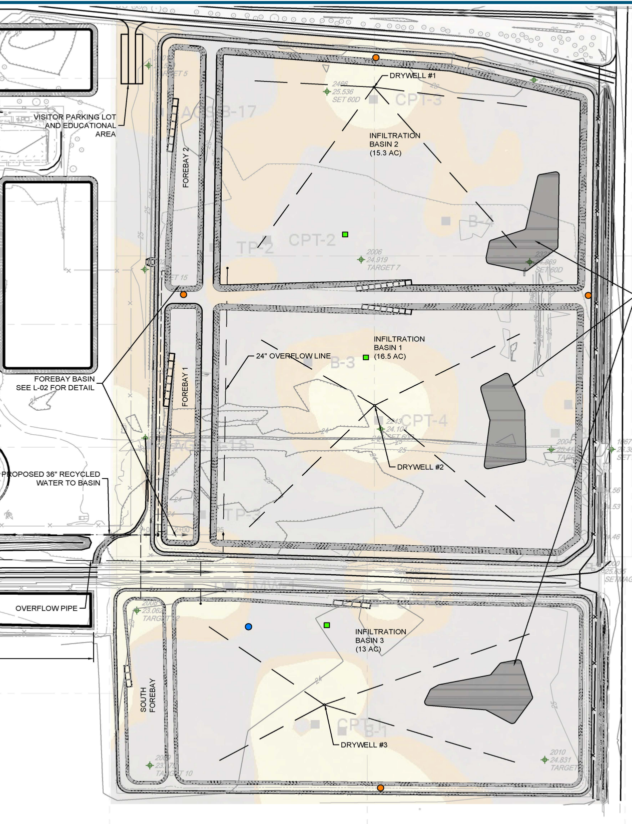
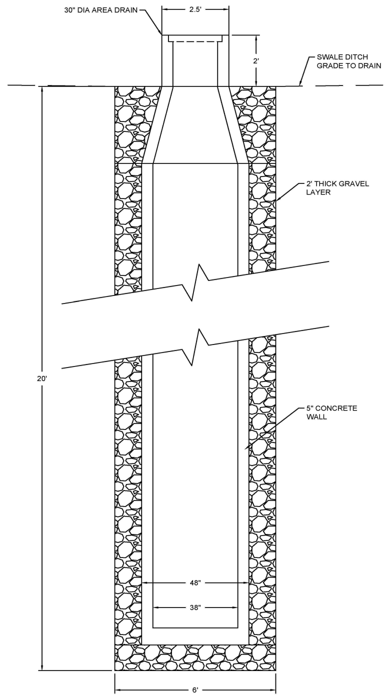
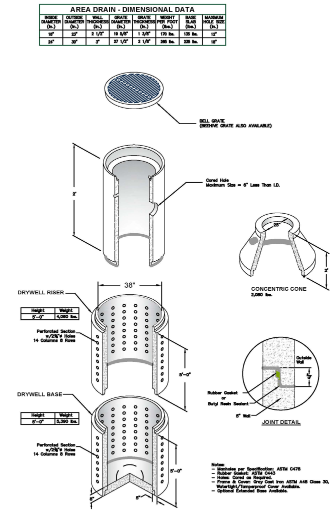




DRYWELL MANHOLE TYPICAL SECTION DETAIL
SCALE: NTS

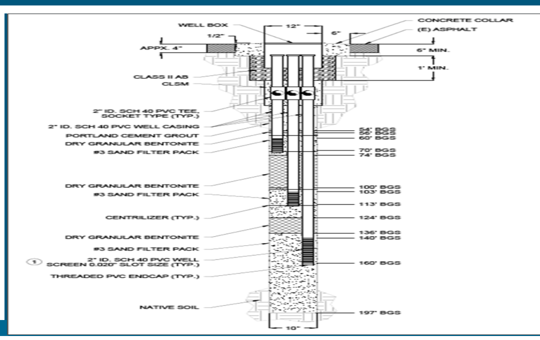


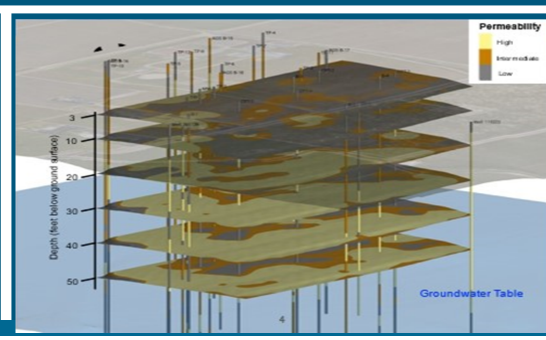
DRYWELL MANHOLE SECTION DETAIL
SCALE: NTS

Delta Water Treatment Plant Groundwater Recharge Improvement Project

Preliminary Design

December 2023





Geosyntec consultants

engineers | scientists | innovators

PREPARED FOR

City of Stockton

Municipal Utilities Department

Delta Water Treatment Plant

Geosyntec

Preliminary Design

Delta Water Treatment Plant Groundwater Recharge Improvement Project

Prepared for

City of Stockton
Municipal Utilities Department
Delta Water Treatment Plant

Prepared by

Geosyntec Consultants, Inc.

Joseph Turner, P.G. 5125, C.Hg 454
Senior Principal Hydrogeologist

Michael Rudd, P.E. 51806
Senior Principal Engineer

Project Number: SFO140

December 2023

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1. INTRODUCTION

This report presents the preliminary design for the City of Stockton's (City) Delta Water Treatment Plant (DWTP) groundwater recharge improvement project. This work is being conducted in accordance with the City Agreement Number 422000858 between the City and Geosyntec Consultants, Inc. (Geosyntec) dated July 1, 2022, and amended on April 11, 2023. The results of the feasibility study conducted under this agreement that formed the basis for the preliminary design have been submitted under separate cover.

1.1 Overview

The DWTP is located along Lower Sacramento Road, north of Eight Mile Road, between the City of Stockton and the City of Lodi (Figure 1). During the design phase of the DWTP, the City of Stockton Municipal Utility District (MUD) commissioned the design-build team to conduct a preliminary groundwater recharge feasibility study of the approximately 70-acre site adjacent to the DWTP. This draft study, completed in 2009 (CDM Smith 2009), concluded that with water from the Woodbridge Irrigation District (WID) and possibly City of Lodi stormwater flows, a direct groundwater recharge and recovery project was feasible. The study recommended additional engineering feasibility and design studies to confirm water availability, recharge infiltration rates, and storage capabilities.

The City (via Agreement Number 422000858) commissioned Geosyntec to conduct these additional assessments, including nine tasks. Tasks 1 and 2 included literature searches for regional and site-specific existing information, respectively. Task 2 also included the development of a geographic information system (GIS)-based topographic survey of the site and assessment of existing utilities. Task 3 included completion of an electrical resistivity profiling (ERP) survey of the proposed recharge area to provide an initial assessment of the underlying lithology. Tasks 4 and 5 were preparation of the draft and final work plan that outlined the procedures and methods used to perform the field investigations completed for the project. Task 6 included obtaining necessary permits for the approved field investigations, and Task 7 was the approved field investigation that included completion of cone penetrometer tests (CPT), soil borings, drilling and installation of groundwater wells, infiltration testing, aquifer testing, and laboratory testing of soil and water. Task 8 included the hydrogeologic characterization of the site using the information developed from the ERP survey and the field investigations from Task 7. Task 9 is preparation of this Feasibility Study Report which provides an assessment of the suitability to recharge surface-applied water to the site. This Feasibility Study Report also presents the results of the hydrogeologic characterization completed for Task 8. Task 9 also included preparation of a preliminary design of the groundwater recharge facility with estimates of probable cost that are presented in this report.

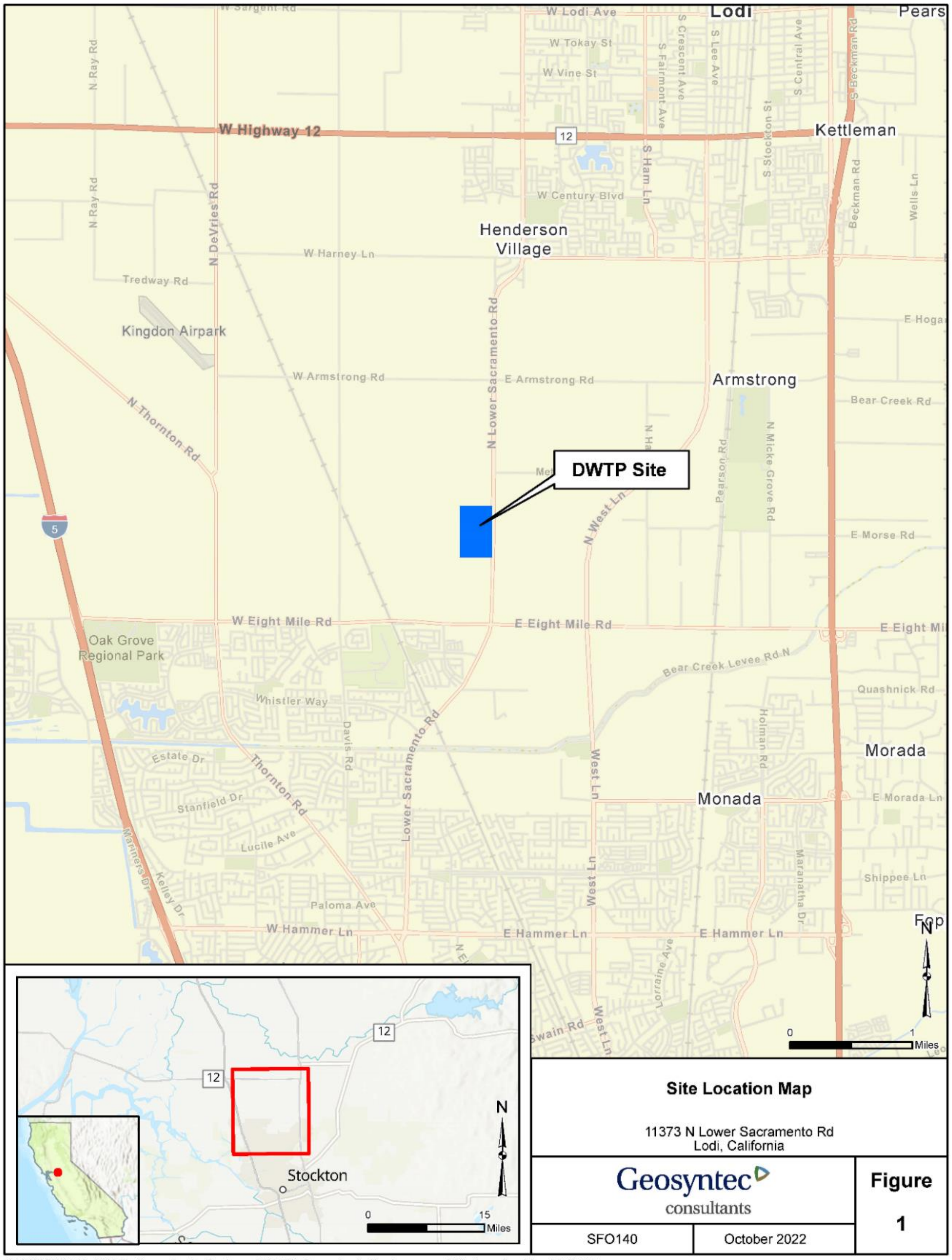


Figure 1. Site Location Map

1.2 Purpose and Objectives

The purpose of the DWTP groundwater recharge improvement project is to evaluate the potential for groundwater recharge at the site and to develop a feasibility study and preliminary design report. As indicated above, the results of the feasibility study have been provided under separate cover, and the purpose of this report is to present the preliminary design and estimate of probable costs.

1.3 Report Organization

Section 2 presents a brief summary of the feasibility report. Section 3 presents the preliminary design for the groundwater recharge basin.

2. SUMMARY OF FEASIBILITY STUDY

The primary objective of the feasibility study was to assess the potential for using a portion of the DWTP facility for groundwater recharge. Several field investigations were conducted to assess this potential, including completion of the field activities for Tasks 3 and 7 discussed in Section 1.1. The objectives of these field investigations were to assess the suitability to recharge surface-applied water in terms of ft/day over the site and an estimate of the annual quantity of water capable of being recharged to the underlying groundwater basin.

As discussed in detail in the FS Report, soils beneath the proposed groundwater recharge area appear to be suitable for groundwater recharge. However, surface soils down to 15 feet have lower permeabilities that could limit the ability to maximize the amount of water that can be recharged annually. To illustrate the change in overall permeabilities from shallow soils to deeper soils, depth layers from the 3D model (see FS Report for discussion) were constructed as illustrated on Figure 27 of the FS Report (reproduced as Figure 2 below). Each layer shows the distribution of high permeable soils (yellow), intermediate permeable soils (orange), and low permeable soils (gray). The blue layer shows the approximate depth to first encountered groundwater at 50 feet. Copies of each of these layers are provided in Appendix H of the FS Report.

