APPENDIX I

HYDROLOGIC RESOURCES

Preliminary Hydrologic Analysis

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August 7, 2015

Ms. Kris Shackelford
City of San Diego
1222 First Avenue
San Diego, California 92101

Dear Ms. Shackelford,

Subject: Preliminary Hydrologic Analysis for Stadium Reconstruction EIR

The following preliminary hydrologic analysis was conducted for the Stadium Reconstruction Project in San Diego, California.

Introduction

This letter report presents the existing and proposed runoff rates for the Stadium Reconstruction Project and discusses the capacity of the existing storm drain systems and the potential need for new infrastructure. This analysis uses the Rational Method in accordance with the 1984 City of San Diego Drainage Design Manual (DDM), Appendix I for the hydrology calculations, and Manning's equation for the analysis of the existing storm drain systems.

Existing Conditions

The approximate 166-acre Qualcomm Stadium site is located in the San Diego River watershed, an area of 440 square miles that drains to the San Diego River and discharges into the Pacific Ocean at the community of Ocean Beach. The river generally flows from the northeast to the southwest through urban areas and is the Project site's receiving waters, located along the southern boundary of the Project site.

The Project site consists of the existing stadium, the surrounding parking lots, practice field, fire station, recycling center, and maintenance area. The majority of the Project site is impervious area except for the stadium field. There is no existing landscaping or pervious surfaces within the pedestrian or parking areas outside the stadium.

The existing stadium was constructed on top of an earthen dome to raise it above the 100-year and 500-year San Diego River floodplain, leaving a majority of the parking lot area within the mapped floodplain. Flood Insurance Rate Maps (FIRM) delineating the floodplain limits within the Project site are attached for reference.

Conveyance and Outfalls

Stormwater runoff from the Project site is conveyed directly to the San Diego River via three underground storm drain systems. The westerly system (System A) is comprised of 18-inch to 24-inch to 30-inch RCP that ties to a 4-foot by 2-foot reinforced concrete box culvert that discharges to a 36-inch RCP, which drains the western portion of stadium parking lot. The easterly system (System B) is composed of 24-inch to 30-inch to 36-inch reinforced concrete pipes (RCPs) running north-south through the Qualcomm Stadium east parking lot. The middle system (System C) is a closed 24-inch to 36-inch RCP draining south from Qualcomm Stadium and has a flap-gate installed upstream of the outfall in an on-site manhole to protect the stadium from flooding in the event the river rises above the inlet elevation (i.e., backwatering). The majority of the runoff sheet flows across the Project site to the nearest inlet and is conveyed directly into one of these three storm drain systems. All three of the storm drain systems physically penetrate through (but are not hydraulically connected to) the existing North Mission Valley Interceptor sewer, which parallels the San Diego River along the southern boundary. Each storm drain section through the sewer consists of a 34-inch steel pipe encased in a 36-inch steel sleeve, and all three

systems outlet to the river with a 36-inch RCP pipe. Refer to the attached Figure 1 Existing Hydrology and Drainage Map and the existing system as-built drawings for existing drainage conditions.

Outfall Capacity

The three storm drain systems have limited capacity due to their size and minimal slopes. Table 1 below shows the existing capacity and velocity for each outfall, as determined by the attached calculations.

Table 1: Existing Outfall Conditions

System	Existing Outfall	Capacity (cubic feet per second)	Velocity (feet per second)
A	36-inch RCP @ 0.30%	37	5.17
B	36-inch RCP @ 0.76%	58	8.23
C	36-inch RCP @ 0.10%	21	2.98

Outfall Discharge

System A's outfall does not have any formal energy dissipation; however, the vegetation in this area is extremely dense, which currently provides protection against erosion from the outfall discharge. The velocity is also below the 6 feet per second (fps) threshold stated in the Standard Drawings for Public Works Construction (SDD-104), which is considered non-erosive. System C's outfall has no formal energy dissipation; however, the velocity is also non-erosive. System B's outfall could not be accessed for observation due to security fencing and ongoing construction, and no erosion protection is shown on the system as-built drawings for this system. It is assumed that System B outfall conditions are the same as System A and the existing dense vegetation provides the energy dissipation protection required. Recent photographs of System A and C outfalls are attached based on July 2015 reconnaissance.

Offsite Drainage and Runon

Murphy Canyon Creek flows along the eastern boundary of the Project site and outlets into the San Diego River. Along the Project boundary, the creek is characterized by an earthen trapezoidal channel with riprap slopes, approximately 1,700 feet long, but exists as a concrete trapezoidal channel north of the Project site. According to the Individual Hydrologic and Hydraulic (IHHA) Assessment Report for Murphy Canyon Channels dated June 14, 2013, the earthen channel has the capacity to contain a 10-year storm event and the concrete channel has the capacity to contain the 50-year storm event. The channel was recently maintained and repaired during the 2014-2015 maintenance period to maintain capacity according to the Final Monitoring Report for the Murphy Canyon Channel Maintenance Project dated June 2015.

During storms that exceed a 10-year storm event, the western bank of Murphy Canyon Creek would overtop onto the eastern stadium parking lot. The resulting runon would follow parking lot topography to the existing underground storm drain system and discharge into the San Diego River. For storms larger than a 50-year storm, Murphy Canyon Creek will overtop the concrete channel banks north of the Project site and flow south through the Kinder Morgan Energy Partners Mission Valley Terminal and onto the eastern stadium parking lot. This is shown on the attached FIRM. This runon will also follow on-site topography to the existing storm drain system and discharge into the San Diego River. The runon from Murphy Canyon Creek would not jeopardize flooding within the existing stadium given the stadium structure is elevated above the floodplain.

Pre-project Conditions

The Project site is hydrologically three drainage areas, one associated with each existing storm drain system. Drainage Area A consists of the western parking lot, Drainage Area B consists of the eastern parking lot, and Drainage Area C consists of Qualcomm Stadium footprint. The flow rate from each drainage area has been calculated for the 50-year and 100-year storms, which is shown in Table 2 below. Existing hydrology calculations are attached.

Table 2: Project Site Existing Flow Rates

Drainage Area	Area	C	I_{50}	I_{100}	Q_{50}	Q_{100}
	(acres)	(-)	(inches/hour)	(inches/ hour)	(cubic fps)	(cubic fps)
A	95.96	0.95	2.90	3.10	264.37	282.60
B	61.47	0.95	2.90	3.05	269.35	178.11
C	8.99	0.82	4.20	4.40	31.02	32.50
TOTAL:	**166.42**	**-**	**-**	**-**	**564.74**	**493.21**

The DDM requires:

"(a) The storm drain system shall be designed so that the combination of storm drain system capacity and overflow would 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 storm frequency."

As shown by the calculated 50-year and 100-year flow rates in Table 2 and the existing pipe capacity in Table 1, the existing systems do not have adequate capacity to carry flows from a 50-year storm. Once the capacity is reached in Systems A and B, on-site runoff will continue to pond within the low points of the existing parking lot until the storm subsides and eventually discharge through the existing storm drain system into the San Diego River. The ponding within the western and eastern parking lots, System A and System B, respectively, will range from 2 to 5 feet deep due to the elevation of the riverbank. When the top of the ponded runoff rises above the river bank along the southern edge of the Project site, runoff will overflow into the San Diego River. Ponded runoff that remains within the parking lots would not impact the existing stadium. System C is a closed system, and once its capacity is reached, runoff will backup and cause ponding within the stadium. Ponded water inside the stadium will increase the pressure in the pipe, thereby increasing the velocity and capacity of the pipe. Only the stadium field is impacted by the ponded water from System C.

Anticipated Project Conditions

The Project would reconstruct the stadium in the northeast corner of the existing site. Once completed, the Qualcomm Stadium would be demolished and the earthen dome foundation regraded to meet the elevation of the surrounding parking lot. The proposed stadium would also be constructed on top of an earthen dome in order to be elevated above the San Diego River 100-yr floodplain. The Project would be similar to the existing stadium and surrounding parking lots, except it would include more pervious areas. The Project would include 20 percent pervious areas within the pedestrian zone around the perimeter of the stadium and 15 percent pervious areas within the parking lots. All work would be contained within the site boundary and also outside of the River Park

Influence Area. Figure 2 Proposed Drainage Areas and Storm Drain Systems shows the proposed reconstructed stadium location.

Post-Project Results

The proposed Project would not change the existing flow patterns or drainage areas; however, because pervious area would increase with the implementation of the Project, runoff from Drainage Areas A and B would decrease relative to existing conditions. Refer to Figure 2 and the proposed hydrology calculations for the proposed drainage conditions.

Table 3: Project Site Proposed Flow Rates

Drainage Area	Area	C	I_{50}	I_{100}	Q_{50}	Q_{100}
	(acres)	(-)	(inches/hour)	(inches/hour)	(cubic fps)	(cubic fps)
A	95.96	0.90	2.75	2.95	237.50	254.77
B	61.47	0.87	2.45	2.60	130.75	138.76
C	8.99	0.82	4.20	4.40	31.02	32.50
TOTAL:	**166.42**	**-**	**-**	**-**	**399.27**	**426.03**

Hydraulic Analysis

Even though flow rates would be reduced in the post-Project condition due to an increase in impervious area, the 50-year flow rate would remain greater than existing system capacities. Systems A and B would continue to drain the parking areas, and existing low points within the parking lots would not change in the post-Project condition. The parking lot areas would continue to function as detention ponds under peak flow conditions, representing no change from the existing conditions. System A would remain as currently constructed. The upper portion of System B would be reconstructed to accommodate the new stadium location, the change in grading within the northeast corner, and the regraded existing stadium area. System C would also remain as constructed and would be extended to connect to the new stadium. The extension of System C would be designed to avoid ponding within the stadium for a 50-year storm event by installing inlets at lower elevations than the stadium field. This would allow any backwater to pond within the parking area and not the stadium, improving the current condition. The flap-gate in the on-site manhole would be replaced with a duckbill reed valve design (e.g., Tide Flex) that would help to eliminate backwatering during high river floodwater elevations that pressurize the flap-gate and render it inoperable. Based on the outfall velocities and the dense vegetation at each outfall that acts as energy dissipation, no erosion protection would be required as part of the Project. However, even though some riverbank vegetation may eventually be removed due to its invasive nature, the existing conditions at the outfall would be improved from the decrease in runoff created under the post-Project condition.

If it is determined during the design phase that the parking lots cannot flood during a storm event smaller than a 50-year storm, underground detention would need to be provided. Because existing drainage systems physically penetrate and pass through the North Mission Valley Interceptor sewer, the ability to upsize the existing drainage systems near the river to accommodate runoff from the 50-year storm is significantly constrained.

The existing runon conditions discussed in the Existing Conditions section above would remain in the post-Project condition since the causes are not affected by the proposed improvements. The design of the earthen foundation dome for the new stadium would need to accommodate flow pathways for runon from Murphy Canyon Creek to the north and east. These flow pathways would convey off-site flows around the stadium and into System B for

discharge to the San Diego River, allowing the existing flow paths to remain. There would be no change to the existing condition.

Floodplain Analysis

The reconstructed stadium location on the northeast corner of the site encroaches on the existing San Diego River 100-year and 500-year floodplain. Approximately 15 acres of the 100-year floodplain and 12 acres of the 500-year floodplain would be displaced. Demolition of the existing Qualcomm Stadium and regrading the foundation to match the elevation of the surrounding parking lot would compensate for the displaced floodplain created under the new stadium.

However, the coexistence of both stadiums during the 3-to-5-year construction period would temporarily displace available on-site floodplain until the existing stadium is demolished and the foundation is regraded to match surrounding elevation. Southerly flows from the Murphy Canyon Creek floodplain would also be impeded potentially propagating effects upstream.

The City of San Diego requires that the minimum elevation of the finished floor elevation of any building must be 2 feet above the 100-year frequency flood elevation to protect from flooding, and fully enclosed areas below the lowest floor that are subject to flooding must comply with FEMA's flood-proofing requirements. Under industry standards, the stadium base would be raised several feet above the base flood elevation (BFE). According to FEMA (44 CFR 60.3), development within the floodplain (or floodway fringe) is allowed within an area of an adopted regulatory floodway providing development does not increase BFE by more than one foot. Therefore, provided the Project would not result in a BFE rise within the San Diego River of more than one foot upstream or downstream of the Project, there would be no adverse flooding impacts along the San Diego River since the floodway has been established to accommodate this rise. However, the upstream reach of Murphy Canyon Creek north of the Project site has a 50-year storm event flow capacity, which will overtop and potentially flow onto the Project site from the north in an event larger than a 50-year storm. The Project site design would be expected to include improvements to address the runon from Murphy Canyon Creek.

Conclusions

Based on the hydrological analysis of a 50-year and 100-year storm event for the Project, the new stadium would not pose any significant impacts to the existing conditions and would improve the existing hydrologic and hydraulic conditions. There would be a reduction in the post-Project flow rates and on-site flooding due to an associated increase of pervious surface. Systems A and B and their associated outfalls would remain as constructed. System C's outfall would remain, but the system would be upgraded to avoid stadium flooding during inundation by San Diego River floodwaters.

Through the environmental and construction permitting process to authorize project implementation, the Project proponents would be required to design site conditions such that floodplain impacts to upstream/downstream properties along the San Diego River and Murphy Canyon Creek are limited or eliminated to the satisfaction of the City of San Diego and FEMA. The Project design would be required to mitigate any potential on-site and off-site flooding and avoid impacts to the stadium.

During the permitting process, a CLOMR would provide FEMA an assurance measure that there will be no adverse impacts upstream or downstream along the San Diego River, and that there would be no increase or expansion of the (FIRM) Zone A associated with Murphy Canyon Creek during the temporary construction period or the permanent post-project condition. The CLOMR would need to be accepted by FEMA before new stadium construction could commence, and a LOMR may be required after completion of the Project to delineate new permanent (if any) adjustments to the floodplain extent.

Once demolition of the existing stadium and regrading is complete, there would be approximately no net change in available floodplain on the site and the Murphy Canyon Creek floodplain would once again (under certain high-flow conditions) be allowed to flow onto the project site, around the elevated stadium. As a result, the Project would not impact off-site drainage conditions or systems, and the health of the San Diego River would experience a beneficial impact from decreases in runoff volume and pollutant loads from the Project site.

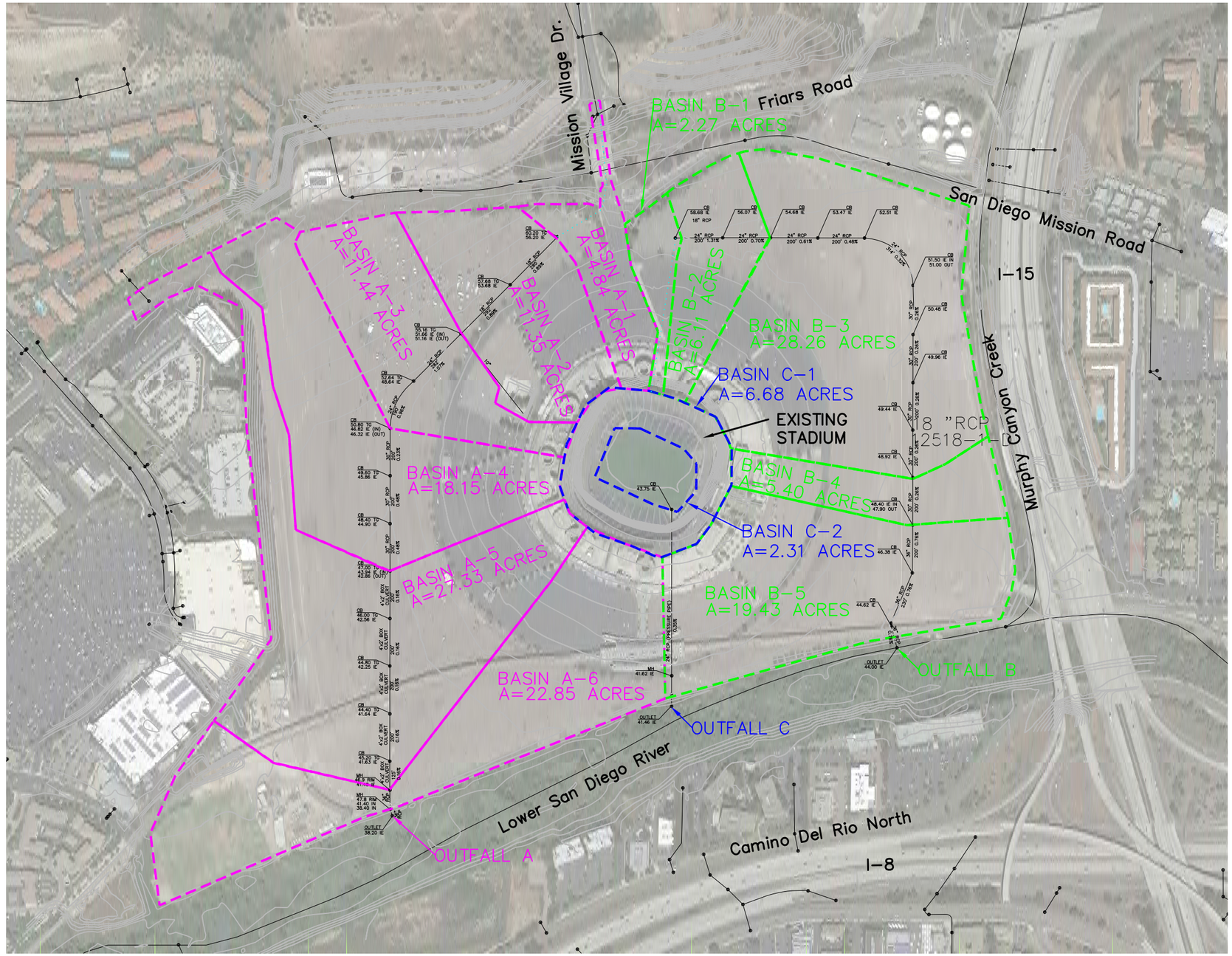
Sincerely,

Keri Gannon, P.E.
Civil Engineer/Technical Lead

cc: Ray Hrenko, Project File

Attachments: Figure 1
Existing Storm Drain System As-Builts
Existing Storm Drain Outfall Calculations
Existing Strom Drain Outfall Photos
Federal Insurance Rate Maps
Existing Hydrology Calculations
Figure 2
Proposed Hydrology Calculations

stadium reconstruction hydrology ltr rpt 08072015 revised



LEGEND

DRAINAGE AREA A

DRAINAGE AREA B

DRAINAGE AREA C

EXISTING STORM DRAIN

INITIAL FLOW LINE

N

NO SCALE

AECOM
401 WEST A STREET, SUITE 1200
SAN DIEGO, CA, 92101
T 619.610.7600 F 619.610.7601
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Existing Hydrology and Drainage Map

STADIUM RECONSTRUCTION EIR
PRELIMINARY HYDROLOGY STUDY

FIGURE 1

Storm Drain As-Builts

12300-4-D Original West, North, and Middle System

12300-5-D Original North System

12504-8-D Original East System

25499-18-D Replacement of Portion of West System at Sewer Crossing

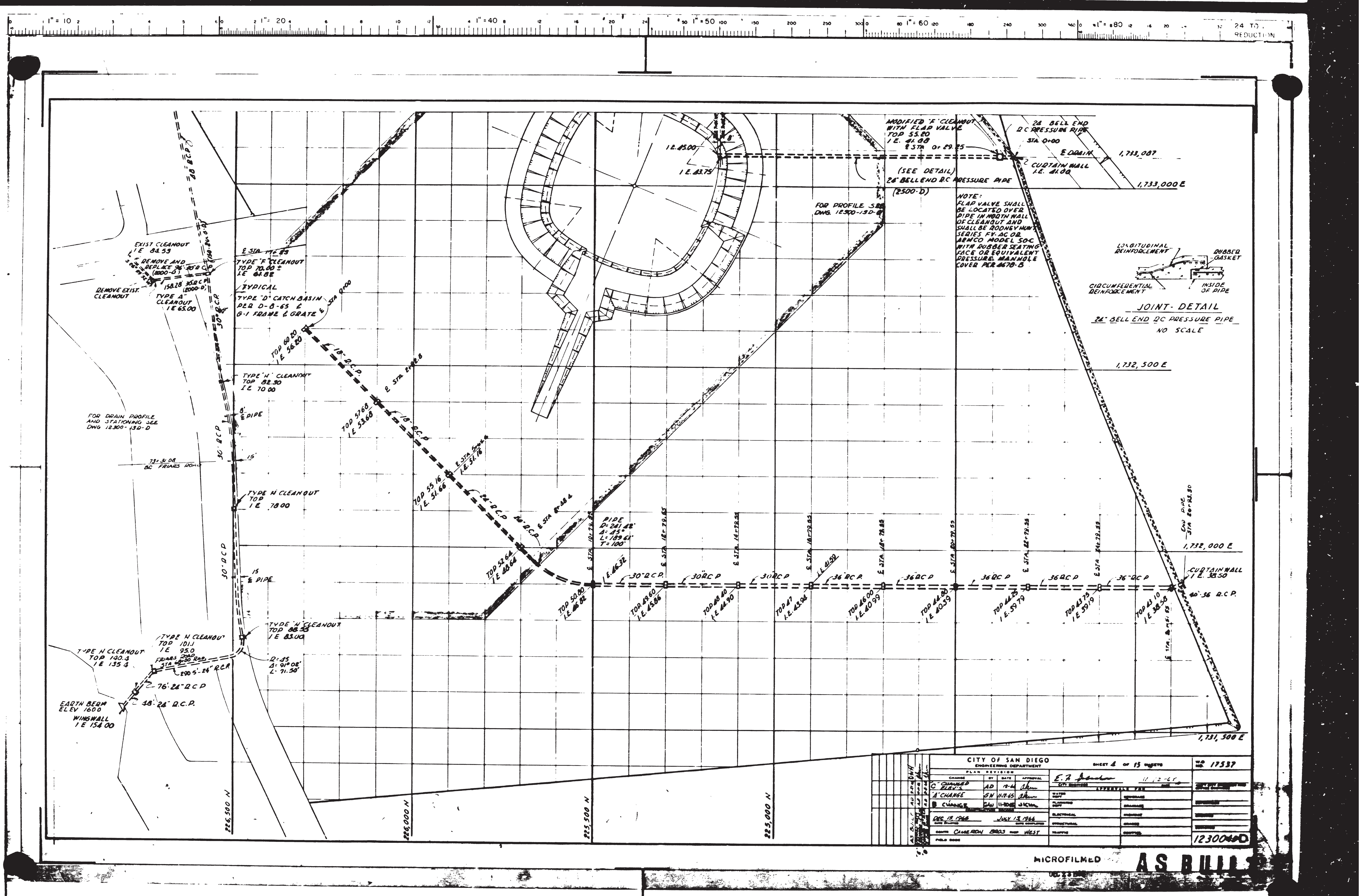
25499-31-D Detail of West System at Sewer Crossing

