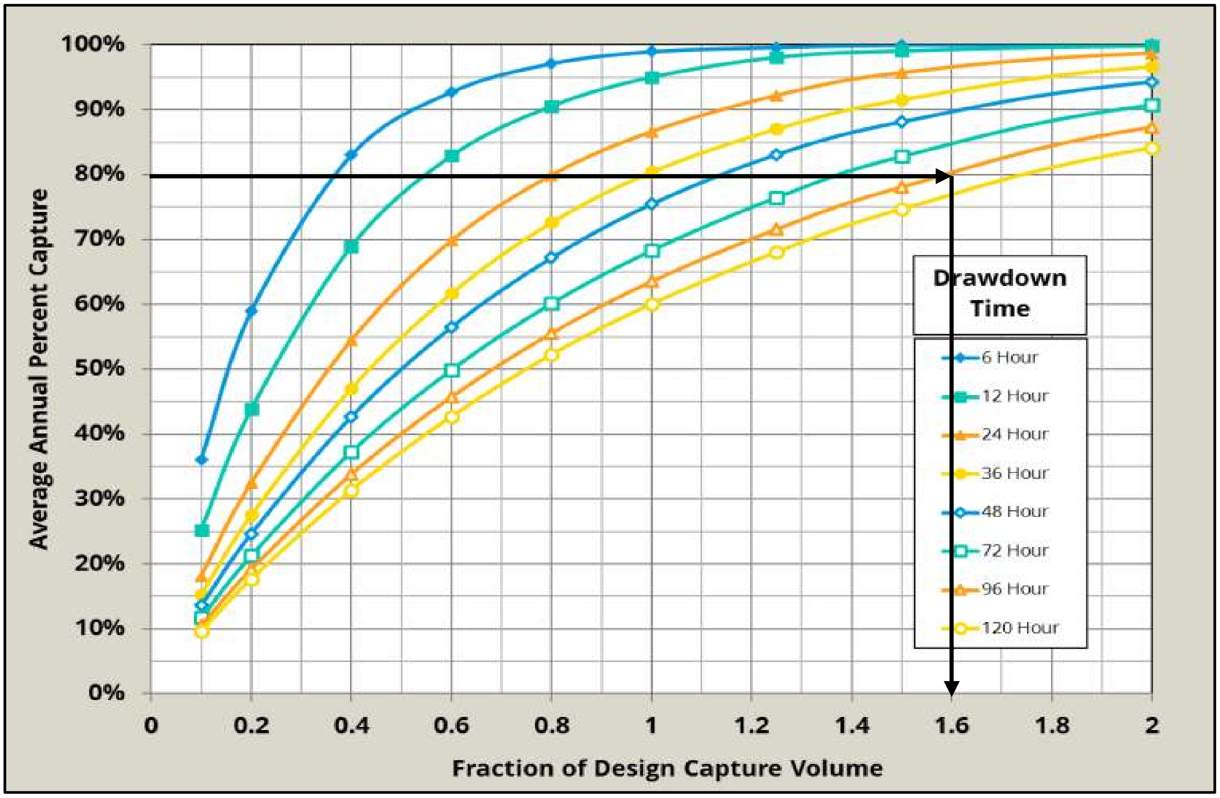
Provide basis for Criteria 7:

Include copy of manufacturer guidelines and conditions of third-party certification in the maintenance agreement. PDP SWQMP must include a statement that the compact BMP will be maintained in accordance with manufacturer guidelines and conditions of third-party certification.