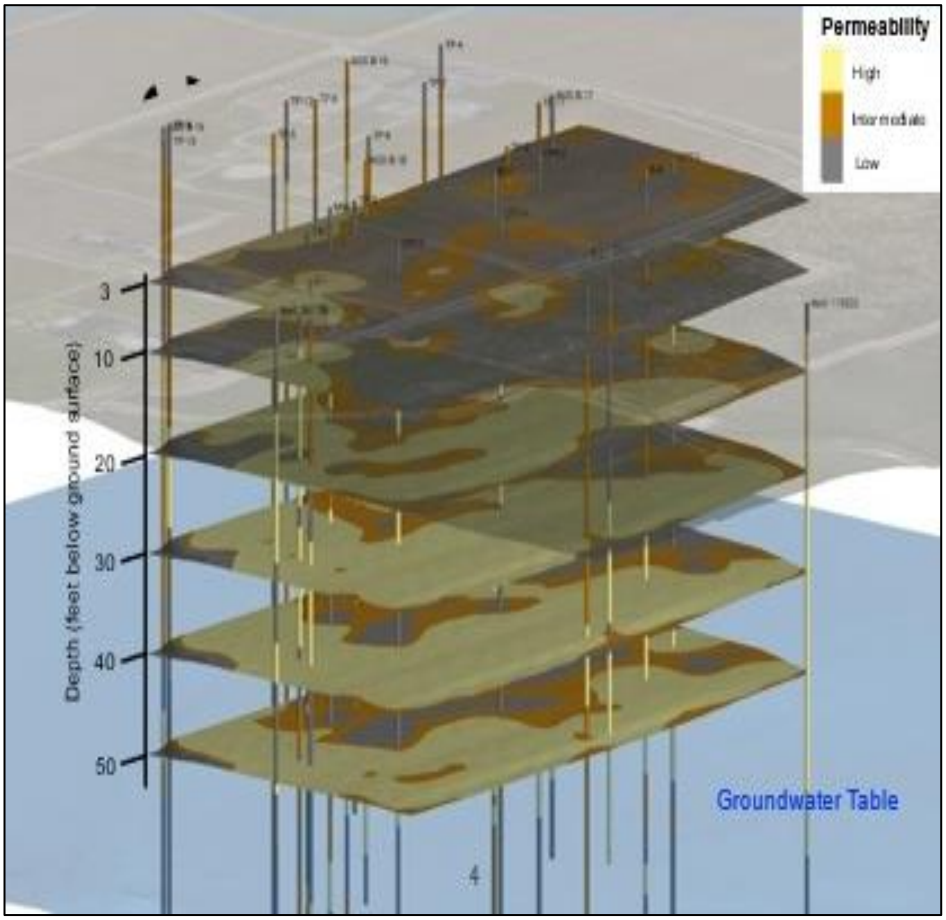


Figure 2. Depth Layers from 3D Model Showing Percentage of High Permeable, Intermediate Permeable, and Low Permeable Soils Beneath Proposed Groundwater Recharge Area

The percentage of low permeability soils within the upper 15 feet ranges from 65% to 70%, whereas from 20 feet below ground surface (bgs) to 50 feet bgs, the high permeable soils are greater than 50%. As discussed in Section 3, our proposed preliminary design for the recharge facility includes three separate pond areas ranging in size from 13.5 acres (Pond 3) to 15.7 acres (Pond 2) for a total recharge area of about 43.5 acres. The proposed design for each pond is to excavate soils to 3 feet bgs. To estimate the annual recharge capacity from this excavation depth, uniform vertical hydraulic conductivities (Kv) values were assigned to each layer based on the average of the estimated K values within the three soil zones described above as follows:

- High permeable soils—Kv = 3 ft/day
- Intermediate permeable soils—Kv = 1.5 ft/day
- Low permeable soils—Kv = 0.2 ft/day

These K values were based on the lower range of values calculated from the various methods to estimate infiltration rates, as discussed in the FS Report. The average Kv values for the 3-foot depth plus the other depth interval slices are summarized in the following table. To estimate the volume of water that could infiltrate directly from this depth, the harmonic mean for the upper 10 feet for Kv values was used. Using these values, the estimated volume that can be directly infiltrated is 11,490 acre-feet per year (see Table 23 from FS Report).

Table 1. Hydraulic Conductivity Data Beneath Recharge Pond Areas Based in Interpolated Hydraulic Testing Within Depth Slices from 3D Model

Depth Interval	Permeability Unit	Estimated Kv (ft/day)	Area (square feet)	Portion (%)	Average Kv in Slice (ft/day)
Total Area Pond 1 (square feet) = 622,908					
3	High	3.5	0	0%	0.57
3	Intermediate	1.5	180,643	29%	
3	Low	0.2	442,265	71%	
5	High	3.5	18,687	3%	0.54
5	Intermediate	1.5	112,123	18%	
5	Low	0.2	492,097	79%	
10	High	3.5	68,520	11%	0.78
10	Intermediate	1.5	105,894	17%	
10	Low	0.2	448,494	72%	
20	High	3.5	436,036	70%	2.82
20	Intermediate	1.5	143,269	23%	
20	Low	0.2	37,374	6%	
30	High	3.5	523,243	84%	3.18
30	Intermediate	1.5	93,436	15%	
30	Low	0.2	6,229	1%	
40	High	3.5	467,181	75%	2.95
40	Intermediate	1.5	124,582	20%	
40	Low	0.2	24,916	4%	
50	High	3.5	242,934	39%	2.05
50	Intermediate	1.5	274,080	44%	
50	Low	0.2	105,894	17%	
Total Area Pond 2 (square feet) = 683,892					
3	High	3.5	0	0%	0.44
3	Intermediate	1.5	129,939	19%	
3	Low	0.2	553,953	81%	
5	High	3.5	0	0%	0.53
5	Intermediate	1.5	170,973	25%	
5	Low	0.2	512,919	75%	
10	High	3.5	41,034	6%	0.80
10	Intermediate	1.5	205,168	30%	
10	Low	0.2	430,852	63%	
20	High	3.5	191,490	28%	1.56
20	Intermediate	1.5	218,845	32%	
20	Low	0.2	266,718	39%	
30	High	3.5	246,201	36%	1.66
30	Intermediate	1.5	150,456	22%	
30	Low	0.2	287,235	42%	
40	High	3.5	266,718	39%	1.73
40	Intermediate	1.5	129,939	19%	

Depth Interval	Permeability Unit	Estimated Kv (ft/day)	Area (square feet)	Portion (%)	Average Kv in Slice (ft/day)
40	Low	0.2	287,235	42%	
50	High	3.5	307,751	45%	
50	Intermediate	1.5	170,973	25%	2.01
50	Low	0.2	205,168	30%	
Total Area Pond 3 (square feet) = 588,060					
3	High	3.5	141,134	24%	
3	Intermediate	1.5	123,493	21%	1.27
3	Low	0.2	323,433	55%	
5	High	3.5	129,373	22%	
5	Intermediate	1.5	82,328	14%	1.09
5	Low	0.2	382,239	65%	
10	High	3.5	135,254	23%	
10	Intermediate	1.5	64,687	11%	1.11
10	Low	0.2	388,120	66%	
20	High	3.5	370,478	63%	
20	Intermediate	1.5	141,134	24%	2.58
20	Low	0.2	82,328	14%	
30	High	3.5	570,418	97%	
30	Intermediate	1.5	11,761	2%	3.42
30	Low	0.2	5,881	1%	
40	High	3.5	541,015	92%	
40	Intermediate	1.5	17,642	3%	3.29
40	Low	0.2	23,522	4%	
50	High	3.5	482,209	82%	
50	Intermediate	1.5	76,448	13%	3.08
50	Low	0.2	29,403	5%	

The City has up to 22,000 acre-feet available annually for recharge. Assuming 335 days for recharge in the basin, this volume would require an average infiltrate rate of about 1.44 ft/day. To account for this volume of water, the recharge program needs to include and maximize the amount of infiltrated water directly to the permeable soils at 20 feet, where the harmonic mean for Kv values between 20 feet bgs to 50 feet bgs range from 1.73 ft/day (Pond 2) to 3.06 ft/day (Pond 3). As such, as discussed in Section 3, the proposed design includes installation of large diameter vertical infiltration slotted wells placed in areas with high permeabilities to depths of 20 to 25 feet bgs. These wells would be placed in large diameter borings filled with gravel to maximize the amount of water that can be directed to these depths. In addition, gravel-filled trenches sloped toward these wells will also be constructed to allow water to flow towards these areas. The Kv values used are believed to be conservatively low, and higher infiltration may occur. Also, once saturated conditions occur, higher rates may occur based on the horizontal hydraulic conductivity (Kh) values observed at the site discussed in the FS Report.

As discussed in Section 4 of the FS Report, locally, the first water beneath the site occurs within a perched groundwater system. However, the perching zone appears to pinch out, and infiltrated water should reach the regional shallow aquifer that extends to about 200 feet bgs. As such, it is difficult to estimate the amount of mounding that will occur, but the specific yield values suggest that there is sufficient storage capacity to accept the volume of recharged water.

3. PRELIMINARY BASIN LAYOUT

This section summarizes the overall preliminary basin layout, followed by the recommended monitoring programs, a discussion of environmental clearance and permitting requirements, and recommendations for operation and maintenance activities.

3.1 Preliminary Basin Layout

The preliminary basin layout, surface water delivery locations, and other features for the proposed groundwater recharge facility and the estimate of probable costs are presented in Appendix A. As shown in Figure 3 (cutout from Drawing L-01, Appendix A), the proposed layout includes three separate infiltration basins totaling about 43.5 acres. Surface water will be delivered by tapping into the existing raw water supply pipeline to the DWTP facility, as shown on Drawing WS-1. The water will be distributed into forebays constructed on the west side of each infiltration basin to allow for settling of sediments and energy dissipation from the pipeline. Drawing L-04 shows a cross-section of the forebays going into the infiltration basins.

Each infiltration basin will be excavated to about 3 feet below existing grade. Each infiltration basin will include the installation of a large diameter slotted infiltration pipe to a depth of about 20 feet bgs (see Drawing L-05) to maximize the amount of water infiltrated. These pipes were located in areas that consist of high permeability soils at 10 feet bgs (yellow areas shown on Drawing L-05). Trenches graded toward the infiltration pipes will also be constructed to help direct water to these areas. Currently, as shown on Drawing L-05, habitat areas are also included in the layout.