25499-25-D Replacement of Portion of Middle System at Sewer Crossing

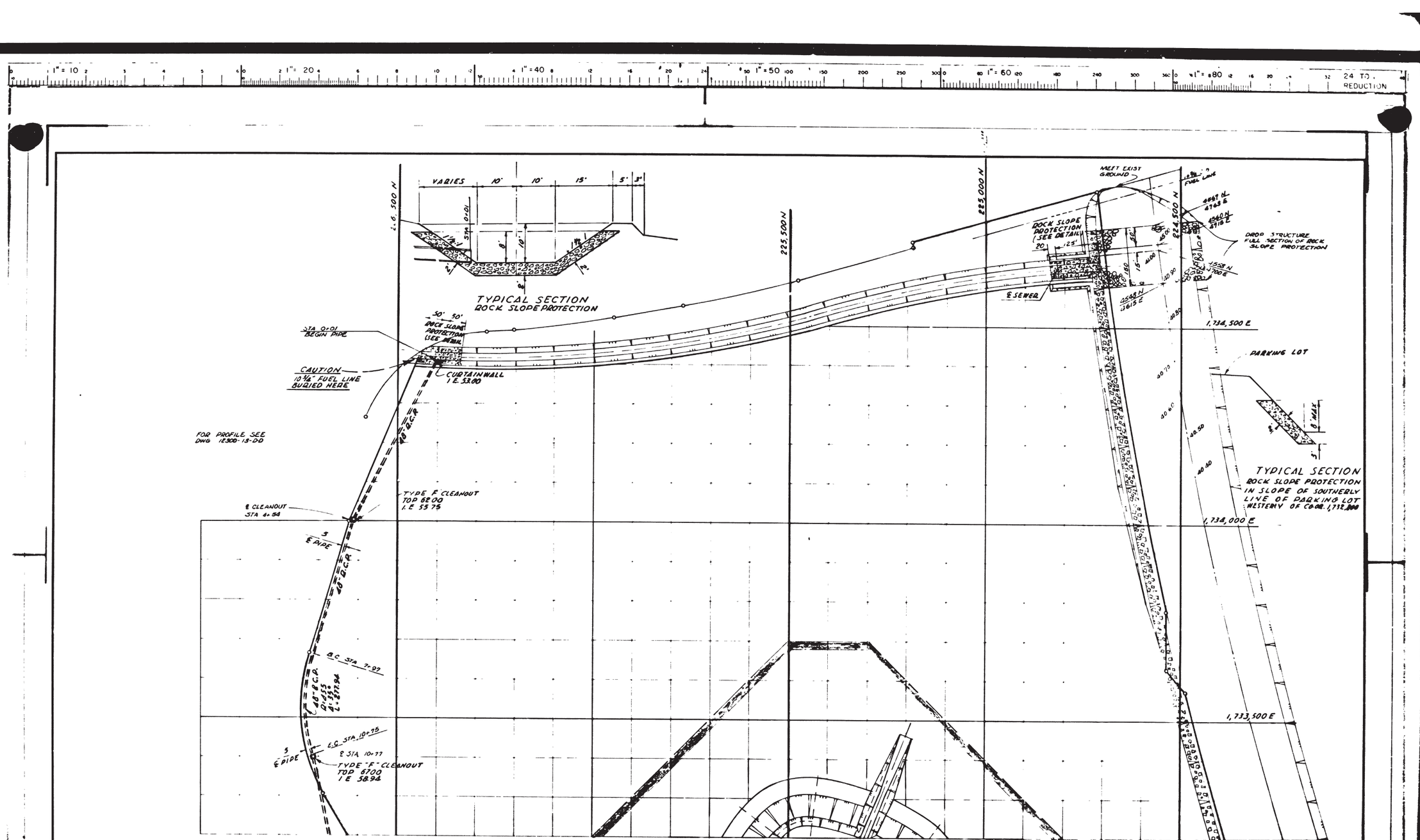
25499-32-D Detail of Middle System at Sewer Crossing

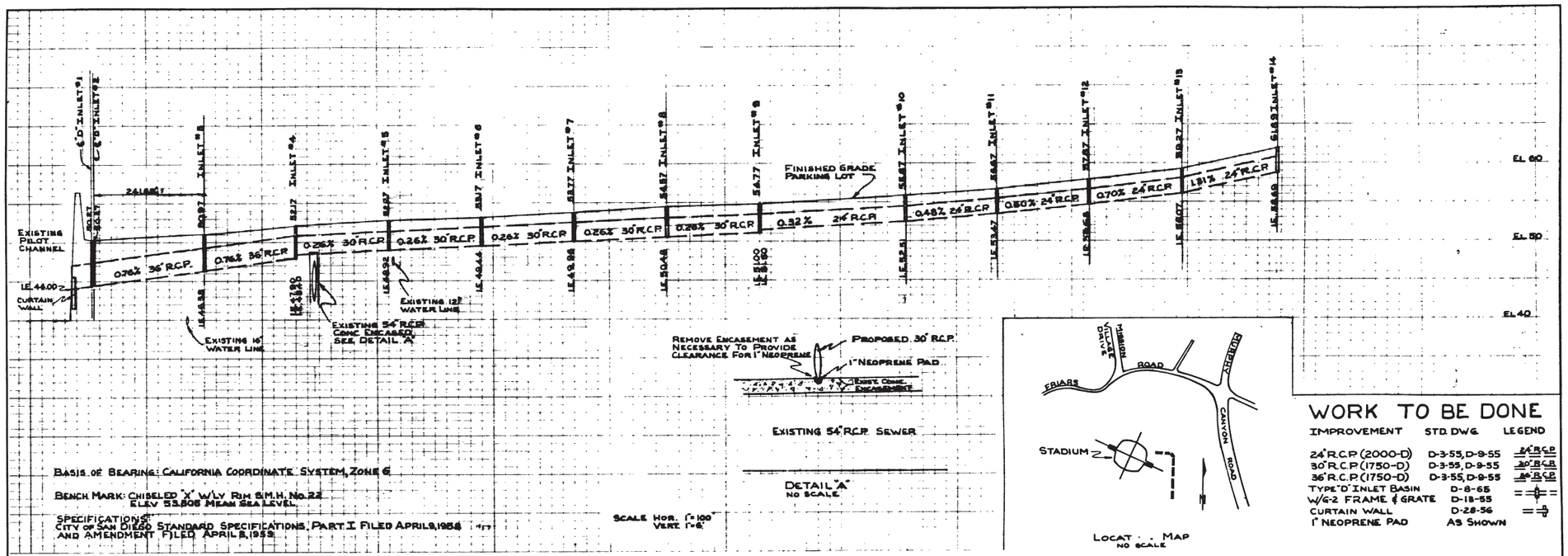
25499-12-D East System at Sewer Crossing

25499-33-D Detail of East System at Sewer Crossing



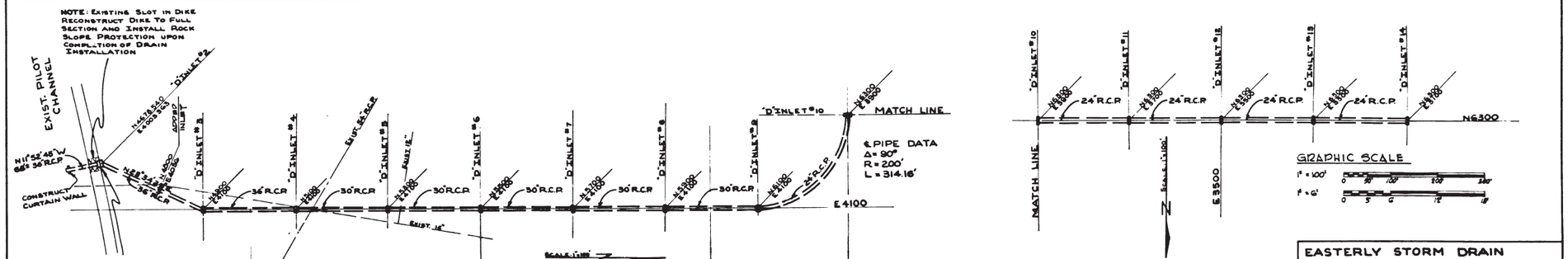
24 TO 1 REDUCTION
MODIFIED "F" CLEANOUT WITH FLAP VALVE TOP 55.20 I.E. 41.68
24" BELL END RC PRESSURE PIPE
(SEE DETAIL) 24" BELL END RC PRESSURE PIPE (2500-D)
CURTAIN WALL I.E. 41.00
1,733,000 E
NOTE: FLAP VALVE SHALL BE LOCATED OVER PIPE IN NORTH WALL OF CLEANOUT AND SHALL BE RODNEY HUNT SERIES FV-AC OR ARMCO MODEL 50C WITH RUBBER SEATING FACE OR EQUIVALENT PRESSURE MANHOLE COVER PER 4678-B
FOR PROFILE SEE DWG. 12300-15D-B
LONGITUDINAL REINFORCEMENT
RUBBER GASKET
CIRCUMFERENTIAL REINFORCEMENT
INSIDE OF PIPE
JOINT - DETAIL
24" BELL END RC PRESSURE PIPE
NO SCALE
1,732,500 E
1,732,000 E
1,731,500 E
EXIST CLEANOUT I.E. 84.53
REMOVE AND REPLACE 96' 30" R.C.P. (2000-D)
REMOVE EXIST. CLEANOUT
TYPE "A" CLEANOUT I.E. 65.00
TYPE "F" CLEANOUT TOP 70.00± I.E. 61.82
TYPICAL TYPE "D" CATCH BASIN PER D-8-65 & G-1 FRAME & GRATE
TYPE "H" CLEANOUT TOP 82.50 I.E. 70.00
FOR DRAIN PROFILE AND STATIONING SEE DWG 12300-13D-D
TYPE H CLEANOUT TOP I.E. 78.00
TYPE "H" CLEANOUT TOP 88.50 I.E. 83.00
TYPE H CLEANOUT TOP 101.1 I.E. 95.0
TYPE H CLEANOUT TOP 140.4 I.E. 135.4
76' 24" RCP
48' 24" R.C.P.
EARTH BERM ELEV 160.0
WINGWALL I.E. 154.00
18" R.C.P.
24" R.C.P.
30" R.C.P.
36" R.C.P.
80' 36" R.C.P.
CURTAIN WALL I.E. 38.50
226,500 N
226,000 N
225,500 N
225,000 N
CITY OF SAN DIEGO
ENGINEERING DEPARTMENT
SHEET 4 OF 15 SHEETS
W.O. NO. 17537
PLAN REVISION
CHANGE | BY | DATE | APPROVAL
"C" CHANGED ELEV'S | AD
"A" CHANGE | GW | 11-17-65
"B" CHANGE | GW
DEC 13 1966 DATE STARTED
JULY 13 1966 DATE COMPLETED
CONTR CAMERON BROS AND WEST
12300-D
MICROFILMED
AS BUILT


VARIES 10' 10' 15' 5' 3'
TYPICAL SECTION
ROCK SLOPE PROTECTION
225,500 N
225,000 N
MEET EXIST GROUND
ROCK SLOPE PROTECTION (SEE DETAILS)
DROP STRUCTURE FULL SECTION OF ROCK SLOPE PROTECTION
E SEWER
1,734,500 E
PARKING LOT
STA 0+01 BEGIN PIPE
CAUTION 10 3/4" FUEL LINE BURIED HERE
CURTAINWALL I.E. 53.00
FOR PROFILE SEE DWG 12300-13-DD
TYPE F CLEANOUT TOP 62.00 I.E. 55.75
℄ CLEANOUT STA 4+54
℄ PIPE
B.C. STA 7+97
E.C. STA 10+78
℄ STA 10+77
TYPE "F" CLEANOUT TOP 67.00 I.E. 58.94
TYPICAL SECTION
ROCK SLOPE PROTECTION IN SLOPE OF SOUTHERLY LINE OF PARKING LOT WESTERLY OF CO.OR. 1,732,000
1,734,000 E
1,733,500 E
MICROFILMED
JAN 24 1968
MICROFILMED
DEC 23 1968
"AS BUILT" PER BOW 12-19-68
CITY OF SAN DIEGO
ENGINEERING DEPARTMENT
SHEET 5 OF 19 SHEETS
W.O. NO. 17537
PLAN REVISION
CHANGE BY DATE APPROVAL
℄ DROP STRUCTURE W.D. 1-10-66
℄ CHANGE GW 11-16-65
DEC. 13, 1965 JULY 13, 1966
CAMERON SIMS WEST
APPROVALS FOR
WATER DEPT.
PLANNING DEPT.
ELECTRICAL
STRUCTURAL
TRAFFIC
CHANGE
CONSENT
CONTROL
12300-5-D
MICROFILMED
DEC 23 1968
AS BUILT



WORK TO BE DONE

IMPROVEMENT	STD. DWG.	LEGEND
24"R.C.P. (2000-D)	D-3-55, D-9-55	24"R.C.P.
30"R.C.P. (1750-D)	D-3-55, D-9-55	30"R.C.P.
36"R.C.P. (1750-D)	D-3-55, D-9-55	36"R.C.P.
TYPE "D" INLET BASIN W/G-2 FRAME & GRATE	D-8-65 D-18-55	
CURTAIN WALL	D-28-56	
1" NEOPRENE PAD	AS SHOWN	



BEFORE EXCAVATING FOR THIS CONTRACT VERIFY LOCATION OF UNDERGROUND UTILITIES 10 DAYS EARLY

REG. ELECTRICAL CONST. TELEPHONE CO	234-0903 295-2565
GAS & ELECTRIC CO.	232-4252 Ex. 7564
WATER & SEWER	236-5900

APPROVALS		
DEPARTMENT	SUB. DEPT. DIVISION OR ST.	
PLANNING	CONST. INSPECTION	
PROPERTY	ELECTRICAL	
PUBL. & PARKS	TRAFFIC ENG. DRAINS	
RECREATION	HIGHWAYS	J.K. Wilson 3/30/66
UTILITIES	MONUMENTS	
STRUCTURAL	PARKS	
TRAFFIC	REMEDIAGE	
WATER	STREET ACT. ORD.	

EASTERLY STORM DRAIN
STADIUM SITE

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 9 OF 9 SHEETS

W.O. NO. 17601

CITY ENGINEER — NOV. 1, 1966 — DATE — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	T.B.	Q.H.B.	3-24-66	

J.K. Wilson 3/30/66 — DESIGN ENGINEER

CONTROL CERTIFICATION

224-1731
CONTRACT NUMBER

CONTRACTOR — DATE STARTED — DATE COMPLETED

INSPECTOR

SHEET NO. 9

DIVISION	BY	DATE	DESCRIPTION
	A.G.	4/66	AS BUILT

FRANK L. HOPE & ASSOCIATES
ARCHITECTS AND ENGINEERS
SAN DIEGO CALIFORNIA

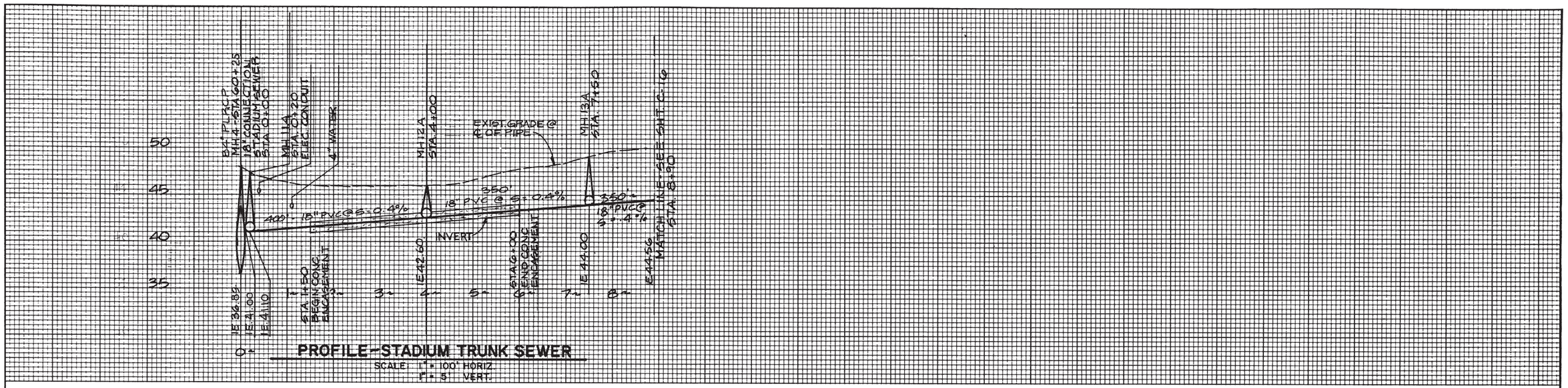
FRANK L. HOPE & ASSOCIATES
ARCHITECTS & ENGINEERS
FRANK L. HOPE JR.
REGISTERED ARCHITECT - C8848

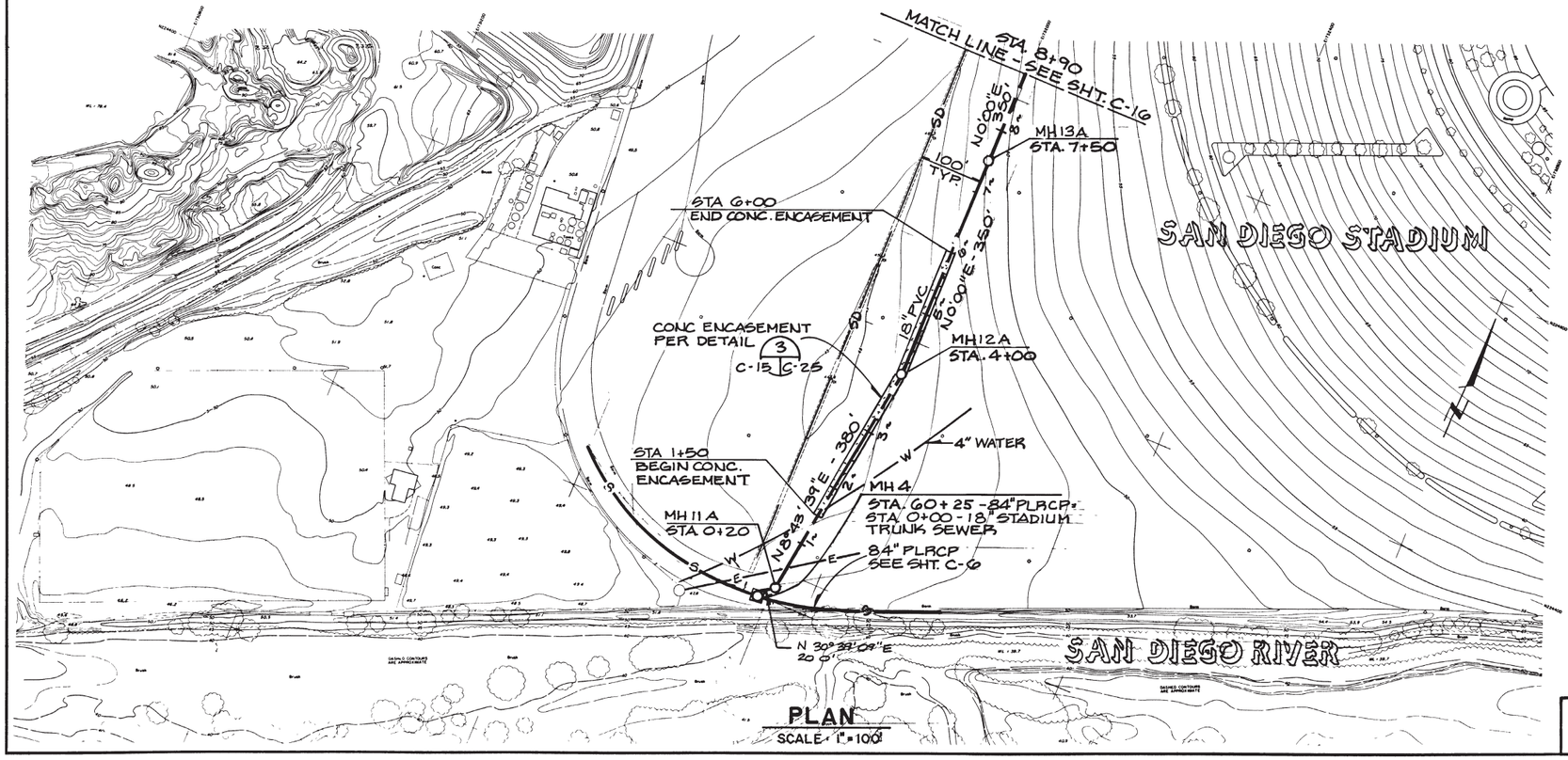
12504-8-D

JOB NO. 66-30
DRAWN BY O.W.H.
CHECKED BY C.R.M.
DATE DEC. 16, 1966

EASTERLY STORM DRAIN - STADIUM SITE
PARKING LOT & ON SITE ROAD WORK
SAN DIEGO STADIUM

SHEET NO. A-13
9 OF 15





GRAPHIC SCALE

0 100 200 300 400

1" = 100'