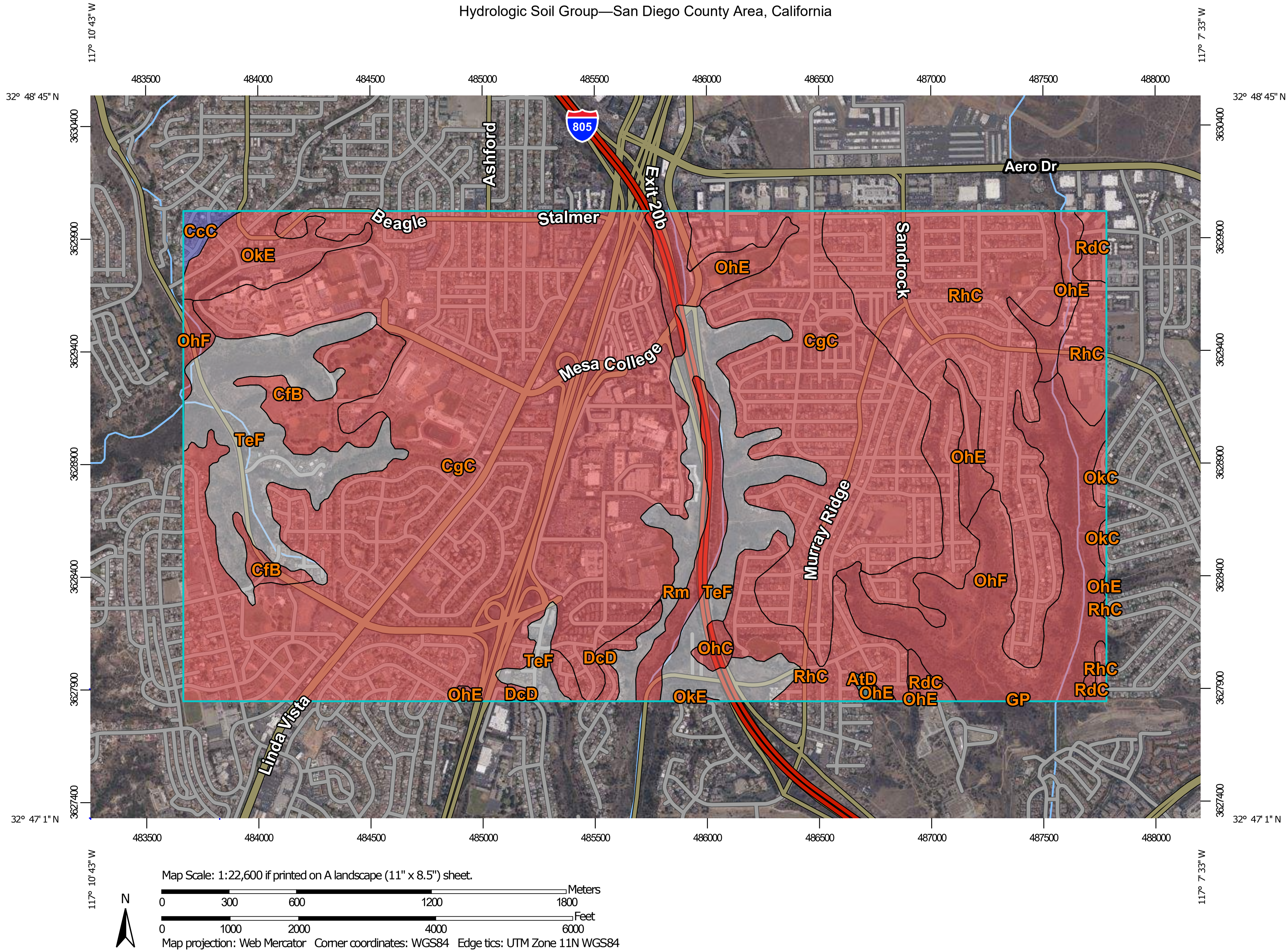
Manufacturer guidelines are included in Attachment 3.

Compact (high rate) Biofiltration BMP Checklist	Form I-10
Section 2: Verification (For City Use Only)	
Is the proposed compact BMP accepted by the City Engineer for onsite pollutant control compliance for the DMA?	○ Yes ○ No, See explanation below
Explanation/reason if the compact BMP is not accepted by the City for onsite pollutant control compliance:	

Project: Sharp MMC Pk 8
DMA 1 (BMP #13)



Volume Required for Infiltration BMP		
DCV	759	cubic-feet
Estimated Drawdown	96	hour
Fraction DCV required	1.6	
Required BMP volume	1213.72	cubic-feet
Infiltration Rate	0.05	inches/hour
Depth Possible to Drawdown (including voids)	1.00	feet
Surface Area	3250	square-feet
Gravel Depth (including voids)	0.93	feet



Map Scale: 1:22,600 if printed on A landscape (11" x 8.5") sheet.

Meters: 0, 300, 600, 1200, 1800

Feet: 0, 1000, 2000, 4000, 6000

N

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 Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

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.

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 Diego County Area, California
Survey Area Data: Version 15, May 27, 2020

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

Date(s) aerial images were photographed: Aug 22, 2018—Aug 31, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AtD	Altamont clay, 9 to 15 percent slopes, warm MAAT, MLRA 20	C	1.5	0.1%
CcC	Carlsbad-Urban land complex, 2 to 9 percent slopes	B	7.4	0.3%
CfB	Chesterton fine sandy loam, 2 to 5 percent slopes	D	53.4	2.4%
CgC	Chesterton-Urban land complex, 2 to 9 percent slopes	D	1,168.5	52.6%
DcD	Diablo-Urban land complex, 5 to 15 percent slopes	D	14.5	0.7%
GP	Gravel pits		0.2	0.0%
OhC	Olivenhain cobbly loam, 2 to 9 percent slopes	D	6.3	0.3%
OhE	Olivenhain cobbly loam, 9 to 30 percent slopes	D	72.8	3.3%
OhF	Olivenhain cobbly loam, 30 to 50 percent slopes	D	171.5	7.7%
OkC	Olivenhain-Urban land complex, 2 to 9 percent slopes	D	5.0	0.2%
OkE	Olivenhain-Urban land complex, 9 to 30 percent slopes	D	44.5	2.0%
RdC	Redding gravelly loam, 2 to 9 percent slopes	D	17.5	0.8%
RhC	Redding-Urban land complex, 2 to 9 percent slopes	D	358.7	16.1%
Rm	Riverwash	D	31.7	1.4%
TeF	Terrace escarpments		268.3	12.1%
Totals for Area of Interest			**2,221.9**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