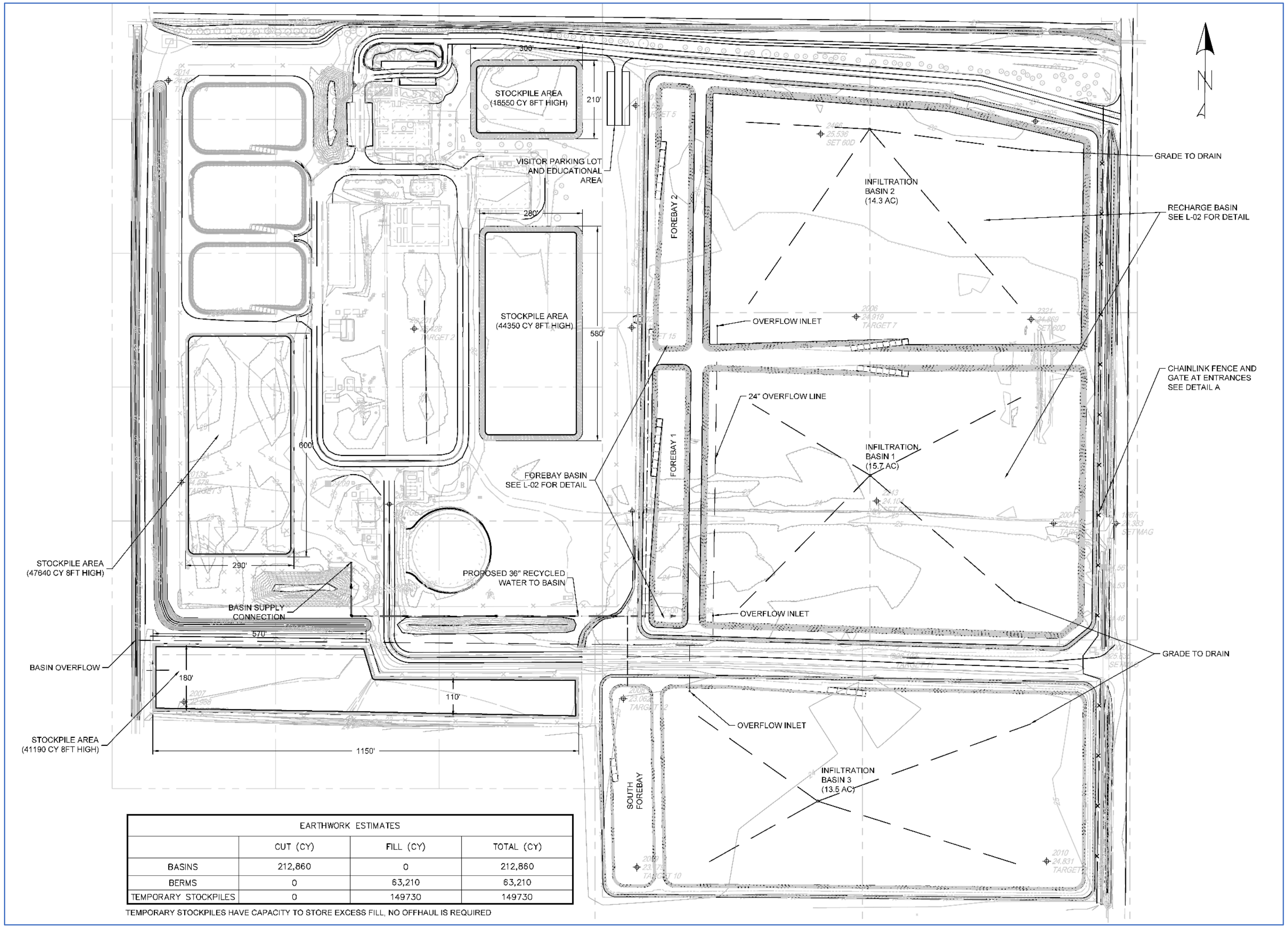
3.2 Recommended Monitoring Programs

There are two recommended monitoring programs for assessing groundwater movement to determine the volume of water recharged and available for recovery without negatively impacting the groundwater basin and/or nearby private (or public) wells. These programs include installing five additional nested monitoring wells similar to MW-1 and installing stilling wells within each groundwater recharge pond to monitor infiltration rates. Proposed locations for these points are shown on Drawing L-05 of the preliminary design plans (Appendix A).

3.2.1 Nested Groundwater Monitoring Wells

Figure 44 shows a schematic for each of the nested monitoring wells based on the construction of MW-1. The actual well construction details, including screen intervals, filter pack interval and size, and bentonite seals, should be based on the lithologic logs and other information produced during the drilling of boreholes for the wells to monitor the appropriate permeable units monitored by MW-1. The upper saturated zones monitored by MW-1S and MW-1I may not exist across the site, requiring modifications of the nested well design when constructed. Prior to construction, all necessary permits should be obtained from San Joaquin County.

After installation, all wells should be developed by bailing, surging, and pumping until turbidity values are less than 10 NTU or a maximum of 10 casing volumes have been removed. After completion of development, each well including the existing wells MW-1 (S, I, and D) and TW-1 should be surveyed by a licensed surveyor to include ground surface elevations and top of casing elevations for each individual well. Each individual well within the nested wells should be clearly labeled with a permanent tag that indicates the well as deep, intermediate, or shallow. A mark at the top of each well should also be clearly visible as the point surveyed for the well. After



EARTHWORK ESTIMATES			
	CUT (CY)	FILL (CY)	TOTAL (CY)
BASINS	212,860	0	212,860
BERMS	0	63,210	63,210
TEMPORARY STOCKPILES	0	149730	149730

TEMPORARY STOCKPILES HAVE CAPACITY TO STORE EXCESS FILL, NO OFFHAUL IS REQUIRED

Figure 3. Cut out from Drawing L-01 (Appendix A) showing the proposed layout that includes three separate infiltration basins totaling about 43.5 acres.

completion, each newly installed well will be equipped with pressure transducers to monitor water levels. Existing wells MW-1 (S, I, and D) are already equipped with an In-Situ Inc. Level Troll 700 vented transducer.

Photograph 1. In Situ Level Troll 700 vented pressure transducer.

For the first year of operation, wells and source water should be sampled for cations, anions, Title 22 metals, and general parameters as discussed in Section 2.6.2 of the FS Report, with addition of the minor stable isotopes of water molecules 2H (deuterium, denoted as D) and oxygen 18 (18O). For each sampling round, during purging of the wells, field measurements should be collected that include temperature, specific conductivity, pH, and oxidation-reduction potential. Based on the results of soil and water testing, it is not anticipated that the recharge water will negatively impact the shallow groundwater in the area. However, 1,2,3-TCP was detected above the MCL in the sample collected from TW-1 for the existing shallow groundwater conditions. During the first round of sampling, samples should be collected for analysis of this compound to confirm and assess whether additional testing should be conducted. After the first year of testing, a report should be prepared assessing the data and providing recommendations for additional testing.

Geosyntec consultants

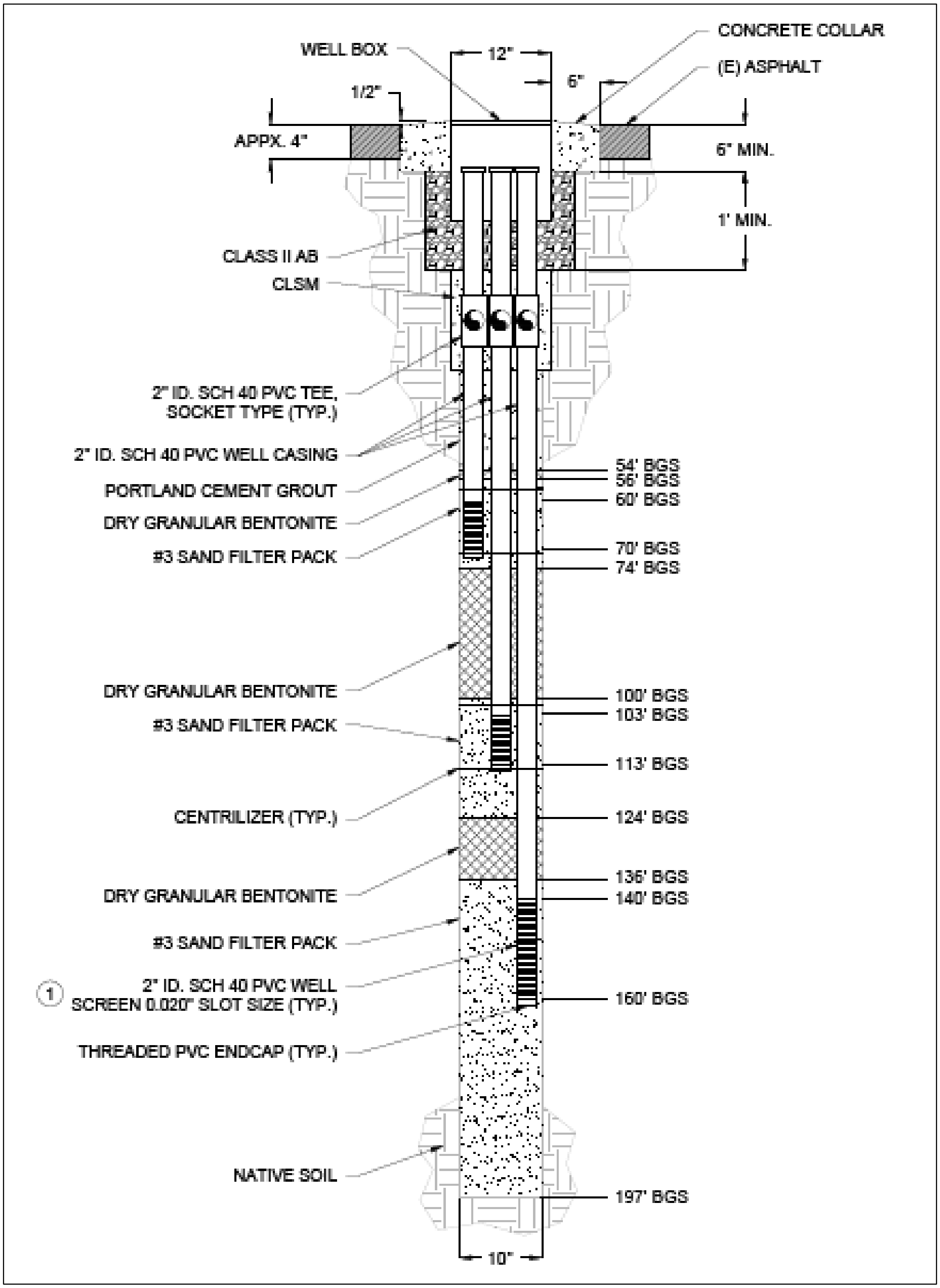


Figure 4. Schematic Drawing of Nested Monitoring Well MW-1

3.2.2 Stilling Wells

A stilling well is a pipe placed within the recharge ponds that allows the measurement of water levels (Photograph 2). For this project, a 2-inch-diameter galvanized steel post cemented into place be used where a pressure transducer can be placed within the pipe. The pipe should also be used to mount a staff gauge that can be used to take visual measurements of water levels. Access for downloading the pressure transducers periodically should be available by constructing a conduit for cables attached to the pressure transducer that runs to one of the levee roads or by use of pressure transducers that can be connected by Bluetooth or wireless services. Pressure transducers should be programed to record water levels at 1-hour intervals in sequence with the pressure transducers installed withing the monitoring wells. Staff gauges should show marking by the tenth of foot with numbers large enough to see from the levee roads. Photograph 2 shows a typical stilling well installed within a recharge basin. This stilling well is equipped with pressure transducer connected to a cable that extends to a protective box installed on the levee road. Photograph 3 shows a picture of a typical staff gauge.

Photograph 2. Example of Stilling Well Installed Within Groundwater Recharge Basin

The cable running from the well is a connection to the pressure transducer installed within the 2-inch pipe.

Photograph 3. Example of Typical Staff Gauge

3.3 Environmental Clearance and Permitting Requirements

It is anticipated for California Environmental Quality Act (CEQA) that a negative declaration will be issued. Based on discussion with the Regional Water Quality Control Board (RWQCB), no waste discharge requirements (WDRs) will be issued since recharge water thought the infiltration pipes will be more than 20 feet above first groundwater, and surface water, not treated water, is being used as source water for recharge.

Anticipated permits include drilling permits for the monitoring and infiltration pipes (installed using drilling rig) and grading permits for construction of the infiltration basins and forebays.

3.4 Operation and Maintenance Recommendations

Each infiltration basin will be used annually for 335 days. This operation will allow for a drying out period of 30 days over the year for each pond. Drying out periods should be staggered within the three basins so that recharge can be conducted throughout the year. Allowing drying out periods has been shown to increase the efficiency of an infiltration basin. These drying out periods can also be used to conduct any other maintenance requirements. The minimum free-board (feet below top of berms) should be 2 feet.

As indicated in Section 3.2.2 of the FS Report, stilling wells will be installed within each basin to measure water levels each hour; that information can be used to establish the initial infiltration rates within each basin. Infiltration rates should be assessed weekly for the first month then monthly thereafter. When infiltration rates decrease by 20% from the initial calculated rates, maintenance should be conducted.

Decrease in infiltration rates are most likely due to the build of fines from sediment in the source water and growth of organic material. Initial maintenance when this occurs should include ripping of the soil surface. Tilling should not be conducted, because this type of activity will mix the fine material with soils at a deeper depth, reducing the overall ability of the basin to recharge. If ripping does not significantly improve recharge, then removal of built of fines may be necessary. Clean-out of the infiltration pipes by flushing or removal of fines from the bottom should also occur during this period. Other maintenance issues include inspection of the berms for integrity and removal of vegetation that occurs.

APPENDIX A
Preliminary Design Layout

CONTRACT DOCUMENTS
VOLUME II

FOR THE CONSTRUCTION OF:

DELTA WATER TREATMENT PLANT
GROUNDWATER RECHARGE BASINS

PROJECT NO. UH2XXXX

PREPARED FOR

DEPARTMENT OF MUNICIPAL UTILITIES
CITY OF STOCKTON
STOCKTON, CALIFORNIA

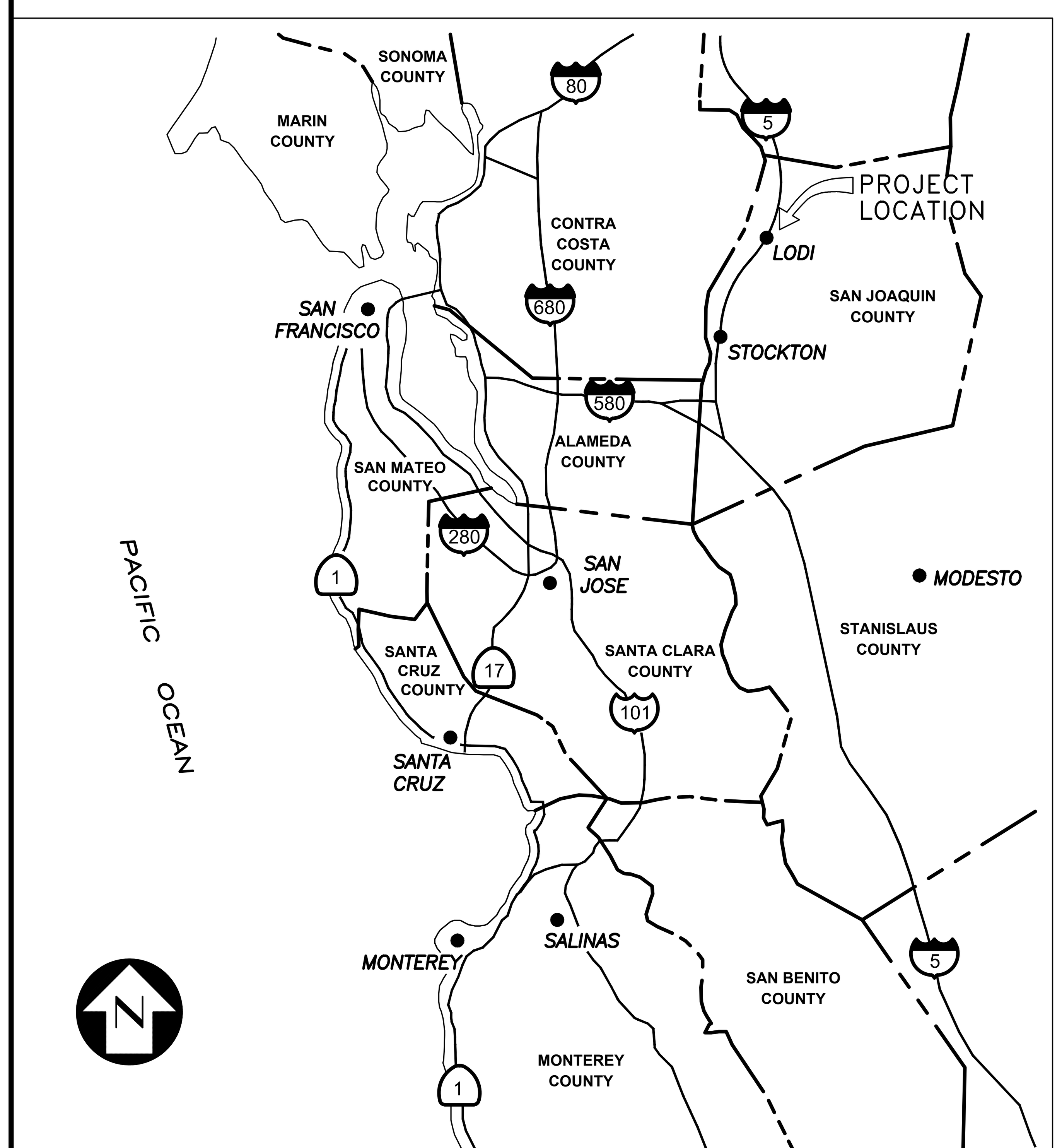
DEPARTMENT OF MUNICIPAL UTILITIES
CITY OF STOCKTON, CALIFORNIA

RECOMMENDED BY: ______________________________ DATE: __________
ENGINEERING MANAGER, DEPARTMENT OF MUNICIPAL UTILITIES

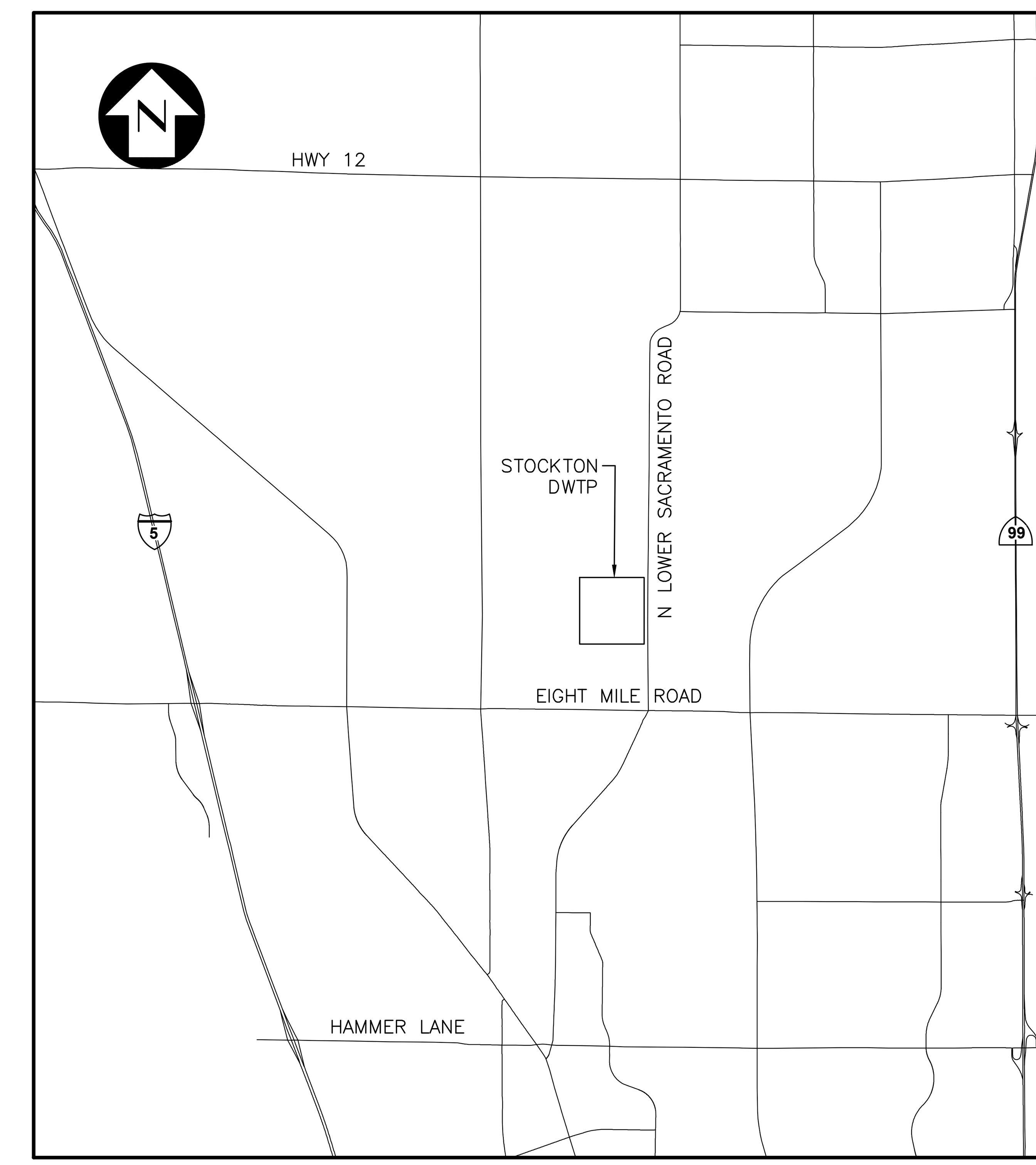
APPROVED BY: ______________________________ DATE: __________
DIRECTOR OF MUNICIPAL UTILITIES

INDEX OF SHEETS

1	TITLE SHEET	T-01
2	SITE PLAN	L-01
3	BASIN DETAIL	L-02
4	GRADING DETAIL	L-03
5	PROFILE AND SECTION	L-04
6	INFILTRATION WELL LAYOUT	L-05
7	BASIN SUPPLY SCHEMATIC 1 OF 3	WS-1
8	BASIN SUPPLY SCHEMATIC 2 OF 3	WS-2
9	BASIN SUPPLY SCHEMATIC 3 OF 3	WS-3



VICINITY MAP
NOT TO SCALE

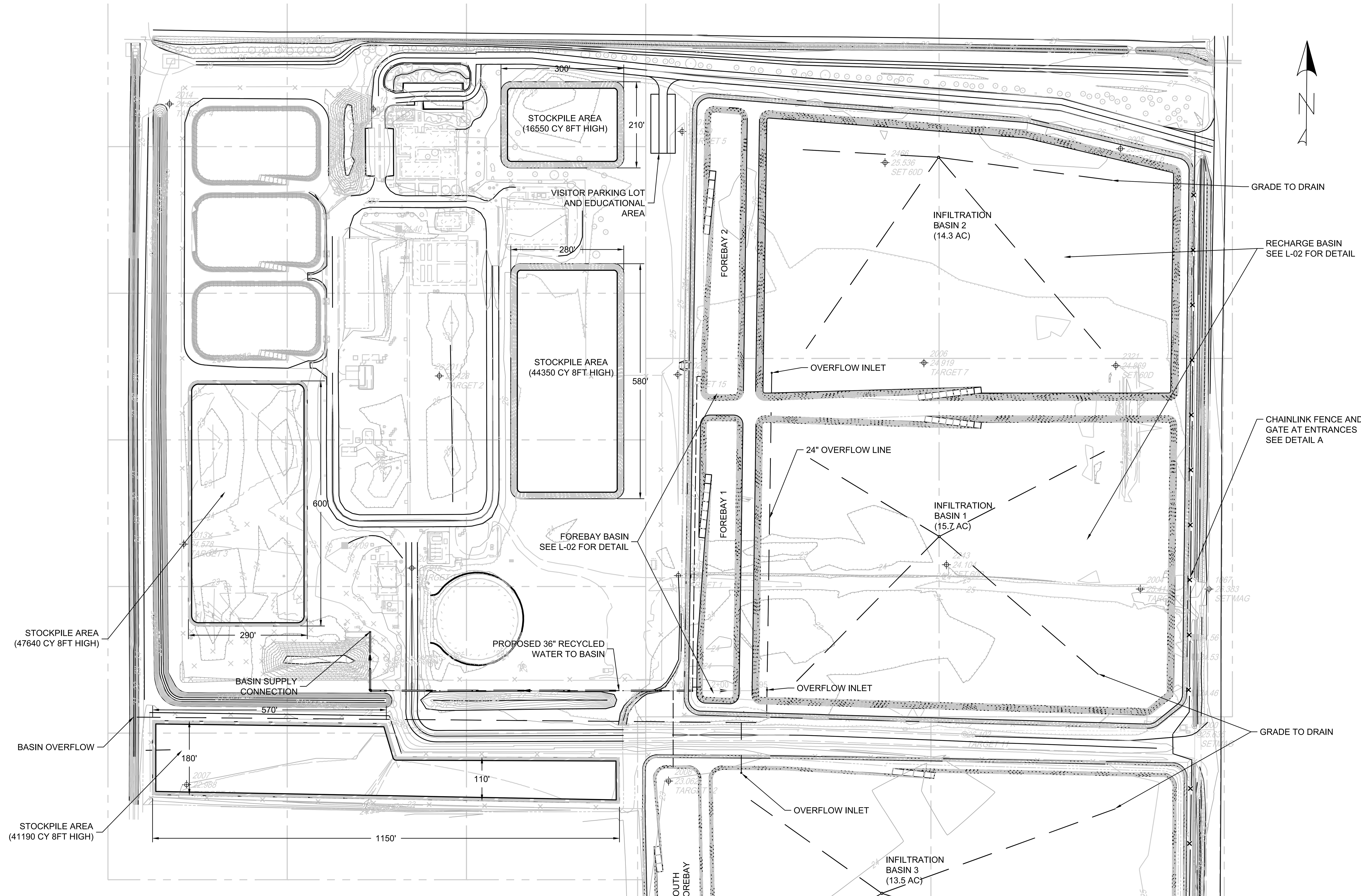


LOCATION MAP
NOT TO SCALE

DWSP WATER TREATMENT PLANT
11373 N LOWER SACRAMENTO RD
LODI, CA

PRELIMINARY PLANS

SCALE	AS SHOWN
DRAWING NO.	T-01
SHEET	01 OF 09
PROJECT NO.	



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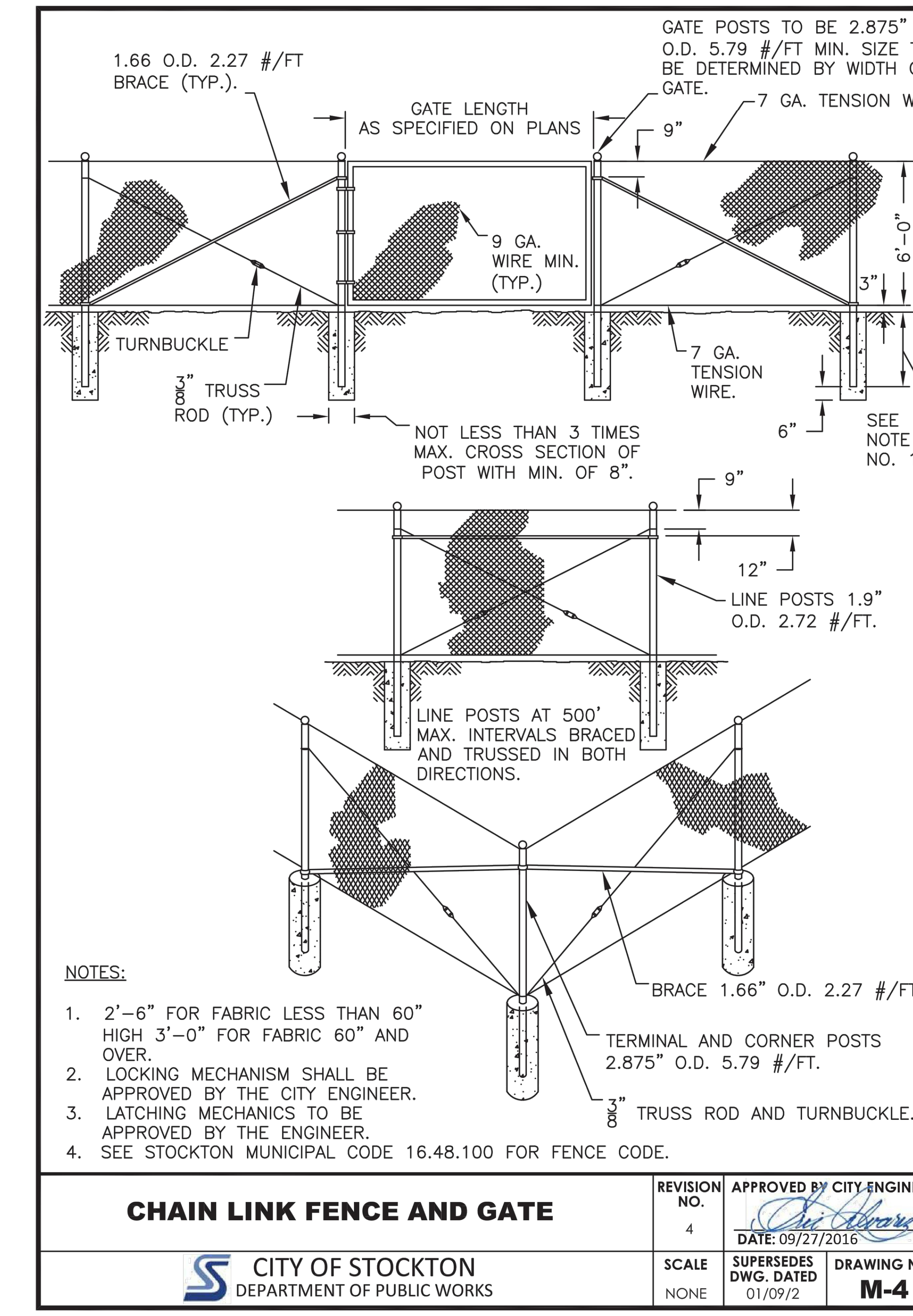


CHAIN LINK FENCE AND GATE DETAIL A
SCALE: NTS

PRELIMINARY PLANS

REVISION NUMBER	DESCRIPTION	DATE	BY	PROJECT NO. UH22008	DATE
				DESIGNED BY:	
				DRAWN BY:	
				CHECKED BY:	
				ENGINEER	
				REGISTRATION NO.	DATE

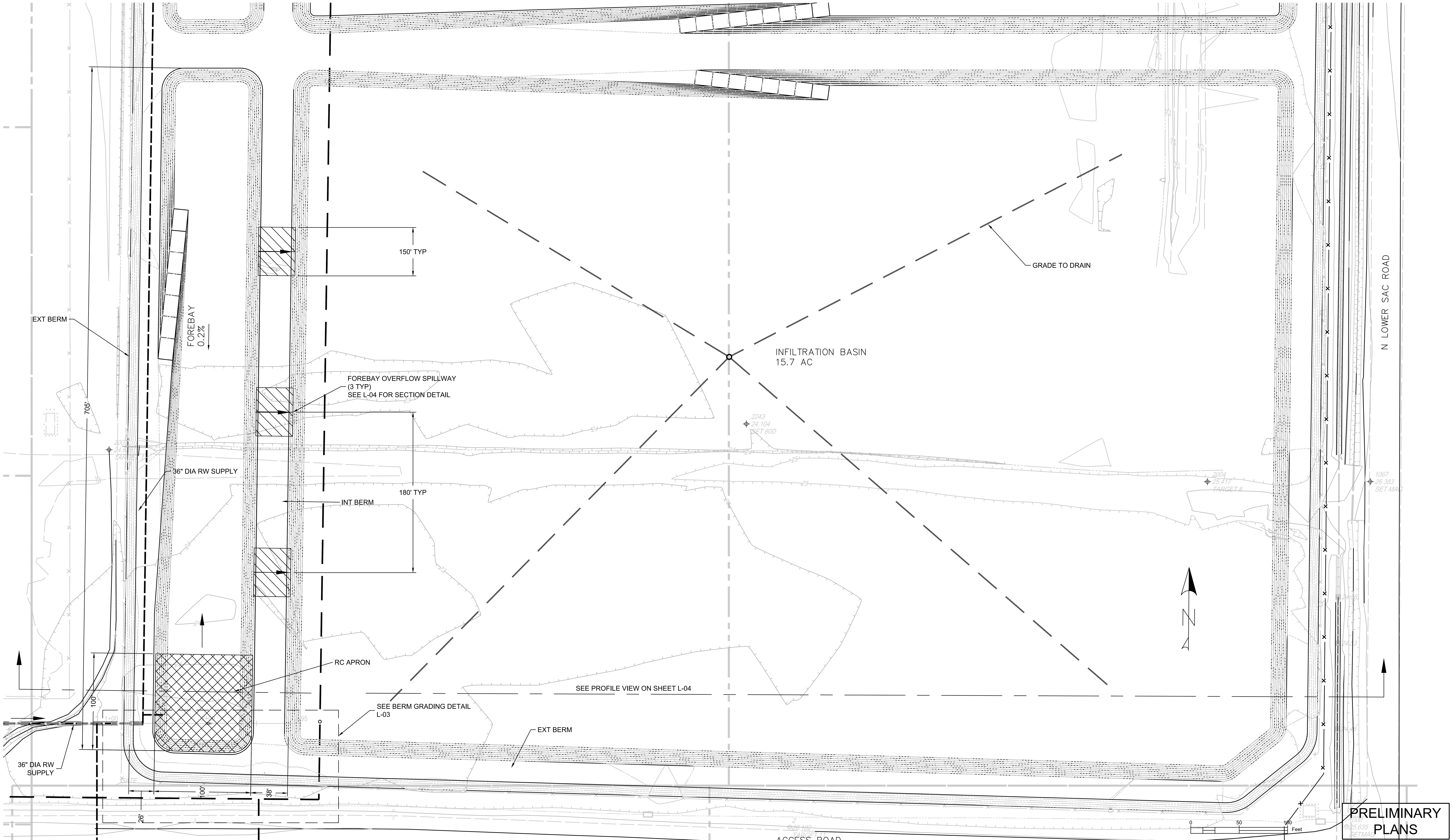
DEPARTMENT OF MUNICIPAL UTILITIES
CITY OF STOCKTON, CALIFORNIA

APPROVED BY: ____________ ENGINEERING SERVICES MANAGER DATE: ________

DELTA WATER TREATMENT PLANT
GROUNDWATER RECHARGE BASINS

SITE PLAN

SCALE 1"=150'
DRAWING NO. L-01
SHEET 02 OF 09
PROJECT NO.



REVISION NUMBER	DESCRIPTION	DATE	BY	PROJECT NO. UH22008	DATE
				DESIGNED BY:	
				DRAWN BY:	
				CHECKED BY:	
				ENGINEER	
				REGISTRATION NO. DATE	

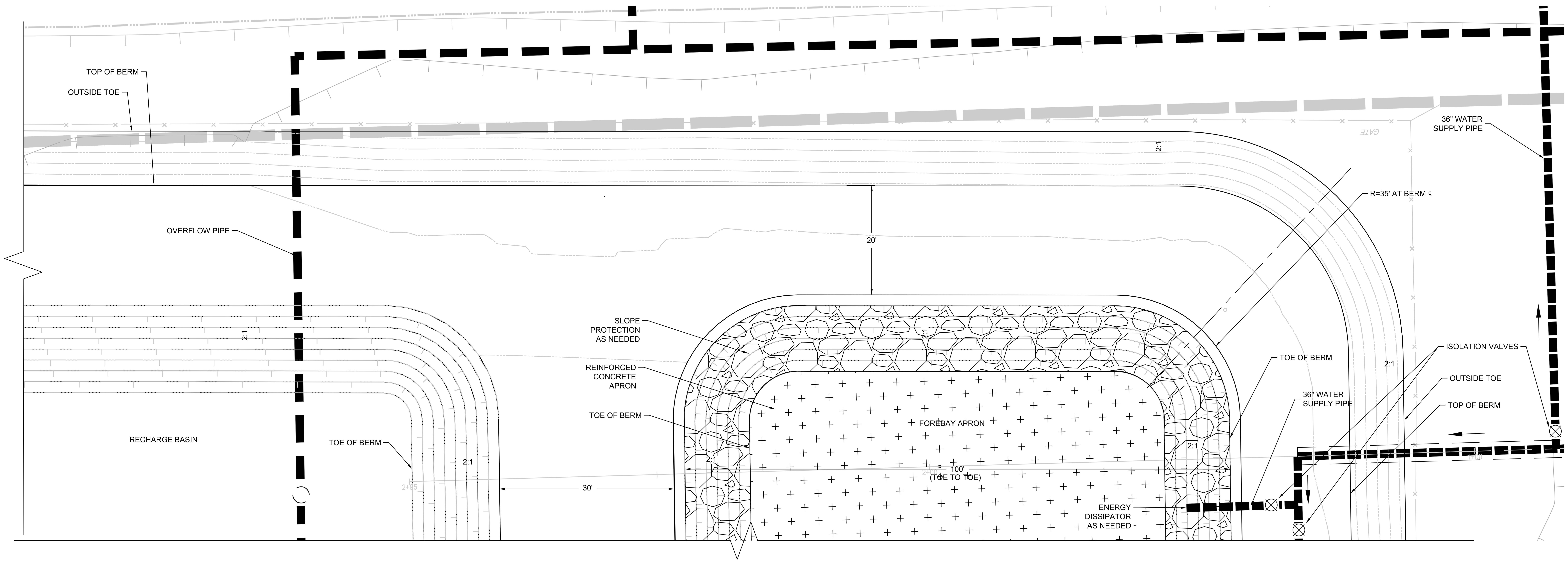
DEPARTMENT OF MUNICIPAL UTILITIES
CITY OF STOCKTON, CALIFORNIA

APPROVED BY: ____________ DATE: ________
ENGINEERING SERVICES MANAGER

DELTA WATER TREATMENT PLANT
GROUNDWATER RECHARGE BASINS

BASIN DETAIL

SCALE AS SHOWN
DRAWING NO. L-02
SHEET 03 OF 09
PROJECT NO.



FOREBAY AND BASIN BERM GRADING DETAIL
SCALE: 1"=10'

PRELIMINARY PLANS

REVISION NUMBER	DESCRIPTION	DATE	BY	PROJECT NO. UH22008	DATE
				DESIGNED BY:	
				DRAWN BY:	
				CHECKED BY:	
				ENGINEER	
				REGISTRATION NO. DATE	

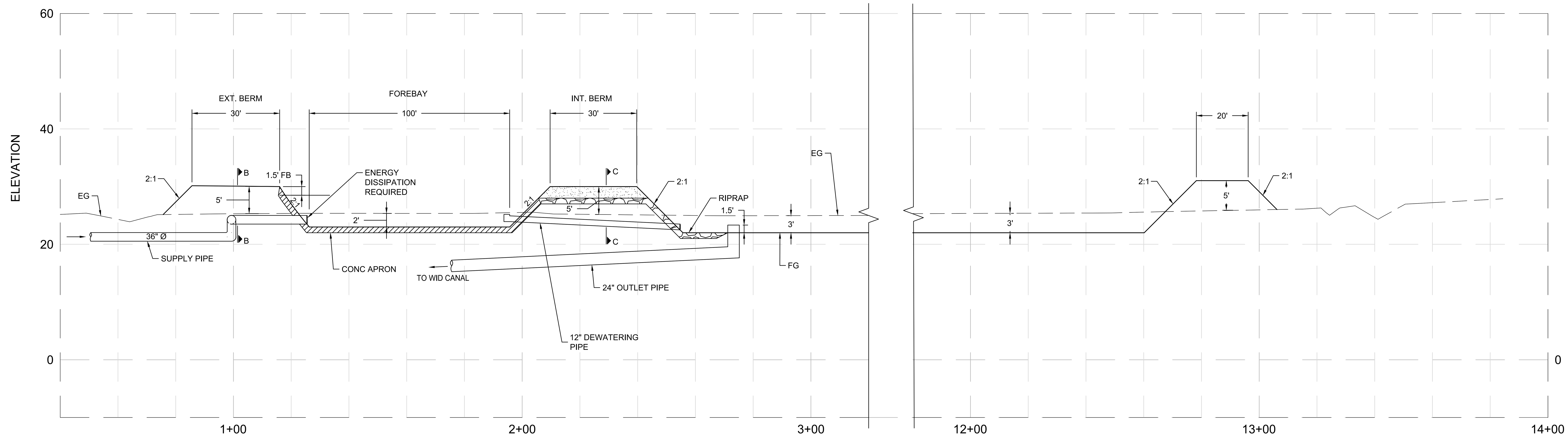
DEPARTMENT OF MUNICIPAL UTILITIES
CITY OF STOCKTON, CALIFORNIA

APPROVED BY: ____________ ENGINEERING SERVICES MANAGER DATE: ________

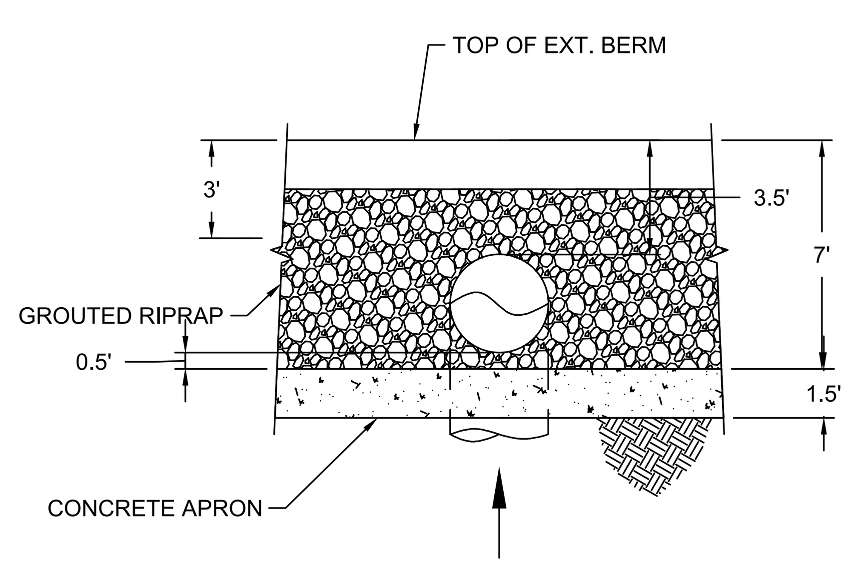
DELTA WATER TREATMENT PLANT
GROUNDWATER RECHARGE BASINS

GRADING DETAIL

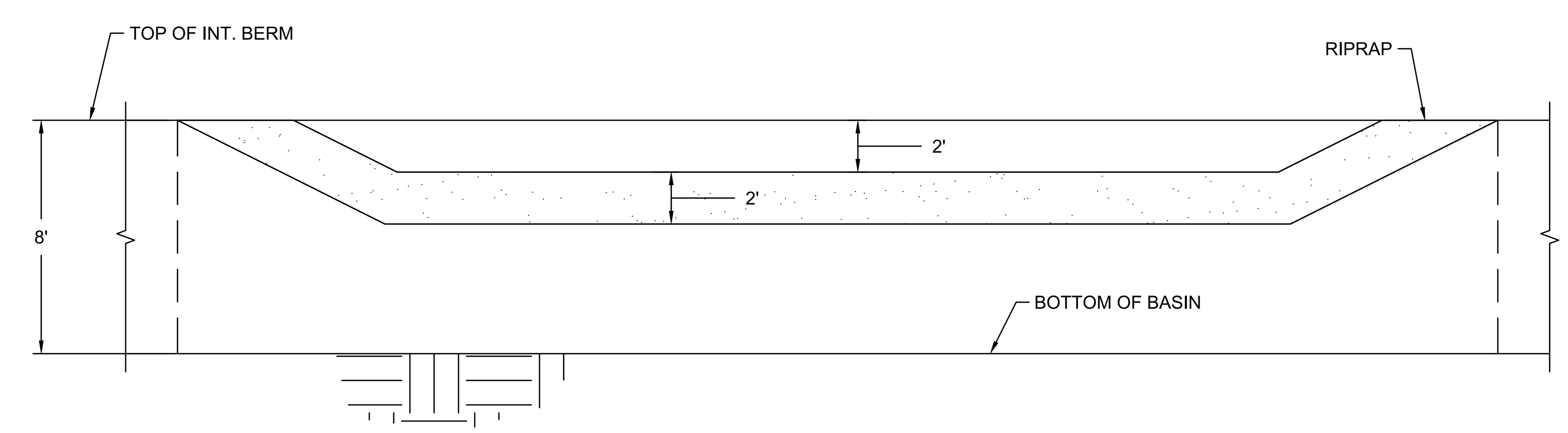
SCALE AS SHOWN
DRAWING NO. L-03
SHEET 04 OF 09
PROJECT NO.



PROFILE VIEW
SCALE: 1"=20' H, 1"=2' V



SECT B-B
SUPPLY OUTLET (TYP)



SECT C-C
OVERFLOW SPILLWAY (TYP)

PRELIMINARY PLANS

REVISION NUMBER	DESCRIPTION	DATE	BY	PROJECT NO. UH22008	DATE
				DESIGNED BY:	
				DRAWN BY:	
				CHECKED BY:	
				ENGINEER	
				REGISTRATION NO. DATE	

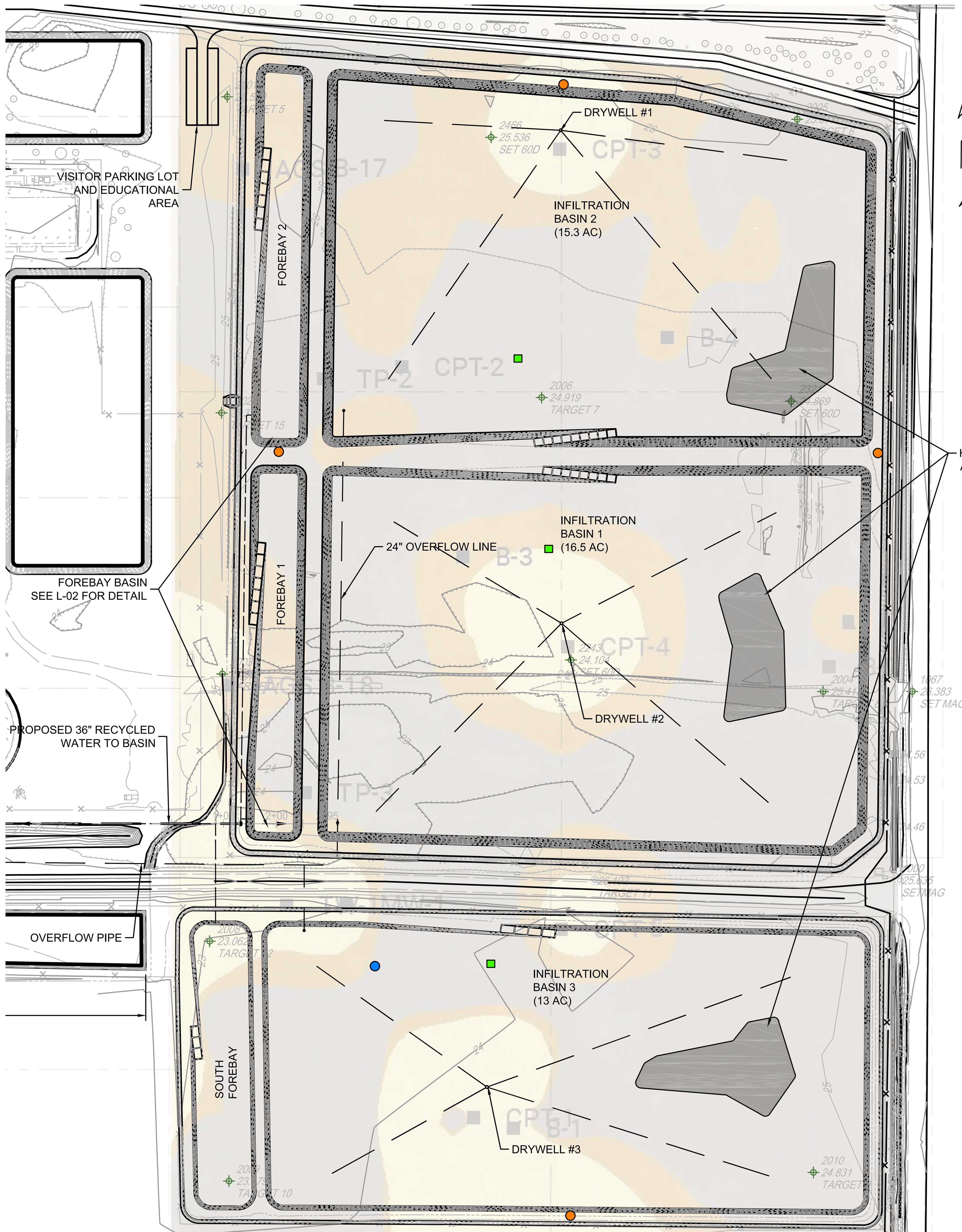
DEPARTMENT OF MUNICIPAL UTILITIES
CITY OF STOCKTON, CALIFORNIA

APPROVED BY: ____________ ENGINEERING SERVICES MANAGER DATE: ________

DELTA WATER TREATMENT PLANT
GROUNDWATER RECHARGE BASINS

PROFILE AND SECTION

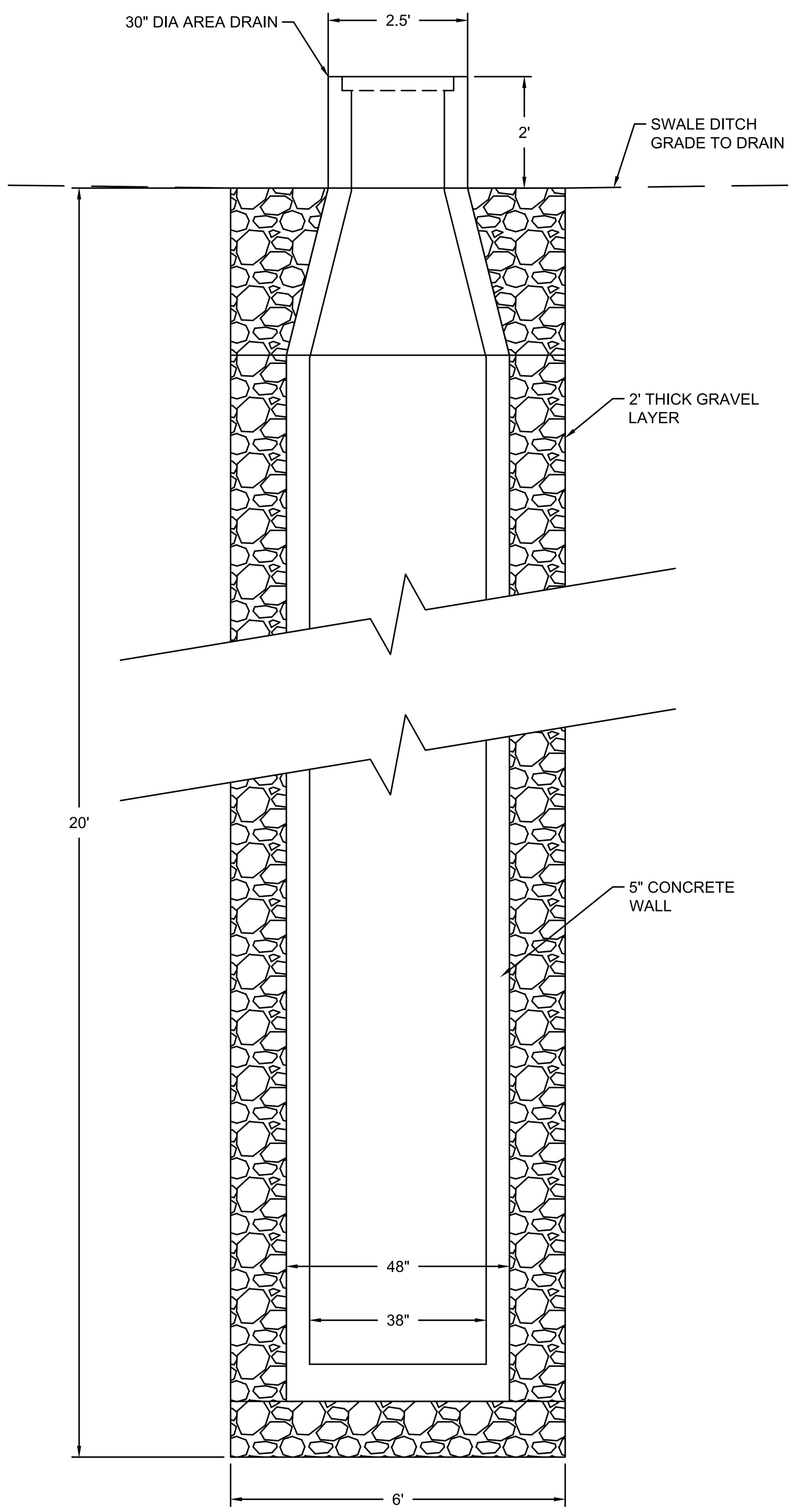
SCALE AS SHOWN
DRAWING NO. L-04
SHEET 05 OF 09
PROJECT NO.



NOTES:
1. GEOLOGY SHOWN IS 10 FT BGS

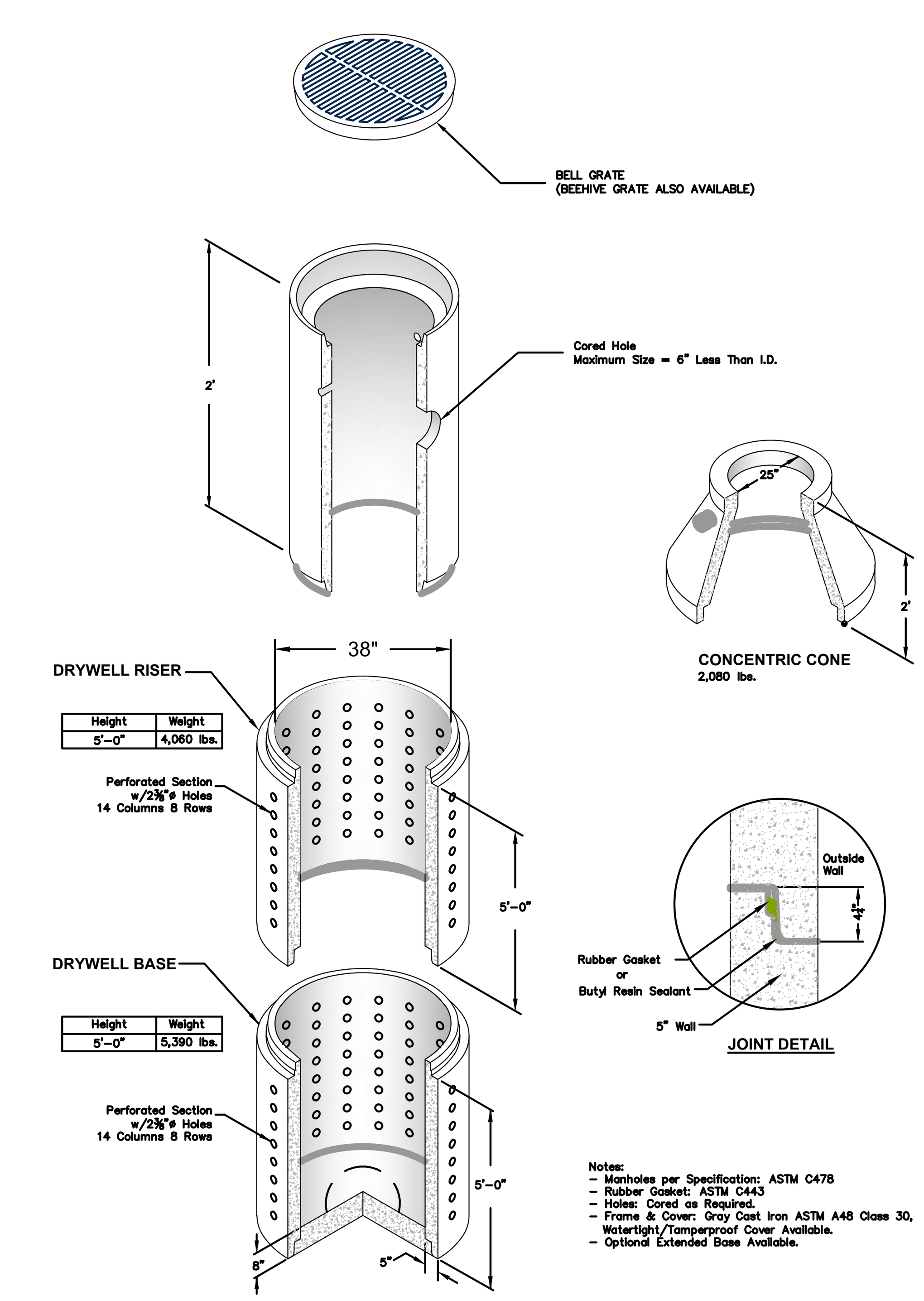
DRYWELL LOCATIONS
SCALE: NTS

WELL LEGEND:
- EXISTING MONITORING WELL
- PROPOSED MONITORING WELL
- PROPOSED STILLING WELL
(SEE FEASIBILITY FOR MONITORING WELL AND STILLING WELL CONSTRUCTION DETAILS)



DRYWELL MANHOLE TYPICAL SECTION DETAIL
SCALE: NTS

AREA DRAIN - DIMENSIONAL DATA							
INSIDE DIAMETER (in.)	OUTSIDE DIAMETER (in.)	WALL THICKNESS (in.)	GRATE DIAMETER (in.)	GRATE THICKNESS (in.)	WEIGHT PER FOOT (lbs.)	BASE SLAB (lbs.)	MAXIMUM HOLE SIZE (in.)
18"	23"	2 1/2"	19 5/8"	1 3/8"	170 lbs.	135 lbs.	12"
24"	30"	3"	27 1/2"	2 1/8"	265 lbs.	235 lbs.	18"



DRYWELL MANHOLE SECTION DETAIL
SCALE: NTS

PRELIMINARY PLANS

REVISION NUMBER	DESCRIPTION	DATE	BY	PROJECT NO. UH22008	DATE
				DESIGNED BY:	
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				ENGINEER	
				REGISTRATION NO. DATE	

INFILTRATION WELL LAYOUT

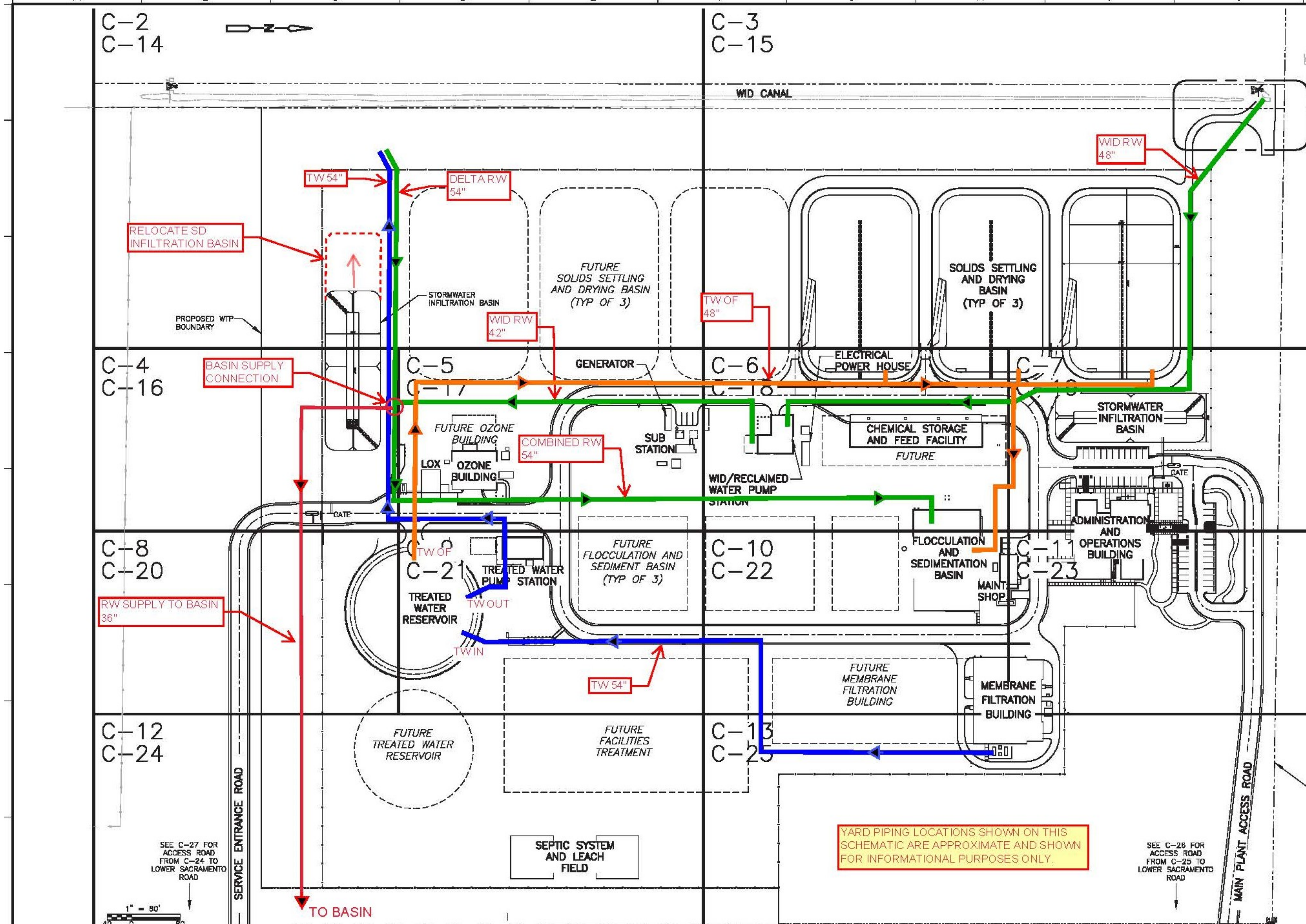
DEPARTMENT OF MUNICIPAL UTILITIES
CITY OF STOCKTON, CALIFORNIA

APPROVED BY: ____________ DATE: ______
ENGINEERING SERVICES MANAGER

DELTA WATER TREATMENT PLANT
GROUNDWATER RECHARGE BASINS

SITE PLAN

SCALE NTS
DRAWING NO. L-05
SHEET 06 OF 09
PROJECT NO.



SEE ENLARGED PLAN DETAIL 2/CD-20

NOTES:

1. C-2 TO C-13, C-26, AND C-27 ARE GRADING AND PAVING C-14 TO C-25 ARE YARD PIPING.
2. CP-1 TO 5 ARE CORROSION CONTROL DETAILS.
3. GC-1 PROVIDES A LEGEND, SYMBOL, ABBREVIATIONS AND GENERAL NOTES THAT APPLY TO GRADING AND YARD PIPING.
4. REFER TO GC-2 THROUGH GC-5 FOR CONTROL POINT LOCATIONS AND ROADWAY LINE AND CURVE DATA.
5. GC-6 SHOWS ALL THE ROADWAY PAINTING AND SIGNAGE IN THE YARD AREAS. REFER TO ARCHITECTURAL DWGS FOR EXTERIOR AND INTERIOR BLDG SIGNAGE.

PIPING LEGEND

- RAW WATER (RW) SUPPLY
- TREATED WATER (TW)
- TW OVERFLOW
- RW TO BASIN

CDM Smith — RECORD DRAWINGS — BY: [signature] DATE 9/2012

DESIGNED BY: C. LUNDIN
DRAWN BY: JC PAYMARD
SHEET CHK'D BY: C. LINDSTADT
CROSS CHK'D BY: J. NISHIMOTO
APPROVED BY: C. LINDSTADT
DATE: MAY 2010

CDM Smith — One Walnut Creek Center, 100 Pringle Ave, Suite 300, Walnut Creek, CA 94596, Tel: (925) 933-2900

DEPARTMENT OF MUNICIPAL UTILITIES CITY OF STOCKTON, CALIFORNIA
APVD BY: [signature] DATE: 9/2012
ENGINEERING MANAGER, DEPARTMENT OF MUNICIPAL UTILITIES

IF THIS BAR DOES NOT MEASURE 1" THEN ADJUST SCALE ACCORDINGLY

No. C 44050 Exp. 6/30/2011 CIVIL STATE OF CALIFORNIA

Delta Water Supply Project — City of Stockton

DWSP WATER TREATMENT PLANT

OVERALL SITE PLAN

PROJECT NO. 5000-61732
FILE NAME: 61732S00C001
SHEET NO. C-1

REVISION NUMBER	DESCRIPTION	DATE	BY

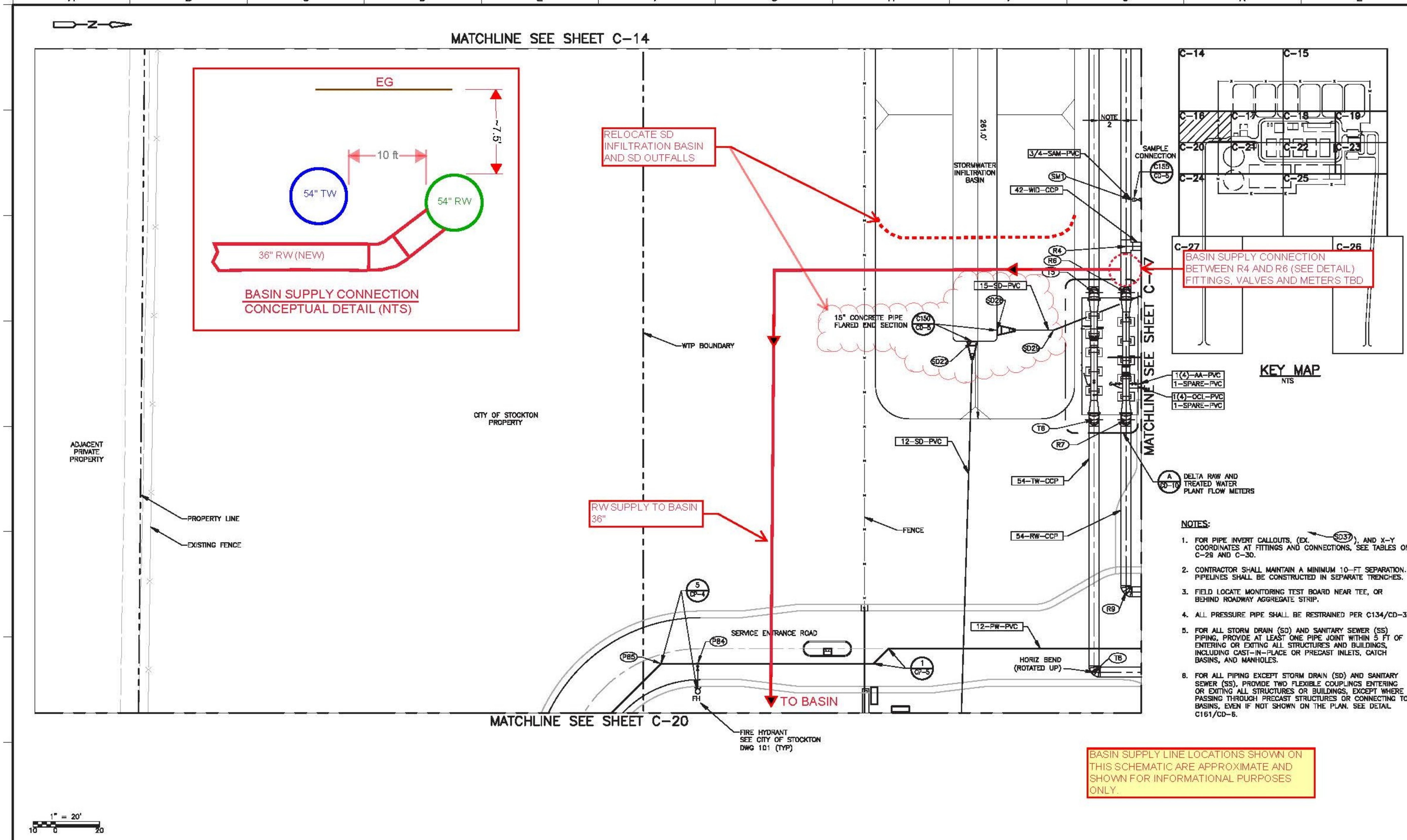
PROJECT NO. — DATE
DESIGNED BY:
DRAWN BY:
CHECKED BY:
ENGINEER
REGISTRATION NO. — DATE

DEPARTMENT OF MUNICIPAL UTILITIES
CITY OF STOCKTON, CALIFORNIA
APPROVED BY: ______ ENGINEERING SERVICES MANAGER DATE: ______

DELTA WATER TREATMENT PLANT
GROUNDWATER RECHARGE BASINS

BASIN WATER SUPPLY SCHEMATIC 1 of 3

SCALE AS SHOWN
DRAWING NO. WS-1
SHEET OF
PROJECT NO. XXXXXXX



RECORD DRAWINGS

BY: DATE 9/2012

DESIGNED BY: J. NISHIMOTO
DRAWN BY: R. UCHIMURA
SHEET CHK'D BY: G. LINDSTADT
CROSS CHK'D BY: J. NISHIMOTO
APPROVED BY: G. LINDSTADT
DATE: MAY 2010

CDM Smith
One Walnut Creek Center, 100 Pringle Ave, Suite 300, Walnut Creek, CA 94596, Tel: (925) 933-2900

DEPARTMENT OF MUNICIPAL UTILITIES, CITY OF STOCKTON, CALIFORNIA
APVD BY: DATE: 9/2012
ENGINEERING MANAGER, DEPARTMENT OF MUNICIPAL UTILITIES

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No. C 44050 Exp. 6/30/2011

Delta Water Supply Project — City of Stockton

DWSP WATER TREATMENT PLANT

YARD PIPING PLAN (3 OF 12)

PROJECT NO. 5000-61732
FILE NAME: 61732S00C016
SHEET NO. C-16

REVISION NUMBER	DESCRIPTION	DATE	BY

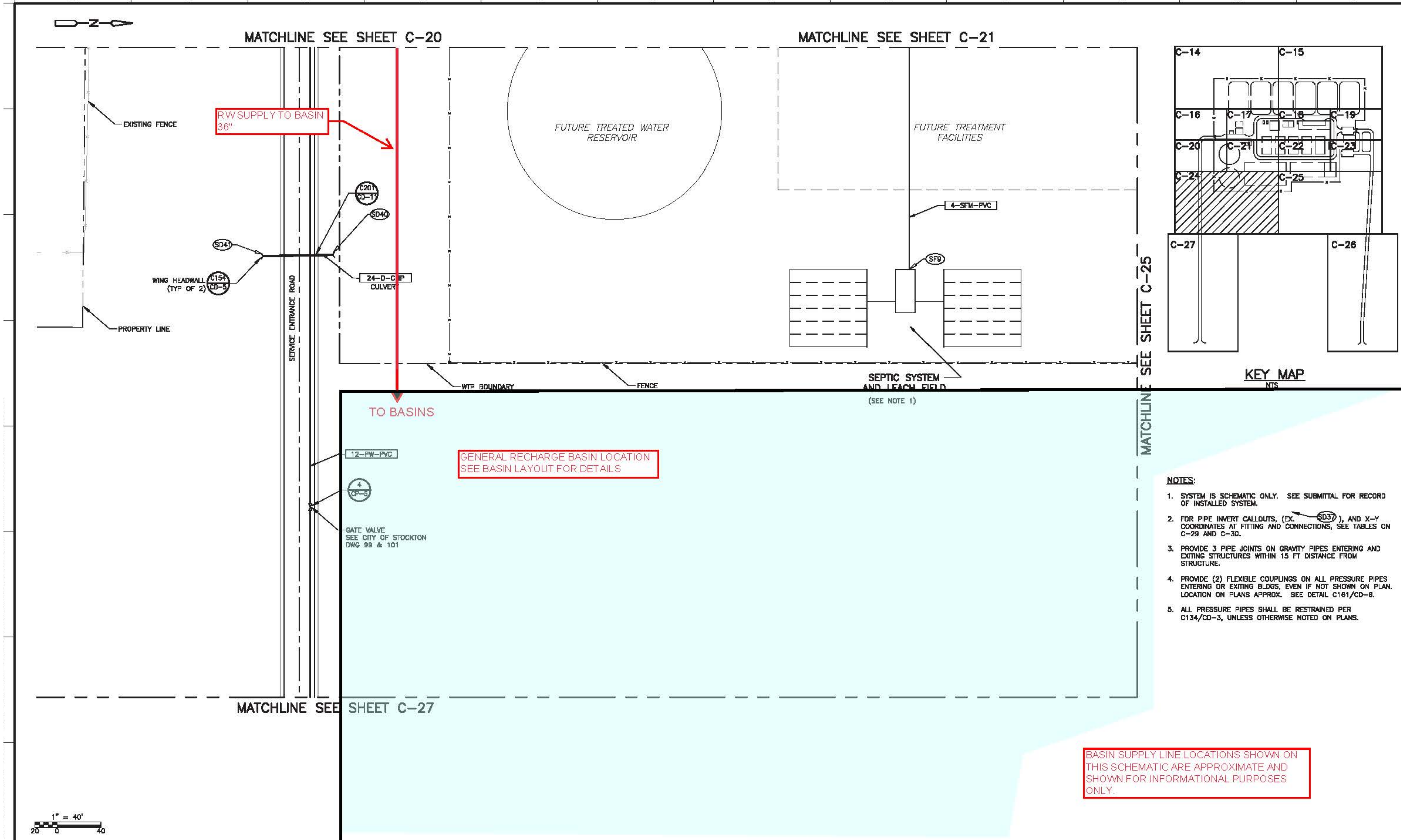
PROJECT NO. | DATE
DESIGNED BY:
DRAWN BY:
CHECKED BY:
ENGINEER
REGISTRATION NO. | DATE

DEPARTMENT OF MUNICIPAL UTILITIES
CITY OF STOCKTON, CALIFORNIA
APPROVED BY: ENGINEERING SERVICES MANAGER DATE:

DELTA WATER TREATMENT PLANT
GROUNDWATER RECHARGE BASINS

BASIN WATER SUPPLY SCHEMATIC 2 of 3

SCALE: AS SHOWN
DRAWING NO. WS-2
SHEET OF
PROJECT NO. XXXXXXX



NOTES:

1. SYSTEM IS SCHEMATIC ONLY. SEE SUBMITTAL FOR RECORD OF INSTALLED SYSTEM.
2. FOR PIPE INVERT CALLOUTS, (EX. SD37), AND X-Y COORDINATES AT FITTING AND CONNECTIONS, SEE TABLES ON C-29 AND C-30.
3. PROVIDE 3 PIPE JOINTS ON GRAVITY PIPES ENTERING AND EXITING STRUCTURES WITHIN 15 FT DISTANCE FROM STRUCTURE.
4. PROVIDE (2) FLEXIBLE COUPLINGS ON ALL PRESSURE PIPES ENTERING OR EXITING BLDGS, EVEN IF NOT SHOWN ON PLAN. LOCATION ON PLANS APPROX. SEE DETAIL C161/CD-6.
5. ALL PRESSURE PIPES SHALL BE RESTRAINED PER C134/CD-3, UNLESS OTHERWISE NOTED ON PLANS.

CDM Smith RECORD DRAWINGS
BY: DATE 9/2012

DESIGNED BY: J. NISHIMOTO
DRAWN BY: R. UCHIMURA
SHEET CHK'D BY: G. LINDSTADT
CROSS CHK'D BY: J. NISHIMOTO
APPROVED BY: G. LINDSTADT
DATE: JAN 2010

CDM Smith
One Walnut Creek Center
100 Pringle Ave, Suite 300
Walnut Creek, CA 94596
Tel: (925) 933-2900

DEPARTMENT OF MUNICIPAL UTILITIES
CITY OF STOCKTON, CALIFORNIA
APVD BY: DATE: 9/2012
ENGINEERING MANAGER, DEPARTMENT OF MUNICIPAL UTILITIES

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN ADJUST SCALE ACCORDINGLY

No. C 44050 Exp. 6/30/2011 CIVIL STATE OF CALIFORNIA

Delta Water Supply Project
CITY OF STOCKTON

DWSP WATER TREATMENT PLANT

YARD PIPING PLAN (11 OF 12)

PROJECT NO. 5000-61732
FILE NAME: 61732S00C024
SHEET NO. C-24

REVISION NUMBER	DESCRIPTION	DATE	BY	PROJECT NO.	DATE
				DESIGNED BY:	
				DRAWN BY:	
				CHECKED BY:	
				ENGINEER	
				REGISTRATION NO.	DATE

DEPARTMENT OF MUNICIPAL UTILITIES
CITY OF STOCKTON, CALIFORNIA

APPROVED BY: ________ DATE: ________
ENGINEERING SERVICES MANAGER

DELTA WATER TREATMENT PLANT
GROUNDWATER RECHARGE BASINS

BASIN WATER SUPPLY SCHEMATIC 3 of 3

SCALE: AS SHOWN
DRAWING NO. WS-3
SHEET OF
PROJECT NO. XXXXXXX