0 5' 10' 15'

1" = 5'

REGISTERED PROFESSIONAL ENGINEER
JOHN H. HARRIS
No. 20017
EXP. 6-30-93
STATE OF CALIFORNIA

IF SHEET IS LESS THAN 24X36 IT IS A REDUCED PRINT — SCALE REDUCED ACCORDINGLY

HIRSCH & COMPANY
CONSULTING ENGINEERS
4420 Rainier Ave Suite 100
San Diego California 92120

C-15

NORTH MISSION VALLEY INTERCEPTOR SEWER REPLACEMENT

STADIUM TRUNK SEWER STA. 0+00 TO STA. 8+90

CITY OF SAN DIEGO, CALIFORNIA
UTILITIES DEPARTMENT
SHEET 18 OF 68 SHEETS

EWO 170401
U.W.O 170401

[signature], UTILITIES DIRECTOR — DATE 5/8/96

Roger Graff, ENGINEERING SUPERINTENDENT

DESCRIPTION	BY	APPROVED	FILMED
ORIGINAL	HIPSCH	[signature]	

DESIGN ENGINEER

CONTROL CERTIFICATION

CONSTRUCTION RECORD

CONTRACTOR. _____ DATE STARTED _____

INSPECTOR _____ DATE COMPLETED _____

CONNECTIONS BY: _____

224-1732
LAMBERT COORDINATES

25499-18-D

N

NEW 36' STEEL STORM DRAIN SEE SHEET C-21

POLYURETHANE COAT AND LINE STEEL STORM DRAIN (TYP.)

FLOW

TRANSITION COUPLING (TYP)

NEW 34" STL PIPE THRU STRUCTURE ENCASED BY 36" POLYETHYLENE

1'-0" 6'-0" 4'-0" 4'-0" 6'-0" 1'-0"

84"PLRCP SPIGOT x SPIGOT

CASING

84"PLRCP

1'-0"

3'-6" (TYP)

A C-28 | C-28

36" MANHOLE OPENING

STA 59+35

36" MANHOLE OPENING

FLOW

A C-28 | C-28

TOE OF FILLET AT FLOOR

7'-0"

1'-0"

3-#7⊃ @ 3" ADDIT. BOT.

10" (TYP)

1'-6" (TYP)

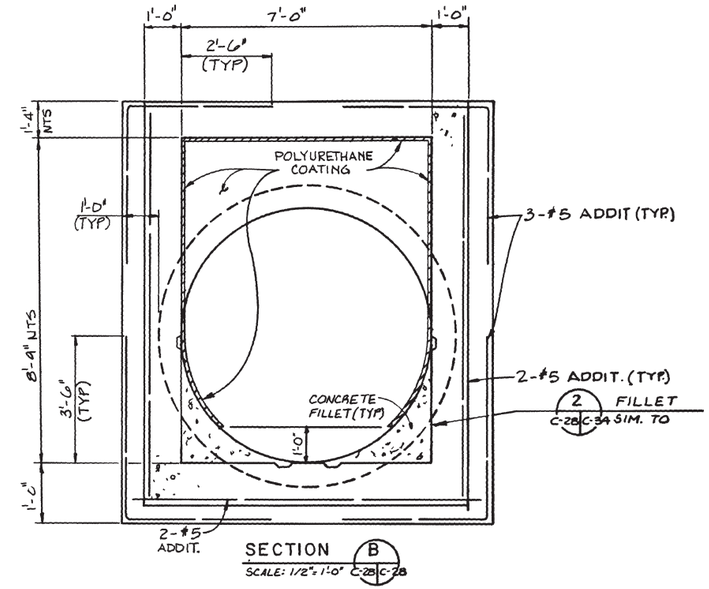
B C-28 | C-28

C C-28 | C-28

NEW 36" STEEL STORM DRAIN SEE SHEET C-21

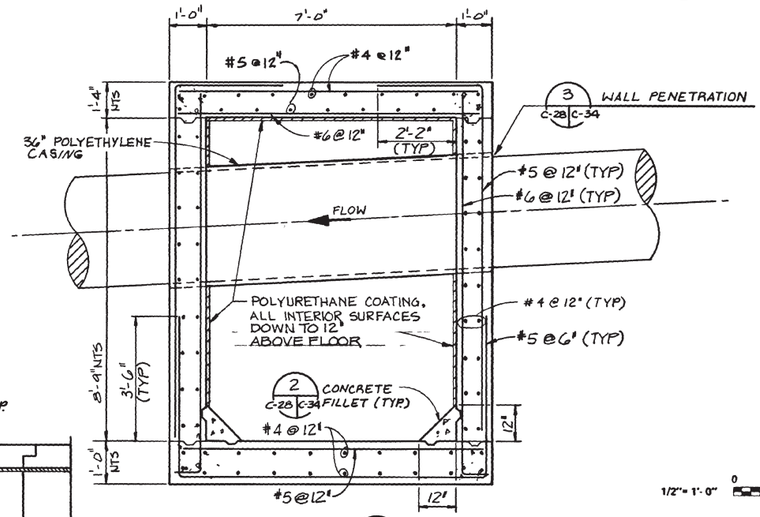
PLAN

SCALE: 1/2"=1'-0"



SECTION B

SCALE: 1/2"=1'-0" C-28 | C-28



SECTION C

SCALE: 1/2"=1'-0" C-28 | C-28

1/2"= 1'-0" 0 1 2 3 4 5 6

CITY STANDARD DWG M-3, M-4 36" MH FRAME AND COVER, SET IN GROUT-TYP

FINISH PAVEMENT EL. 47.2±

1'-4" NTS

#5 @ 12' (TYP)

2-#5 (TYP)

#5 @ 12' (TYP)

4'-0" TYP

POLYURETHANE COATING

3-#6⊂ (TYP)

#4@12'

#6@12'

8" MIN. (TYP.)

5 C-28 | C-34 TYP.

34" STORM DRAIN, STEEL

▽ HGL @ QP (SEE DATA ON C-6)

IE 41 42

36" POLYETHYLENE CASING

6'-0" TYP.

8'-9" NTS

FLOW

IE 36 84

TOP OF FILLET

IE 36 86

#5 @ 12"

12"

#5@6"

#4@12"

3-#5 (TYP) #5@12' (TYP) @ SLAB AND WALLS

1'-0" NTS

1'-0" (TYP)

1'-9" (TYP)

1'-6" (TYP)

SECTION A

SCALE 1/2"=1'-0" A C-28 | C-28

NOTES:

1. FOR GENERAL STRUCTURAL NOTES AND DETAILS, SEE SHEET C-35.

REGISTERED PROFESSIONAL ENGINEER JAMES B. FLEMMONS No C 18613 EXP. 3/31/23 CIVIL STATE OF CALIFORNIA

Kennedy/Jenks/Chilton
17310 Red Hill Avenue, Suite 220
Irvine, California 92714
714-261-1577
1/17/90

HIRSCH & COMPANY
CONSULTING ENGINEERS
4420 Rainier Ave Suite 100
San Diego California 92120

C-28

NORTH MISSION VALLEY INTERCEPTOR SEWER REPLACEMENT

SEWER / STORM DRAIN STRUCTURE 59+95

CITY OF SAN DIEGO, CALIFORNIA
UTILITIES DEPARTMENT
SHEET 31 OF 68 SHEETS

E.W.O. 170401
U.W.O. 170401

ASST. UTILITIES DIRECTOR — DATE 7/9/90

Roger Graff — ENGINEERING SUPERINTENDENT

DESCRIPTION	BY	APPROVED	FILMED
ORIGINAL	KWC		

DESIGN ENGINEER

CONTROL CERTIFICATION

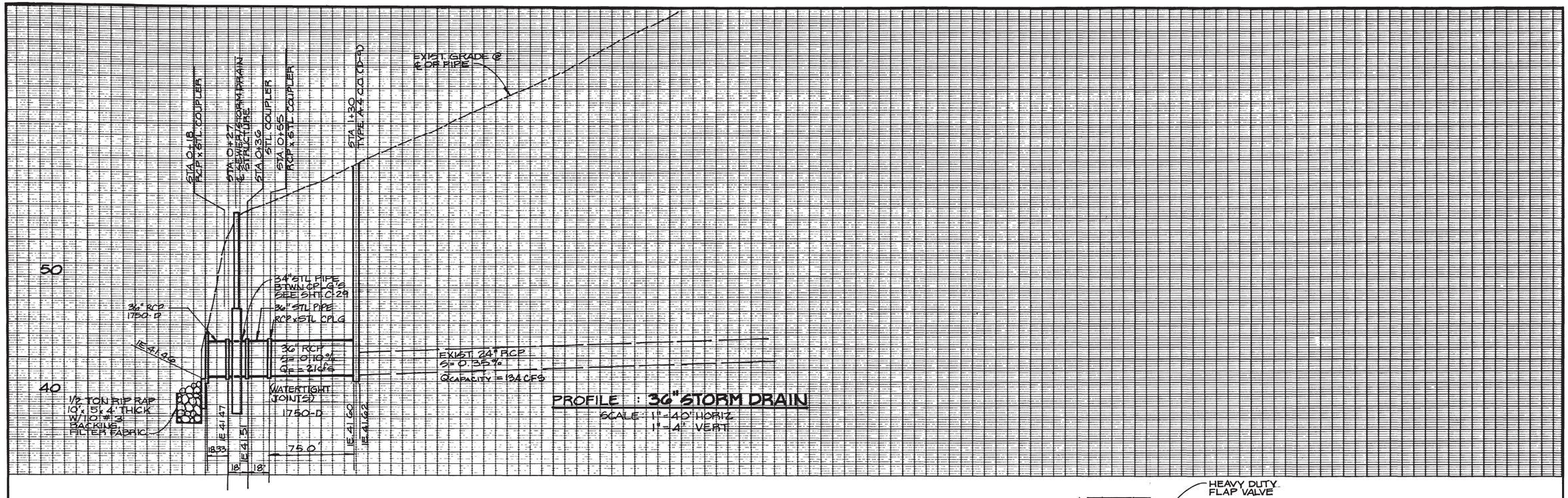
CONSTRUCTION RECORD
CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED
CONNECTIONS BY:

LAMBERT COORDINATES

25490 -31 -D

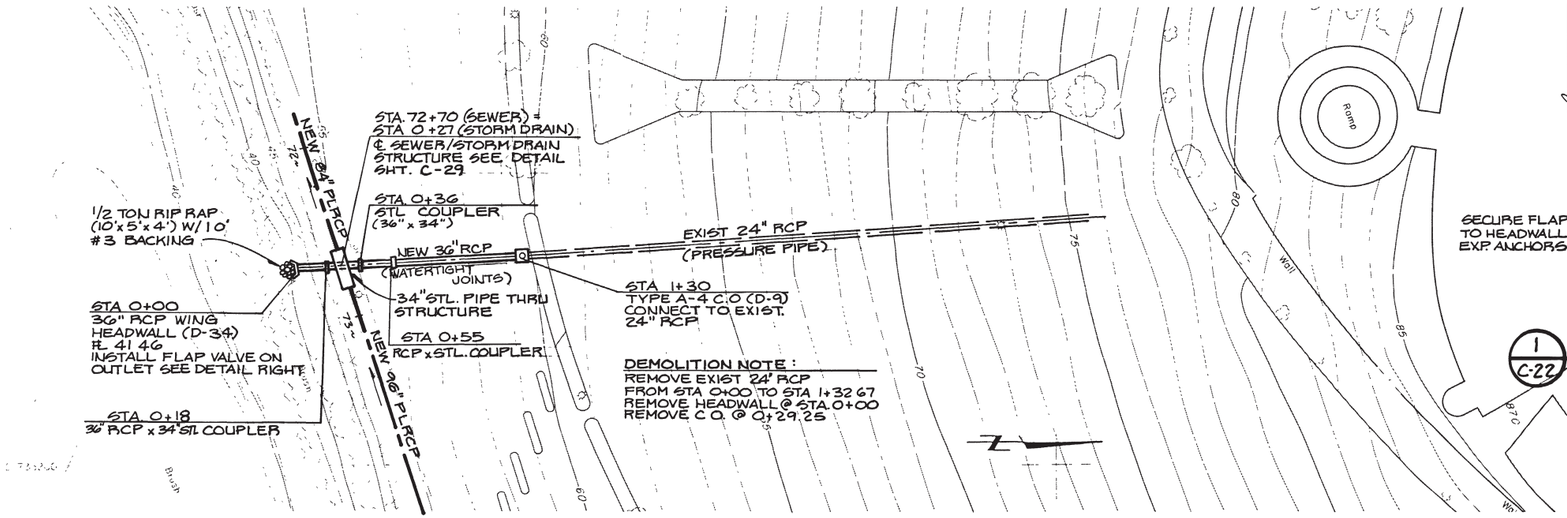
STRUCT # 2

0 1 2 3 4IN.



PROFILE : 36" STORM DRAIN

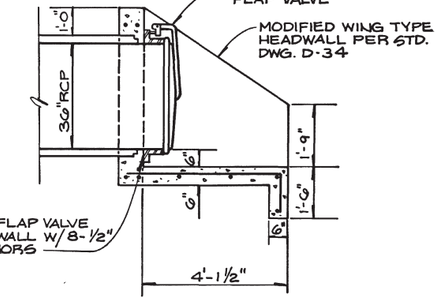
SCALE 1"-40' HORIZ
1"-4" VERT



DEMOLITION NOTE :
REMOVE EXIST 24" RCP
FROM STA 0+00 TO STA 1+32.67
REMOVE HEADWALL @ STA. 0+00
REMOVE C.O. @ 0+29.25

PLAN

SCALE · 1" = 40'



(1) C-22 **FLAP VALVE DETAIL**

SCALE · 1/2" = 1'-0"

GRAPHIC SCALE

0 1' 5'
1/2"=1'-0"

0 20' 40' 80' 120'
1" = 40'

0 2' 4' 8' 12'
1" = 4'

IF SHEET IS LESS THAN 24X36
IT IS A REDUCED PRINT—
SCALE REDUCED ACCORDINGLY

REGISTERED PROFESSIONAL ENGINEER
JOHN H HARRIS
NO 18217
CIVIL
STATE OF CALIFORNIA

C-22

NORTH MISSION VALLEY INTERCEPTOR SEWER REPLACEMENT

RECONSTRUCT STADIUM STORM DRAIN - 2

CITY OF SAN DIEGO, CALIFORNIA
UTILITIES DEPARTMENT
SHEET 25 OF 68 SHEETS

E.W.O. 170401
U.W.O. 170401

Asst. UTILITIES DIRECTOR — DATE 5/10/78
ENGINEERING SUPERINTENDENT

DESCRIPTION	BY	APPROVED	FILMED
ORIGINAL	HIRSCH		

DESIGN ENGINEER

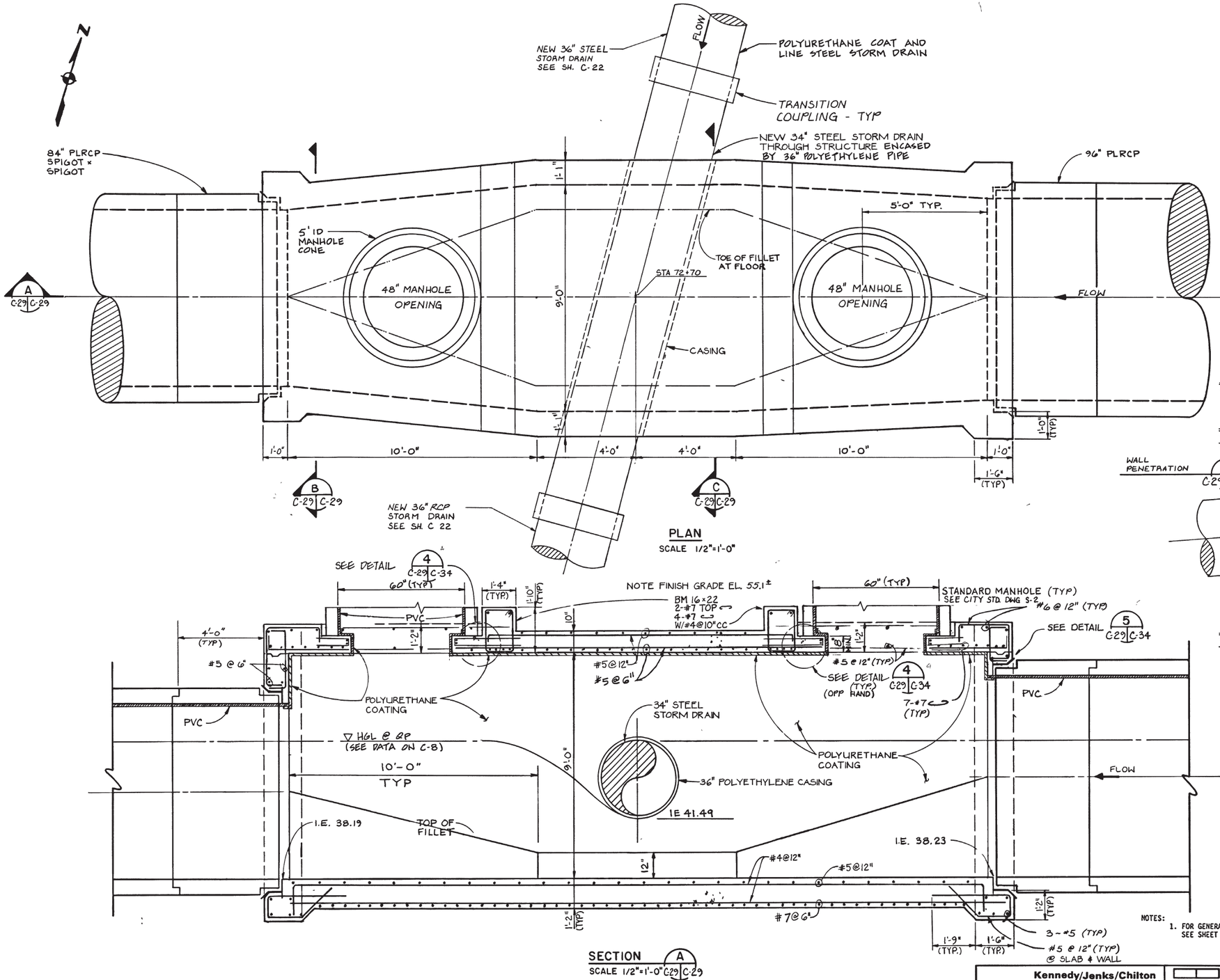
CONTROL CERTIFICATION
224-1733
LAMBERT COORDINATES

CONSTRUCTION RECORD
CONTRACTOR: DATE STARTED
INSPECTOR: DATE COMPLETED
CONNECTIONS BY:

25499-25 -D

HIRSCH & COMPANY
CONSULTING ENGINEERS
4420 Rainier Ave Suite 100
San Diego, California 92120

0 1 2 3 4IN.



C-29

NOTES:
1. FOR GENERAL STRUCTURAL NOTES AND DETAILS, SEE SHEET C-35.