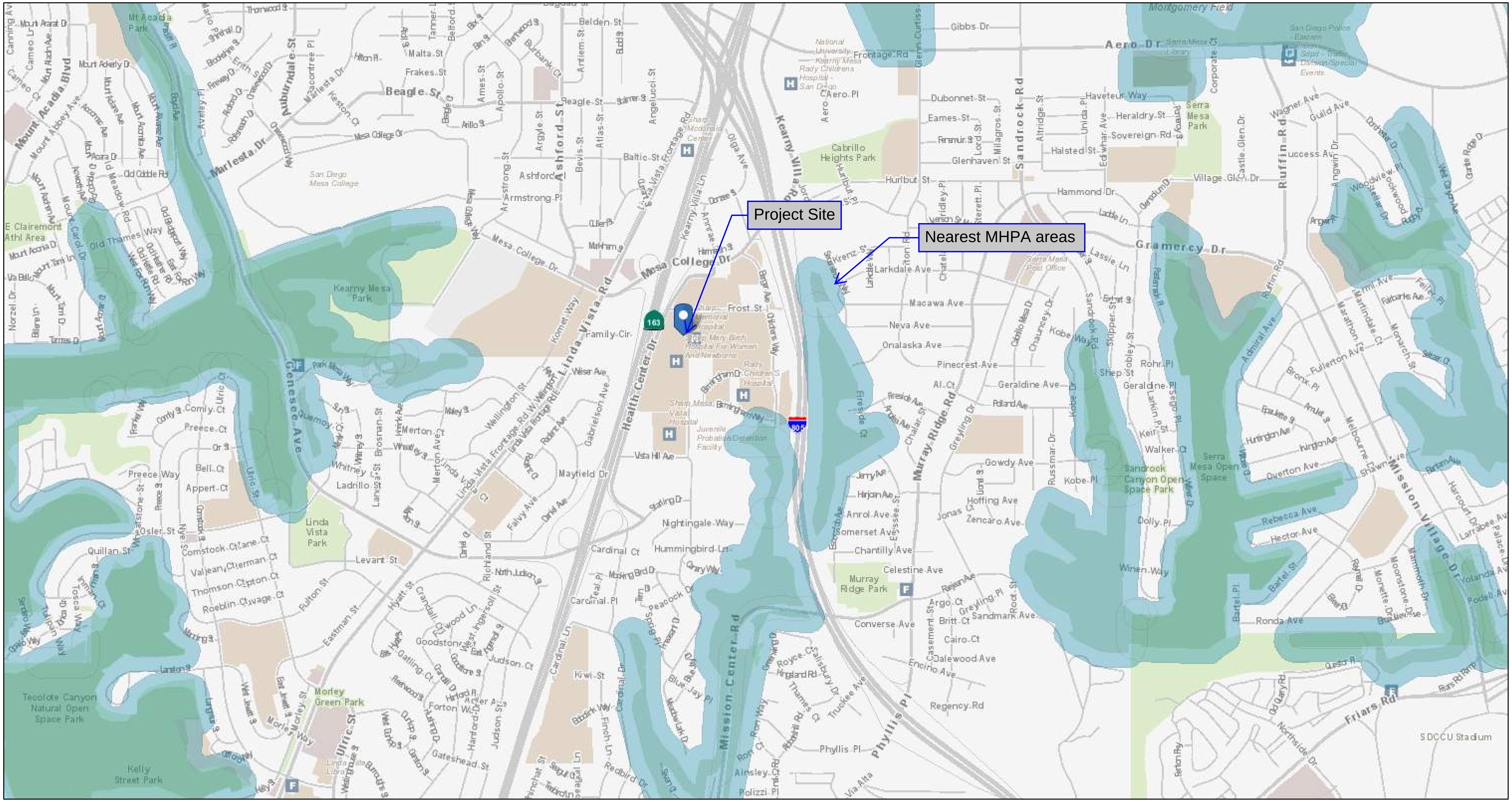
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Parcel Lookup Tool Map



July 2, 2021

- Regional Board ASBS Area
- Regional Board 303d polygons
- Regional Board 303d lines
- EPA Basin Plan Listed RARE
- SANGIS MHPA Areas
- MHPA

1:18,056

0 0.225 0.45 0.9 mi

0 0.35 0.7 1.4 km

SanGIS

Data Sources: SANDAG and SanGIS
SanGIS Legal Notice: http://www.sangis.org/Legal_Notice.htm

Attachment 2
Backup for PDP Hydromodification Control Measures

This is the cover sheet for Attachment 2.