REGISTERED PROFESSIONAL ENGINEER
No C 13613
Exp 3/31/93
CIVIL
STATE OF CALIFORNIA

NORTH MISSION VALLEY
INTERCEPTOR SEWER REPLACEMENT

SEWER / STORM DRAIN STRUCTURE 72+70

CITY OF SAN DIEGO, CALIFORNIA
UTILITIES DEPARTMENT
SHEET 32 OF 68 SHEETS

E.W.O. 170401
U.W.O. 170401

Assist. UTILITIES DIRECTOR — DATE 5/9/90

Roger Graff
ENGINEERING SUPERINTENDENT

DESCRIPTION	BY	APPROVED	FILMED
ORIGINAL	K/J/C		

DESIGN ENGINEER

CONTROL CERTIFICATION

LAMBERT COORDINATES

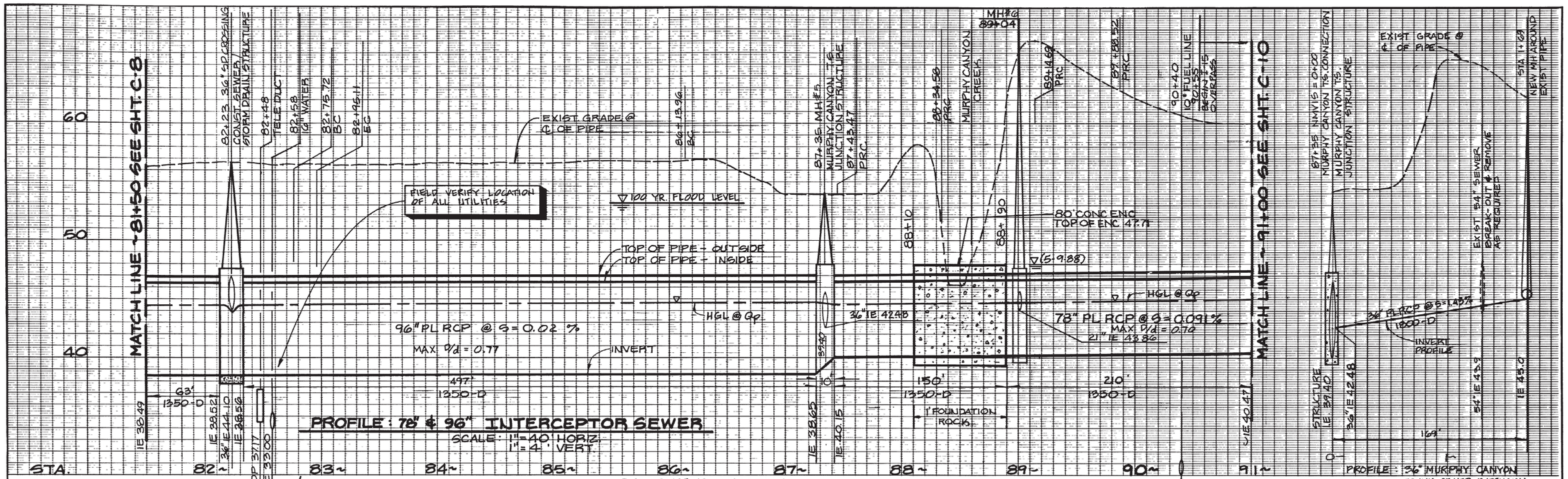
CONSTRUCTION RECORD
CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED
CONNECTIONS BY:

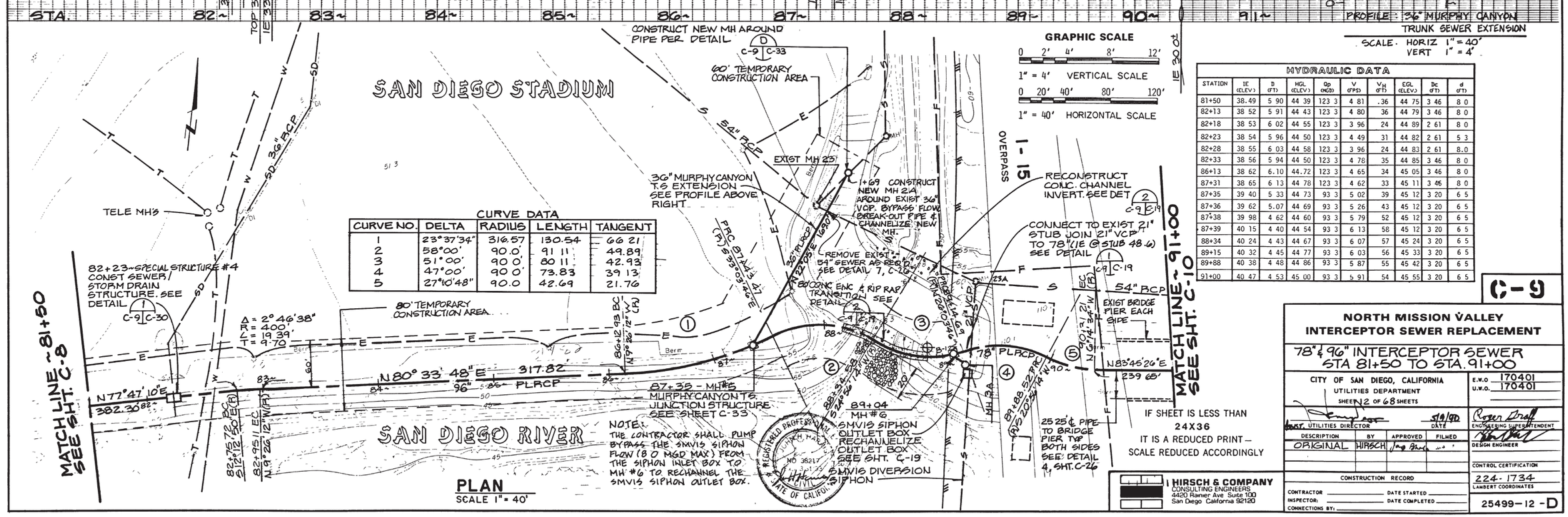
25499 -32-D

Kennedy/Jenks/Chilton
17310 Red Hill Avenue, Suite 220
Irvine, California 92714
714-261-1577

1/17/90

HIRSCH & COMPANY
CONSULTING ENGINEERS
4420 Rainier Ave Suite 100
San Diego, California 92120





CURVE DATA

CURVE NO.	DELTA	RADIUS	LENGTH	TANGENT
1	23°37'34"	316.57	130.54	66 21
2	58°00'	90.0	91 11	49.89
3	51°00'	90.0	80 11	42.93
4	47°00'	90.0	73.83	39 13
5	27°10'48"	90.0	42.69	21.76

NOTE:
THE CONTRACTOR SHALL PUMP BYPASS THE SMVIS SIPHON FLOW (8.0 MGD MAX) FROM THE SIPHON INLET BOX TO MH #6 TO RECHANNEL THE SMVIS SIPHON OUTLET BOX.

HYDRAULIC DATA

STATION	IE (ELEV.)	D (FT.)	HGL (ELEV.)	Qp (MGD)	V (FPS)	V_H (FT)	EGL (ELEV.)	Dc (FT)	d (FT)
81+50	38.49	5 90	44 39	123 3	4 81	.36	44 75	3 46	8 0
82+13	38 52	5 91	44 43	123 3	4 80	36	44 79	3 46	8 0
82+18	38 53	6 02	44 55	123 3	3 96	24	44 89	2 61	8 0
82+23	38 54	5 96	44 50	123 3	4 49	31	44 82	2 61	5 3
82+28	38 55	6 03	44 58	123 3	3 96	24	44 83	2 61	8.0
82+33	38 56	5 94	44 50	123 3	4 78	35	44 85	3 46	8 0
86+13	38 62	6.10	44.72	123 3	4 65	34	45 05	3 46	8 0
87+31	38 65	6 13	44 78	123 3	4 62	33	45 11	3 46	8 0
87+35	39 40	5 33	44 73	93 3	5 02	39	45 12	3 20	6 5
87+36	39 62	5.07	44 69	93 3	5 26	43	45 12	3 20	6 5
87+38	39 98	4 62	44 60	93 3	5 79	52	45 12	3 20	6 5
87+39	40 15	4 40	44 54	93 3	6 13	58	45 12	3 20	6 5
88+34	40 24	4 43	44 67	93 3	6 07	57	45 24	3 20	6 5
89+15	40 32	4 45	44 77	93 3	6 03	56	45 33	3 20	6 5
89+88	40 38	4 48	44 86	93 3	5 87	55	45 42	3 20	6 5
91+00	40 47	4 53	45 00	93 3	5 91	54	45 55	3 20	6 5

C-9

IF SHEET IS LESS THAN 24X36 IT IS A REDUCED PRINT — SCALE REDUCED ACCORDINGLY

NORTH MISSION VALLEY INTERCEPTOR SEWER REPLACEMENT

78" & 96" INTERCEPTOR SEWER STA 81+50 TO STA. 91+00

CITY OF SAN DIEGO, CALIFORNIA
UTILITIES DEPARTMENT
SHEET 12 OF 68 SHEETS

E.W.O. 170401
U.W.O. 170401

ASST. UTILITIES DIRECTOR — DATE 5/9/90
ENGINEERING SUPERINTENDENT — Roger Graf

DESCRIPTION	BY	APPROVED	FILED
ORIGINAL	HIRSCH		

DESIGN ENGINEER

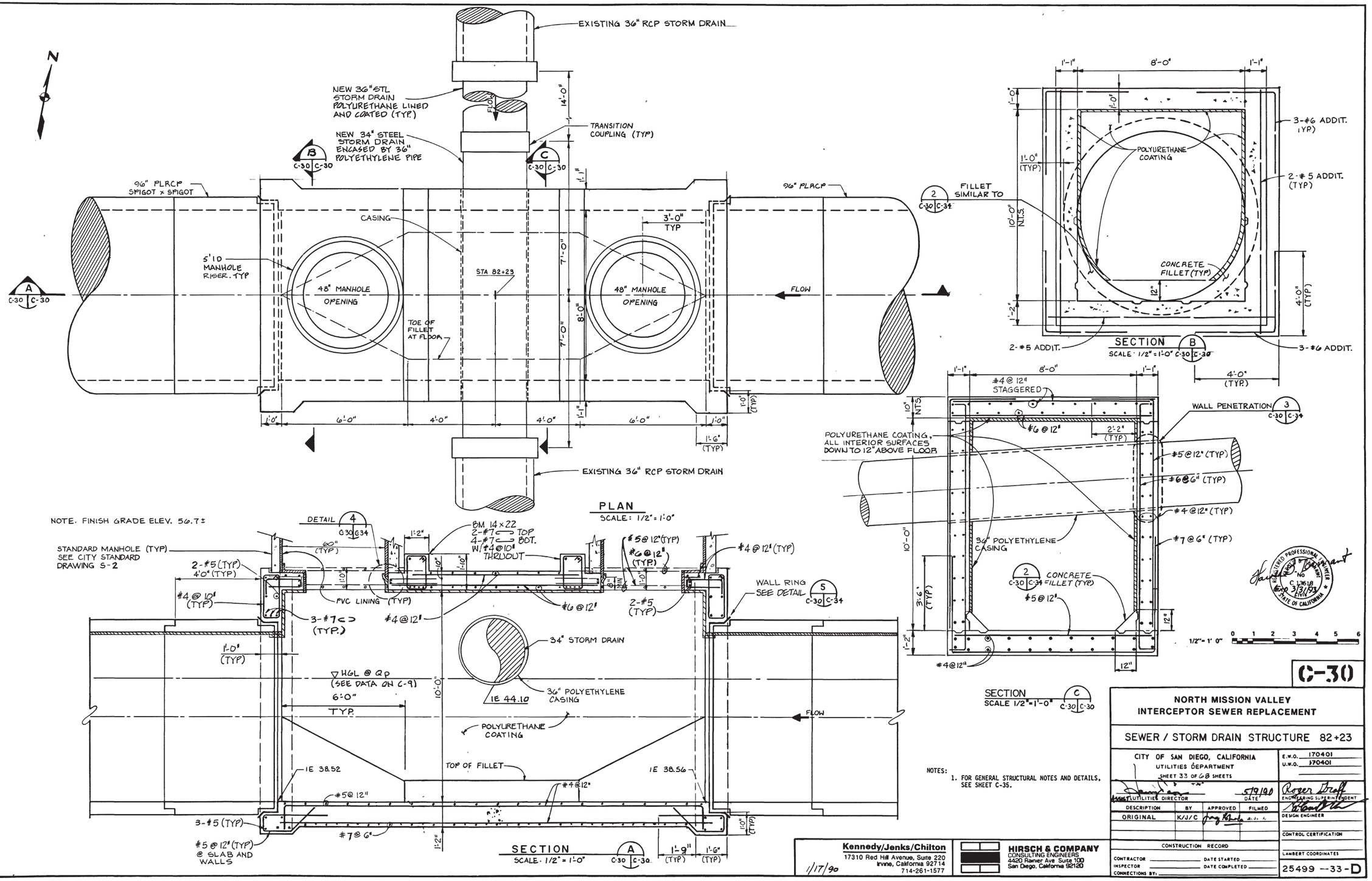
CONTROL CERTIFICATION
224-1734
LAMBERT COORDINATES

CONSTRUCTION RECORD
CONTRACTOR _____ DATE STARTED _____
INSPECTOR: _____ DATE COMPLETED _____
CONNECTIONS BY: _____

HIRSCH & COMPANY
CONSULTING ENGINEERS
4420 Runner Ave. Suite 100
San Diego California 92120

25499-12-D

0 1 2 3 4IN.



NOTES:

1. FOR GENERAL STRUCTURAL NOTES AND DETAILS, SEE SHEET C-35.

REGISTERED PROFESSIONAL ENGINEER — RICHARD B. BRANT — No. C 13618 — EXP. 3/31/93 — CIVIL — STATE OF CALIFORNIA

C-30

NORTH MISSION VALLEY INTERCEPTOR SEWER REPLACEMENT

SEWER / STORM DRAIN STRUCTURE 82+23

CITY OF SAN DIEGO, CALIFORNIA
UTILITIES DEPARTMENT
SHEET 33 OF 68 SHEETS

E.W.O. 170401
U.W.O. 170401

ASST. UTILITIES DIRECTOR — DATE 5/9/90
ENGINEERING SUPERINTENDENT — Roger Graff

DESCRIPTION	BY	APPROVED	FILMED
ORIGINAL	K/J/C		

DESIGN ENGINEER

CONTROL CERTIFICATION

LAMBERT COORDINATES

CONSTRUCTION RECORD
CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED
CONNECTIONS BY:

25499 --33-D

Kennedy/Jenks/Chilton
17310 Red Hill Avenue, Suite 220
Irvine, California 92714
714-261-1577
1/17/90

HIRSCH & COMPANY
CONSULTING ENGINEERS
4420 Rainer Ave. Suite 100
San Diego, California 92120

SHEET #4

0 1 2 3 4 5 6

System A - Existing Outfall Capacity

Project Description

Friction Method	Manning Formula
Solve For	Full Flow Capacity

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.30000	%
Normal Depth	3.00	ft
Diameter	3.00	ft
Discharge	36.53	ft³/s

Results

Discharge	36.53	ft³/s
Normal Depth	3.00	ft
Flow Area	7.07	ft²
Wetted Perimeter	9.42	ft
Hydraulic Radius	0.75	ft
Top Width	0.00	ft
Critical Depth	1.97	ft
Percent Full	100.0	%
Critical Slope	0.00512	ft/ft
Velocity	5.17	ft/s
Velocity Head	0.42	ft
Specific Energy	3.42	ft
Froude Number	0.00	
Maximum Discharge	39.30	ft³/s
Discharge Full	36.53	ft³/s
Slope Full	0.00300	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%

Existing System B - Outfall Capacity

Project Description

Friction Method	Manning Formula
Solve For	Full Flow Capacity

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.76000	%
Normal Depth	3.00	ft
Diameter	3.00	ft
Discharge	58.14	ft³/s

Results

Discharge	58.14	ft³/s
Normal Depth	3.00	ft
Flow Area	7.07	ft²
Wetted Perimeter	9.42	ft
Hydraulic Radius	0.75	ft
Top Width	0.00	ft
Critical Depth	2.47	ft
Percent Full	100.0	%
Critical Slope	0.00755	ft/ft
Velocity	8.23	ft/s
Velocity Head	1.05	ft
Specific Energy	4.05	ft
Froude Number	0.00	
Maximum Discharge	62.54	ft³/s
Discharge Full	58.14	ft³/s
Slope Full	0.00760	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%

Existing System C - Outfall Capacity

Project Description

Friction Method	Manning Formula
Solve For	Full Flow Capacity

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.10000	%
Normal Depth	3.00	ft
Diameter	3.00	ft
Discharge	21.09	ft³/s

Results

Discharge	21.09	ft³/s
Normal Depth	3.00	ft
Flow Area	7.07	ft²
Wetted Perimeter	9.42	ft
Hydraulic Radius	0.75	ft
Top Width	0.00	ft
Critical Depth	1.48	ft
Percent Full	100.0	%
Critical Slope	0.00423	ft/ft
Velocity	2.98	ft/s
Velocity Head	0.14	ft
Specific Energy	3.14	ft
Froude Number	0.00	
Maximum Discharge	22.69	ft³/s
Discharge Full	21.09	ft³/s
Slope Full	0.00100	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%

Existing Outfalls Photo Log

Western (System A) Outfall - Looking towards the outfall form the southern end of the parking lot

Western (System A) Outfall - Looking down to the outfall from the top of the river bank

Western (System A) Outfall - Looking downstream

Western (System A) Outfall – Downstream and looking back to the outfall

Middle (System C) Outfall – Looking down from above

ance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

0 250 500 750 1,000 FEET

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 1636H

FIRM

FLOOD INSURANCE RATE MAP

SAN DIEGO COUNTY, CALIFORNIA AND INCORPORATED AREAS

PANEL 1636 OF 2375

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
SAN DIEGO, CITY OF	060295	1636	H

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER 06073C1636H

MAP REVISED MAY 16, 2012

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

MAP SCALE 1" = 500'

0 250 500 750 1,000 FEET

0 150 300 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 1638H

FIRM

FLOOD INSURANCE RATE MAP

SAN DIEGO COUNTY, CALIFORNIA AND INCORPORATED AREAS

PANEL 1638 OF 2375

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
SAN DIEGO, CITY OF	060295	1638	H

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER 06073C1638H

MAP REVISED MAY 16, 2012

Federal Emergency Management Agency

HYDRAULIC CALCULATIONS - EXISTING CONDITIONS

COMPLETED BY:	KO	DATE:	7/7/2015
CHECKED BY:	KHG	DATE:	7/22/2015

Ti =Initital Overland Flow (Minutes) = 1.8*(1.1-C)*D^(1/2)/S^(1/3) for Urban Areas (Appendix I-E
D = Distance (ft), **S** = Slope in %
Tf = Pipe Travel Time (Minutes)
Tc = Time of Concentration (Minutes), Overland Flow and Pipe Travel Time
I_{50} = Rainfall Intensity for 50 year storm event (inches/hour) - Appendix I-B
C = 0.95 (Industrial) or 0.45 (Rural) per Table 2, page 82 of the DDM
Q_{50} = C*I*A = Flow for 50 year storm event

AREA A - West Side of Parking Lot

OVERLAND FLOW

DRAINAGE AREA	OVERLAND AREA (AC)	L (FT)	H (FT)	Slope (%)	Ti (MIN)	I_{50} (IN/HR)	C	Q_{50} (CFS)
A-1	**4.84**	**670**	**40.00**	5.97%	3.85	**4.20**	**0.95**	19.31

PIPE FLOW

DRAINAGE AREA	AREA (AC)	Q_{50} (CFS)	Pipe Size (IN)	Length (FT)	Slope (%)	Velocity (fps)	Ti (MIN)	Tc (MIN)	I_{50} (IN/HR)	C	$Q_{50\ Area}$ (CFS)	$Q_{50\ TOTAL}$ (CFS)	Pipe Capacity (CFS)
A-2	11.35	19.31	**18**	**577.00**	**0.89%**	**5.61**	1.71	5.57	**4.00**	0.95	43.13	61.52	9.91
A-3	11.44	61.52	**24**	**472.00**	**1.00%**	**7.20**	1.09	6.66	**3.85**	0.95	41.84	101.06	22.62
A-4	18.15	101.06	**30**	**600.00**	**0.40%**	**5.28**	1.89	8.55	**3.45**	0.95	59.49	150.04	25.94
A-5	27.33	150.04	**4'x2'**	**925.00**	**0.16%**	**3.49**	4.42	12.97	**2.90**	0.95	75.29	201.42	27.91
A-6	22.85	201.42	**36**	**82.00**	**0.30%**	**5.17**	0.26	13.23	**2.90**	0.95	62.95	264.37	36.53

AREA B - East Side of Parking Lot

OVERLAND FLOW

DRAINAGE AREA	OVERLAND AREA (AC)	L (FT)	H (FT)	Slope (%)	Ti (MIN)	I_{50} (IN/HR)	C	Q_{50} (CFS)
B-1	**2.27**	**650**	**25.00**	3.85%	4.39	**4.20**	**0.95**	9.06

PIPE FLOW

DRAINAGE AREA	AREA (AC)	Q_{50} (CFS)	Pipe Size (IN)	Length (FT)	Slope (%)	Velocity (fps)	Ti (MIN)	Tc (MIN)	I_{50} (IN/HR)	C	$Q_{50\ AREA}$ (CFS)	$Q_{50\ TOTAL}$ (CFS)	Pipe Capacity (CFS)
B-2	6.11	9.06	**18**	**400.00**	**1.00%**	**5.94**	1.12	5.52	**4.10**	0.95	23.80	32.64	10.5
B-3	28.26	32.64	**24**	**1515.00**	**0.38%**	**4.44**	5.69	11.20	**3.10**	0.95	83.23	107.90	13.94
B-4	5.40	107.90	**30**	**200.00**	**0.26%**	**4.26**	0.78	11.99	**3.00**	0.95	15.39	119.81	20.91
B-5	19.43	119.81	**36**	**441.00**	**0.76%**	**8.23**	0.89	12.88	**2.90**	0.95	53.53	169.35	58.41

AREA C - Stadium

OVERLAND FLOW - Tc of 5 minutes assumed since the majority of the area is structure and there is no true overland flow

DRAINAGE AREA	AREA (AC)	Tc (MIN)	I_{50} (IN/HR)	C	Q_{50} (CFS)	Pipe Capacity (CFS)
C-1	6.68	5.00	**4.20**	0.95	26.65	
C-2	2.31	5.00	**4.20**	0.45	4.37	
				TOTAL	31.02	21

SUMMARY

DRAINAGE AREA	AREA (AC)	I_{50} (IN/HR)	C	Q_{50} (CFS)
A	95.96	2.90	0.95	264.37
B	61.47	2.90	0.95	169.35
C	8.99	4.20	0.82	31.02
TOTAL	**166.42**			**464.74**

HYDRAULIC CALCULATIONS - EXISTING CONDITIONS

COMPLETED BY:	KO	DATE:	7/7/2015
CHECKED BY:	KHG	DATE:	7/22/2015

Ti =Initital Overland Flow (Minutes) = 1.8*(1.1-C)*D^(1/2)/S^(1/3) for Urban Areas (Appendix I-E
D = Distance (ft), **S** = Slope in %
Tf = Pipe Travel Time (Minutes)
Tc = Time of Concentration (Minutes), Overland Flow and Pipe Travel Time
I_{100} = Rainfall Intensity for 50 year storm event (inches/hour) - Appendix I-B
C = 0.95 (Industrial) or 0.45 (Rural) per Table 2, page 82 of the DDM
Q_{100} = C*I*A = Flow for 100 year storm event

AREA A - West Side of Parking Lot

OVERLAND FLOW

DRAINAGE AREA	OVERLAND AREA (AC)	L (FT)	H (FT)	Slope (%)	Ti (MIN)	I_{100} (IN/HR)	C	Q_{100} (CFS)
A-1	**4.84**	**670**	**40.00**	5.97%	3.85	**4.40**	**0.95**	20.23

PIPE FLOW

DRAINAGE AREA	AREA (AC)	Q_{50} (CFS)	Pipe Size (IN)	Length (FT)	Slope (%)	Velocity (fps)	Ti (MIN)	Tc (MIN)	I_{100} (IN/HR)	C	$Q_{100\ Area}$ (CFS)	$Q_{100\ TOTAL}$ (CFS)	Pipe Capacity (CFS)
A-2	11.35	20.23	**18**	**577.00**	**0.89%**	**5.61**	1.71	5.57	**4.20**	0.95	45.29	64.60	9.91
A-3	11.44	64.60	**24**	**472.00**	**1.00%**	**7.20**	1.09	6.66	**4.00**	0.95	43.47	104.99	22.62
A-4	18.15	104.99	**30**	**600.00**	**0.40%**	**5.28**	1.89	8.55	**3.75**	0.95	64.66	163.09	25.94
A-5	27.33	163.09	**4'x2'**	**925.00**	**0.16%**	**3.49**	4.42	12.97	**3.10**	0.95	80.49	215.31	27.91
A-6	22.85	215.31	**36**	**82.00**	**0.30%**	**5.17**	0.26	13.23	**3.10**	0.95	67.29	282.60	36.53

AREA B - East Side of Parking Lot

OVERLAND FLOW

DRAINAGE AREA	OVERLAND AREA (AC)	L (FT)	H (FT)	Slope (%)	Ti (MIN)	I_{100} (IN/HR)	C	Q_{100} (CFS)
B-1	**2.27**	**650**	**25.00**	3.85%	4.39	**4.40**	**0.95**	9.49

PIPE FLOW

DRAINAGE AREA	AREA (AC)	Q_{50} (CFS)	Pipe Size (IN)	Length (FT)	Slope (%)	Velocity (fps)	Ti (MIN)	Tc (MIN)	I_{100} (IN/HR)	C	$Q_{100\ AREA}$ (CFS)	$Q_{100\ TOTAL}$ (CFS)	Pipe Capacity (CFS)
B-2	6.11	9.49	**18**	**400.00**	**1.00%**	**5.94**	1.12	5.52	**4.20**	0.95	24.38	33.44	10.5
B-3	28.26	33.44	**24**	**1515.00**	**0.38%**	**4.44**	5.69	11.20	**3.35**	0.95	89.94	116.61	13.94
B-4	5.40	116.61	**30**	**200.00**	**0.26%**	**4.26**	0.78	11.99	**3.20**	0.95	16.42	127.80	20.91
B-5	19.43	127.80	**36**	**441.00**	**0.76%**	**8.23**	0.89	12.88	**3.05**	0.95	56.30	178.11	62.57

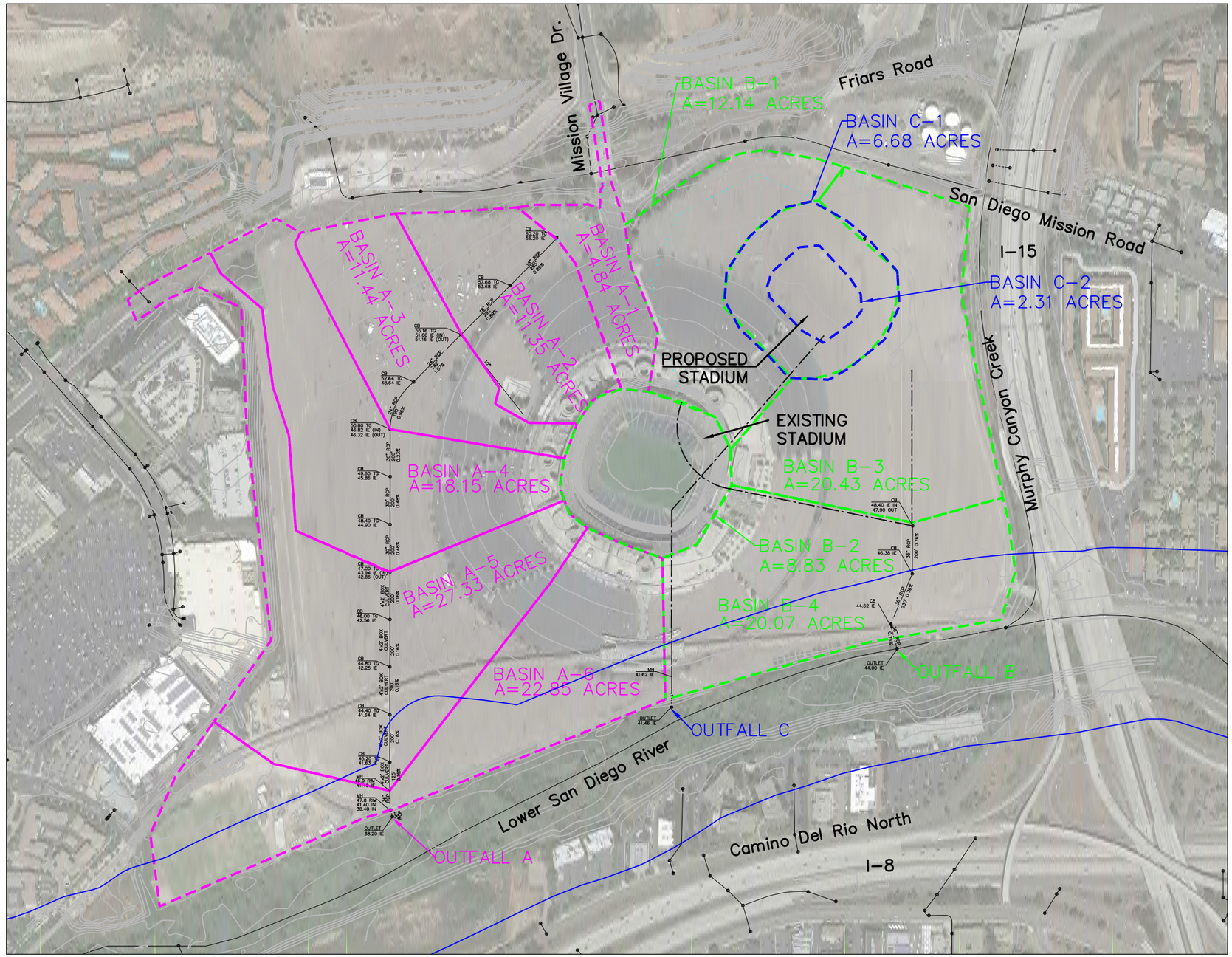
AREA C - Stadium

OVERLAND FLOW - Tc of 5 minutes assumed since the majority of the area is structure and there is no true overland flow

DRAINAGE AREA	AREA (AC)	Tc (MIN)	I_{100} (IN/HR)	C	Q_{100} (CFS)	Pipe Capacity (CFS)
C-1	6.68	5.00	**4.40**	0.95	27.92	
C-2	2.31	5.00	**4.40**	0.45	4.57	
				TOTAL	32.50	21

SUMMARY

DRAINAGE AREA	AREA (AC)	I_{100} (IN/HR)	C	Q_{100} (CFS)
A	95.96	3.10	0.95	282.60
B	61.47	3.05	0.95	178.11
C	8.99	4.40	0.82	32.50
TOTAL	**166.42**			**493.21**



LEGEND

- DRAINAGE AREA A
- DRAINAGE AREA B
- DRAINAGE AREA C
- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- INITIAL FLOW LINE
- RIVER INFLUENCE LINE

NO SCALE

AECOM
401 WEST A STREET, SUITE 1200
SAN DIEGO, CA, 92101
T 619.610.7600 F 619.610.7601
www.aecom.com

Proposed Hydrology and Drainage Map

STADIUM RECONSTRUCTION EIR
PRELIMINARY HYDROLOGY STUDY

FIGURE 2

HYDRAULIC CALCULATIONS - PROPOSED CONDITIONS

COMPLETED BY:	KO	DATE:	7/7/2015
CHECKED BY:	KHG	DATE:	7/22/2015

Ti =Initital Overland Flow (Minutes) = 1.8*(1.1-C)*D^(1/2)/S^(1/3) for Urban Areas (Appendix I-E
D = Distance (ft), **S** = Slope in %
Tf = Pipe Travel Time (Minutes)
Tc = Time of Concentration (Minutes), Overland Flow and Pipe Travel Time
I_{50} = Rainfall Intensity for 50 year storm event (inches/hour) - Appendix I-B
C = 0.95 (Industrial) or 0.45 (Rural) per Table 2, page 82 of the DDM
Q_{50} = C*I*A = Flow for 50 year storm event

AREA A - West Side of Parking Lot (AREA & FLOW REMAIN THE SAME

OVERLAND FLOW

DRAINAGE AREA	OVERLAND AREA (AC)	L (FT)	H (FT)	Slope (%)	Ti (MIN)	I_{50} (IN/HR)	C*	Q_{50} (CFS)
A-1	**4.84**	**670**	**40.00**	5.97%	5.14	**4.20**	**0.90**	18.30

PIPE FLOW

DRAINAGE AREA	AREA (AC)	Q_{50} (CFS)	Pipe Size (IN)	Length (FT)	Slope (%)	Velocity (fps)	Ti (MIN)	Tc (MIN)	I_{50} (IN/HR)	C*	$Q_{50\ Area}$ (CFS)	$Q_{50\ TOTAL}$ (CFS)	Pipe Capacity (CFS)
A-2	11.35	18.30	**18**	**577.00**	**0.89%**	**5.61**	1.71	6.85	**3.80**	0.90	38.82	55.37	9.91
A-3	11.44	55.37	**24**	**472.00**	**1.00%**	**7.20**	1.09	7.94	**3.50**	0.90	36.04	87.03	22.62
A-4	18.15	87.03	**30**	**600.00**	**0.40%**	**5.28**	1.89	9.84	**3.30**	0.90	53.91	135.97	25.94
A-5	27.33	135.97	**4'x2'**	**925.00**	**0.16%**	**3.49**	4.42	14.25	**2.75**	0.90	67.64	180.95	27.91
A-6	22.85	180.95	**36**	**82.00**	**0.30%**	**5.17**	0.26	14.52	**2.75**	0.90	56.55	237.50	36.53

* 15% Impervious = 85/90*0.95=0.90

AREA B - East Side of Parking Lot (AREA & FLOW REMAIN THE SAME

OVERLAND FLOW

DRAINAGE AREA	OVERLAND AREA (AC)	L (FT)	H (FT)	Slope (%)	Ti (MIN)	I_{50} (IN/HR)	C**	Q_{50} (CFS)
B-1	**12.14**	**1500**	**25.00**	1.67%	15.29	**2.70**	**0.84**	27.53

PIPE FLOW

DRAINAGE AREA	AREA (AC)	Q_{50} (CFS)	Pipe Size (IN)	Length (FT)	Slope (%)	Velocity (fps)	Ti (MIN)	Tc (MIN)	I_{50} (IN/HR)	C**	$Q_{50\ AREA}$ (CFS)	$Q_{50\ TOTAL}$ (CFS)	Pipe Capacity (CFS)
B-2	8.83	27.53	**36**	**300.00**	**0.76%**	**8.11**	0.62	15.90	**2.65**	0.90	21.06	48.08	58.14
B-3	20.43	48.08	**36**	**1100.00**	**0.76%**	**9.19**	1.99	17.90	**2.45**	0.84	42.04	86.50	58.14
B-4	20.07	86.50	**36**	**200.00**	**0.76%**	**8.23**	0.41	18.30	**2.45**	0.90	44.25	130.75	58.14

** 20% Impervious = 80/90*0.95=0.84 for Areas B-1 & B-3 and 15% Impervious = 85/90*0.95=0.90 for Areas B-2 & B-4

AREA C - Stadium (AREA & FLOW REMAIN THE SAME

OVERLAND FLOW - Tc of 5 minutes assumed since the majority of the area is structure and there is no true overland flow

DRAINAGE AREA	AREA (AC)	Tc (MIN)	I_{50} (IN/HR)	C	Q_{50} (CFS)	Pipe Capacity (CFS)
C-1	6.68	5.00	**4.20**	0.95	26.65	
C-2	2.31	5.00	**4.20**	0.45	4.37	
				TOTAL	31.02	21

SUMMARY

DRAINAGE AREA	AREA (AC)	I_{50} (IN/HR)	C	Q_{50} (CFS)
A	95.96	2.75	0.90	237.50
B	61.47	2.45	0.87	130.75
C	8.99	4.20	0.82	31.02
TOTAL	**166.42**			**399.27**

HYDRAULIC CALCULATIONS - PROPOSED CONDITIONS

COMPLETED BY:	KO	DATE:	7/7/2015
CHECKED BY:	KHG	DATE:	7/22/2015

Ti =Initital Overland Flow (Minutes) = 1.8*(1.1-C)*D^(1/2)/S^(1/3) for Urban Areas (Appendix I-E
D = Distance (ft), **S** = Slope in %
Tf = Pipe Travel Time (Minutes)
Tc = Time of Concentration (Minutes), Overland Flow and Pipe Travel Time
I_{100} = Rainfall Intensity for 50 year storm event (inches/hour) - Appendix I-B
C = 0.95 (Industrial) or 0.45 (Rural) per Table 2, page 82 of the DDM
Q_{100} = C*I*A = Flow for 100 year storm event

AREA A - West Side of Parking Lot (AREA & FLOW REMAIN THE SAME

OVERLAND FLOW

DRAINAGE AREA	OVERLAND AREA (AC)	L (FT)	H (FT)	Slope (%)	Ti (MIN)	I_{100} (IN/HR)	C*	Q_{100} (CFS)
A-1	**4.84**	**670**	**40.00**	5.97%	5.14	**4.40**	**0.90**	19.17

PIPE FLOW

DRAINAGE AREA	AREA (AC)	Q_{50} (CFS)	Pipe Size (IN)	Length (FT)	Slope (%)	Velocity (fps)	Ti (MIN)	Tc (MIN)	I_{100} (IN/HR)	C	$Q_{100\ Area}$ (CFS)	$Q_{100\ TOTAL}$ (CFS)	Pipe Capacity (CFS)
A-2	11.35	19.17	**18**	**577.00**	**0.89%**	**5.61**	1.71	6.85	**4.00**	0.90	40.86	58.28	9.91
A-3	11.44	58.28	**24**	**472.00**	**1.00%**	**7.20**	1.09	7.94	**3.75**	0.90	38.61	93.25	22.62
A-4	18.15	93.25	**30**	**600.00**	**0.40%**	**5.28**	1.89	9.84	**3.45**	0.90	56.36	142.15	25.94
A-5	27.33	142.15	**4'x2'**	**925.00**	**0.16%**	**3.49**	4.42	14.25	**3.00**	0.90	73.79	197.40	27.91
A-6	22.85	197.40	**36**	**82.00**	**0.30%**	**5.17**	0.26	14.52	**2.95**	0.90	60.67	254.77	36.53

* 15% Impervious = 85/90*0.95=0.90

AREA B - East Side of Parking Lot (AREA & FLOW REMAIN THE SAME

OVERLAND FLOW

DRAINAGE AREA	OVERLAND AREA (AC)	L (FT)	H (FT)	Slope (%)	Ti (MIN)	I_{100} (IN/HR)	C**	Q_{100} (CFS)
B-1	**12.14**	**1500**	**25.00**	1.67%	15.29	**2.90**	**0.84**	29.57

PIPE FLOW

DRAINAGE AREA	AREA (AC)	Q_{50} (CFS)	Pipe Size (IN)	Length (FT)	Slope (%)	Velocity (fps)	Ti (MIN)	Tc (MIN)	I_{100} (IN/HR)	C**	Q_{100} (CFS)	$Q_{100\ TOTAL}$ (CFS)	Pipe Capacity (CFS)
B-2	8.83	29.57	**36**	**300.00**	**0.76%**	**8.26**	0.61	15.89	**2.80**	0.90	22.25	50.80	58.14
B-3	20.43	50.80	**36**	**1100.00**	**0.76%**	**9.25**	1.98	17.87	**2.65**	0.84	45.48	93.56	58.14
B-4	20.07	93.56	**36**	**200.00**	**0.76%**	**8.23**	0.41	18.28	**2.60**	0.90	46.96	138.76	58.14

** 20% Impervious = 80/90*0.95=0.84 for Areas B-1 & B-3 and 15% Impervious = 85/90*0.95=0.90 for Areas B-2 & B-4

AREA C - Stadium (AREA & FLOW REMAIN THE SAME

OVERLAND FLOW - Tc of 5 minutes assumed since the majority of the area is structure and there is no true overland flow

DRAINAGE AREA	AREA (AC)	Tc (MIN)	I_{100} (IN/HR)	C	Q_{100} (CFS)	Pipe Capacity (CFS)
C-1	6.68	5.00	**4.40**	0.95	27.92	
C-2	2.31	5.00	**4.40**	0.45	4.57	
				TOTAL	32.50	21

SUMMARY

DRAINAGE AREA	AREA (AC)	I_{100} (IN/HR)	C	Q_{100} (CFS)
A	95.96	2.95	0.90	254.77
B	61.47	2.60	0.87	138.76
C	8.99	4.40	0.82	32.50
TOTAL	**166.42**			**426.03**

Storm Water Quality Management Plan

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July 21, 2015

Ms. Kris Shackelford
City of San Diego
1222 First Avenue
San Diego, CA 92101

Subject: Qualcomm Stadium Relocation Environmental Impact Report
Priority Development Project Storm Water Quality Management Plan

Ms. Shackelford:

This report, including all checklists and attachments, was prepared in accordance with the *Model BMP Design Manual, San Diego Region, for Permanent Site Design, Storm Water Treatment and Hydromodification Management*, dated June 2015. Its purpose is to summarize the considerations given to permanent source control measures, site design Best Management Practices (BMPs), and structural BMPs for the subject project and to document the related calculations, plan sheets, and the Operation & Maintenance (O&M) Plan.

The subject project involves the relocation of the existing Qualcomm stadium to a new location within the existing project site, the demolition of the existing stadium, and new grading and pavement at the site of the demolished stadium to extend the parking lot. It is classified as a Priority Development Project (PDP) and requires a PDP Storm Water Quality Management Plan (SWQMP).