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

Project Name: Sharp MMC - Package 8 (PK 8)

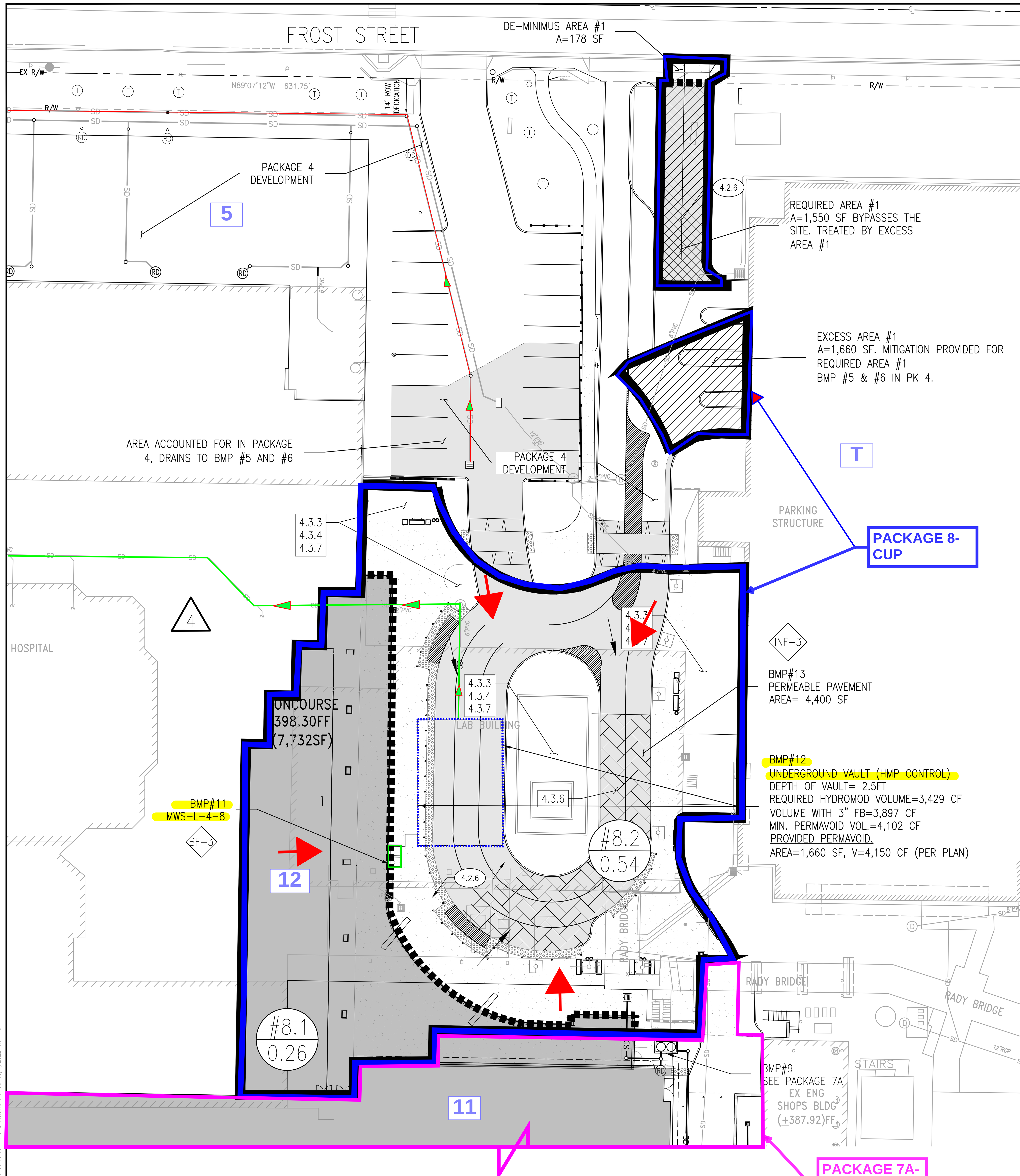
Indicate which Items are Included:

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

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

The Hydromodification Management Exhibit must identify:

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



PACKAGE 8 DMA AREA DETAILS

DMA ID	TOTAL AREA (AC)	TOTAL AREA (SF)	PERVIOUS AREA (SF)	IMPERVIOUS AREA (SF)	IMPERVIOUS RATIO (%)	NOTES
8.1	0.26	11473	0	11473	100	POLLUTANT CONTROL MITIGATED BY BMP#11. HMP CONTROL MITIGATED BY BMP#12
8.2	0.53	23057	7633	16061	68	POLLUTANT CONTROL BY PERMEABLE PAVERS AND HMP CONTROL MITIGATED BY BMP#12