The submittal requirements for the SWQMP and their fulfillments are outlined below:

Submittal Requirement	Location
Project Identification & Summary	Forms I-1, I-2, I-3
Consideration and implementation of permanent source control and site design BMPs	Forms I-4, I-5
Structural BMPs: selection process	Form I-6, I-7, I-8
Structural BMPs: performance calculations	Appendix A
Structural BMPs: O&M requirements	Appendix B
Structural BMPs: O&M maintenance mechanisms (unknown at this time)	Appendix B
Pollutant Control Checklists	Appendix C
Hydromodification Management Checklists	N/A
Plan Sheets (Planning Phase Project Exhibits)	Appendix D

Sincerely,

Keri Gannon, PE
CC: Project File

Applicability of Permanent, Post-Construction Storm Water BMP Requirements (Storm Water Intake Form for all Development Permit Applications)	Form I-1

Project Identification

Project Name: Qualcomm Stadium Relocation Environmental Impact Report (EIR)

Permit Application Number: N/A | Date: 7/14/2015

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 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 exception to PDP definitions? To answer this item, see Section 1.4 of the manual *in its entirety* for guidance, AND complete Form I-2, Project Type Determination.	□ Standard Project	Stop. Standard Project requirements apply, including Standard Project SWQMP.
	■ PDP	PDP requirements apply, including PDP SWQMP. Go to Step 3.
	□ Exception to PDP definitions	Stop. Standard Project requirements apply. Provide discussion and list any additional requirements below. Prepare Standard Project SWQMP.

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

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 for guidance.	☐ Yes	Consult the [City Engineer] to determine requirements. Provide discussion and identify requirements below. Go to Step 4.
	■ No	BMP Design Manual PDP requirements apply. Go to Step 4.
Discussion / justification of prior lawful approval, and identify requirements (*not required if prior lawful approval does not apply*):		
Step 4. Do hydromodification control requirements apply? See Section 1.6 of the manual 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: The proposed project directly discharges runoff into the San Diego River, which is an exempt river reach per the Watershed Management Area Analysis (WMAA) for the San Diego River watershed.		
Step 5. Does protection of critical coarse sediment yield areas apply? See Section 6.2 of the manual 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: Critical coarse sediment yield does not apply because the proposed project is exempt from hydromodification management criteria.		

Project Type Determination Checklist			Form I-2
Project Information			
Project Name: Qualcomm Stadium Relocation Environmental Impact Report (EIR)			
Permit Application Number:			
Project Type Determination: Standard Project or PDP			
The project is (select one): ☐ New Development ■ Redevelopment			
The total proposed newly created or replaced impervious area is: 6,161,998 ft² (141.46) acres			
Is the project in any of the following categories, (a) through (f)?			
Yes ☐	No ■	(a)	New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.
Yes ■	No ☐	(b)	Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site 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 ☐	(c)	New and redevelopment projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses: (i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption SIC code 5812). (ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater. (iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce. (iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

Form I-2 Page 2 of 2			
Yes ■	No □	(d)	New or redevelopment projects that create or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging 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). Note: ESAs are areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and SDRWQCB; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and SDRWQCB; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees. See manual Section 1.4.2 for additional guidance.
Yes □	No ■	(e)	New development projects that support one or more of the following uses: (i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following SIC codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. (ii) Retail gasoline outlets. This category includes retail gasoline outlets that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic of 100 or more vehicles per day.
Yes ■	No □	(f)	New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction. *Note: See manual Section 1.4.2 for additional guidance.*

Does the project meet the definition of one or more of the PDP categories (a) through (f) listed above?

□ No – the project is not a PDP (Standard Project).

■ Yes – the project is a PDP.

The following is for redevelopment PDPs only:

The area of existing (pre-project) impervious area at the project site is: 7,148,632 ft² (A)

The total proposed newly created or replaced impervious area is: 6,161,998 ft² (B)

Percent impervious surface created or replaced (A/B)*100: 86 %

The percent impervious surface created or replaced is (select one based on the above calculation):

□ less than or equal to fifty percent (50%) – only new impervious areas are considered PDP

OR

■ greater than fifty percent (50%) – the entire project site is a PDP

Site Information Checklist For PDPs	Form I-3B (PDPs)
Project Summary Information	
Project Name	Qualcomm Stadium Relocation EIR
Project Address	9449 Friars Road San Diego, CA
Assessor's Parcel Number(s)	7602411602, 4332501300
Permit Application Number	N/A
Project Watershed (Hydrologic Unit)	Select One: ☐ Santa Margarita 902 ☐ San Luis Rey 903 ☐ Carlsbad 904 ☐ San Dieguito 905 ☐ Penasquitos 906 ■ San Diego 907 ☐ Pueblo San Diego 908 ☐ Sweetwater 909 ☐ Otay 910 ☐ Tijuana 911
Parcel Area (total area of Assessor's Parcel(s) associated with the project)	166.42 _____ Acres (_____ Square Feet)
Area to be disturbed by the project (Project Area)	166.42 _____ Acres (_____ Square Feet)
Project Proposed Impervious Area (subset of Project Area)	141.46 _____ Acres (_____ Square Feet)
Project Proposed Pervious Area 15% (subset of Project Area)	24.96 _____ Acres (_____ Square Feet)
Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Parcel Area.	

Form I-3B Page 2 of 9

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 site consists of the existing Qualcomm stadium and associated parking lot. There are three existing storm drain systems which convey runoff from the project site to the San Diego River. There is no run-on outside of the project boundary aside from run-on from the San Diego River and Murphy Canyon Creek during flooding conditions. Run-on from Murphy Canyon Creek will be addressed as part of the proposed project to minimize flood hazards.

Existing Land Cover Includes (select all that apply):

- ■ Vegetative Cover
- ■ Non-Vegetated Pervious Areas
- ■ Impervious Areas

Description / Additional Information:

The site consists of the existing stadium and associated practice, parking, landscape and maintenance areas.

Underlying Soil belongs to Hydrologic Soil Group (select all that apply):

- □ NRCS Type A
- □ NRCS Type B
- □ NRCS Type C
- ■ NRCS Type D

The soil type is not identified on the County of San Diego soils map. It is assumed to be Soil Type D in order to assume worst case scenario.

Approximate Depth to Groundwater:

- □ Groundwater Depth < 5 feet
- ■ 5 feet < Groundwater Depth < 10 feet
- ■ 10 feet < Groundwater Depth < 20 feet
- ■ Groundwater Depth > 20 feet

The groundwater is at an elevation of 40 feet, and the site elevations range from 50 feet to 80 feet.

Existing Natural Hydrologic Features (select all that apply):

- □ Watercourses
- □ Seeps
- □ Springs
- □ Wetlands
- ■ None

Description / Additional Information:

The entire site is completely developed and all run-off is conveyed by underground storm drain systems. The San Diego River runs along the southern edge of the project site. Murphy Canyon Creek runs along the eastern boundary of the project site.

Form I-3B Page 3 of 9

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) describe existing constructed storm water conveyance systems, if applicable; and (3) is runoff from offsite conveyed through the site? If so, describe]:

The existing drainage conveyance for the existing stadium is urban. There are three separate underground storm drain systems within the project site, all of which outlet directly to the San Diego River. One storm drain system conveys run-off from the stadium only, and the other two systems convey run-off from the parking lot. The parking lot is split into two watersheds. The general flow pattern for the eastern side of the parking lot is from north to south and west to east; the flow pattern for the western side of the parking lot is from north to south and east to west. The majority of the run-off from the site sheet flows across the parking lot to the nearest inlet. The existing storm drain facilities are undersized and do not convey the design flows, resulting in surface ponding in the parking lot areas. The existing flap gate and storm drain design causes flooding of the existing stadium in high tailwater conditions in the San Diego River. Both the San Diego River and Murphy Canyon Creek flood the parking lot area in significant storm events.

Form I-3B Page 4 of 9

Description of Proposed Site Development and Drainage Patterns

Project Description / Proposed Land Use and/or Activities:

The project involves the relocation of the existing stadium to the northeast corner. The existing stadium will be demolished and the area re-graded to create more parking. The stadium site includes a parking lot used for sports and other special events.

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

The proposed impervious features of the project include parking lots and the stadium.

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

The proposed pervious features of the project include the stadium field and landscaped and pervious paved areas throughout the project site. Some of the proposed pervious areas would also serve as storm water treatment areas.

Does the project include grading and changes to site topography?

■ Yes

□ No

Description / Additional Information:

The existing stadium was built on top of an earth dome to raise it out of the 100-year floodplain. The new stadium will also be constructed on an earthen dome for the same reason. The existing earthen dome will be regraded to match the parking lot once the existing stadium is demolished.

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

■ Yes

□ No

Description / Additional Information:

In order to keep the existing drainage patterns and flow rates the same in the post-project condition as in the pre-project condition, new underground storm drain conveyance systems will be constructed. These new systems will connect into the existing systems and the flow rate and tributary area to each system will remain unchanged. The storm drain system will also facilitate connection to storm water treatment facilities distributed throughout the project site.

Form I-3B Page 5 of 9

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

Form I-3B Page 6 of 9

Identification of Receiving Water Pollutants of Concern

Describe path of storm water from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable):

Run-off from the project site sheet flows across the project site and into underground storm drain systems, which outlet to the San Diego River and ultimately the Pacific Ocean.

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 for the impaired water bodies:

303(d) Impaired Water Body	Pollutant(s)/Stressor(s)	TMDLs
San Diego River (Lower)	Fecal coliform	Twenty Beaches and Creeks TMDL
	Enterococcus, Low Dissolved Oxygen, Manganese, Nitrogen, Phosphorus, Total Dissolved Solids, Toxicity	N/A

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 expected from the project site based on all proposed use(s) of the site (see manual Appendix B.6):

Pollutant	Not Applicable to the Project Site	Expected 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 7 of 9

Hydromodification Management Requirements

Do hydromodification management requirements apply (see Section 1.6 of the manual)?

☐ Yes, hydromodification management flow control structural BMPs required.

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

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

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

Description / Additional Information (to be provided if a 'No' answer has been selected above):
The project outlets directly to the San Diego River, which is an exempt river reach.

Critical Coarse Sediment Yield Areas*

***This Section only required if hydromodification management requirements apply**

Based on the maps provided within the WMAA, do potential critical coarse sediment yield areas exist within the project drainage boundaries?

☐ Yes

☐ No, no critical coarse sediment yield areas to be protected based on WMAA maps

If yes, have any of the optional analyses presented in Section 6.2 of the manual been performed?

☐ 6.2.1 Verification of GLUs Onsite

☐ 6.2.2 Downstream Systems Sensitivity to Coarse Sediment

☐ 6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite

☐ No optional analyses performed, the project will avoid critical coarse sediment yield areas identified based on WMAA maps

If optional analyses were performed, what is the final result?

☐ No critical coarse sediment yield areas to be protected based on verification of GLUs onsite.

☐ Critical coarse sediment yield areas exist but additional analysis has determined that protection is not required. Documentation attached in Attachment 8 of the SWQMP.

☐ Critical coarse sediment yield areas exist and require protection. The project will implement management measures described in Sections 6.2.4 and 6.2.5 as applicable, and the areas are identified on the SWQMP Exhibit.

Discussion / Additional Information:

Form I-3B Page 8 of 9
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.
Has a geomorphic assessment been performed for the receiving channel(s)?   ☐ No, the low flow threshold is 0.1Q2 (default low flow threshold)   ☐ Yes, the result is the low flow threshold is 0.1Q2   ☐ Yes, the result is the low flow threshold is 0.3Q2   ☐ Yes, the result is the low flow threshold is 0.5Q2   If a geomorphic assessment has been performed, provide title, date, and preparer: Discussion / Additional Information: (optional)

Form I-3B Page 9 of 9
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. The existing site is in the 100-yr and 500-yr floodplain of the San Diego River. The design of all BMPs and maintenance requirements will take this into consideration. The 100-yr floodplain from Murphy Canyon Creek also could impact the project site, which will be taken into consideration during the design phase. There are also set-backs from the River Corridor Area that need to be adhered to, as well as open space planning. In addition, storm water management facilities will be limited by soils conditions, high groundwater table, and the existing groundwater contaminant plume under the project site. Infiltration is infeasible due to a high groundwater table and groundwater contamination.
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 All Development Projects (Standard Projects and PDPs)	Form I-4

Project Identification

Project Name Qualcomm Stadium Relocation Environmental Impact Report (EIR)

Permit Application Number N/A

Source Control BMPs

All development projects must implement source control BMPs SC-1 through SC-6 where applicable and feasible. See Chapter 4 and Appendix E of the manual 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 manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification may be provided.

Source Control Requirement	Applied?		
SC-1 Prevention of Illicit Discharges into the MS4	■ Yes	□ No	□ N/A
Discussion / justification if SC-1 not implemented:			
SC-2 Storm Drain Stenciling or Signage	■ Yes	□ No	□ N/A
Discussion / justification if SC-2 not implemented:			
SC-3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	■ Yes	□ No	□ N/A
Discussion / justification if SC-3 not implemented:			
SC-4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	■ Yes	□ No	□ N/A
Discussion / justification if SC-4 not implemented:			

Form I-4 Page 2 of 2			
Source Control Requirement	**Applied?**		
SC-5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	■ Yes	☐ No	☐ N/A
Discussion / justification if SC-5 not implemented:			
SC-6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below)			
■ Onsite 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 and equipment cleaning	■ 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
Discussion / justification if SC-6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for all "No" answers shown above.			

Site Design BMP Checklist for All Development Projects (Standard Projects and PDPs)	Form I-5

Project Identification

Project Name Qualcomm Stadium Relocation Environmental Impact Report (EIR)

Permit Application Number N/A

Site Design BMPs

All development projects must implement site design BMPs SD-1 through SD-8 where applicable and feasible. See Chapter 4 and Appendix E of the manual 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 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.

Site Design Requirement	Applied?		
SD-1 Maintain Natural Drainage Pathways and Hydrologic Features	☐ Yes	☐ No	■ N/A
Discussion / justification if SD-1 not implemented: The existing drainage pathways will be retained but they are not natural hydrologic features. The project will impact the San Diego River and Murphy Canyon Creek floodplains. A temporary displacement of floodplain will occur during construction; however, upon construction completion, the displaced floodplain will be compensated for by the old stadium footprint. Run-on from Murphy Canyon Creek will be conveyed through the site as in existing conditions.			
SD-2 Conserve Natural Areas, Soils, and Vegetation	☐ Yes	☐ No	■ N/A
Discussion / justification if SD-2 not implemented: There are no natural areas on the project site.			
SD-3 Minimize Impervious Area	■ Yes	☐ No	☐ N/A
Discussion / justification if SD-3 not implemented: The majority of the project site is impervious area, however landscaped areas and porous paving will be utilized to the maximum extent practicable. The proposed project will reduce the impervious area of the project site as compared to existing conditions. Some of the proposed pervious areas will be utilized as storm water management features.			
SD-4 Minimize Soil Compaction	■ Yes	☐ No	☐ N/A
Discussion / justification if SD-4 not implemented: Soil compaction will be minimized in the proposed landscaped areas.			

Form I-5 Page 2 of 2			
Site Design Requirement	**Applied?**		
SD-5 Impervious Area Dispersion	■ Yes	□ No	□ N/A
Discussion / justification if SD-5 not implemented: Run-off from impervious areas will be routed to pervious areas where practicable.			
SD-6 Runoff Collection	■ Yes	□ No	□ N/A
Discussion / justification if SD-6 not implemented: Run-off will be collected as close to the source to the maximum extent practicable and as site design allows. The final runoff collection points and storm water facilities will be determined during the design phase.			
SD-7 Landscaping with Native or Drought Tolerant Species	■ Yes	□ No	□ N/A
Discussion / justification if SD-7 not implemented: All landscape design will utilize native and drought-tolerant species.			
SD-8 Harvesting and Using Precipitation	■ Yes	□ No	□ N/A
Discussion / justification if SD-8 not implemented: It is anticipated that a portion of the run-off will be retained for reuse on the project site.			

Summary of PDP Structural BMPs	Form I-6 (PDPs)

Project Identification

Project Name Qualcomm Stadium Relocation Environmental Impact Report (EIR)

Permit Application Number N/A

PDP Structural BMPs

All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the manual). 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 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 local jurisdiction at the completion of construction. This may include requiring the project owner or project owner's representative to certify construction of the structural BMPs (see Section 1.12 of the manual). PDP structural BMPs must be maintained into perpetuity, and the local jurisdiction must confirm the maintenance (see Section 7 of the 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 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.

This project is not subject to the hydromodification requirements, therefore, the structural BMPs are designed for pollutant control only. The methodology in Section 5.1 was followed to select and size the proposed structural BMPs. Infiltration is infeasible within the project site due to a high groundwater table and existing groundwater contamination. The only option for retention without infiltration is harvest and reuse. For the total project area, 243,910 cubic-feet of retention will be needed. Biofiltration will also be provided for the volume unable to be reused. Reuse options include irrigation for the landscaped areas, vehicle washing, evaporative cooling, and toilet flushing. There would be three retention basins; one underneath the playing field, one within the east parking area, and one within the west parking area. Due to the high groundwater table and the flooding potential, underground retention basins would be designed to withstand these conditions. The maximum amount of area needed for biofiltration would be approximately 195,000 square feet. This area would decrease depending on the amount of runoff able to be retained for reuse. The biofiltration would be provided along the northern side of the existing overhead trolley line or dispersed throughout the parking area.

Form I-6 Page 2 of 4

(Page reserved for continuation of description of general strategy for structural BMP implementation at the site)

(Continued from page 1)

The biofiltration system would be interconnected and designed along with interior circulation elements. The biofiltration system would need to be maintained in proper order to ensure the pollutants captured would not be dislodged during a flood event. Both the retention basins and biofiltration areas would need an impermeable liner since infiltration is not recommended due to the high groundwater and existing contamination.

Four BMP options are proposed as shown in the Proposed Structural BMPs exhibit:

Option 1 is only retention and reuse;

Option 2 only involves bioretention along the southern boundary of the site;

Option 3 only involves bioretention dispersed throughout the parking lot; and

Option 4 is a combination of retention and biofiltration (this is the preferred option, with the majority of treatment occurring via biofiltration).

Form I-6 Page 3 of 4 (Copy as many as needed)
Structural BMP Summary Information **(Copy this page as needed to provide information for each individual proposed structural BMP)**
Structural BMP ID No. 1 (there will be multiple harvest and use retention facilities throughout the site)
Construction Plan Sheet No. N/A
Type of structural BMP: ■ Retention by harvest and use (HU-1) □ Retention by infiltration basin (INF-1) □ Retention by bioretention (INF-2) □ Retention by permeable pavement (INF-3) □ Partial retention by biofiltration with partial retention (PR-1) □ Biofiltration (BF-1) □ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) □ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) □ Flow-thru treatment control with alternative compliance (provide BMP type/description in 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 forms if required by the [City Engineer] (See Section 1.12 of the manual)	The Engineer of Record
Who will be the final owner of this BMP?	The City of San Diego
Who will maintain this BMP into perpetuity?	The City of San Diego
What is the funding mechanism for maintenance?	Not known at this time.

Discussion (as needed):
This project is only in the environmental planning stages; therefore, details of the certification, maintenance, and funding are not known at this time.

Form I-6 Page 4 of 4 (Copy as many as needed)

Structural BMP Summary Information

(Copy this page as needed to provide information for each individual proposed structural BMP)

Structural BMP ID No. 2 (there will be multiple biofiltration facilities distributed throughout the site)

Construction Plan Sheet No. N/A

Type of structural BMP:

- ☐ Retention by harvest and use (HU-1)
- ☐ Retention by infiltration basin (INF-1)
- ☐ Retention by bioretention (INF-2)
- ☐ Retention by permeable pavement (INF-3)
- ☐ Partial retention by biofiltration with partial retention (PR-1)
- ■ Biofiltration (BF-1)
- ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below)
- ☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below)
- ☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in 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 forms if required by the [City Engineer] (See Section 1.12 of the manual)	Engineer of Record
Who will be the final owner of this BMP?	The City of San Diego
Who will maintain this BMP into perpetuity?	The City of San Diego
What is the funding mechanism for maintenance?	Unknown at this time

Discussion (as needed):

This project is only in the environmental planning stages; therefore, details of the certification, maintenance, and funding are not known at this time.

Harvest and Use Feasibility Checklist	Form I-7

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

- ■ Toilet and urinal flushing
- ■ Landscape irrigation
- ■ Other: Vehicle Washing, Evaporative Cooling

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.

To be completed during the planning-level phase of the project. The harvest and use demand is not expected to be close to the required retention volume.

3. Calculate the DCV using worksheet B-2.1.

DCV = 243,910 (cubic feet)

3a. Is the 36 hour demand greater than or equal to the DCV?	3b. Is the 36 hour demand greater than 0.25DCV but less than the full DCV?	3c. Is the 36 hour demand less than 0.25DCV?
☐ Yes / ☐ No ⇨	☐ Yes / ☐ No ⇨	☐ Yes
⇩ Possible	⇩ Possible	⇩ Unlikely
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.

Harvest and reuse on this project site appears feasible at this preliminary level; however, whether full or partial harvest and reuse is feasible would be determined during a later phase of this project. Most likely,only a small portion of the DCV will be able to be harvested and reused, so biofiltration would be provided for the remaining DCV.