LEGEND	SYMBOL
OUTER DMA BOUNDARY	
MAJOR DMA BOUNDARY	
MINOR DMA BOUNDARY	
EXISTING STORM DRAIN	SD
NEW STORM DRAIN	SD
FLOW DIRECTION	
POINT OF COMPLIANCE (POC)	
DRAINAGE MANAGEMENT AREA MARKER & AREA (AC)	#8.X X.XX
CONCRETE PAVEMENT	
ASPHALT PAVEMENT	
PERMEABLE PAVERS	
EXCESS MITIGATED AREA TO OFFSET REQUIRED AREA FOR FUTURE DRIVEWAY	
REQUIRED AREA FOR FUTURE DRIVEWAY (NOT INCLUDED IN PACKAGE 4)	
PERVIOUS AREA	LANDSCAPE/DIRT AREA
DMA-PACKAGE 3A	
DMA-PACKAGE 7A	
DMA-PACKAGE 8	
BUILDING NO.	XX
SD FLOW DIRECTION	OR
UG-VAULT	
STORM DRAIN	

SWQMP NOTES

1. THE SITE IS COMPRISED OF HYDROLOGIC SOIL TYPE D.
2. NO CRITICAL COARSE SEDIMENT YIELD AREAS ARE PRESENT ON SITE.
3. THERE ARE NO NATURAL HYDROLOGIC FEATURES PRESENT ON SITE.
4. DEPTH TO GROUNDWATER IS GREATER THAN 20 FT.

STRUCTURAL BMPS:

- BF-3 COMPACT BIOFILTRATION BMP
- INF-3 PERMEABLE PAVEMENT

SOURCE CONTROL BMPS:

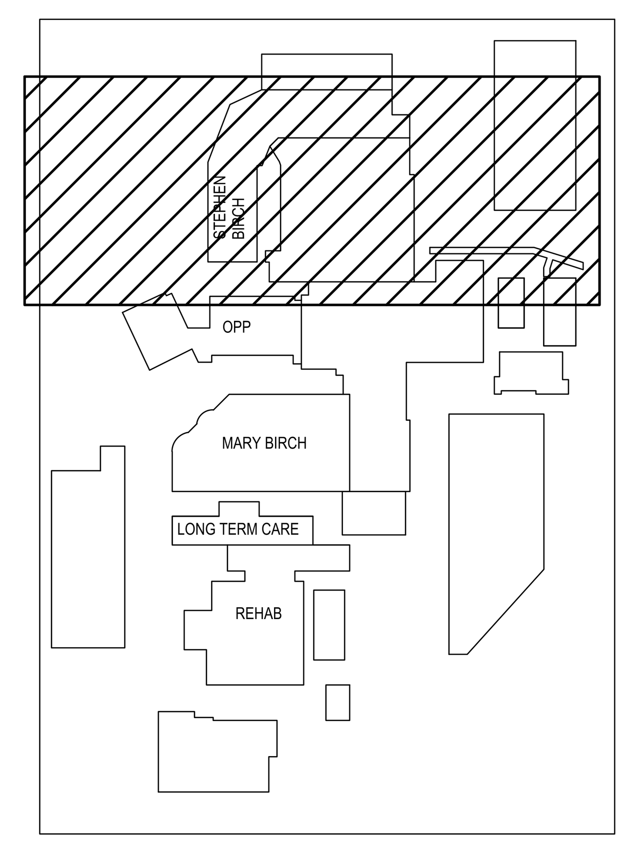
- 4.2.1 PREVENTION OF ILLICIT DISCHARGE INTO THE MS4
- 4.2.2 STORM DRAIN STENCILING OR SIGNAGE
- 4.2.6 ADDITIONAL BMPS
  - ONSITE STORM DRAIN INLETS
  - INTERIOR FLOOR DRAINS AND ELEVATOR SHAFT SUMP PUMPS
  - NEED FOR FUTURE INDOOR & STRUCTURAL PEST CONTROL
  - LANDSCAPE/OUTDOOR PESTICIDE USE
  - FIRE SPRINKLER TEST WATER
  - MISCELLANEOUS DRAIN OR WASH WATER
  - PLAZAS, SIDEWALKS, AND PARKING LOTS

SITE DESIGN BMPS:

- 4.3.3 MINIMIZE IMPERVIOUS AREA
- 4.3.4 MINIMIZE SOIL COMPACTION
- 4.3.6 RUNOFF COLLECTION
- 4.3.7 LANDSCAPING WITH NATIVE OR DROUGHT TOLERANT SPECIES

20 10 0 20 40 60

SCALE: 1"=20'



KEY PLAN

BWE
CIVIL•STRUCTURAL•SURVEY•PLANNING
9449 BALBOA AVE, STE 270
SAN DIEGO, CA 92123
619.299.5550

SYM	DESCRIPTION	DATE	APPR

BENCHMARK:

ISSUE DATE:	09/17/2021
DRAWN BY:	MDS
CHECKED BY:	MGC
B&W JOB NUMBER:	9545.10.00
CLIENT JOB NUMBER:	

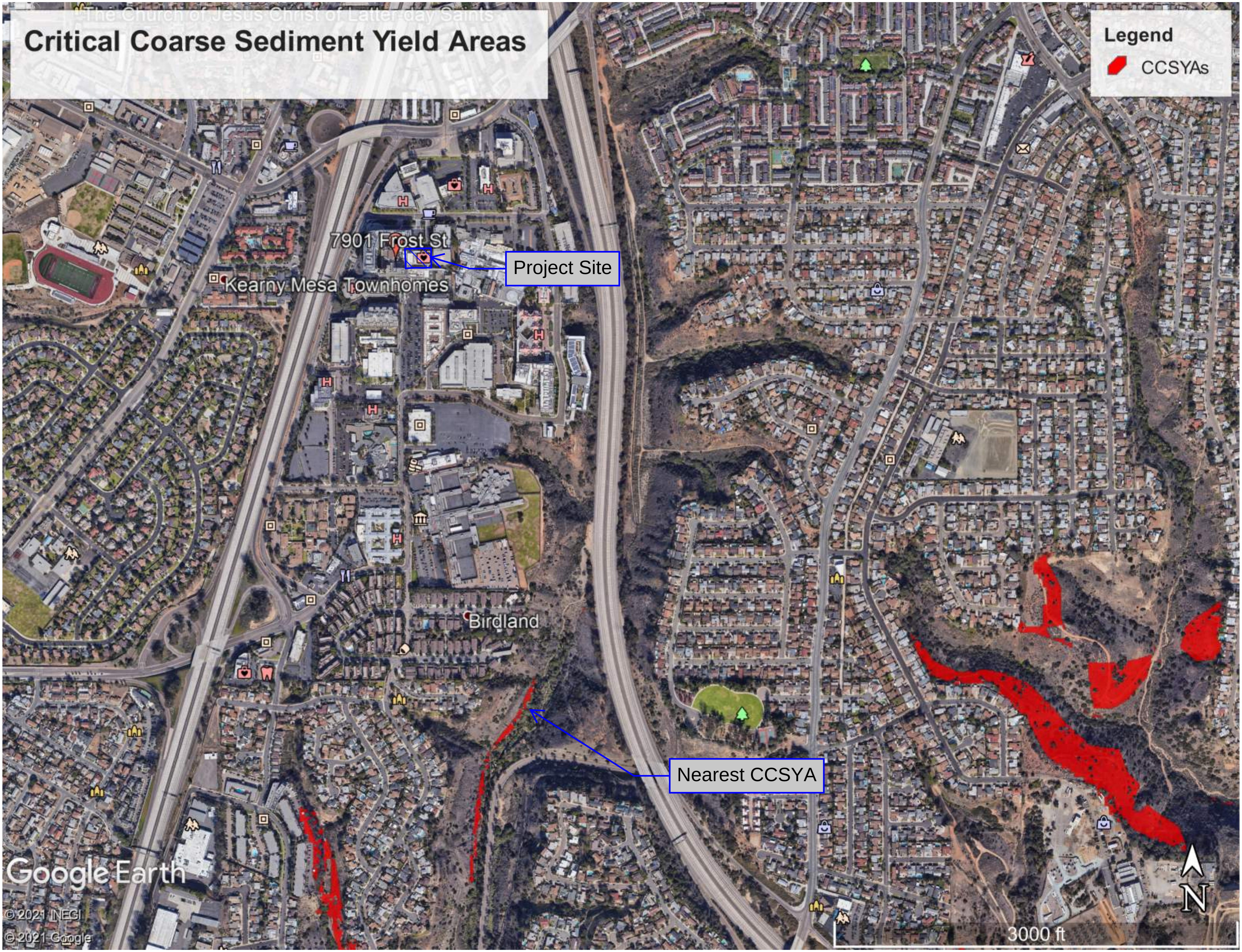
PROJECT
SHARP MMC CAMPUS REDEVELOPMENT
7901 FROST STREET
SAN DIEGO, CA 92123

SHEET TITLE
DMA EXHIBIT

SHEET 1 OF 1

PLOT: W:\PROJECTS\9500\9545\10.00 SHARP MMC\DWGS\EXHIBITS\SWQMP\PACKAGE 8 (CUP)\9545\10.00 PK 8-DMAS.DWG MAV GC 10/6/2022 4:01 PM

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING


Critical Coarse Sediment Yield Areas
Legend
CCSYAs
Project Site
7901 Frost St
Kearny Mesa Townhomes
Birdland
Nearest CCSYA
N
3000 ft
Google Earth
© 2021 INEGI
© 2021 Google

BMP Sizing Spreadsheet V3.1

Project Name:	Sharp MMC - Package 8
Project Applicant:	BWE Inc
Jurisdiction:	City of San Diego
Parcel (APN):	
Hydrologic Unit:	San Diego
Rain Gauge:	Oceanside
Total Project Area (sf):	35,167
Channel Susceptibility:	High