Categorization of Infiltration Feasibility Condition	Form I-8

Part 1 - Full Infiltration Feasibility Screening Criteria

Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?

Criteria	Screening Question	Yes	No
1	**Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		✓

Provide basis: The soil type is not identified on the County of San Diego soils map. The soil is therefore assumed to be Type D (worst-case scenario), which has an infiltration rate less than 0.5 in/hr. Further investigation will be needed during the planning phase of this project.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

2	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		

Provide basis:

Unknown at this time. Further investigation will be needed.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

Form I-8 Page 2 of 4			
Criteria	Screening Question	**Yes**	**No**
3	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		✓
Provide basis: The groundwater below the existing stadium is contaminated. Based on the size of the contamination plume and the 1,000-foot recommended buffer, there is no location on the project site that is suitable for infiltration. During the planning phase, the characteristics of the contamination can be further investigated and infiltration re-evaluated. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
4	**Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		✓
Provide basis: See discussion above. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
Part 1 Result *	If all answers to rows 1 - 4 are "**Yes**" a full infiltration design is potentially feasible. The feasibility screening category is **Full Infiltration** If any answer from row 1-4 is "**No**", infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design. Proceed to Part 2		

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

Form I-8 Page 3 of 4

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

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

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

Provide basis: See the response to Criteria 1.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

6	**Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level**? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		

Provide basis: See the response to Criteria 2.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

Form I-8 Page 4 of 4			
Criteria	Screening Question	**Yes**	**No**
7	**Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		✓
Provide basis: The groundwater is only 10 feet below the surface in many areas of the project site. Also, there is a large contamination plume underneath the majority of the project site. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
8	**Can infiltration be allowed without violating downstream water rights**? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		✓
Provide basis: See the response to Criteria 3 and Criteria 7. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
Part 2 Result*	If all answers from row 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is **Partial Infiltration.** If any answer from row 5-8 is no, then infiltration of any volume is considered to be **infeasible** within the drainage area. The feasibility screening category is **No Infiltration.**		

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

APPENDIX A
Structural BMPs: Performance Calculations

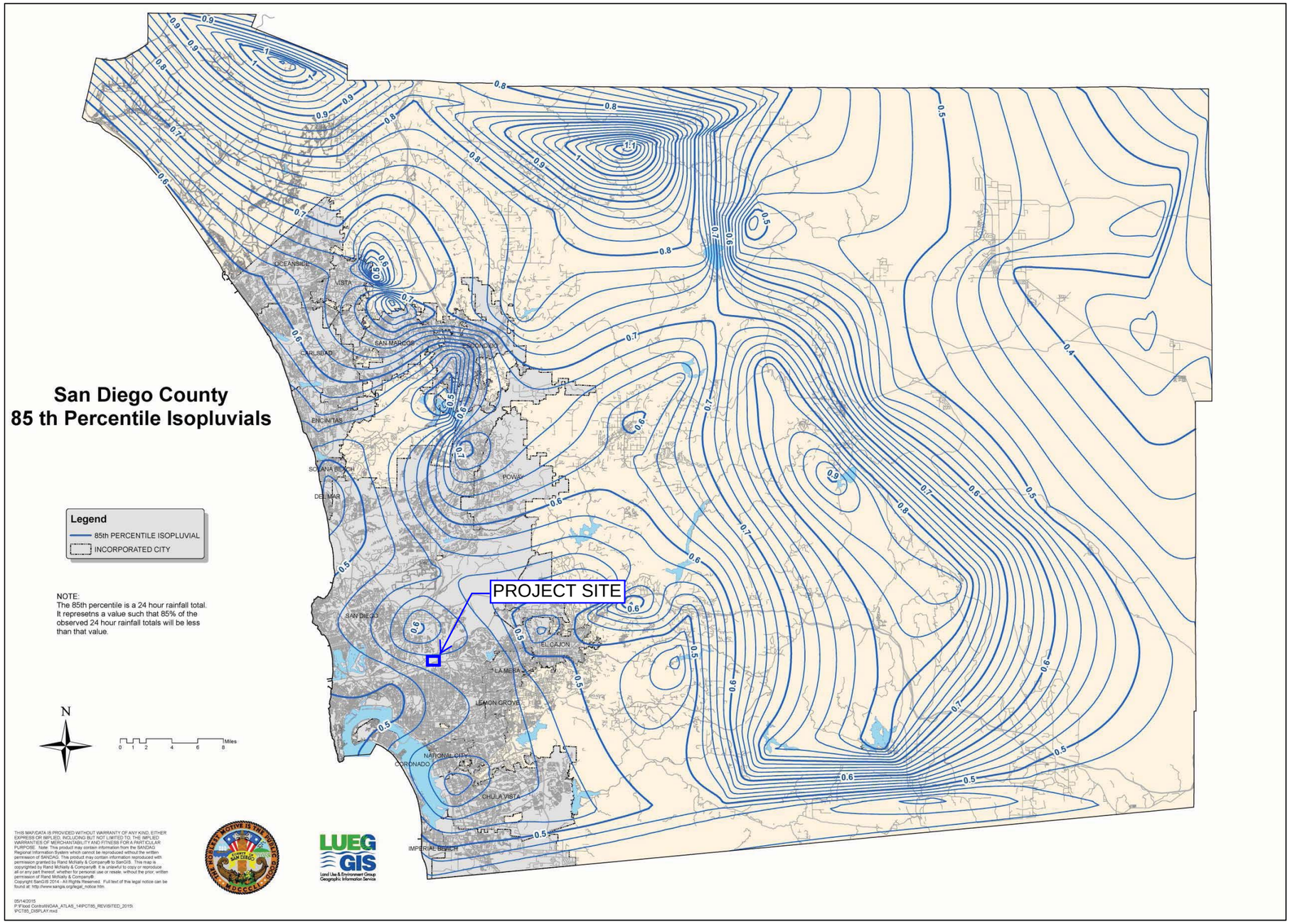


Figure A.1-1: 85th Percentile 24-hour Isopluvial Map

COMPLETED BY:	KHG	DATE:	7/10/2015
CHECKED BY:		DATE:	

50% Development Rule

Existing Project Site Impervious Area (acres)	164.11
Minimum Impacted Project Site Impervious Area (acres)	141.46
Percentage of Impacted Area to Project Area (%)	86%

Design Capture Volume

DCV = Design Capture Volume (cubic feet)
C x d x A x 43,560(sf/ac) x 1/12(in/ft)
C = Runoff factor, per B.1.1 of the Final SD Model BMP Design Manual
d = 85th percentile, 24-hr storm event railfall depth (inches), Per B.1.3
A = Tributrary area (acres)

DMA	Area	85th % Rainfall Depth	Surface Cover	C-Value	Volume	Volume
	(acres)	(inches)		(unit-less)	(cubic-feet)	(acre-feet)
DMA A	95.96	0.55	Parking lot	0.90	172,426	3.96
DMA B	61.47	0.55	Parking lot	0.90	110,452	2.54
DMA C-1	2.31	0.55	Field	0.10	461	0.01
DMA C-2	6.68	0.55	Stadium	0.90	12,003	0.28
Note: see Figure 3-Proposed Structural BMPs				TOTAL	295,342	6.78

Reductions

STREET TREES

DMA	Area	% Landscaped Area	Landscaped Area	Area Per 5' Tree	Total Number of Trees	Credit per 5' Tree	Volume Reduction
	(acres)	(%)	(acres)	(acres)		(cubic-feet)	(cubic-feet)
DMA A	95.96	7.50%	7.20	0.0023	3,135	10	31,350
DMA B	61.47	7.50%	4.61	0.0023	2,008	10	20,082
DMA C-1	2.31	0%	0.00	0.0000	0	10	0
DMA C-2	6.68	0%	0.00	0.0000	0	10	0
						TOTAL	51,432

Total 85th Percentile Volume Required to be Retained

DMA	85th Percentile Volume	Volume Reduction	Required Volume
	(cubic-feet)	(cubic-feet)	(cubic-feet)
DMA A	172,426	31,350	141,076
DMA B	110,452	20,082	90,370
DMA C-1	461	0	461
DMA C-2	12,003	0	12,003
		TOTAL	**243,910**
TOTAL AREA (Assumed a 4' depth)			**60,977**

BIOFILTRATION

Area Required (sf)	193,555	(see Worksheet B.5-1)
Project Length Along Southern Edge (ft)	3,000	
Width Required (ft)	65	

DMA - A

Worksheet B.2-1. DCV

Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.55	inches
2	Area tributary to BMP (s)	A=	95.96	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.90	unitless
4	Street trees volume reduction	TCV=	31,350	cubic-feet
5	Rain barrels volume reduction	RCV=	N/A	cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=	141,076	cubic-feet

Assumptions for Street Trees:

7.5% of the tributary area
Area needed per tree is 100 square-feet
Total number of trees = 3,135
Credit is 10 cubic-feet per tree

DMA - B

Worksheet B.2-1. DCV

Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.55	inches
2	Area tributary to BMP (s)	A=	61.47	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.90	unitless
4	Street trees volume reduction	TCV=	20,082	cubic-feet
5	Rain barrels volume reduction	RCV=	N/A	cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=	90,370	cubic-feet

Assumptions for Street Trees:

7.5% of the tributary area
Area needed per tree is 100 square-feet
Total number of trees = 2,008
Credit is 10 cubic-feet per tree

DMA - C-1

Worksheet B.2-1. DCV

Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.55	inches
2	Area tributary to BMP (s)	A=	2.31	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.10	unitless
4	Street trees volume reduction	TCV=	N/A	cubic-feet
5	Rain barrels volume reduction	RCV=	N/A	cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=	461	cubic-feet

DMA - C-2

Worksheet B.2-1. DCV

Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.55	inches
2	Area tributary to BMP (s)	A=	6.68	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.90	unitless
4	Street trees volume reduction	TCV=	N/A	cubic-feet
5	Rain barrels volume reduction	RCV=	N/A	cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=	12,003	cubic-feet

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

Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1	
1	Remaining DCV after implementing retention BMPs	243,910	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0.0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36	hours
4	Depth of runoff that can be infiltrated [Line 2 x Line 3]	0.0	inches
5	Aggregate pore space	0.40	in/in
6	Required depth of gravel below the underdrain [Line 4/ Line 5]	0.0	inches
7	Assumed surface area of the biofiltration BMP	150,450	sq-ft
8	Media retained pore space	0.1	in/in
9	Volume retained by BMP [[Line 4 + (Line 12 x Line 8)]/12] x Line 7	22,568	cubic-feet
10	DCV that requires biofiltration [Line 1 – Line 9]	221,343	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	6	inches
12	Media Thickness [18 inches minimum]	18	inches
13	Aggregate Storage above underdrain invert (12 inches typical) – use 0 inches for sizing if the aggregate is not over the entire bottom surface area	12	inches
14	Media available pore space	0.2	in/in
15	Media filtration rate to be used for sizing	5	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6	hours
17	Depth filtered during storm [Line 15 x Line 16]	30	inches
18	Depth of Detention Storage [Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5)]	14.4	inches
19	Total Depth Treated [Line 17 + Line 18]	44.4	inches
Option 1 – Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]	332,015	cubic-feet
21	Required Footprint [Line 20/ Line 19] x 12	89,734	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume [0.75 x Line 10]	166,007	cubic-feet
23	Required Footprint [Line 22/ Line 18] x 12	138,339	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	7,249,255	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.89	
26	Minimum BMP Footprint [Line 24 x Line 25 x 0.03]	193,555	sq-ft
25	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	193,555	sq-ft

Note: Line 7 is used to estimate the amount of volume retained by the BMP. Update assumed surface area in Line 7 until its equivalent to the required biofiltration footprint (either Line 21 or Line 23). Line 7 assumes continuous linear configuration and 50 feet wide. This is conceptual and different configurations would be proposed in final design.

Note: The original sizing assumption does not meet the requirements; therefore, the following worksheet provides verification that the 193,555 square feet does meet the requirements.

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

Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1	
1	Remaining DCV after implementing retention BMPs	243,910	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0.0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36	hours
4	Depth of runoff that can be infiltrated [Line 2 x Line 3]	0.0	inches
5	Aggregate pore space	0.40	in/in
6	Required depth of gravel below the underdrain [Line 4/ Line 5]	0.0	inches
7	Assumed surface area of the biofiltration BMP	193,555	sq-ft
8	Media retained pore space	0.1	in/in
9	Volume retained by BMP [[Line 4 + (Line 12 x Line 8)]/12] x Line 7	29,033	cubic-feet
10	DCV that requires biofiltration [Line 1 – Line 9]	214,877	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	6	inches
12	Media Thickness [18 inches minimum]	18	inches
13	Aggregate Storage above underdrain invert (12 inches typical) – use 0 inches for sizing if the aggregate is not over the entire bottom surface area	12	inches
14	Media available pore space	0.2	in/in
15	Media filtration rate to be used for sizing	5	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6	hours
17	Depth filtered during storm [Line 15 x Line 16]	30	inches
18	Depth of Detention Storage [Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5)]	14.4	inches
19	Total Depth Treated [Line 17 + Line 18]	44.4	inches
Option 1 – Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]	322,316	cubic-feet
21	Required Footprint [Line 20/ Line 19] x 12	87,112	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume [0.75 x Line 10]	161,158	cubic-feet
23	Required Footprint [Line 22/ Line 18] x 12	134,298	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	7,249,255	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.89	
26	Minimum BMP Footprint [Line 24 x Line 25 x 0.03]	193,555	sq-ft
25	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	193,555	sq-ft

Note: Line 7 is used to estimate the amount of volume retained by the BMP. Update assumed surface area in Line 7 until its equivalent to the required biofiltration footprint (either Line 21 or Line 23). Line 7 assumes continuous linear configuration and 65 feet wide. This is conceptual and different configurations would be proposed in final design.

APPENDIX B
Structural BMPs: O&M Requirements and Maintenance Mechanisms

AECOM

OPERATIONS AND MAINTENANCE PLAN – STADIUM RECONSTRUCTION

This Operation & Maintenance Plan is for the proposed structural BMPs as part of the relocation of Qualcomm Stadium. The structural BMPs include biofiltration systems, cisterns, and permeable pavement. Please refer to the other appendices for the location and description of each treatment facility, the drainage areas tributary to the facility, pervious and impervious areas, discharge point descriptions and locations, and the treatment capacity of each facility.

OWNERSHIP AND MAINTENANCE RESPONSIBILITY:
As owners of the project site, the City of San Diego is responsible for the long-term operation and maintenance of the structural BMPs of the proposed project, unless otherwise delegated through a maintenance agreement or tenant lease contract.

FUNDING SOURCE:
The funding source for this maintenance will be determined by the City of San Diego during the design phase of the project.

COST OF MAINTENANCE:
It is anticipated that 32 hours per month will be required to maintain the proposed structural BMPs. Assuming labor costs $120 per a two-man crew, the approximate yearly maintenance cost is $46,080. This cost does not take into account potential material costs such as new plants, re-seeding, paver replacements, and pump parts.

MAINTENANCE REQUIREMENTS:
Descriptions of the proposed structural BMPs, typical maintenance indicators, and maintenance actions are shown below.

Biofiltration
The landscaped areas within and adjacent to the parking lot will have biofiltration systems that filter runoff prior to outlet into the San Diego River.

Biofiltration (BF-1)	
Typical Maintenance Indicators	**Maintenance Actions**
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials, without damage to the vegetation.
Poor vegetation establishment	Re-seed, re-plant, or re-establish vegetation per original plans.
Overgrown vegetation	Mow or trim as appropriate, but not less than the design height of the vegetation per original plans when applicable (e.g. a vegetated swale may require a minimum vegetation height).
Erosion due to concentrated irrigation flow	Repair/re-seed/re-plant eroded areas and adjust the irrigation system.
Erosion due to concentrated storm water runoff flow	Repair/re-seed/re-plant eroded areas, and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or minor re-grading to restore proper

Biofiltration (BF-1)	
Typical Maintenance Indicators	**Maintenance Actions**
	drainage according to the original plan.
Standing water in vegetated swales	Make appropriate corrective measures such as adjusting irrigation systems, removing obstructions of debris or invasive vegetation, loosening or replacing top soil to allow for better infiltration, or minor re-grading for proper drainage.
Standing water in biofiltration areas for longer than 96 hours following a storm event*	Make appropriate corrective measures such as adjusting irrigation systems, removing obstructions of debris or invasive vegetation, clearing underdrains (where applicable), or repairing/replacing clogged or compacted soils.
Obstructed inlet or outlet structure	Clear obstructions.
Damage to structural components such as weirs, inlet or outlet structures	Repair or replace as applicable.
*These BMPs typically include a surface ponding layer as part of their function which may take 96 hours to drain following a storm event.	

Cistern

Cisterns are proposed for the project to capture runoff from the stadium and the surrounding parking lots for storage and reuse.

Cistern (HU-1)	
Typical Maintenance Indicators	**Maintenance Actions**
Obstructed inlet, outlet, or overflow outlet structure	Clear obstructions.
Damage to structural components such as the storage container, inlets, outlets, valves, piping, or overflow outlets	Repair or replace as applicable.

Permeable Pavement

Permeable pavement and/or pavers are proposed to reduce the volume of runoff and control pollutants.

Permeable Pavement (SD-6B)	
Typical Maintenance Indicators	**Maintenance Actions**
Accumulation of sediment, litter, or debris in infiltration basins, pre-treatment device, or on permeable pavement surface	Remove and properly dispose of accumulated materials.
Standing water in permeable paving area	Flush fine sediment from paving and subsurface gravel. Provide routine vacuuming of permeable paving areas to prevent clogging.
Damage to permeable paving surface	Repair or replace damaged surface as appropriate.

APPENDIX C
Pollutant Controls Checklist

If These Sources Will Be on the Project Site …	… Then Your SWQMP Shall Consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on Drawings**	**3** **Permanent Controls—List in Table and Narrative**	**4** **Operational BMPs—Include in Table and Narrative**
■ **A.** Onsite storm drain inlets ❑ Not Applicable	■ Locations of inlets.	■ Mark all inlets with the words "No Dumping! Flows to Bay" or similar.	■ Maintain and periodically repaint or replace inlet markings. ■ Provide storm water pollution prevention information to new site owners, lessees, or operators. ■ See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com. ■ Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on Drawings**	**3** **Permanent Controls—List in Table and Narrative**	**4** **Operational BMPs—Include in Table and Narrative**
■ **B.** Interior floor drains and elevator shaft sump pumps ❑ Not Applicable		■ State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.	■ Inspect and maintain drains to prevent blockages and overflow.
❑ **C.** Interior parking garages ■ Not Applicable		❑ State that parking garage floor drains will be plumbed to the sanitary sewer.	❑ Inspect and maintain drains to prevent blockages and overflow.
■ **D1.** Need for future indoor & structural pest control ❑ Not Applicable		■ Note building design features that discourage entry of pests.	■ Provide Integrated Pest Management information to owners, lessees, and operators.

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on Drawings**	**3** **Permanent Controls—List in Table and Narrative**	**4** **Operational BMPs—Include in Table and Narrative**
■ **D2.** Landscape/ Outdoor Pesticide Use ❑ Not Applicable	■ Show locations of existing trees or areas of shrubs and ground cover to be undisturbed and retained. ■ Show self-retaining landscape areas, if any. ■ Show storm water treatment facilities.	State that final landscape plans will accomplish all of the following. ■ Preserve existing drought tolerant trees, shrubs, and ground cover to the maximum extent possible. ■ Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to storm water pollution. ■ Where landscaped areas are used to retain or detain storm water, specify plants that are tolerant of periodic saturated soil conditions. ■ Consider using pest-resistant plants, especially adjacent to hardscape. ■ To ensure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	■ Maintain landscaping using minimum or no pesticides. ■ See applicable operational BMPs in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com. ■ Provide IPM information to new owners, lessees and operators.

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on Drawings**	**3** **Permanent Controls—List in Table and Narrative**	**4** **Operational BMPs—Include in Table and Narrative**
❑ **E.** Pools, spas, ponds, decorative fountains, and other water features. ■ Not Applicable	❑ Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet.	❑ If the local municipality requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.	❑ See applicable operational BMPs in Fact Sheet SC-72, "Fountain and Pool Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com.
■ **F.** Food service ❑ Not Applicable	■ For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment. ■ On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.	■ Describe the location and features of the designated cleaning area. ■ Describe the items to be cleaned in this facility and how it has been sized to ensure that the largest items can be accommodated.	

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on Drawings**	**3** **Permanent Controls—List in Table and Narrative**	**4** **Operational BMPs—Include in Table and Narrative**
■ **G.** Refuse areas ❑ Not Applicable	■ Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas. ■ If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run- on and show locations of berms to prevent runoff from the area. Also show how the designated area will be protected from wind dispersal. ■ Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.	■ State how site refuse will be handled and provide supporting detail to what is shown on plans. ■ State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	■ State how the following will be implemented: Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com.

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on Drawings**	**3** **Permanent Controls—List in Table and Narrative**	**4** **Operational BMPs—Include in Table and Narrative** **Table and Narrative**
❑ **H.** Industrial processes. ■ Not Applicable	❑ Show process area.	❑ If industrial processes are to be located onsite, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."	❑ See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com.
■ **I.** Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.) ❑ Not Applicable	■ Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or runoff from area and protected from wind dispersal. ■ Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults. ■ Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.	■ Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains. Where appropriate, reference documentation of compliance with the requirements of local Hazardous Materials Programs for: ▪ Hazardous Waste Generation ▪ Hazardous Materials Release Response and Inventory ▪ California Accidental Release Prevention Program ▪ Aboveground Storage Tank ▪ Uniform Fire Code Article 80 Section 103(b) & (c) 1991 ▪ Underground Storage Tank	■ See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com.

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on Drawings**	**3** **Permanent Controls—List in Table and Narrative**	**4** **Operational BMPs—Include in Table and Narrative**
■ **J.** Vehicle and Equipment Cleaning ❑ Not Applicable	■ Show on drawings as appropriate: (1) Commercial/industrial facilities having vehicle /equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses. (2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited onsite and hoses are provided with an automatic shut-off to discourage such use). (3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer. (4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.	■ If a car wash area is not provided, describe measures taken to discourage onsite car washing and explain how these will be enforced.	Describe operational measures to implement the following (if applicable): ■ Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system. ❑ Car dealerships and similar may rinse cars with water only. ■ See Fact Sheet SC-21, "Vehicle and Equipment Cleaning," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on Drawings**	**3** **Permanent Controls—List in Table and Narrative**	**4** **Operational BMPs—Include in Table and Narrative**
■ **K.** Vehicle/Equipment Repair and Maintenance ❑ Not Applicable	■ Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to protect from rainfall, run-on runoff, and wind dispersal. ■ Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas. ■ Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.	■ State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area. ■ State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements. ■ State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.	In the report, note that all of the following restrictions apply to use the site: ■ No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains. ■ No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately. ■ No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment.

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on Drawings**	**3** **Permanent Controls—List in Table and Narrative**	**4** **Operational BMPs—Include in Table and Narrative**
■ **L.** Fuel Dispensing Areas ❑ Not Applicable	■ Fueling areas[1] shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are (1) graded at the minimum slope necessary to prevent ponding; and (2) separated from the rest of the site by a grade break that prevents run-on of storm water to the MEP. ■ Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area1.] The canopy [or cover] shall not drain onto the fueling area.		■ The property owner shall dry sweep the fueling area routinely. ■ See the Business Guide Sheet, "Automotive Service—Service Stations" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com.

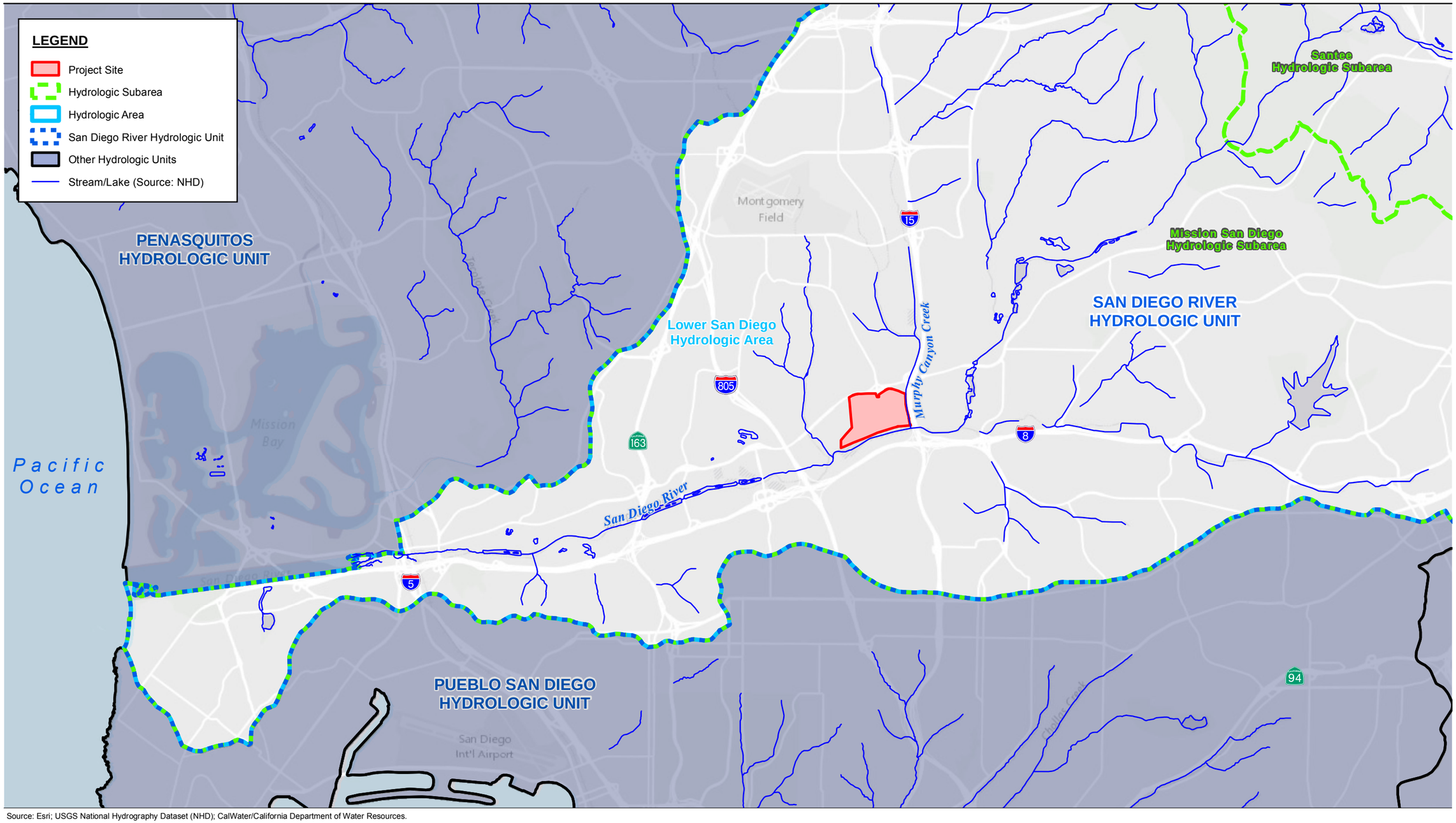
1. The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on Drawings**	**3** **Permanent Controls—List in Table and Narrative**	**4** **Operational BMPs—Include in Table and Narrative**
M. Loading Docks ■ Not Applicable	■ Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct storm water away from the loading area. Water from loading dock areas should be drained to the sanitary sewer where feasible. Direct connections to storm drains from depressed loading docks are prohibited. ■ Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation. ■ Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.		■ Move loaded and unloaded items indoors as soon as possible. ■ See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com.

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on Drawings**	3 **Permanent Controls—List in Table and Narrative**	4 **Operational BMPs—Include in Table and Narrative**
■ **N.** Fire Sprinkler Test Water ❑ Not Applicable		■ Provide a means to drain fire sprinkler test water to the sanitary sewer.	■ See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com.
O. Miscellaneous Drain or Wash Water ■ Boiler drain lines ■ Condensate drain lines ■ Rooftop equipment ■ Drainage sumps ❑ Roofing, gutters, and trim ❑ Not Applicable		■ Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system. ■ Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system. ■ Rooftop mounted equipment with potential to produce pollutants shall be roofed and/or have secondary containment. ■ Any drainage sumps onsite shall feature a sediment sump to reduce the quantity of sediment in pumped water. ❑ Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff.	

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on Drawings**	3 **Permanent Controls—List in Table and Narrative**	4 **Operational BMPs—Include in Table and Narrative**
■ **P.** Plazas, sidewalks, and parking lots. ❑ Not Applicable			■ Plazas, sidewalks, and parking lots shall be swept regularly to prevent the accumulation of litter and debris. Debris from pressure washing shall be collected to prevent entry into the storm drain system. Washwater containing any cleaning agent or degreaser shall be collected and discharged to the sanitary sewer and not discharged to a storm drain.

APPENDIX D
Plan Sheet (Planning Phase Project Exhibits)



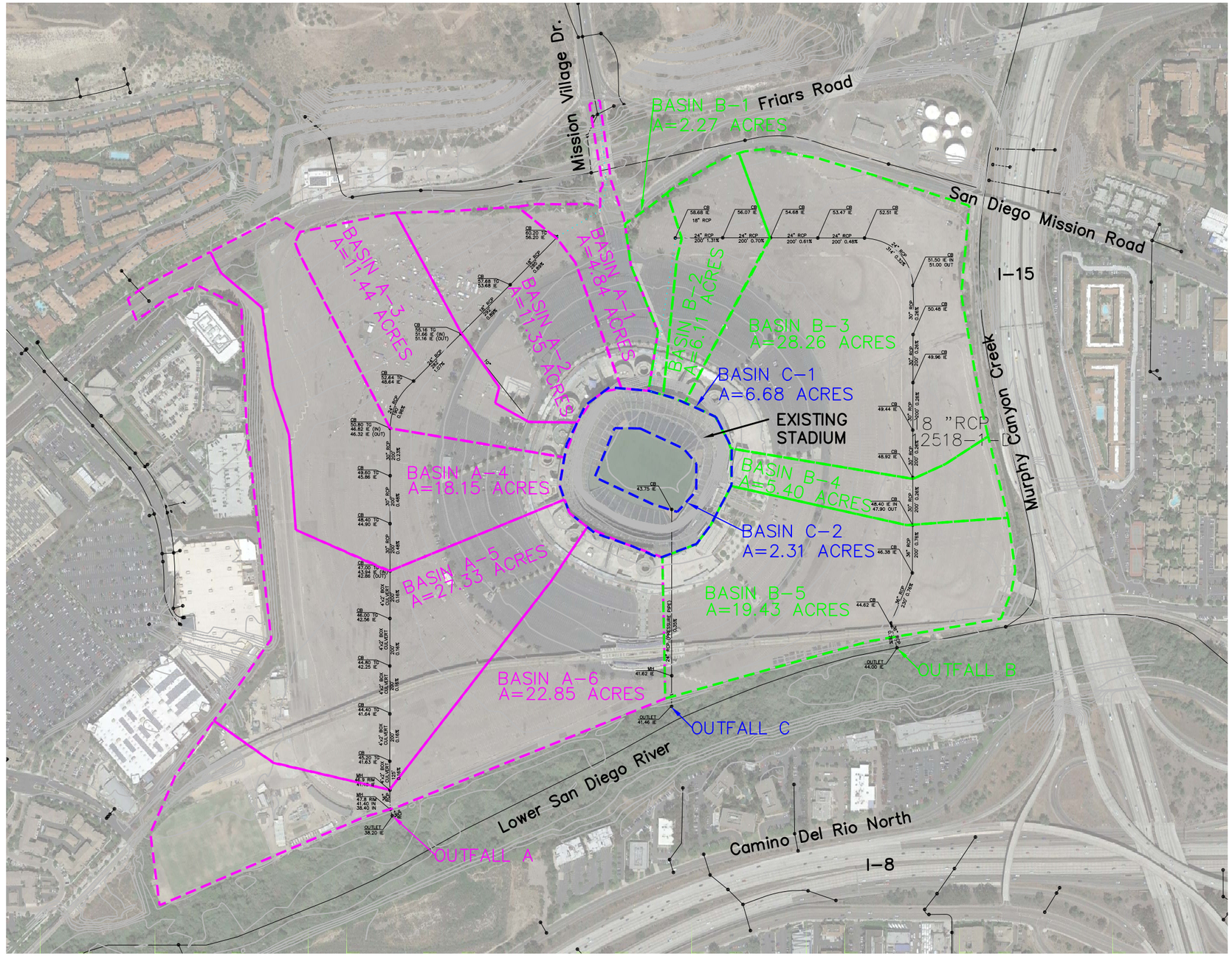
Source: Esri; USGS National Hydrography Dataset (NHD); CalWater/California Department of Water Resources.

1 0.5 0 1 Mile

Scale: 1 = 63,360; 1 inch = 1 mile

Figure 4.8-1
Watershed Map

Path: P:_6043\60431885_SD_StadiumEIR\900-CAD-GIS\920 GIS\922_Maps\Water\Fig4_8_1_Stadium_Watersheds.mxd, 7/14/2015, Daniel_Arellano



LEGEND

DRAINAGE AREA A

DRAINAGE AREA B

DRAINAGE AREA C

EXISTING STORM DRAIN

INITIAL FLOW LINE

N

NO SCALE

AECOM
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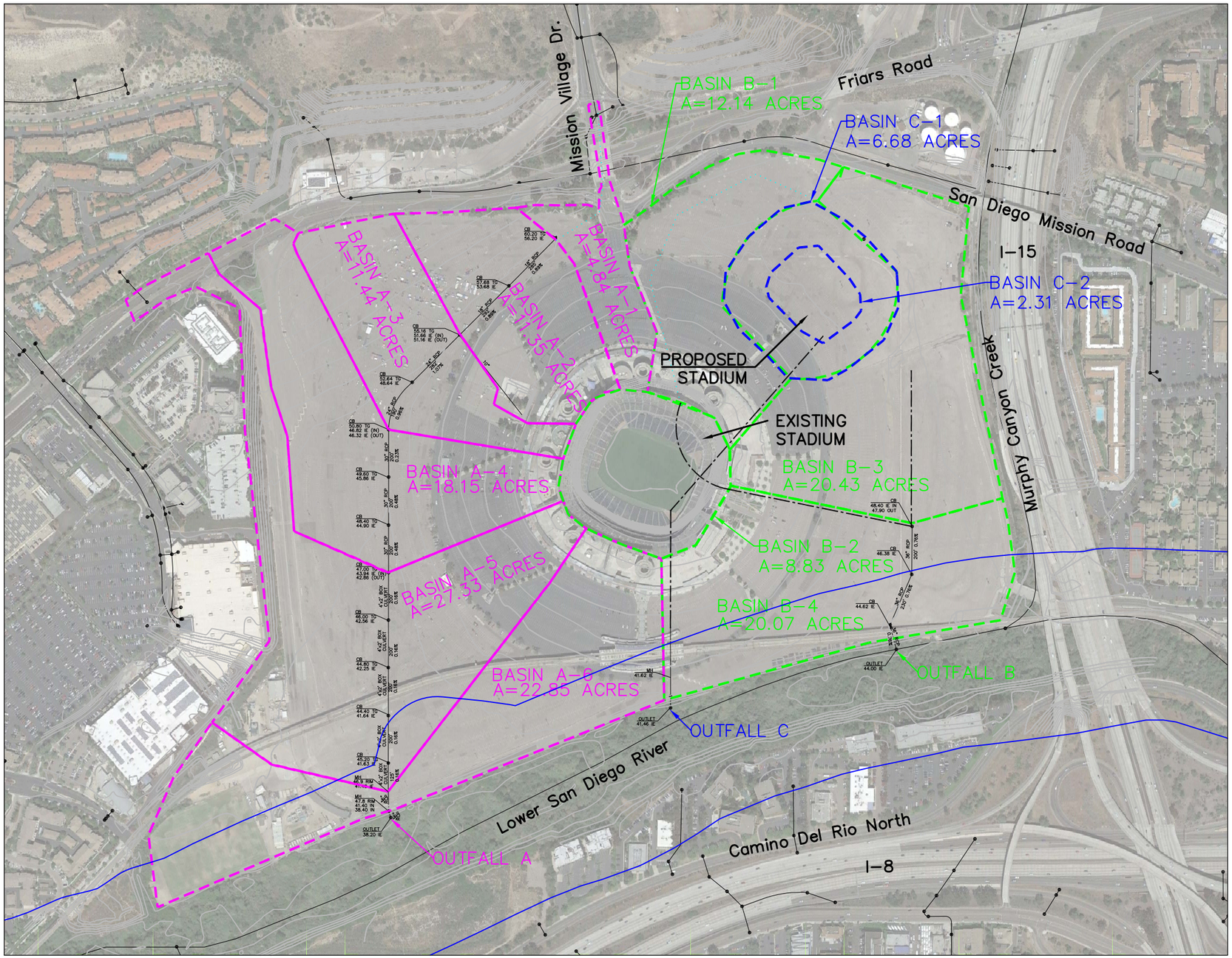
SAN DIEGO, CA, 92101
T 619.610.7600 F 619.610.7601
www.aecom.com

Existing Hydrology and Drainage Map

STADIUM RECONSTRUCTION EIR
PRELIMINARY HYDROLOGY STUDY

FIGURE 1



LEGEND

- DRAINAGE AREA A
- DRAINAGE AREA B
- DRAINAGE AREA C
- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- INITIAL FLOW LINE
- RIVER INFLUENCE LINE

NO SCALE

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Proposed Hydrology and Drainage Map

STADIUM RECONSTRUCTION EIR
PRELIMINARY HYDROLOGY STUDY

FIGURE 2

OPTIONS

OPTION 1

245,000 cubic–feet of retention and reuse
61,000 square–feet with an assumed 4–foot depth

OPTION 2

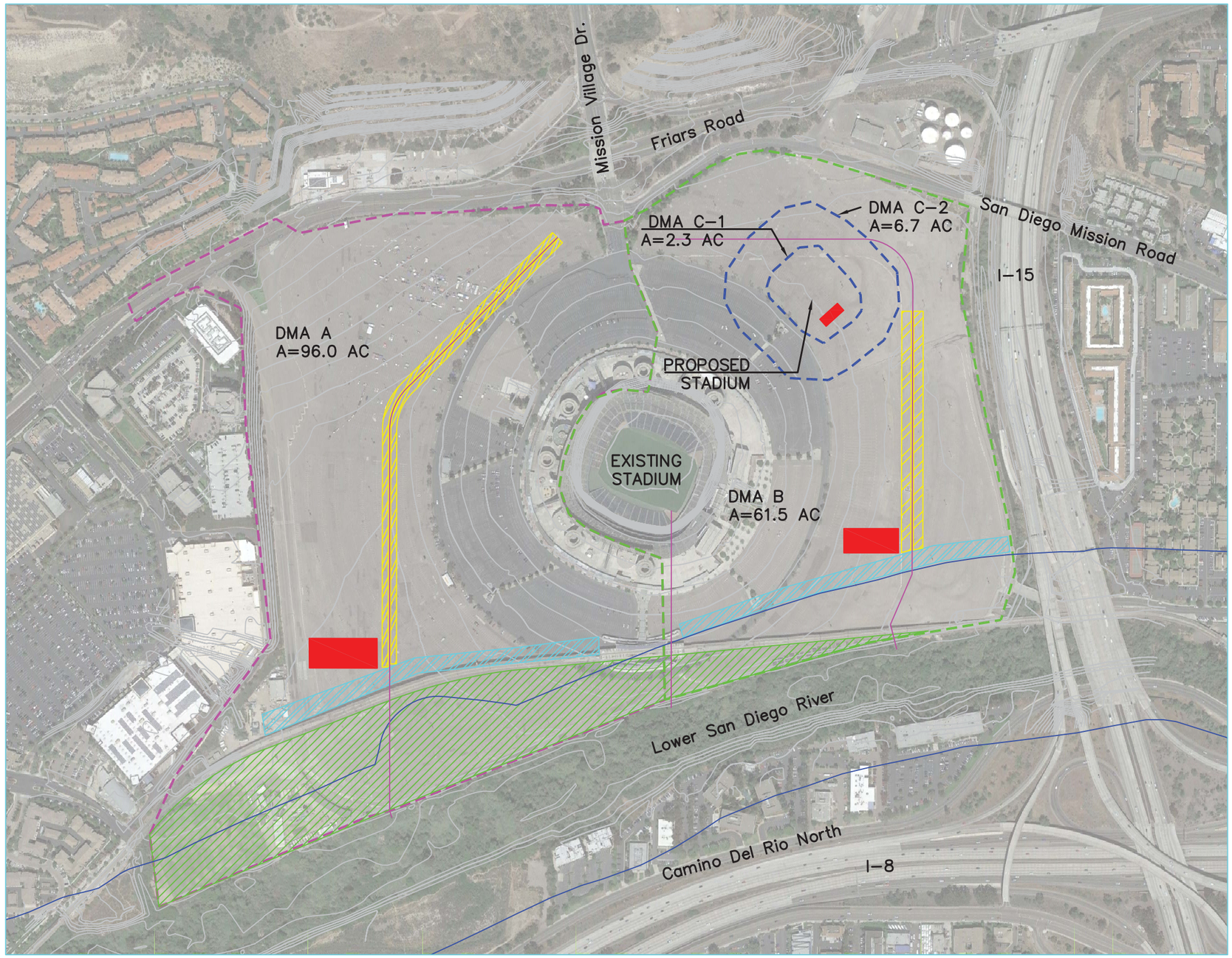
195,000 square–feet of biofiltration
Along the southern boundary

OPTION 3

195,000 square–feet of biofiltration
Dispersed amongst the parking area

OPTION 4

A combination of retention and biofiltration



LEGEND

DMA A AREA
DMA B AREA
DMA C AREA
EXISTING STORM DRAIN
FLOODWAY BUFFER
RESERVED OPEN SPACE

N

NO SCALE

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Proposed Structural BMPs

STADIUM RECONSTRUCTION EIR
SWQMP

FIGURE 3