BMP Sizing Spreadsheet V3.1			
Project Name:	Sharp MMC - Package 8	Hydrologic Unit:	San Diego
Project Applicant:	BWE Inc	Rain Gauge:	Oceanside
Jurisdiction:	City of San Diego	Total Project Area:	35,167
Parcel (APN):	0	Low Flow Threshold:	0.1Q2
BMP Name:	BMP 12	BMP Type:	Cistern
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	NA

Areas Draining to BMP						HMP Sizing Factors	Minimum BMP Size
DMA Name	Area (sf)	Pre Project Soil Type	Pre-Project Slope	Post Project Surface Type	Area Weighted Runoff Factor (Table G.2-1)[1]	Volume	Volume (CF)
8.1	11,473	D	Flat	Roofs	1.0	0.12	1377
8.2	2,741	D	Flat	d Unit Pavers on granular l	0.2	0.12	66
	4,892	D	Flat	Landscape	0.1	0.12	59
	16,061	D	Flat	Concrete	1.0	0.12	1927
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
BMP Tributary Area	35,167					Minimum BMP Size	3429
						Proposed BMP Size*	3895

* Assumes standard configuration

Standard Cistern Depth (Overflow Elevation)	3.5	ft
Provided Cistern Depth (Overflow Elevation)	2.2	ft
Minimum Required Cistern Footprint)	1558	CF

Notes:

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

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

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

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

BMP Sizing Spreadsheet V3.1			
Project Name:	Sharp MMC - Package 8	Hydrologic Unit:	San Diego
Project Applicant:	BWE Inc	Rain Gauge:	Oceanside
Jurisdiction:	City of San Diego	Total Project Area:	35,167
Parcel (APN):	0	Low Flow Threshold:	0.1Q2
BMP Name	BMP 12	BMP Type:	Cistern

DMA Name	Rain Gauge	Pre-developed Condition		Unit Runoff Ratio	DMA Area (ac)	Orifice Flow - $\%Q_2$	Orifice Area
		Soil Type	Slope	(cfs/ac)		(cfs)	(in^2)
8.1	Oceanside	D	Flat	0.571	0.263	0.015	**0.28**
8.2	Oceanside	D	Flat	0.571	0.063	0.004	**0.07**

2.20	**0.019**	**0.35**	**0.66**
Max Orifice Head (feet)	**Max Tot. Allowable Orifice Flow (cfs)**	**Max Tot. Allowable Orifice Area (in^2)**	**Max Orifice Diameter (in)**

Provide Hand Calc.	**0.018**	**0.33**	**0.650**
Average outflow during surface drawdown (cfs)	Max Orifice Outflow (cfs)	Actual Orifice Area (in^2)	Selected Orifice Diameter (in)

Drawdown (Hrs)	Provide Hand Calculation

Project Name:	Sharp MMC - Package 8
Project Applicant:	BWE Inc.
BMP Name:	**BMP #12**

From HMP Analysis (hand calculation method)

Sizing calculations assuming 100% voids

Storage Depth, d (ft)	**2.5**	Modified
HMP Volume Depth, d_{hmp} (ft) = d*7/8	**2.2**	
Required HMP Volume @ 3.2' depth, (CF) - V	**3,429**	From HMP Analysis
Void Ratio (100%)	1	
Required Surface area A, (sf) = V/d_{hmp}	**1,559**	
Required Volume @ 2.5' depth including 0.5' Freeboard	**3,897**	

Permavoid Sizing

Void ratio	0.95	Per Manufacturer
Required gross PV Volume for HMP Control @ 2.2' depth, V1 (cf) = V/0.95	3,609	
Required PV Surface area for HMP control @ 2.2' depth, A1 (sf)=	1,641	
Required gross volume at 4' depth (including 0.5' Freeboard), V2 (cf) = A1*d	**4,102**	
Volume of single unit (cf) = 2.32'*1.16'*0.49'	1.32	
Total units required =	3,110	
Permavoid Area per plan	**1,660**	
Net Vol. provided at 3.5' and 0.95 void ratio (cf)	**3,469**	
Gross Volume of Permavoid at 4' (cf)	**4,150**	

Attachment 3
Structural BMP Maintenance Information

This is the cover sheet for Attachment 3.

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Project Name: Sharp MMC - Package 8 (PK 8)

Indicate which Items are Included:

Attachment Sequence	Contents	Checklist
Attachment 3	Maintenance Agreement (Form DS-3247) (when applicable)	☐ Included ☐ Not applicable

THE CITY OF SAN DIEGO

RECORDING REQUESTED BY:
THE CITY OF SAN DIEGO
AND WHEN RECORDED MAIL TO:

____

____

____

(THIS SPACE IS FOR RECORDER'S USE ONLY)

STORM WATER MANAGEMENT AND DISCHARGE CONTROL MAINTENANCE AGREEMENT

APPROVAL NUMBER:	ASSESSOR'S PARCEL NUMBER:	PROJECT NUMBER:
____________________	____________________________	__________________

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

____;

the owner or duly authorized representative of the owner [Property Owner] of property located at

____
(PROPERTY ADDRESS)

and more particularly described as:

____
(LEGAL DESCRIPTION OF PROPERTY)

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

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

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

Continued on Page 2

NOW, THEREFORE, the parties agree as follows:

1. Property Owner shall have prepared, or if qualified, shall prepare an Operation and Maintenance Procedure [OMP] for Permanent Storm Water BMPs, satisfactory to the City, according to the attached exhibit(s), consistent with the Grading and/or Improvement Plan Drawing No(s), or Building Plan Project No(s): ________________________________.

2. Property Owner shall install, maintain, and repair or replace all Permanent Storm Water BMPs within the property, according to the OMP guidelines as described in the attached exhibit(s), the project's SWQMP, and Grading and/or Improvement Plan Drawing No(s), or Building Plan Project No(s) ________________________________.

3. Property Owner shall maintain operation and maintenance records for at least five (5) years. These records shall be made available to the City for inspection upon request at any time.

This Maintenance Agreement shall commence upon execution of this document by all parties named hereon, and shall run with the land.

Executed by the City of San Diego and by Property Owner in San Diego, California.

See Attached Exhibit(s): ________________________________

____
(PROPERTY OWNER SIGNATURE)

____
(PRINT NAME AND TITLE)

____
(COMPANY/ORGANIZATION NAME)

____
(DATE)

THE CITY OF SAN DIEGO

APPROVED:

____
(DEPUTY CITY ENGINEER SIGNATURE)

____
(PRINT NAME)

____
(DATE)

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

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

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

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

SITE DESIGN, SOURCE CONTROL AND POLLUTANT CONTROL BMP OPERATION + MAINTENANCE PROCEDURE

STORM WATER MANAGEMENT AND DISCHARGE CONTROL MAINTENANCE AGREEMENT APPROVAL NO.: TBD

O&M RESPONSIBLE PARTY DESIGNEE: TBD

BMP DESCRIPTION	INSPECTION FREQUENCY	MAINTENANCE FREQUENCY	MAINTENANCE METHOD	QUANTITY	INCLUDED IN O&M MANUAL YES		INCLUDED IN O&M MANUAL NO	SHEET NUMBER(S)
SITE DESIGN ELEMENTS					YES		NO	
LANDSCAPING W/ NATIVE OR DROUGHT TOLERANT SPECIES (4.3.7)	SEMI-ANNUALLY	AS-NEEDED	RE-SEED, RE-PLANT VEGETATION IN ERODED AREAS	N/A				C.3.2.3
SOURCE CONTROL ELEMENTS					YES		NO	
PREVENTION OF ILLICIT DISCHARGES INTO THE MS4 (4.2.1)	N/A	AS NEEDED	ELIMINATE NON-STORM WATER DISCHARGE REPAIR/REPLACE IRRIGATION SYSTEM	N/A				C.3.2.3
ON-SITE STORM DRAIN INLETS (4.2.6)	AFTER RAIN EVENT	AS NEEDED	REMOVE ACCUMULATED SEDIMENT, TRASH, DEBRIS	5				C.3.2.3
PLAZAS, SIDEWALKS, AND PARKING LOTS (4.2.6)	BASED ON DIRT ACCUMULATION	AS NEEDED	REMOVE ACCUMULATED DIRT USING APPROPRIATE SWEEPING	N/A				C.3.2.3
POLLUTANT CONTROL BMP(S)					YES		NO	
PERMEABLE PAVERS (BMP #13)	QUARTERLY	AS NEEDED	SWEEP ANY TRASH, DEBRIS, OR SEDIMENT	3,250 SF				C.3.2.3
PROPRIETARY/COMPACT UNDERGROUND BIOFILTRATION MODULAR WETLAND SYSTEM (BMP #11)	SEE MANUFACTURER'S RECOMMENDATIONS FOR MORE INFORMATION (SWQMP ATTACHMENT 3)			1				
HYDROMODIFICATION CONTROL BMP					YES		NO	
PERMAVOID UNDERGROUND VAULT (BMP #12)	QUARTERLY	AS NEEDED	CLEAR ANY OBSTRUCTIONS FROM OUTLET CONTROL STRUCTURE ORIFICE	1				C.3.2.3

Attachment 4
Copy of Plan Sheets Showing Permanent Storm Water BMPs

This is the cover sheet for Attachment 4.

REFER TO ATTACHMENT 4 OF PACKAGE 3A FOR DRAINAGE REPORT

Project Name: Sharp MMC - Package 8 (PK 8)

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

The plans must identify:

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

Attachment 5
Drainage Report

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

REFER TO ATTACHMENT 5 OF PACKAGE 3A FOR DRAINAGE REPORT

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Attachment 6
Geotechnical and Groundwater Investigation Report

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

REFER TO ATTACHMENT 6 OF PACKAGE 3A FOR GEOTECHNICAL REPORT

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING