American River Flood Control District
Central Valley Flood Protection Board Permit Application
Sump 155 Modifications (City of Sacramento)
Staff Report

Discussion:

The City of Sacramento submitted this encroachment permit application to modify facilities at their Sump 155 Pump Station. The work proposed is to remove and replace approximately 360 ft of two (2) 36” welded steel pipes. Remove and replace approximately 120 ft of one (1) 42” Corrugated Metal Pipe.

Sump 155 is located adjacent to the American River South Levee and just north of the H Street Bridge in River Park.

These modifications are required to upgrade the pipe outfall system at the pump station. The current system does not meet modern U.S. Army Corps of Engineers’ standards. The USACE now requires that all pressurized pipes cross the levee at or above the 200-year flood elevation for the adjacent channel and that the pipes each have a positive closure device (shut-off valve) at the waterside crown hinge point. The proposed work will upgrade the facility to meet all State and Federal requirements.

Once the work is complete, it is not anticipated that this work will pose significant operations and maintenance impacts to the District. There will be temporary loss of access and thoroughfare for the District during construction.

Recommendation:

The General Manager recommends that the Board of Trustees endorse the CVFPB permit application.

State of California

DEPARTMENT OF WATER RESOURCES
CENTRAL VALLEY FLOOD PROTECTION BOARD

California Natural Resources Agency

APPLICATION FOR A CENTRAL VALLEY FLOOD PROTECTION BOARD
ENCROACHMENT PERMIT

Application No. _____
(For Office Use Only)

1. Description of proposed work being specific to include all items that will be covered under the issued permit.
Sump 155 Modifications: Remove and replace approximately 360 ft of two (2) 36" welded steel pipes. Remove and replace approximately 120 ft of one (1) 42" Corrugated Metal Pipe.

2. Project Location: Sacramento County, in Section See Attachment A
Township: See Attachment A (N) (S), Range: See Attachment A (E) (W), M. D. B. & M.
Latitude: 38.57020 Longitude: -121.42420
Stream: American River , Levee : Left Bank Designated Floodway: American River
APN: See Attachment A

3. Raymond Kong, PE (Name of Applicant / Land *Owner*) of 1395 35th Ave (Address)
Sacramento (City) CA (State) 95822 (Zip Code) (916) 808-1435 (Telephone Number)
RKong@cityofsacramento.org (E-mail)

4. Ashley Smith, PE (Name of Applicant's Representative) of Peterson Brustad Inc. (Company)
Folsom (City) CA (State) 95630 (Zip Code) (916) 608-2212 x 123 (Telephone Number)
asmith@pbieng.com (E-mail)

5. Endorsement of the proposed project from the Local Maintaining Agency (LMA):

We, the Trustees of American River Flood Control District (Name of LMA) approve this plan, subject to the following conditions:

☐ Conditions listed on back of this form ☐ Conditions Attached ☐ No Conditions

Trustee _____ Date _____ Trustee _____ Date _____

Trustee _____ Date _____ Trustee _____ Date _____

APPLICATION FOR A CENTRAL VALLEY FLOOD PROTECTION BOARD
ENCROACHMENT PERMIT

6. Names and addresses of adjacent property owners sharing a common boundary with the land upon which the contents of this application apply. If additional space is required, list names and addresses on back of the application form or an attached sheet.

Name	Address	Zip Code
See Attachment A		

7. Has an environmental determination been made of the proposed work under the California Environmental Quality Act of 1970? ☐ Yes ☐ No ☑ Pending

If yes or pending, give the name and address of the lead agency and State Clearinghouse Number:

City of Sacramento
1395 35th Avenue
Sacramento, CA 95822

SCH No. Pending

8. When is the project scheduled for construction? April 2021

9. Please check exhibits accompanying this application.

A. ☑ Regional and vicinity maps showing the location of the proposed work.

B. ☑ Drawings showing plan view(s) of the proposed work to include map scale.

C. ☑ Drawings showing the cross section dimensions and elevations (vertical datum?) of levees, berms, stream banks, flood plain,

D. ☑ Drawings showing the profile elevations (vertical datum?) of levees, berms, flood plain, low flow, etc.

E. ☑ A minimum of four photographs depicting the project site.

Signature of Applicant Date

Include any additional information:

A summary of the Project and a description of the proposed methods are provided in Attachment A. Attachment B includes relevant plan sheets which are an excerpt from a larger plan set. Attachment C includes the categorical permission checklist for pressurized pipe. Attachment D includes the categorical permission checklist for gravity pipe. Attachment E includes the Biological Assessment.

Attachment A – Summary of Proposed Work

CITY OF SACRAMENTO PUMP OUTFALLS PROJECT:

CENTRAL VALLEY FLOOD PROTECTION BOARD ENCROACHMENT PERMIT

SUMMARY OF PROPOSED WORK

September 15, 2020

INTRODUCTION

As mandated by the Sacramento Area Flood Control Agency (SAFCA) and the U.S. Army Corps of Engineers (USACE), sump station outfalls that penetrate and cross major levees are inspected on a 5-year cycle. The project entails the complete replacement of the pump discharge for three (3) drainage sump station facilities and partial replacement of the pump discharge pipe for five (5) drainage sump station facilities. The following information pertains to a complete replacement sump (Sump 155) that will need an updated Encroachment Permit from the CVFPB.

APN Parcels

Sump	Existing Permit #	APN
155	N/A	005-0010-024-0000, 005-0010-025-0000

ADJACENT PARCELS

All of the parcels adjacent to the Sump to be modified are listed in the table presented below as provided by the Sacramento County Assessor's Office.

APN	Address	Owner	Owner Address	City	Zip
005-0010-005-0000	SEWARD CT	STATE OF CALIFORNIA	N/A	SACRAMENTO	95826
005-0203-002-0000	250 SANDBURG DR	TIMOTHY C JOHNSON	250 SANDBURG DR	SACRAMENTO	95819
005-0203-003-0000	240 SANDBURG DR	MICHAEL L CHIECHI	240 SANDBURG DR	SACRAMENTO	95819
005-0203-004-0000	230 SANDBURG DR	OBRIEN FAMILY TRUST	230 SANDBURG DR	SACRAMENTO	95819
005-0203-005-0000	220 SANDBURG DR	SURVIVORS TRUST	220 SANDBURG DR	SACRAMENTO	95819
005-0203-006-0000	210 SANDBURG DR	DONALD T TERRELL	210 SANDBURG DR	SACRAMENTO	95819

005-0203-014-0000	E SANDBURG DR	AMERICAN RIVER FLOOD CONTROL DIST	165 COMMERCE CIR UNIT D	SACRAMENTO	95815
005-0203-018-0000	6005 CAMELLIA AVE	SEAN RANNEY	PO BOX 191334	SACRAMENTO	95819
005-0233-003-0000	6025 CAMELLIA AVE	CITY OF SACRAMENTO	915 I ST FL5	SACRAMENTO	95814
005-0233-004-0000	6009 CAMELLIA AVE	SCOTTISH GARDENS LLC	5813 W 2ND ST	RIO LINDA	95673
005-0233-006-0000	H ST	AMERICAN RIVER FLOOD CONTROL DIST	185 COMMERCE CIR	SACRAMENTO	95815

TOWNSHIP AND RANGE INFORMATION

Note that gaps exist in Townships and Ranges within the project area. Land not covered by T9N R5E has been in private ownership since before California joined the United States and therefore is not part of the Township and Range system, which was a survey of federal lands.

SITE PHOTOGRAPHS

Attached to this Summary of Proposed Work are photographs showing levee and channel areas representative of proposed work sites.

Figure 1: View of pump station

Figure 2: View from waterside TOE of Levee facing Levee crest (upstream)

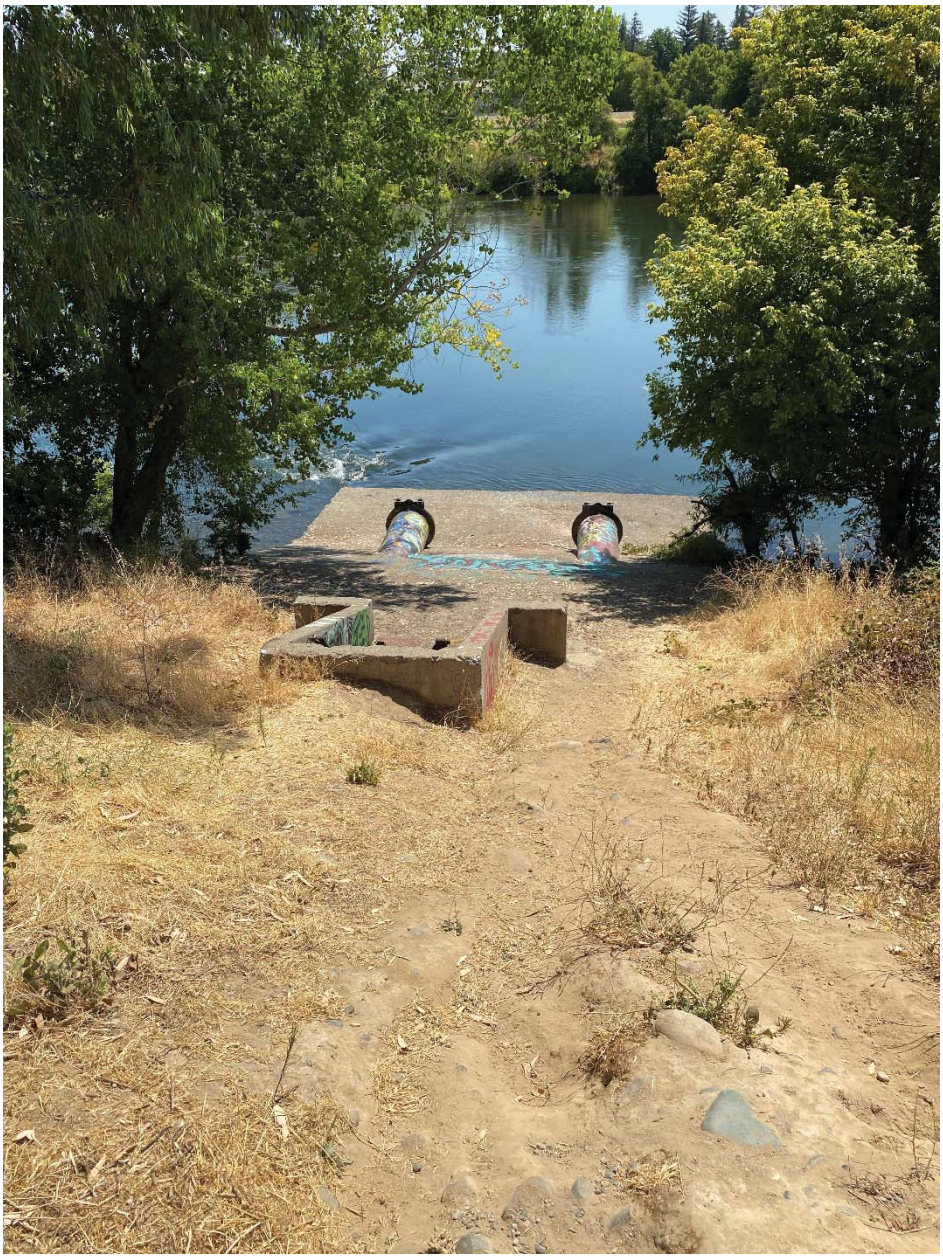
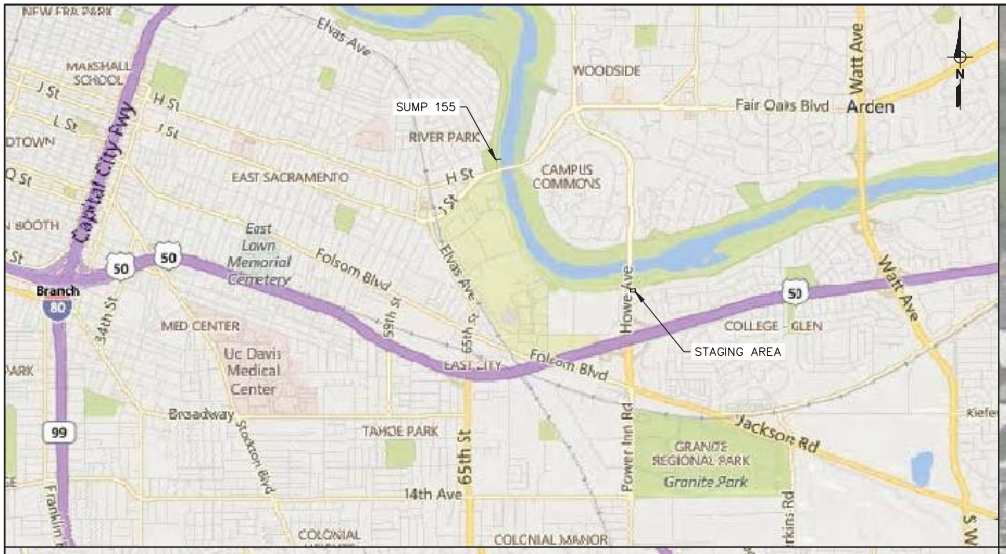


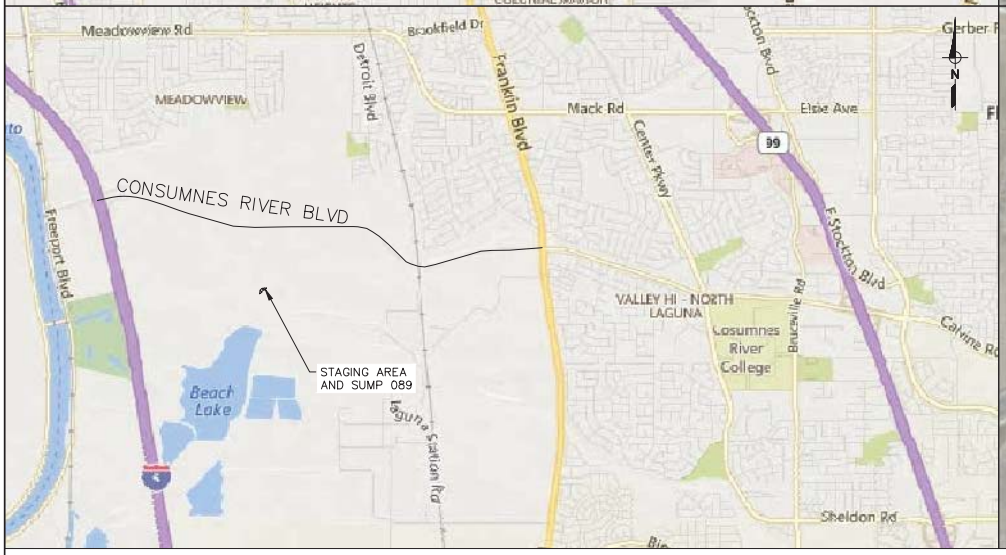
Figure 3: View from waterside slope of levee facing downstream towards American River

Figure 4: View of outfall structure with flapgates at the waterside slope of Levee

Attachment B – Plan Sheets

(Excerpt from larger plan set for Pump Outfalls Replacement Project – B)





65% SUBMITTAL

PN: W14130615 | PUMP OUTFALLS REPLACEMENT PROJECT PN: W14130615

REVISIONS DESCRIPTION	DATE	BY

BENCH MARK DESCRIPTION: ELEV.

FIELD BOOK 0000 SCALE: H: NTS V: NTS

1" ON ORIGINAL SCALE DRAWING ADJUST SCALED DIMENSIONS IF THIS DOES NOT SCALE AT 1"

CITY OF SACRAMENTO
DEPARTMENT OF UTILITIES

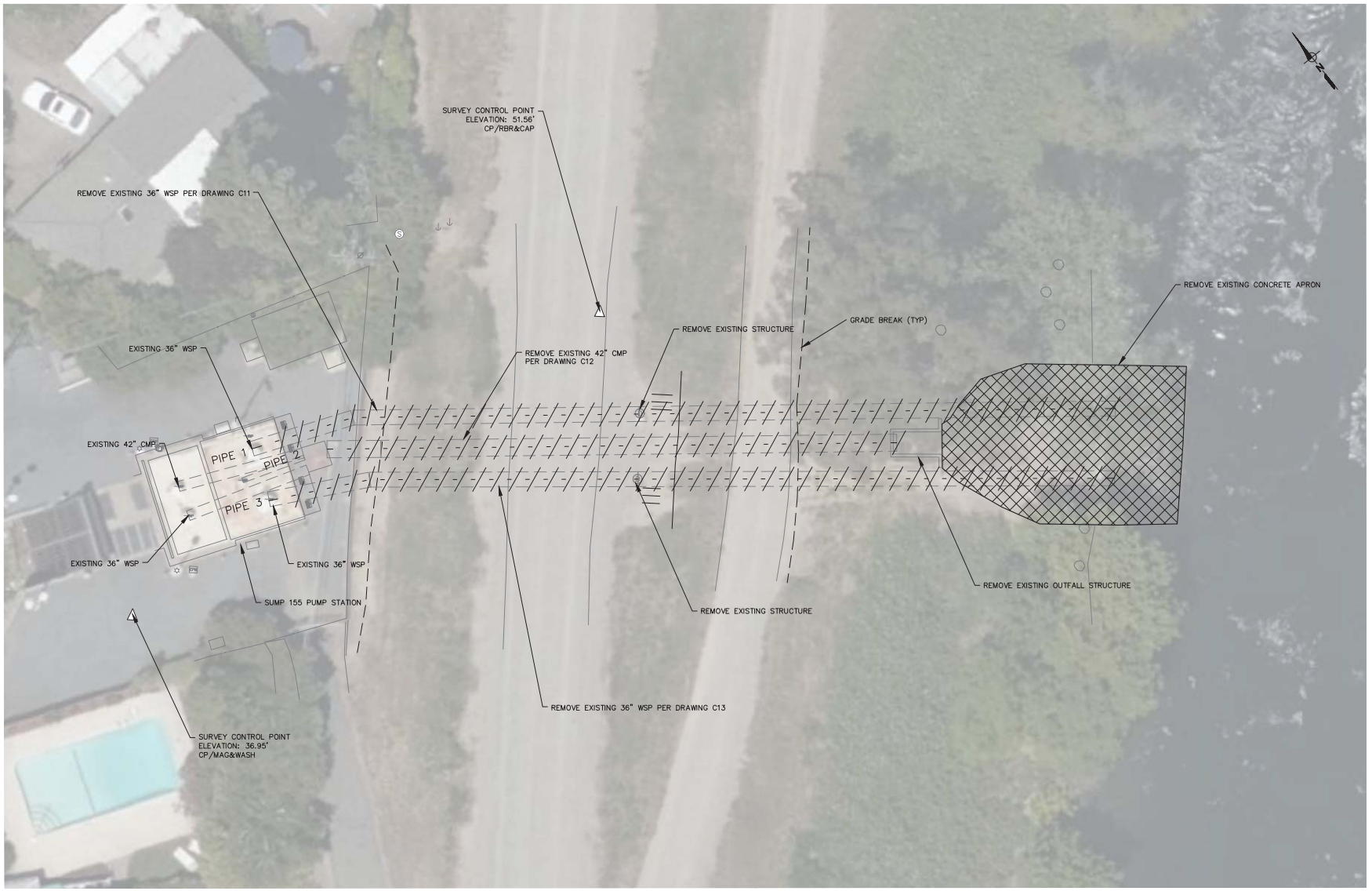
DRAWN BY: E. TUTEJA DATE: 09/15/20
DESIGNED BY: B. JENSEN R.C.E. NO. C90949 DATE: 03/31/22
CHECKED BY: A. SMITH R.C.E. NO. C86512 DATE: 03/31/21

PRELIMINARY

IMPROVEMENT PLANS FOR:
PUMP OUTFALLS REPLACEMENT PROJECT – B
SUMP 089 AND 155
STAGING AREA

PN: W14130615 DWG. NO. 23 SHEET 30

Page 112



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5 2.5 0 5
VERT SCALE: 1"=5'

65% SUBMITTAL

PN: W14130615 PUMP OUTFALLS REPLACEMENT PROJECT

REVISIONS		
DESCRIPTION	DATE	BY

BENCH MARK ELEV. 36.95
DESCRIPTION:
MAGNETIC NAIL & WASHER

FIELD BOOK 0000
SCALE:
H: 1"=10'
V: 1"=5'

1"
ON ORIGINAL SCALE DRAWING ADJUST SCALED DIMENSIONS IF THIS DOES NOT SCALE AT 1"

CITY OF SACRAMENTO
DEPARTMENT OF UTILITIES

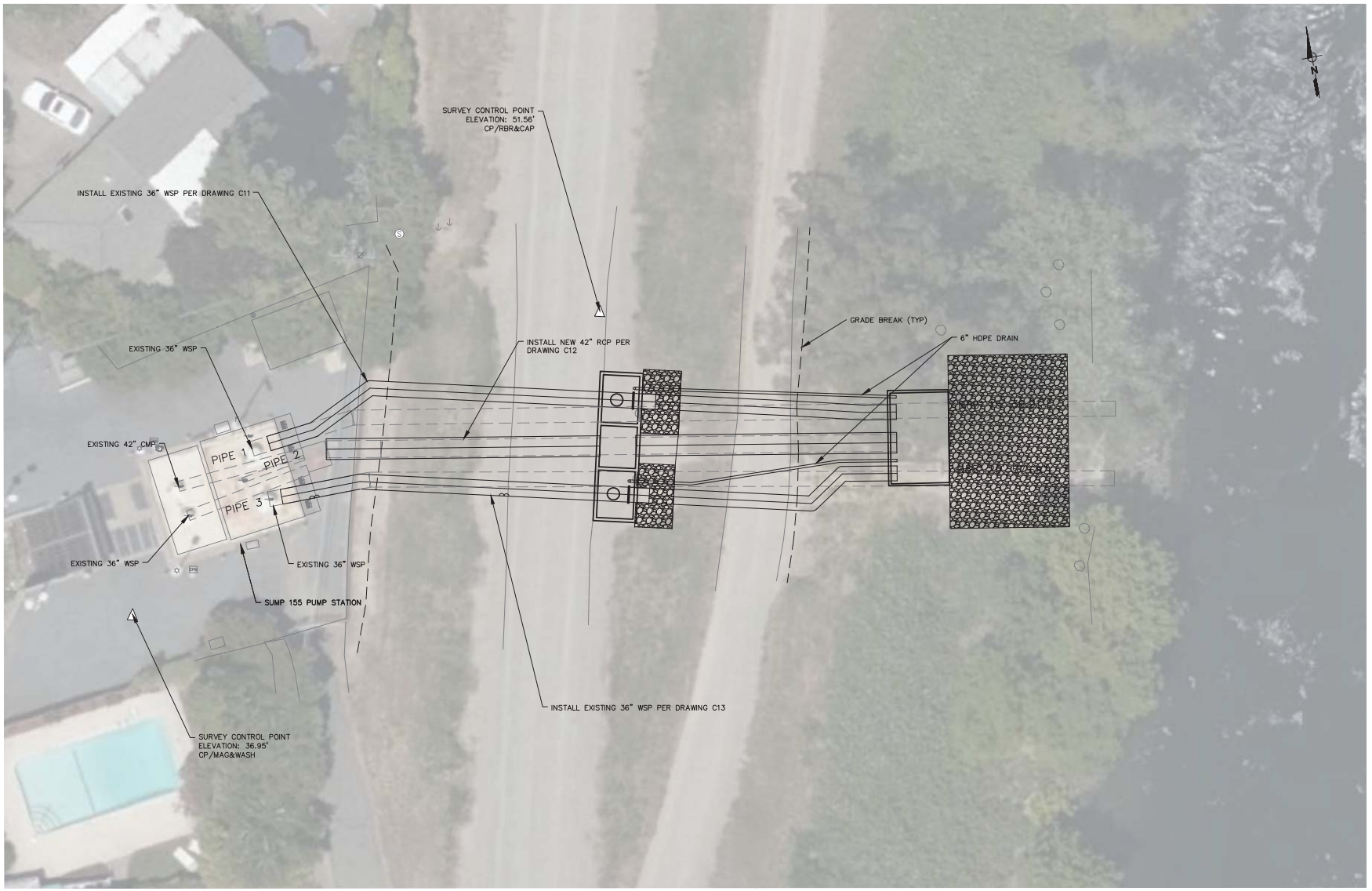
DRAWN BY: E. TUTEJA DATE: 09/15/20
DESIGNED BY: B. JENSEN R.C.E. NO. C90949 DATE: 03/31/22
CHECKED BY: A. SMITH R.C.E. NO. C86512 DATE: 03/31/21

PRELIMINARY

IMPROVEMENT PLANS FOR:
PUMP OUTFALLS REPLACEMENT PROJECT – B
SUMP 155
DEMO PLAN

PN: W14130615
DWG. NO. 19
SHEET 12 OF 30

PN: W14130615



65% SUBMITTAL

PN: W14130615

PUMP OUTFALLS REPLACEMENT PROJECT
PN: W14130615

REVISIONS		
DESCRIPTION	DATE	BY

BENCH MARK ELEV. 36.95
DESCRIPTION:
MAGNETIC NAIL & WASHER

FIELD BOOK 0000
SCALE:
H: 1"=10'
V: 1"=5'

1"
ON ORIGINAL SCALE DRAWING ADJUST SCALED DIMENSIONS IF THIS DOES NOT SCALE AT 1"

CITY OF SACRAMENTO
DEPARTMENT OF UTILITIES

DRAWN BY: E. TUTEJA DATE: 09/15/20
DESIGNED BY: B. JENSEN R.C.E. NO. C90949 DATE: 03/31/22
CHECKED BY: A. SMITH R.C.E. NO. C86512 DATE: 03/31/21

PRELIMINARY

IMPROVEMENT PLANS FOR:
PUMP OUTFALLS REPLACEMENT PROJECT – B
SUMP 155
SITE PLAN

PN: W14130615
DWG. NO. 10
SHEET 7 of 30

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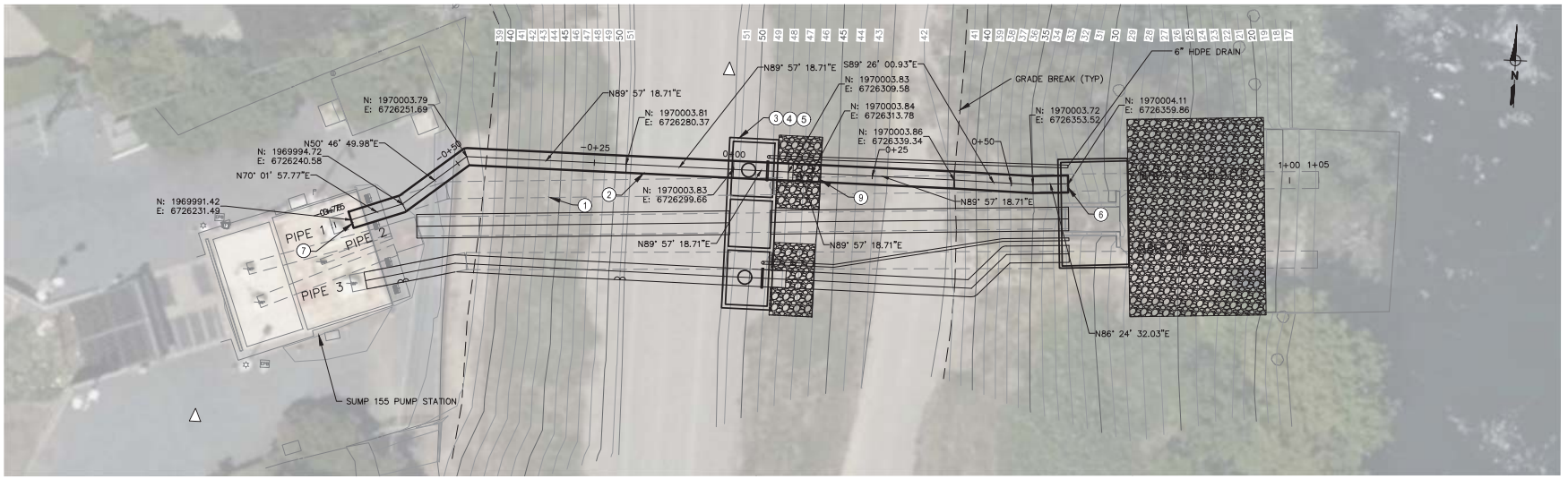
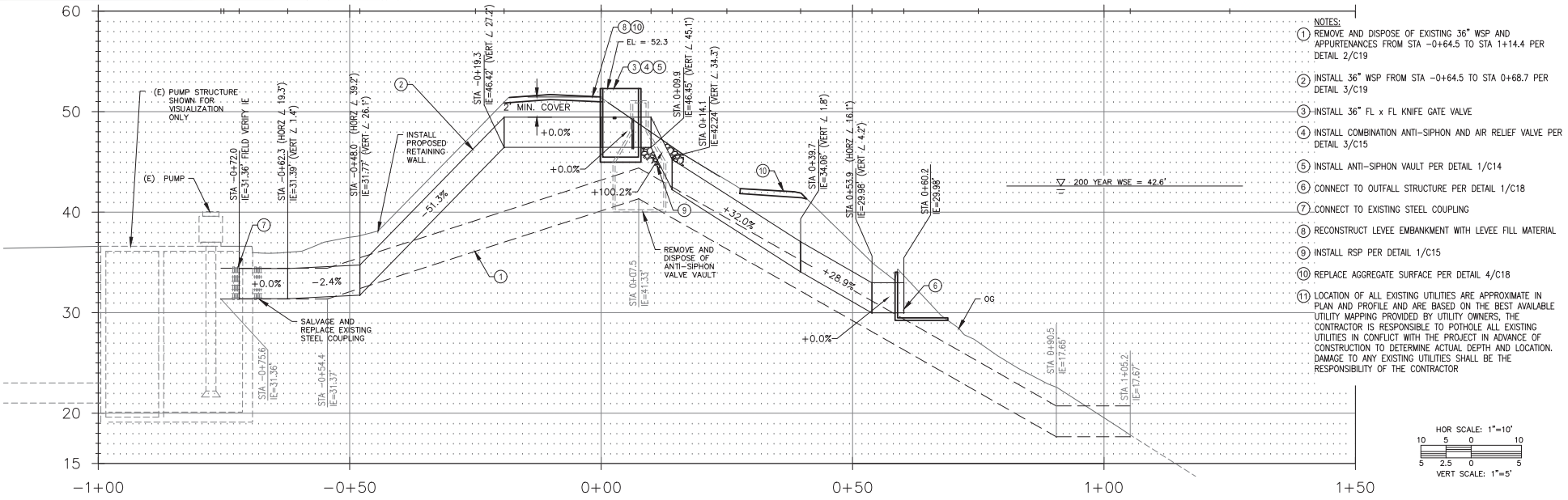




NOTES:

1. REMOVE AND DISPOSE OF EXISTING 36" WSP AND APPURTENANCES FROM STA −0+64.5 TO STA 1+14.4 PER DETAIL 2/C19
2. INSTALL 36" WSP FROM STA −0+64.5 TO STA 0+68.7 PER DETAIL 3/C19
3. INSTALL 36" FL x FL KNIFE GATE VALVE
4. INSTALL COMBINATION ANTI−SIPHON AND AIR RELIEF VALVE PER DETAIL 3/C15
5. INSTALL ANTI−SIPHON VAULT PER DETAIL 1/C14
6. CONNECT TO OUTFALL STRUCTURE PER DETAIL 1/C18
7. CONNECT TO EXISTING STEEL COUPLING
8. RECONSTRUCT LEVEE EMBANKMENT WITH LEVEE FILL MATERIAL
9. INSTALL RSP PER DETAIL 1/C15
10. REPLACE AGGREGATE SURFACE PER DETAIL 4/C18
11. LOCATION OF ALL EXISTING UTILITIES ARE APPROXIMATE IN PLAN AND PROFILE AND ARE BASED ON THE BEST AVAILABLE UTILITY MAPPING PROVIDED BY UTILITY OWNERS, THE CONTRACTOR IS RESPONSIBLE TO POTHOLE ALL EXISTING UTILITIES IN CONFLICT WITH THE PROJECT IN ADVANCE OF CONSTRUCTION TO DETERMINE ACTUAL DEPTH AND LOCATION. DAMAGE TO ANY EXISTING UTILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR

HOR SCALE: 1"=10'
10 5 0 10
VERT SCALE: 1"=5'
5 2.5 0 5

65% SUBMITTAL

PN: W14130615

PUMP OUTFALLS REPLACEMENT PROJECT
PN: W14130615

REVISIONS		
DESCRIPTION	DATE	BY

BENCH MARK — ELEV. 36.95
DESCRIPTION: MAGNETIC NAIL & WASHER

FIELD BOOK 0000
SCALE: H: 1"=10' V: 1"=5'

1" ON ORIGINAL SCALE DRAWING ADJUST SCALED DIMENSIONS IF THIS DOES NOT SCALE AT 1"

CITY OF SACRAMENTO
DEPARTMENT OF UTILITIES

DRAWN BY: E. TUTEJA DATE: 09/15/20
DESIGNED BY: B. JENSEN R.C.E. NO. C90949 DATE: 03/31/22
CHECKED BY: A. SMITH R.C.E. NO. C86512 DATE: 03/31/21

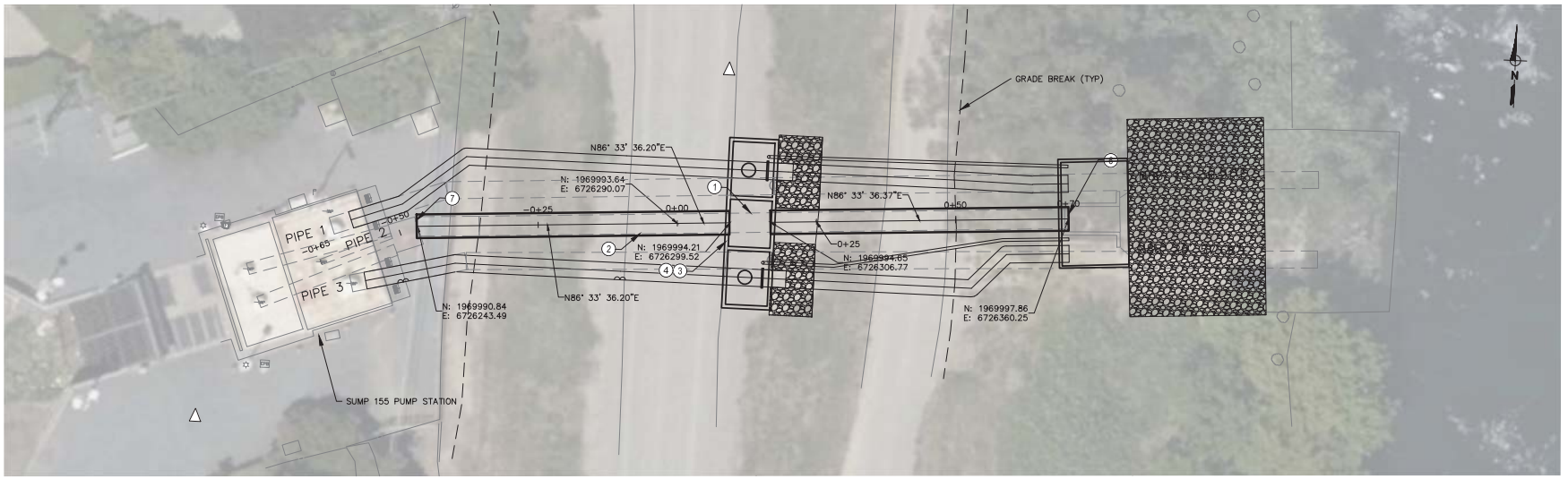
PRELIMINARY — NOT FOR CONSTRUCTION — PROFESSIONAL ENGINEER — CIVIL — STATE OF CALIFORNIA

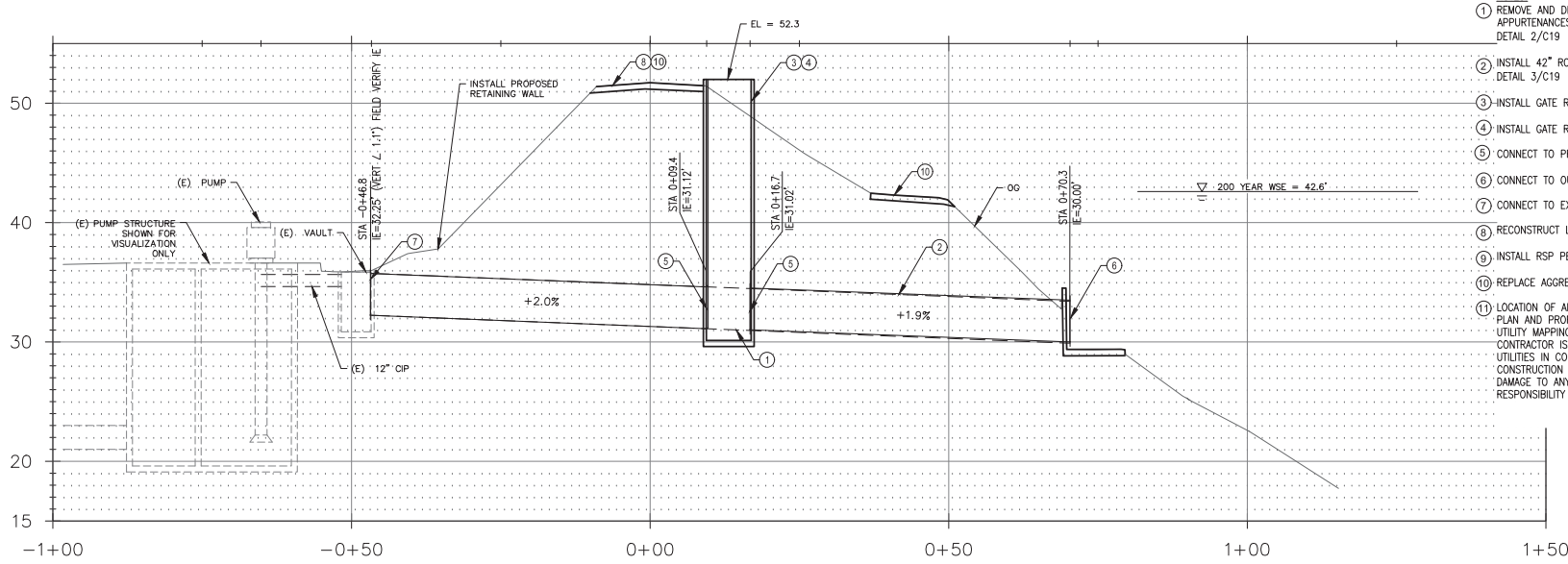
IMPROVEMENT PLANS FOR:

PUMP OUTFALLS REPLACEMENT PROJECT – B
SUMP 155
PLAN AND PROFILE 1 – 36" WSP

PN: W14130615 DWG. NO. 11 SHEET 4 OF 30

Page 115





NOTES:

1. REMOVE AND DISPOSE OF EXISTING 42" CMP AND APPURTENANCES FROM STA -0+46.7 TO STA 0+70.3 PER DETAIL 2/C19
2. INSTALL 42" RCP FROM STA -0+46.7 TO STA 0+70.3 PER DETAIL 3/C19
3. INSTALL GATE RISER STRUCTURE PER DETAIL 1/ C17
4. INSTALL GATE RISER PER DETAIL 1/ C19
5. CONNECT TO PROPOSED GATE RISER STRUCTURE
6. CONNECT TO OUTFALL STRUCTURE PER DETAIL 1/C18
7. CONNECT TO EXISTING VAULT
8. RECONSTRUCT LEVEE EMBANKMENT WITH LEVEE FILL MATERIAL
9. INSTALL RSP PER DETAIL 1/C18
10. REPLACE AGGREGATE SURFACE PER DETAIL 4/C17
11. LOCATION OF ALL EXISTING UTILITIES ARE APPROXIMATE IN PLAN AND PROFILE AND ARE BASED ON THE BEST AVAILABLE UTILITY MAPPING PROVIDED BY UTILITY OWNERS, THE CONTRACTOR IS RESPONSIBLE TO POTHOLE ALL EXISTING UTILITIES IN CONFLICT WITH THE PROJECT IN ADVANCE OF CONSTRUCTION TO DETERMINE ACTUAL DEPTH AND LOCATION. DAMAGE TO ANY EXISTING UTILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR

HOR SCALE: 1"=10'
10 5 0 10
VERT SCALE: 1"=5'
5 2.5 0 5

65% SUBMITTAL

PUMP OUTFALLS REPLACEMENT PROJECT
PN: W14130615

REVISIONS		
DESCRIPTION	DATE	BY

BENCH MARK ELEV. 36.95
DESCRIPTION:
MAGNETIC NAIL & WASHER

FIELD BOOK 0000
SCALE:
H: 1"=10'
V: 1"=5'

1"
ON ORIGINAL SCALE DRAWING ADJUST SCALED DIMENSIONS IF THIS DOES NOT SCALE AT 1"

CITY OF SACRAMENTO
DEPARTMENT OF UTILITIES

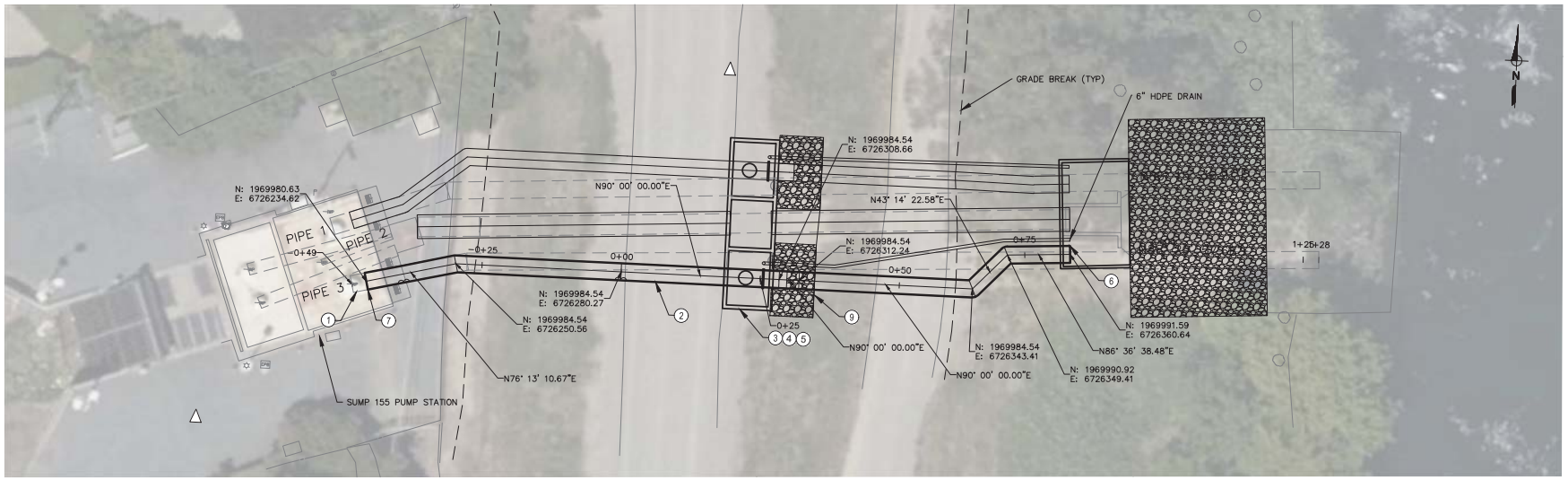
DRAWN BY: E. TUTEJA DATE: 09/15/20
DESIGNED BY: B. JENSEN R.C.E. NO. C90949 DATE: 03/31/22
CHECKED BY: A. SMITH R.C.E. NO. C86512 DATE: 03/31/21

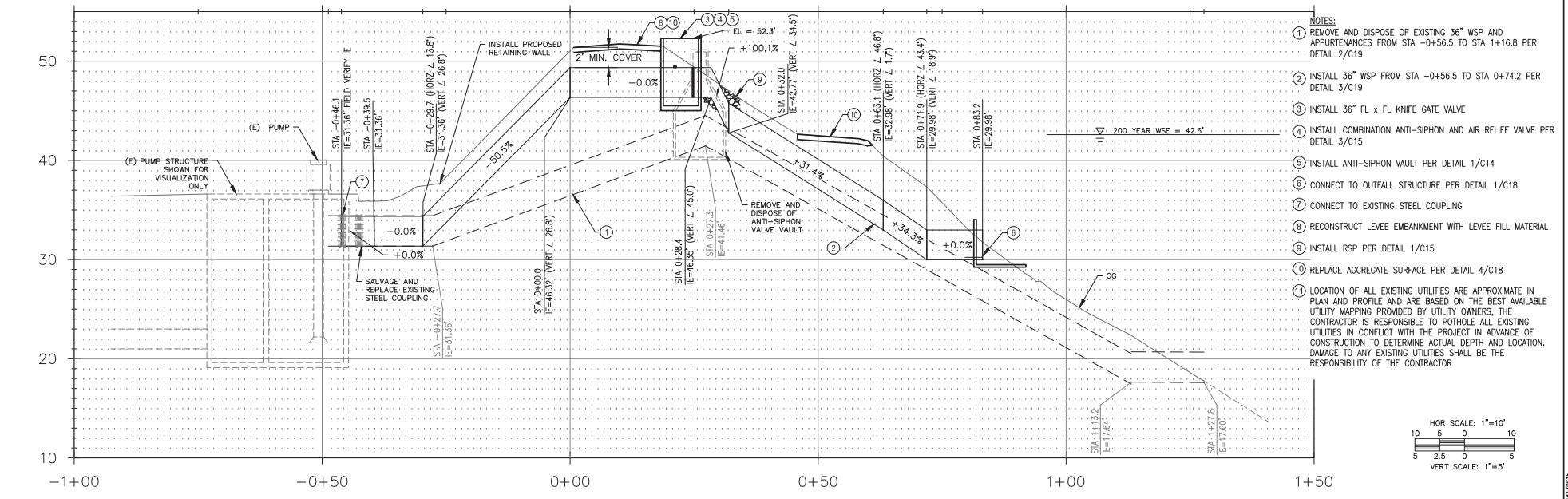
PRELIMINARY

IMPROVEMENT PLANS FOR:
PUMP OUTFALLS REPLACEMENT PROJECT – B
SUMP 155
PLAN AND PROFILE 2 – 42" RCP

PN: W14130615
DWG. NO. 12
SHEET 15
OF 30

Page 16





NOTES:

1. REMOVE AND DISPOSE OF EXISTING 36" WSP AND APPURTENANCES FROM STA −0+56.5 TO STA 1+16.8 PER DETAIL 2/C19
2. INSTALL 36" WSP FROM STA −0+56.5 TO STA 0+74.2 PER DETAIL 3/C19
3. INSTALL 36" FL x FL KNIFE GATE VALVE
4. INSTALL COMBINATION ANTI-SIPHON AND AIR RELIEF VALVE PER DETAIL 3/C15
5. INSTALL ANTI-SIPHON VAULT PER DETAIL 1/C14
6. CONNECT TO OUTFALL STRUCTURE PER DETAIL 1/C18
7. CONNECT TO EXISTING STEEL COUPLING
8. RECONSTRUCT LEVEE EMBANKMENT WITH LEVEE FILL MATERIAL
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HOR SCALE: 1"=10'
10 5 0 10
5 2.5 0 5
VERT SCALE: 1"=5'

65% SUBMITTAL

PN: W14130615

PUMP OUTFALLS REPLACEMENT PROJECT
PN: W14130615

REVISIONS		
DESCRIPTION	DATE	BY

BENCH MARK ELEV. 36.95
DESCRIPTION:
MAGNETIC NAIL & WASHER

FIELD BOOK 0000
SCALE:
H: 1"=10'
V: 1"=5'

1"
ON ORIGINAL SCALE DRAWING ADJUST SCALED DIMENSIONS IF THIS DOES NOT SCALE AT 1"

CITY OF SACRAMENTO
DEPARTMENT OF UTILITIES

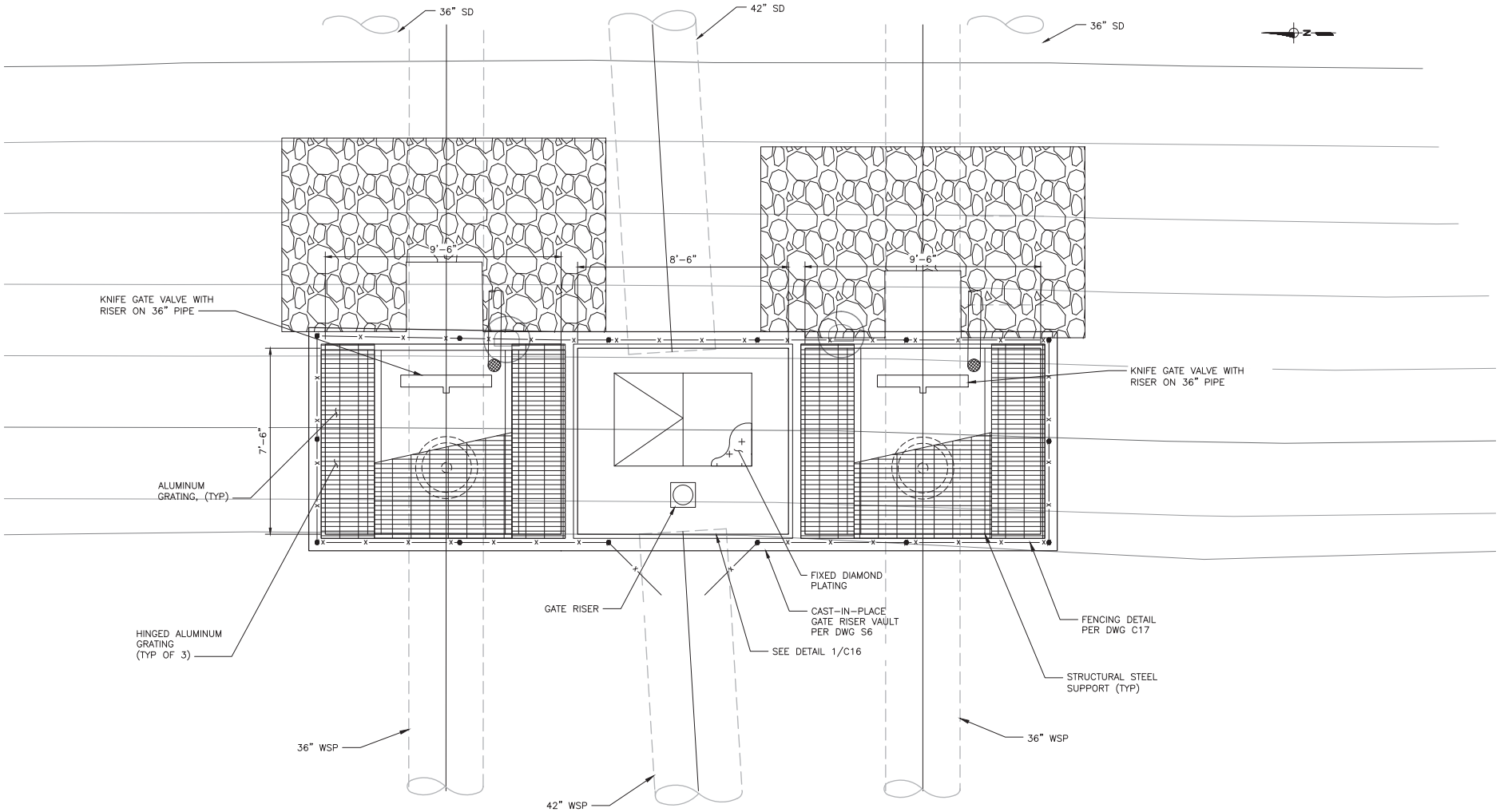
DRAWN BY: E. TUTEJA	DESIGNED BY: B. JENSEN	CHECKED BY: A. SMITH
DATE: 09/15/20	R.C.E. NO. C90949 DATE: 03/31/22	R.C.E. NO. C86512 DATE: 03/31/21

PRELIMINARY

IMPROVEMENT PLANS FOR:
PUMP OUTFALLS REPLACEMENT PROJECT – B
SUMP 155
PLAN AND PROFILE 3 – 36" WSP

PN: W14130615
DWG. NO. 13
SHEET 6 OF 30

Page 117



NOTES:

1. CUT 48"x7" OPENING IN FIXED ALUMINUM GRATING FOR 42" KNIFE GATE VALVE.
2. CUT 42"x7" OPENING IN FIXED ALUMINUM GRATING FOR 36" KNIFE GATE VALVE.

65% SUBMITTAL

PN: W14130615

PUMP OUTFALLS REPLACEMENT PROJECT
PN: W14130615

Page 118

REVISIONS			BENCH MARK	ELEV.	FIELD BOOK	1"
DESCRIPTION	DATE	BY	DESCRIPTION:		0000	ON ORIGINAL SCALE DRAWING ADJUST SCALED DIMENSIONS IF THIS DOES NOT SCALE AT 1"
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CITY OF SACRAMENTO
DEPARTMENT OF UTILITIES

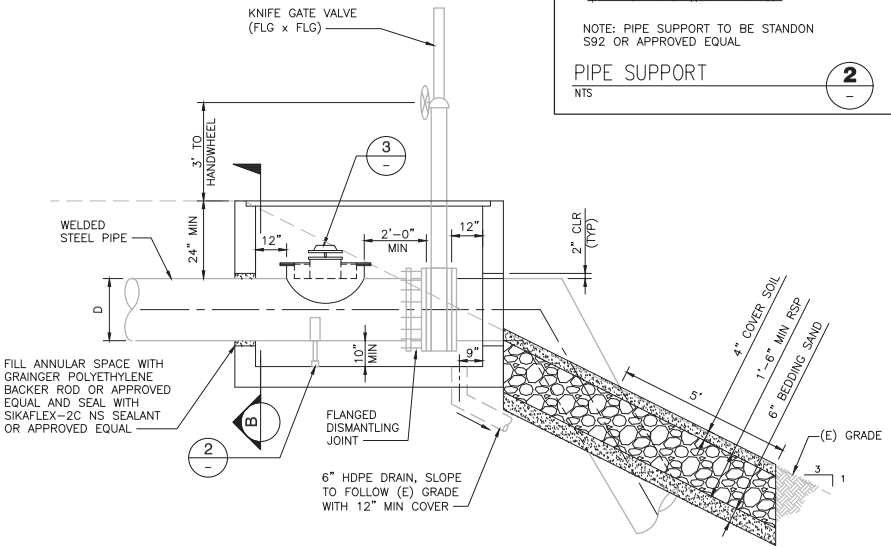
DRAWN BY: E. TUTEJA	DESIGNED BY: B. JENSEN	CHECKED BY: A. SMITH
DATE: 09/15/20	R.C.E. NO. C90949 DATE: 03/31/22	R.C.E. NO. C86512 DATE: 03/31/21

PRELIMINARY

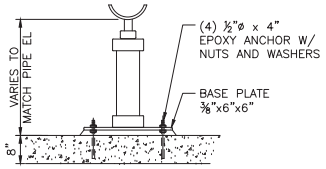
IMPROVEMENT PLANS FOR:
PUMP OUTFALLS REPLACEMENT PROJECT – B
SUMP 155
VAULT DETAIL

PN: W14130615 | DWG. NO. 14 | SHEET 17 of 30

PN: W14130615

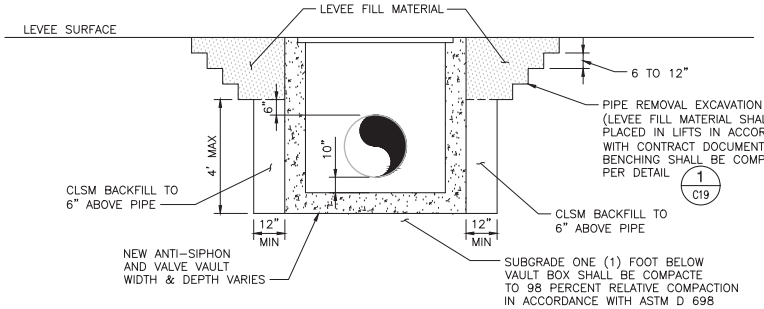


SUMP 155 ANTI SIPHON VAULT DETAIL **1**
NTS

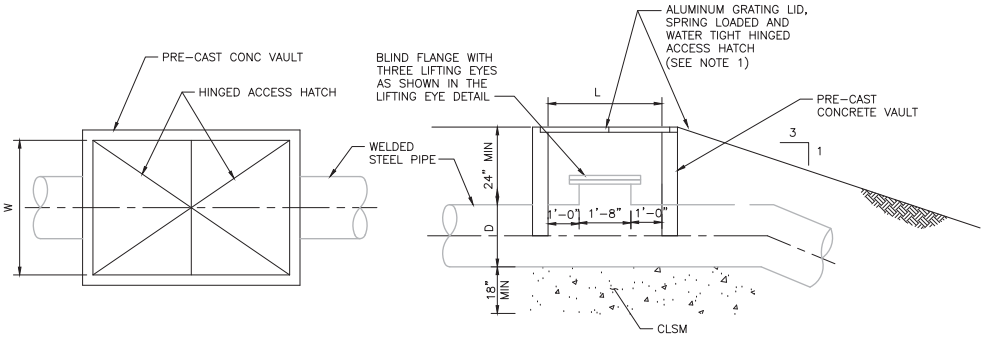


NOTE: PIPE SUPPORT TO BE STANDON S92 OR APPROVED EQUAL

PIPE SUPPORT **2**
NTS



SECTION **B**
NTS

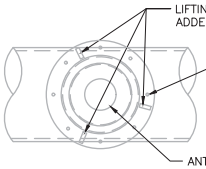


PLAN SECTION

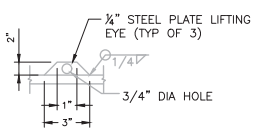
NOTE:
HATCH TO MEET H20 OR HL93 WHEEL LOADING REQUIREMENTS, WHICHEVER IS GREATER

D	L	W
18"	24"	24"
42"	42"	48"

SUMP 089 INSPECTION PORT WITH ANTI SIPHON VAULT PLAN **6**
NTS



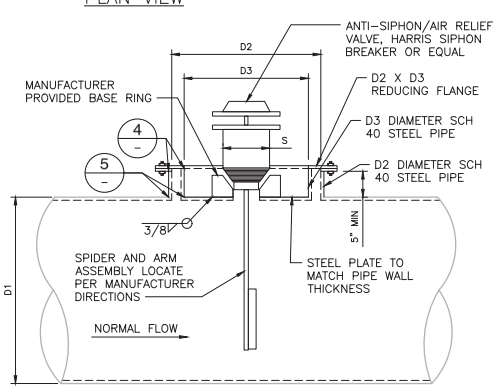
PLAN VIEW



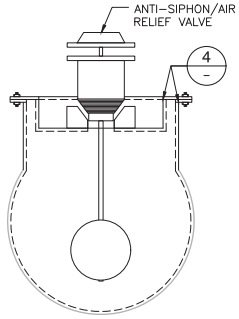
LIFTING EYE DETAIL

TYPICAL ANTI-SIPHON VALVE SIZE

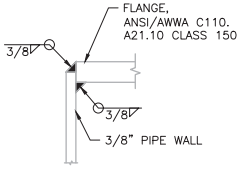
D1	D2	D3	S	MODEL
18"	16"	12"	3"	HSB-03-A-18
30"	24"	20"	7"	HSB-07-B-30
36"	30"	24"	5"	HSB-05-A-36
42"	30"	24"	8"	HSB-08-B-42



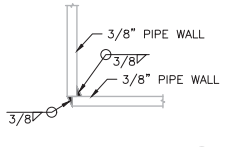
PROFILE VIEW



SECTION VIEW



WELD DETAIL **4**
NTS



WELD DETAIL **5**
NTS

ANTI-SIPHON AND AIR RELIEF VALVE CONNECTION DETAIL **3**
NTS

65% SUBMITTAL

PN: W14130615 PUMP OUTFALLS REPLACEMENT PROJECT PN: W14130615

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REVISIONS DESCRIPTION	DATE	BY

BENCH MARK ELEV. _____
DESCRIPTION:

FIELD BOOK 0000
SCALE: H: _____ V: _____

1" ON ORIGINAL SCALE DRAWING ADJUST SCALED DIMENSIONS IF THIS DOES NOT SCALE AT 1"

CITY OF SACRAMENTO
DEPARTMENT OF UTILITIES

DRAWN BY: E. TUTEJA DATE: 09/15/20
DESIGNED BY: B. JENSEN R.C.E. NO. C90949 DATE: 03/31/22
CHECKED BY: A. SMITH R.C.E. NO. C86512 DATE: 03/31/21

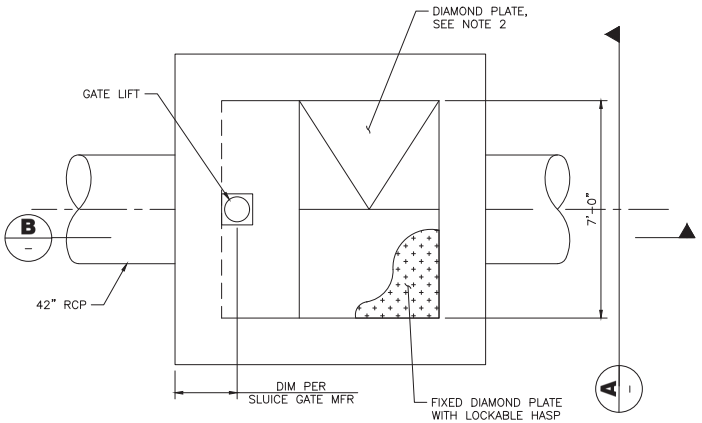
PRELIMINARY

IMPROVEMENT PLANS FOR:
PUMP OUTFALLS REPLACEMENT PROJECT – B
ANTI SIPHON AND VALVE VAULT
SECTIONS AND DETAILS

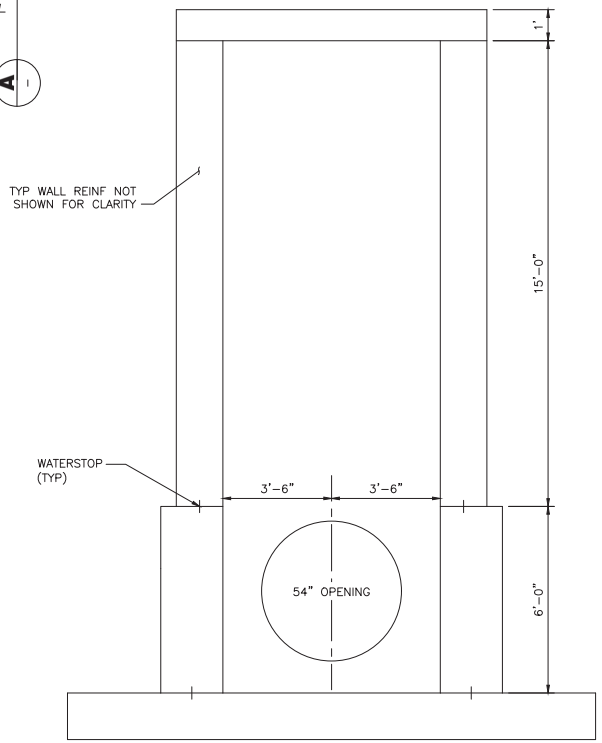
PN: W14130615 DWG. NO. 15 SHEET 18 OF 30

PN: W14130615

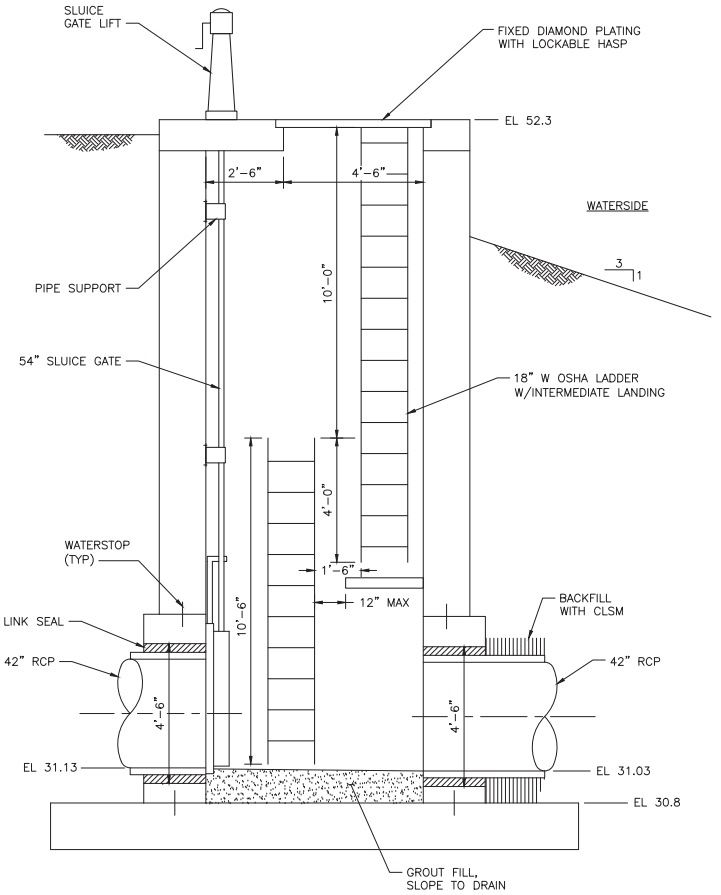
NOTES:
1. DETAILS FOR CAST IN PLACE STRUCTURE ARE SHOWN ON STRUCTURAL DRAWINGS. GATE RISER STRUCTURE MAY BE PRECAST AS AN ALTERNATIVE.
2. HINGED COVER SHALL HAVE TORSION ASSIST PER SPECIFICATION 05 50 00.



SUMP 155
GATE RISER STRUCTURE DETAIL 1
1/2"=1'-0"



SECTION A
NTS



SECTION B
NTS

65% SUBMITTAL

PN: W14130615 PUMP OUTFALLS REPLACEMENT PROJECT PN: W14130615

REVISIONS DESCRIPTION	DATE	BY

BENCH MARK ELEV. _____
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CITY OF SACRAMENTO
DEPARTMENT OF UTILITIES

DRAWN BY: E. TUTEJA	DESIGNED BY: B. JENSEN	CHECKED BY: A. SMITH
DATE: 09/15/20	R.C.E. NO. C90949 DATE: 03/31/22	R.C.E. NO. C86512 DATE: 03/31/21

PRELIMINARY

IMPROVEMENT PLANS FOR:
PUMP OUTFALLS REPLACEMENT PROJECT – B
SUMP 155 GATE RISER ACCESS DETAIL AND SECTIONS

PN: W14130615 DWG. NO. 16 SHEET 19 OF 30

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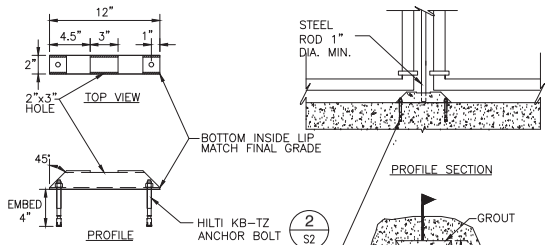
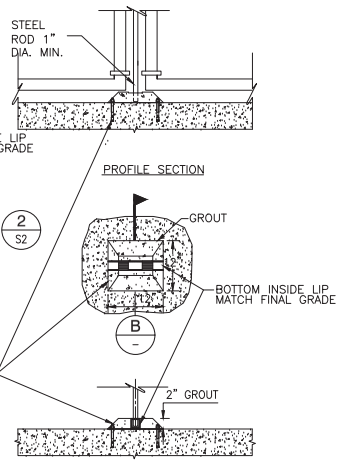
GENERAL NOTES:

1. LINE POSTS SHALL BE MIN 2½" O.D. SPACED AT MAX 10' O.C.
2. HORIZONTAL BRACE AND TOP RAIL SIZE SHALL BE MIN 1⅝" DIA.
3. END, CORNER, AND GATE POSTS SHALL BE MIN 2½" O.D. WITH 1⅝" O.D BRACE RAIL, ⅜" TRUSS ASSEMBLY, 12-GAUGE TENSION BANDS SECURED AT MAX 12" O.C.
4. GATE FRAME SHALL BE FABRICATED FROM 2½" O.D. OR 2½" SQUARE MEMBERS WELDED AT ALL CORNERS.
5. CHAIN LINK FABRIC SHALL BE SECURED TO LINE POST AND TOP RAIL USING 9-GAUGE TIE WIRE SPACED AT MAX 12" O.C.
6. 2-3/8" SHOULDERED EYE BOLT 3" LENGTH TO ANCHOR TENSION WIRE PER 10' SECTION EVENLY SPACED, SECURED WITH HOG RING CAPTURING FENCE FABRIC AND TENSION WIRE TO MAINTAIN DOWNWARD TENSION ON SECURITY FENCE SYSTEM.
7. PROVIDE "CITY UTILITY FACILITY – NO TRESPASSING" SIGNAGE GATE.

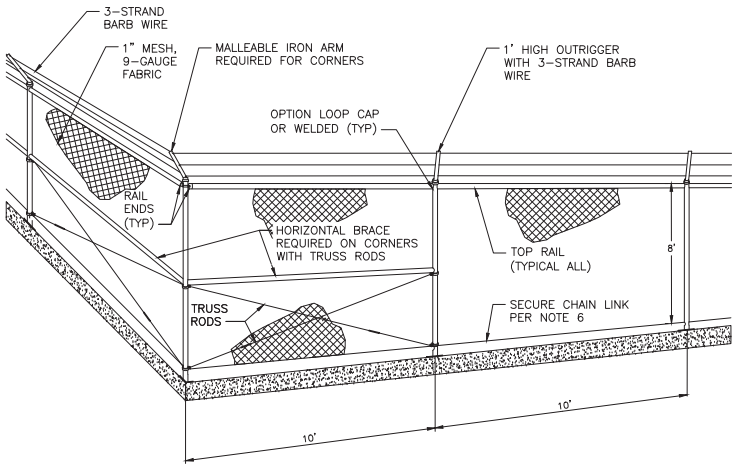


2" SQUARE TUBING DETAIL
NOT TO SCALE

2" (SQ. TUBING) x 0.250" WALL TH. x 12"L, CUT ONE 3" x 2" HOLE IN TOP AND ANGLE CUT BOTH ENDS 45° FROM HORIZONTAL. ANCHOR WITH HILTI KB-TZ ANCHOR BOLT SEE DETAIL ABOVE. BOTTOM INSIDE LIP OF SQUARE TUBING SHALL MATCH FINAL GRADE. "DO NOT BLOCK ENDS OF SQUARE TUBING WITH GROUT".

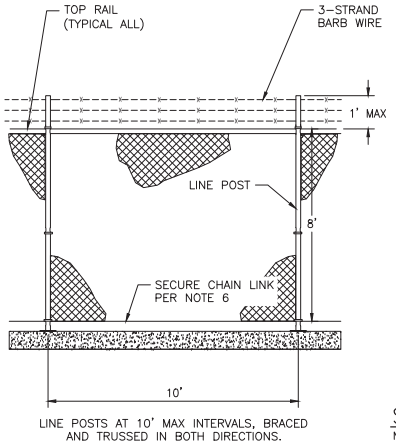


RIGHT SECTION B
NTS



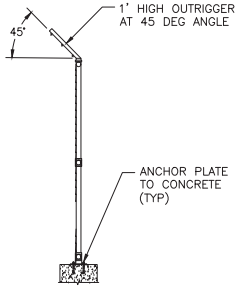
CORNER DETAIL 2
NTS

GATE ANTI-SWING FOOTING DETAIL 1
NTS

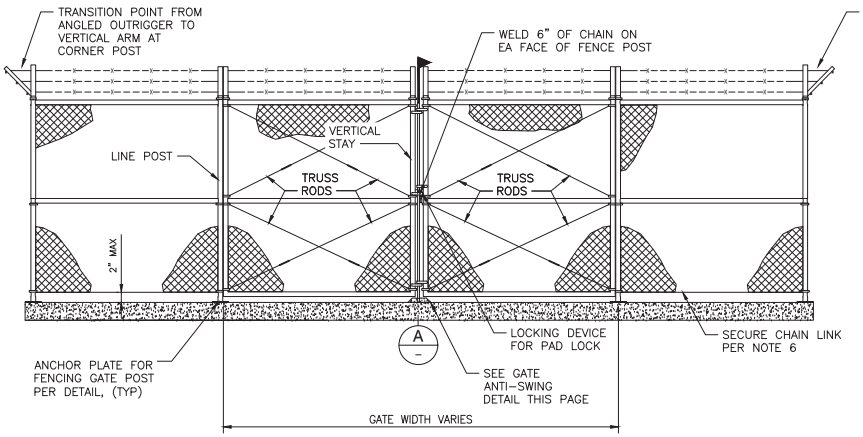


LINE POSTS AT 10' MAX INTERVALS, BRACED AND TRUSSED IN BOTH DIRECTIONS.

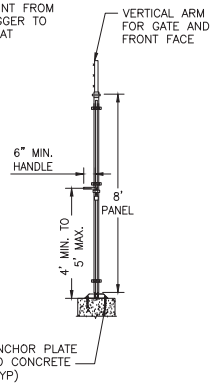
LINE POST DETAIL 3
NTS



SIDE VIEW DETAIL 4
NTS



MAINTENANCE GATE DETAIL 5
NTS



GATE OPERATOR SECTION A
NTS

8 FOOT HIGH CHAIN LINK FABRIC WITH ANGLED OUTRIGGER AND 3 STRAND BARB WIRE (OUTSIDE) STANDARD FENCING DETAIL

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REVISIONS DESCRIPTION	DATE	BY

BENCH MARK DESCRIPTION: ELEV.

FIELD BOOK 0000 SCALE: H: V:

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CITY OF SACRAMENTO
DEPARTMENT OF UTILITIES

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DESIGNED BY: B. JENSEN R.C.E. NO. C90949 DATE: 03/31/22
CHECKED BY: A. SMITH R.C.E. NO. C86512 DATE: 03/31/21

PRELIMINARY

IMPROVEMENT PLANS FOR:
PUMP OUTFALLS REPLACEMENT PROJECT – B
MISCELLANEOUS VAULT SECURITY DETAILS

PN: W14130615 DWG. NO. 17 SHEET 20 OF 30

PUMP OUTFALLS REPLACEMENT PROJECT PN: W14130615

PN: W14130615

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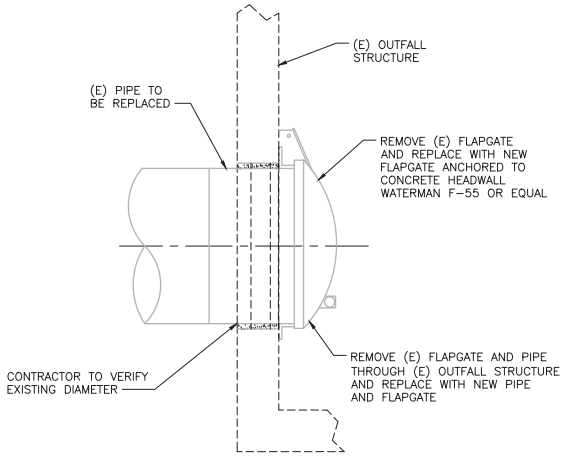
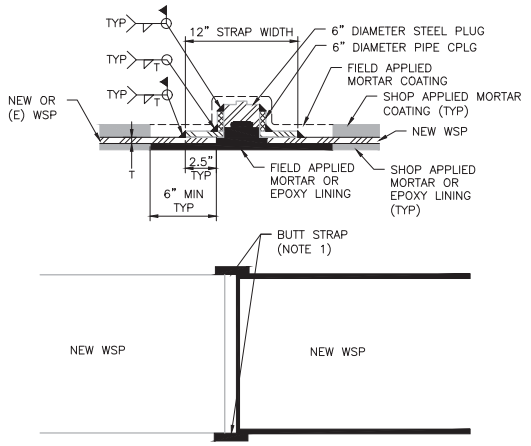
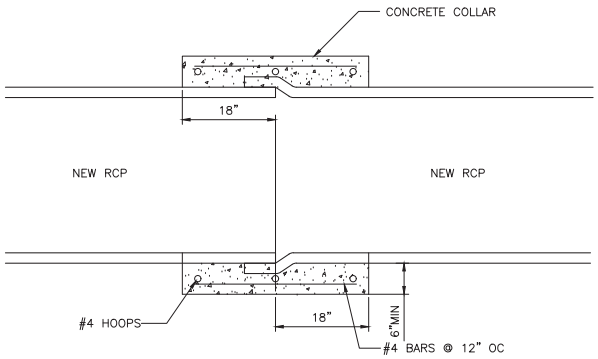


OUTFALL STRUCTURE CONNECTION DETAIL 1
NTS

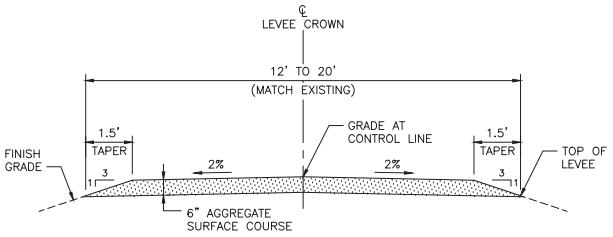


NOTES:
1. PROVIDE HAND HOLES AS NEEDED TO INSTALL FIELD LINING. WELD HAND HOLE CLOSED WHEN COMPLETE. HAND HOLES NOT REQUIRED AT OUTLETS IF ACCESSIBLE THROUGH FLAP GATE.

NEW OR EXISTING STEEL
PIPE CONNECTION DETAIL 2
NTS



NEW OR EXISTING RCP
PIPE CONNECTION DETAIL 3
NTS



CROWN SURFACING DETAIL 4
NTS

PN: W14130615 PUMP OUTFALLS REPLACEMENT PROJECT PN: W14130615

65% SUBMITTAL

PN: W14130615

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FIELD BOOK 0000 SCALE: H: V:

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CITY OF SACRAMENTO
DEPARTMENT OF UTILITIES

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DESIGNED BY: B. JENSEN R.C.E. NO. C90949 DATE: 03/31/22
CHECKED BY: A. SMITH R.C.E. NO. C86512 DATE: 03/31/21

PRELIMINARY

IMPROVEMENT PLANS FOR:
PUMP OUTFALLS REPLACEMENT PROJECT – B
MISCELLANEOUS DETAILS I

PN: W14130615 DWG. NO. T18 SHEET 21 OF 30

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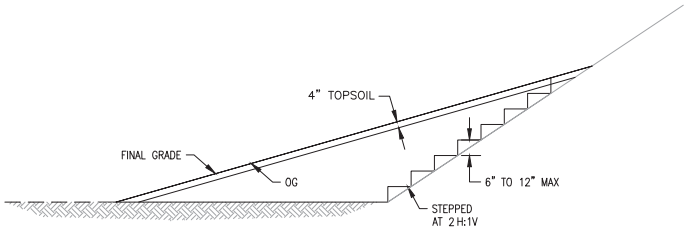
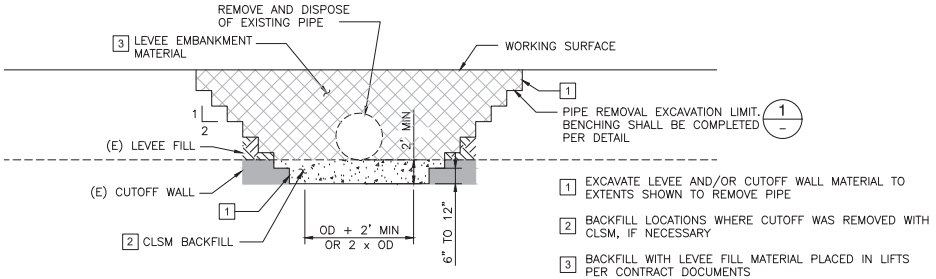


TYPICAL SLOPE BENCHING NOTES:

1. PLACE FILL IN HORIZONTAL LIFTS AGAINST VERTICAL FACES CUT INTO EXISTING LEVEE MATERIAL.
2. THE BOTTOM OF THE KEY TRENCH SHALL BE SCARIFIED TO A DEPTH OF 8 INCHES AND RECOMPACTED TO 95% MAX DENSITY PER ASTM D698.

SLOPE BENCHING (LANDSIDE OR WATERSIDE) DETAIL 1/–

NTS



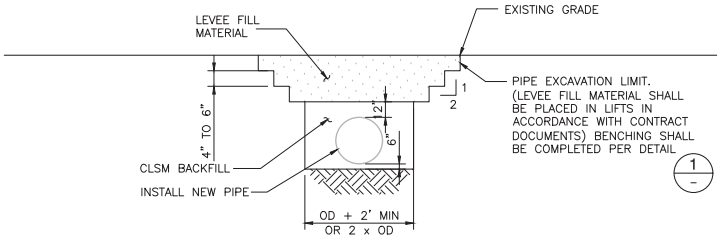
1 EXCAVATE LEVEE AND/OR CUTOFF WALL MATERIAL TO EXTENTS SHOWN TO REMOVE PIPE

2 BACKFILL LOCATIONS WHERE CUTOFF WAS REMOVED WITH CLSM, IF NECESSARY

3 BACKFILL WITH LEVEE FILL MATERIAL PLACED IN LIFTS PER CONTRACT DOCUMENTS

TYPICAL REMOVAL OF EXISTING PIPE DETAIL 2/–

NTS



INSTALLATION OF NEW PIPE DETAIL 3/–

NTS

65% SUBMITTAL

PN: W14130615

PUMP OUTFALLS REPLACEMENT PROJECT
PN: W14130615

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BENCH MARK ELEV. _____
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CITY OF SACRAMENTO
DEPARTMENT OF UTILITIES

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CHECKED BY: A. SMITH R.C.E. NO. C86512 DATE: 03/31/21

PRELIMINARY

IMPROVEMENT PLANS FOR:
PUMP OUTFALLS REPLACEMENT PROJECT – B
MISCELLANEOUS DETAILS II

PN: W14130615
DWG. NO. 19
SHEET 22 OF 30

4/1/2021

STRUCTURAL ABBREVIATIONS

Abbreviation	Meaning
@	AT
∠	ANGLE
ABV	ABOVE
AB	ANCHOR BOLT
ACI	AMERICAN CONCRETE INSTITUTE
ADDNL	ADDITIONAL
ADJ	ADJACENT
AISC	AMERICAN INSTITUTE FOR STEEL CONSTRUCTION
ALT	ALTERNATE
APPROX	APPROXIMATE
ASTM	AMERICAN SOCIETY FOR TESTING & MATERIALS
AWS	AMERICAN WELDING SOCIETY
BLW	BELOW
BOC	BOTTOM OF CONCRETE
BOF	BOTTOM OF FOOTING
BOTT	BOTTOM
BTW	BETWEEN
BYD	BEYOND
CBC	CALIFORNIA BUILDING CODE
CCR	CALIFORNIA CODE OF REGULATIONS
CE	CIVIL ENGINEER
CJ	CONSTRUCTION JOINT
℄	CENTERLINE
CLR	CLEAR
CLSM	CONTROLLED LOW–STRENGTH MATERIAL
CONC	CONCRETE
CONN	CONNECTION
CONSTR	CONSTRUCTION
CONT	CONTINUOUS
COORD	COORDINATE/COORDINATION
CTR	CENTER
CTRD	CENTERED
DBL	DOUBLE
DEG	DEGREE
DEPR	DEPRESSED
DIA (ø)	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DL	DEAD LOAD
DTL	DETAIL
DWG	DRAWING
EA	EACH
EF	EACH FACE
EE	EACH END
EJ	EXPANSION JOINT
EL	ELEVATION
ELEV	ELEVATION
EOS	EDGE OF SLAB
EOR	ENGINEER OF RECORD
EQ (=)	EQUAL
ES	EACH SIDE
EW	EACH WAY
EB	EXPANSION BOLT
EQUIP	EQUIPMENT
EXTR	EXTERIOR
FAB	FABRICATE
f'c	MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF CONCRETE
FD	FLOOR DRAIN
FF	FINISH FLOOR
FFE	FINISH FLOOR ELEVATION
FG	FINISH GRADE
FIN	FINISH
FLG	FLANGE
FND	FOUNDATION
FOC	FACE OF CONCRETE
FOW	FACE OF WALL
FT (')	FOOT/FEET
FTG	FOOTING
Fy	SPECIFIED YIELD STRENGTH OF REINFORCING, PSI OR SPECIFIED MINIMUM YIELD STRESS OF STEEL, KSI
GA	GAUGE
GALV	GALVANIZED
GRD	GRADE
GT	GROUT
HAS	HEADED ANCHOR STUD
HDG	HOT–DIPPED GALVANIZED
HK	HOOK
HORIZ	HORIZONTAL
HT	HEIGHT
HSB	HIGH STRENGTH BOLT
ICBO	INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS
ICC	INTERNATIONAL CODE COUNCIL
IN (")	INCH
INFO	INFORMATION
INTR	INTERIOR
JT	JOINT
KSI	KIPS PER SQUARE INCH
LL	LIVE LOAD
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LONG	LONGITUDINAL
MAX	MAXIMUM
MECH	MECHANICAL
MEP	MECHANICAL, ELECTRICAL, PLUMBING
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MTL	METAL
N/A	NOT APPLICABLE
NIC	NOT IN CONTRACT
NO. (#)	NUMBER OR POUNDS
NOM	NOMINAL
NS&FS	NEARSIDE & FARSIDE
NSG	NON SHRINK GROUT
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OSHA	OCCUPATIONAL SAFETY & HEALTH ADMINSTRATION
OPG	OPENING
OPP	OPPOSITE
OH	OPPOSITE HAND
PCF	POUNDS PER CUBIC FOOT
PERP	PERPENDICULAR
⅊	PLATE
PSI	POUNDS PER SQUARE INCH
PSF	POUNDS PER SQUARE FOOT
PT	POINT
R	RADIUS
RCP	REINFORCED CONCRETE PIPE
REINF	REINFORCING/REINFORCEMENT
REQ	REQUIRED
SCHED	SCHEDULE
SE	STRUCTURAL ENGINEER
SEIS JT	SEISMIC JOINT
SEOR	STRUCTURAL ENGINEER OF RECORD
SHT	SHEET
SIM	SIMILAR
SJ	SHRINKAGE JOINT
SOG	SLAB ON GRADE
SPCG	SPACING
SPEC	SPECIFICATION
SQ	SQUARE
SS	STAINLESS STEEL
STAG	STAGGER
STD	STANDARD
STIFF	STIFFENER
STL	STEEL
STRUC	STRUCTURAL
SYM	SYMMETRICAL
t_f	FLANGE THICKNESS
THRD	THREAD OR THREADED
THK	THICK/THICKNESS
T.O.	TOP OF
TOC	TOP OF CONCRETE
TOF	TOP OF FOOTING/ TOP OF FRAMING
TOS	TOP OF STEEL
TOW	TOP OF WALL
TRAN	TRANSVERSE
TYP	TYPICAL
T&B	TOP & BOTTOM
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
VIF	VERIFY IN FIELD
W/	WITH
W/O	WITHOUT
WP	WORK POINT
WSP	WELDED STEEL PIPE
WT	WEIGHT

FOUNDATIONS:

1. FOUNDATION DESIGN IS BASED ON SOIL STRATA THAT IS UNDISTURBED, NON–ORGANIC NATIVE SOIL, CLASS 5 AS PER CBC CHAPTER 18 AND TABLE 1806.2, WITH A BEARING CAPACITY OF 1500 PSF. FOUNDATIONS SHALL BEAR ON FIRM FOUNDATION SOIL STRATA. EXPANSIVE, ORGANIC, LOOSE OR SOFT SOILS SHALL NOT BE UTILIZED FOR SUPPORT OF FOOTINGS OR SLABS ON GRADE. THE ENGINEER IS NOT RESPONSIBLE FOR SETTLEMENT DUE TO SOFT SOILS OR EFFECTS DUE TO EXPANSIVE SOILS. IT IS THE OWNER'S RESPONSIBILITY TO INSURE COMPLIANCE WITH THESE REQUIREMENTS.
2. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO SHORE AND BRACE AS REQUIRED. SEE SAFETY NOTES FOR ADDITIONAL INFORMATION.
3. ALL FOUNDATIONS ARE SHOWN AND DIMENSIONED AS BEING FORMED. FOUNDATIONS MAY BE PLACED IN NEAT EXCAVATIONS PROVIDED FOOTINGS ARE INCREASED 2" IN WIDTH, SEE TYPICAL UNFORMED FOOTING DETAIL.
4. EXCAVATIONS SHALL BE CLEANED OF ALL DEBRIS AND LOOSE SOIL. STANDING WATER SHALL BE REMOVED PRIOR TO CONCRETE PLACEMENT.
5. TOPS AND BOTTOMS OF ALL FOUNDATIONS SHALL BE LEVEL. SLOPING FOUNDATIONS ARE NOT PERMITTED.
6. FOOTINGS SHALL BE CENTERED UNDER WALLS AND/OR COLUMNS UNLESS OTHERWISE INDICATED ON DRAWINGS.
7. CONTRACTOR SHALL CHECK FOOTING FORMS TO VERIFY THAT THEY ARE SQUARE AND PLUMB. THE CONTRACTOR SHALL ALSO VERIFY THAT ALL INSERTS AND EMBEDS ARE IN THEIR CORRECT LOCATION AND ORIENTATION PRIOR TO PLACING CONCRETE.
8. NOTIFY THE STRUCTURAL ENGINEER 48 HOURS IN ADVANCE OF PLACING CONCRETE.

REINFORCING STEEL

1. REINFORCING SHALL CONFORM TO ASTM A706 – GRADE 60 UNO.
2. NO REINFORCING BARS ARE TO BE WELDED UNLESS SPECIFICALLY DETAILED IN CONTRACT DOCUMENTS. ALL BARS SO DETAILED TO BE WELDED SHALL BE ASTM A706 BARS.
3. ALL REBAR TO BE WELDED SHALL BE CONTINUOUSLY INSPECTED BY A QUALIFIED TESTING LABORATORY. CONTRACTOR MUST FURNISH TO THE LABORATORY MILL CERTIFICATES SHOWING CHEMICAL ANALYSIS. ALL PREHEATING AND WELDING SHALL BE DONE BY WELDERS CERTIFIED TO WELD REINFORCING BARS IN ACCORDANCE WITH AWS D1.4–11 STANDARDS.
4. E80xx ELECTRODE SHALL BE USED FOR ALL REBAR WELDING.
5. TACK WELDING TO REBAR IS STRICTLY PROHIBITED.
6. REINFORCING, DOWELS, BOLTS, ANCHORS, SLEEVES, ETC. TO BE EMBEDDED SHALL BE SECURELY POSITIONED BEFORE PLACING CONCRETE. OBTAIN APPROVAL OF ALL AFFECTED TRADES PRIOR TO PLACING CONCRETE.
7. SEE CONCRETE NOTES AS APPLICABLE FOR ADDITIONAL REQUIREMENTS.
8. CONTRACTOR SHALL PROVIDE AN ALLOWANCE OF 2% OF THE BID FOR ALL REINFORCING STEEL TO BE USED AT THE DISCRETION OF THE STRUCTURAL ENGINEER. UNUSED AMOUNT TO REVERT TO THE OWNER UPON COMPLETION OF THE JOB.

REINFORCEMENT LAP SPLICE LENGTHS (IN INCHES)

f'c = 4000 PSI AT 28 DAYS										
SPLICE CLASS	REINFORCEMENT LOCATION	REINFORCEMENT SIZE (GR60, UNO)								
		#3	#4	#5	#6	#7	#8	#9	#10	#11
B	TOP	24	32	40	48	70	80	91	102	113
	OTHER	19	25	31	37	54	62	70	79	87

FOOTNOTES:
1. TABLE ABOVE BASED ON UNCOATED REINFORCING.
2. TOP REINFORCING IS HORIZONTAL REINFORCEMENT THAT HAS MORE THAN TWELVE INCHES OF FRESH CONCRETE CAST BELOW IT.
3. FOR BARS WITH COVER LESS THAN 1 BAR DIAMETER OR WITH CLEAR SPACING LESS THAN 2 BAR DIAMETERS, INCREASE LAP SPLICE BY 50%.
4. FOR LIGHTWEIGHT AGGREGATE CONCRETE, (WT = 110 PCF) INCREASE LAP SPLICE BY 30%.
5. ALL LAP SPLICES SHALL BE CLASS B, UNO.

SPECIAL INSPECTIONS

X	REINFORCING PLACEMENT
X	CONCRETE PLACEMENT
X	CONCRETE ANCHORS

MATERIAL TESTS

X	CONCRETE: 7, 28 AND 56 DAY STRENGTH TESTS
X	CONCRETE ANCHORS

DESIGN CRITERIA (2016 CBC):

OCCUPANCY
RISK CATEGORY III

LIVE LOADS
SLAB .... 100.0 PSF TYP

FLOOD DESIGN DATA
N/A

SPECIAL LOADS
SOIL LOADS TAKEN AS AT REST PRESSURE OF 75 PSF/FT OF DEPTH EQUIVALENT FLUID WEIGHT

SAFETY NOTES:

1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COMPLY WITH THE PERTINENT SECTIONS OF THE "CONSTRUCTION SAFETY ORDERS" ISSUED BY THE STATE OF CALIFORNIA LATEST EDITION, AND ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJECT.
2. THE STRUCTURAL ENGINEER DOES NOT ACCEPT ANY RESPONSIBILITY FOR THE CONTRACTOR'S FAILURE TO COMPLY WITH THESE REQUIREMENTS.
3. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURE DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING FOR VERTICAL AND/OR LATERAL LOADS, SHORING AND LOADS DUE TO CONSTRUCTION EQUIPMENT, ETC. OBSERVATION VISITS TO THE SITE BY THE STRUCTURAL ENGINEER WILL NOT INCLUDE INSPECTION OF THE ABOVE ITEMS.

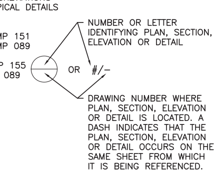
INSPECTION NOTES:

GENERAL:
IN ADDITION TO THE INSPECTIONS REQUIRED BY SECTION 110 OF THE 2019 CBC, THE OWNER SHALL EMPLOY A SPECIAL INSPECTOR TO PERFORM SPECIAL INSPECTIONS AND TESTS AS INDICATED ON THE STATEMENT OF SPECIAL INSPECTIONS.
1. INSPECTORS: ALL TESTS AND INSPECTIONS SHALL BE PERFORMED BY AN INDEPENDENT INSPECTION AGENCY WHICH IS IN THE EMPLOYMENT OF THE OWNER.
2. ALL SPECIAL INSPECTION AND TESTING AGENCIES SHALL BE QUALIFIED PER ASTM E329 AND APPROVED BY THE BUILDING DEPARTMENT.
3. PROVIDE INSPECTION REPORTS TO BUILDING DEPARTMENT, OWNER, ARCHITECT AND ENGINEER WITHIN TWO WEEKS OF PERFORMANCE OF INSPECTION OR TEST.
4. REFER TO CHAPTER 17 OF THE CODE FOR OTHER REQUIRED SPECIAL INSPECTIONS AND TESTS NOT LISTED.
5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SEE THAT THE TESTS AND INSPECTIONS ARE PERFORMED. JOBSITE VISITS BY THE STRUCTURAL ENGINEER DO NOT CONSTITUTE AND ARE NOT A SUBSTITUTE FOR INSPECTIONS.
6. WHERE THE CONTRACTOR CHOOSES TO USE AN APPROVED ALTERNATIVE MEANS FOR FASTENING OR ANCHORING MATERIALS THAT REQUIRE SPECIAL FIELD INSPECTION, SUCH AS FIELD WELDING, ADHESIVE OR EXPANSION ANCHORS, ETC. ALL ADDITIONAL SPECIAL INSPECTION AND TESTING COSTS SHALL BE PAID BY THE OWNER AND DEDUCTED FROM THE CONTRACT AMOUNT.

GENERAL NOTES:

1. ALL DRAWINGS ARE CONSIDERED TO BE A PART OF THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REVIEW AND COORDINATION OF ALL DRAWINGS AND SPECIFICATIONS PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCIES THAT OCCUR SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO THE START OF CONSTRUCTION SO THAT A CLARIFICATION CAN BE ISSUED. ANY WORK PERFORMED IN CONFLICT WITH THE CONTRACT DOCUMENTS OR ANY CODE REQUIREMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT THEIR OWN EXPENSE AND AT NO EXPENSE TO THE OWNER OR ARCHITECT.
2. TYPICAL NOTES AND DETAILS SHALL APPLY UNLESS OTHERWISE SHOWN OR NOTED ON DRAWINGS.
3. DETAILS OF CONSTRUCTION NOT FULLY SHOWN SHALL BE OF THE SAME NATURE AS SHOWN FOR SIMILAR CONDITION.
4. ALL WORK SHALL CONFORM TO THE MINIMUM STANDARDS OF THE 2019 CALIFORNIA BUILDING CODE, CCR, TITLE 24, PART 2, VOLUME 2 WITH LATEST REVISIONS REFERRED TO HEREIN AS "THE CODE", AND OTHER REGULATING AGENCIES WHICH HAVE AUTHORITY OVER ANY PORTION OF THE WORK, INCLUDING THE STATE OF CALIFORNIA DIVISION OF INDUSTRIAL SAFETY, AND THOSE CODES AND STANDARDS LISTED IN THESE NOTES AND SPECIFICATIONS.
5. NOTES AND DETAILS ON DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE GIVEN, CONSTRUCTION SHALL BE AS SHOWN FOR SIMILAR WORK. IF CONFLICTS OCCUR BETWEEN DRAWINGS AND SPECIFICATIONS, THE MOST EXPENSIVE MATERIALS OR METHODS SHALL PREVAIL (FOR BIDDING). STRUCTURAL ENGINEER SHALL BE NOTIFIED OF CONFLICTS AND THAT PORTION OF WORK SHOULD NOT PROCEED UNTIL CONFLICT IS RESOLVED.
6. THE CONTRACT STRUCTURAL DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION.
7. ASTM SPECIFICATIONS ON THE DRAWINGS AND SPECIFICATIONS SHALL BE OF THE LATEST REVISION.
8. CONSTRUCTION MATERIAL SHALL BE SPREAD OUT IF PLACED ON FRAMED ROOF OR FLOOR. LOAD SHALL NOT EXCEED DESIGN LIVE LOAD PER SQUARE FOOT. PROVIDE ADEQUATE SHORING AND/OR BRACING WHERE STRUCTURE HAS NOT ATTAINED DESIGN STRENGTH.
9. HEAVY EQUIPMENT, CRANES AND MATERIAL STOCKPILES SHALL NOT BE LOCATED ON OR ADJACENT TO SHORING.
10. SUBSTITUTIONS FOR STRUCTURAL MEMBERS, HARDWARE, OR DETAILS SHALL BE REVIEWED BY THE ARCHITECT AND STRUCTURAL ENGINEER AND APPROVED BY THE APPROPRIATE AGENCY. FOR A SUBSTITUTION TO BE REVIEWED THE CONTRACTOR SHALL AGREE & COMPLY WITH THE FOLLOWING:
    - A. THE CONTRACTOR SHALL BE BILLED ON A TIME AND MATERIALS BASIS FOR THE REVIEW OF THE SUBSTITUTION WITH NO GUARANTEE OF APPROVAL.
    - B. VERIFY THAT THE SUBSTITUTION DOES NOT AFFECT DIMENSIONS SHOWN ON DRAWINGS.
    - C. THE CONTRACTOR SHALL ALSO PAY FOR CHANGES TO THE BUILDING DESIGN, WHICH INCLUDES BUT IS NOT LIMITED TO; ENGINEERING DESIGN, DETAILING, APPROVAL AGENCY PROCESS AND CONSTRUCTION COSTS CAUSED BY THE REQUESTED SUBSTITUTION.
    - D. THE PROPOSED SUBSTITUTION IS TO HAVE NO ADVERSE AFFECT ON OTHER TRADES, THE CONSTRUCTION SCHEDULE, OR THE SPECIFIED WARRANTY REQUIREMENTS.
11. NO STRUCTURAL MEMBERS SHALL BE CUT, NOTCHED OR OTHERWISE PENETRATED UNLESS SPECIFICALLY APPROVED BY THE STRUCTURAL ENGINEER IN ADVANCE OR SHOWN ON THESE DRAWINGS.
12. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO STARTING CONSTRUCTION. DIMENSIONS AND ELEVATIONS MUST BE VERIFIED WITH ARCHITECTURAL DRAWINGS. IN THE EVENT OF A CONFLICT, THE STRUCTURAL ENGINEER AND ARCHITECT ARE TO BE NOTIFIED IMMEDIATELY. DRAWING SCALES GIVEN ARE APPROXIMATE– DO NOT SCALE PLANS OR DETAILS.
13. SITE VISITS BY STRUCTURAL ENGINEER SHALL NOT BE IN LIEU OF INSPECTIONS.
14. SEE CIVIL DRAWINGS FOR THE FOLLOWING:
    - SIZE AND LOCATION OF ALL CONCRETE CURBS, EQUIPMENT PADS, PITS, FLOOR DRAINS, SLOPES AND DEPRESSED AREAS, CHANGE IN LEVEL, CHAMFERS, GROOVES, INSERTS, ETC.
    - SIZE AND LOCATION OF OPENINGS EXCEPT AS SHOWN.
    - FINISHES.
    - DIMENSIONS NOT SHOWN ON STRUCTURAL DRAWINGS.
15. SEE MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR THE FOLLOWING:
    - PIPE RUNS, SLEEVES, HANGERS, TRENCHES, WALL AND SLAB OPENINGS, ETC EXCEPT AS SHOWN OR NOTED.
    - ELECTRICAL CONDUIT RUNS, BOXES, OUTLETS IN WALL OR SLABS.
    - CONCRETE INSERTS FOR ELECTRICAL, MECHANICAL OR PLUMBING FIXTURES.
    - SIZE AND LOCATION OF MACHINE OR EQUIPMENT BASES AND ANCHOR BOLTS FOR MOTOR MOUNTS.

STRUCTURAL SHEET INDEX:



REGISTERED PROFESSIONAL ENGINEER ARTHUR ERNEST ROSS No. S2030 STRUCTURAL STATE OF CALIFORNIA

THESE DRAWINGS ARE PRELIMINARY AND NOT FOR CONSTRUCTION UNLESS STAMPED & SIGNED BY THE ENGINEER OF RECORD.

CYS STRUCTURAL ENGINEERS INC.

CYS Job No. 20054

65% SUBMITTAL

REVISIONS				BENCH MARK	FIELD BOOK		
NO.	DESCRIPTION	DATE	BY	DESCRIPTION: ELEV.	0000 SCALE: H: V:	1" ON ORIGINAL SCALE DRAWING ADJUST SCALED DIMENSIONS IF THIS DOES NOT SCALE AT 1"	

CITY OF SACRAMENTO
DEPARTMENT OF UTILITIES

DRAWN BY: E. TUTEJA	DESIGNED BY: B. JENSEN	CHECKED BY: A. SMITH
DATE: 09/15/20	R.C.E. NO. C90949 DATE: 03/31/22	R.C.E. NO. C86512 DATE: 03/31/21

PRELIMINARY

IMPROVEMENT PLANS FOR:
PUMP OUTFALLS REPLACEMENT PROJECT – B
GENERAL STRUCTURAL NOTES & ABBREVIATIONS

PN: W14130615 DWG. NO. S1 SHEET 23 OF 30

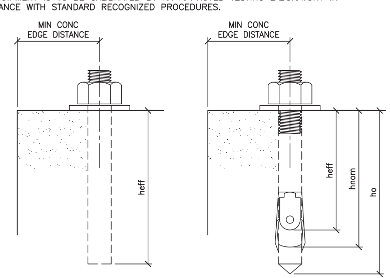
Item 7

PN: W14130615
PUMP OUTFALLS REPLACEMENT PROJECT PN: W14130615

L:\Jobs2020\20054 Pump Outfall Replacement Valve Vaults\ACAD\STRU\PKG B\S1_PKG B.dwg Time:Sep14,2020-02:54pm Login:camachom Dimscale:1 LTScale:0.5

POST-INSTALLED ANCHORS:

1. ANCHORS SHALL BE INSTALLED IN ACCORDANCE WITH THE RECOMMENDATIONS GIVEN IN THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS (MPII) AND THE RESPECTIVE ICC OR IAPMO REPORT:
   A. CONCRETE ANCHORS:
      HILTI KWIK-BOLT TZ EXPANSION ANCHORS ESR-1917
      HILTI HIT-RE 500 V3 ADHESIVE ANCHORS ESR-3814
2. SPECIAL INSPECTION IS REQUIRED FOR ALL MECHANICAL AND ADHESIVE ANCHORS PER CBC SECTION 1705.3 AND THE REPORTS NOTED ABOVE, UNLESS NOTED OTHERWISE.
3. SEE ANCHOR SCHEDULE(S) AND DETAILS FOR TEST LOAD OR TORQUE VALUES, IN ACCORDANCE WITH CBC SECTION 1901.3.4.4. TESTING OF UNDERCUT ANCHORS THAT ALLOW VISUAL CONFIRMATION OF FULL SET IS NOT REQUIRED.
4. TEST EACH ANCHOR OF DIFFERENT DIAMETER AND EMBEDMENT DEPTH FOR EACH TYPE AND STRENGTH OF CONCRETE PER CBC SECTION 1901.3.4.3 AS FOLLOWS:
   A. ANCHORS USED FOR OTHER STRUCTURAL APPLICATIONS SHALL HAVE 100 PERCENT OF THE ANCHORS TENSION TESTED.
   B. ANCHORS USED FOR NON-STRUCTURAL APPLICATIONS SUCH AS EQUIPMENT ANCHORAGE SHALL HAVE 50 PERCENT OR ALTERNATE BOLTS IN A GROUP INCLUDING AT LEAST ONE-HALF THE ANCHORS IN EACH GROUP TENSION TESTED.
5. FAILURE/ACCEPTANCE CRITERIA. THE FOLLOWING CRITERIA APPLY FOR THE ACCEPTANCE OF INSTALLED ANCHORS PER CBC SECTION 1901.3.4.5:
   A. HYDRAULIC RAM METHOD: THE ANCHOR MUST MAINTAIN THE TEST LOAD FOR 15 SECONDS AND NOT EXHIBIT OBSERVABLE MOVEMENT AT THE APPLICABLE TEST LOAD. FOR WEDGE AND SLEEVE-TYPE ANCHORS, A PRACTICAL WAY TO DETERMINE OBSERVABLE MOVEMENT IS THAT THE WASHER UNDER THE NUT BECOMES LOOSE. DROP-IN ANCHORS ARE ONLY TO BE TESTED WITH THIS METHOD. FOR ADHESIVE ANCHORS, WHERE OTHER THAN BOND IS BEING TESTED, THE TESTING DEVICE SHALL NOT RESTRICT THE CONCRETE SHEAR CONE TYPE FAILURE MECHANISM FROM OCCURRING.
   B. TORQUE WRENCH METHOD: THE APPLICABLE TEST TORQUE FOR WEDGE OR SLEEVE-TYPE ANCHORS MUST BE REACHED WITHIN THE FOLLOWING LIMITS, ONE-HALF (½) TURN OF THE NUT; ONE QUARTER (¼) TURN OF THE NUT FOR THE ⅜" SLEEVE ANCHOR ONLY.
   C. PER CBC SECTION 1901.3.4.1 IF ANCHOR FAILS TESTING, ALL ANCHORS OF THE SAME CATEGORY, NOT PREVIOUSLY TESTED, SHALL BE TESTED UNTIL 20 CONSECUTIVE ANCHORS PASS THE TEST REQUIREMENTS THEN INITIAL TESTING FREQUENCY SHALL THEN BE RESUMED.
6. WHEN INSTALLING DRILLED-IN ANCHORS IN EXISTING CONCRETE, USE CARE AND CAUTION TO AVOID CUTTING OR DAMAGING EXISTING REINFORCING BARS.
7. THE TESTING OF THE ANCHORS SHALL BE DONE BY THE TESTING LABORATORY IN THE PRESENCE OF THE SPECIAL INSPECTOR AND A REPORT OF THE TEST RESULTS SHALL BE SUBMITTED TO THE GOVERNING AGENCY AND ARCHITECT/STRUCTURAL ENGINEER. TESTING SHALL OCCUR AT MINIMUM OF 24 HOURS AFTER THE INSTALLATION OF THE ANCHORS.
8. APPLY TENSION TEST LOADS TO EXPANSION OR ADHESIVE ANCHORS WITHOUT REMOVING THE NUT IF POSSIBLE. IF NOT POSSIBLE, REPLACE THE NUT WITH A THREADED COUPLER OF THE SAME DIAMETER AND TORQUE TO THE SAME LEVEL AS THE ORIGINAL NUT AND APPLY TEST LOAD.
9. REACTION LOADS FROM TEST FIXTURES SHALL NOT BE APPLIED CLOSE TO THE ANCHOR BEING TESTED.
10. TEST EQUIPMENT IS TO BE CALIBRATED BY AN APPROVED TESTING LABORATORY IN ACCORDANCE WITH STANDARD RECOGNIZED PROCEDURES.



HILTI HIT-RE 500 V3
ADHESIVE ANCHORS

HILTI KB-TZ
EXPANSION ANCHORS

HILTI KB-TZ EXPANSION ANCHORS (ICC-ES ESR-1917)

ANCHOR DIA (INCH)	INSTALLATION EMBED (INCH) hnom	EFFECTIVE EMBED (INCH) heff	HOLE DEPTH (INCH) ho	MIN CONC THICKNESS (INCH) h	MIN CONC EDGE DISTANCE (INCH)	INSTALLATION TORQUE (FT-LBS)
1/2	3 5/8	3 1/4	4	12	6	40
5/8	4 7/16	4	4 3/4	12	SEE PLAN	60

HILTI HIT-RE 500 V3 ADHESIVE ANCHORS (ICC-ES ESR-3814)

ANCHOR DIA (INCH)	EFFECTIVE EMBED (INCH) heff	MIN CONC THICKNESS (INCH) h	MIN CONC EDGE DISTANCE (INCH)
5/8	SEE PLAN	SEE PLAN	SEE PLAN

2
—
POST INSTALLED ANCHOR
SCHED

CONCRETE:

1. CONCRETE CONSTRUCTION SHALL CONFORM TO THE CODE PER GENERAL NOTES.
2. CONCRETE SHALL BE PLACED IN ACCORDANCE WITH ASTM C94 AND ACI STANDARD 304. IN ADDITION, MAXIMUM FREE FALL OF CONCRETE SHALL BE 4'-0".
3. ALL CONCRETE SHALL BE THOROUGHLY CONSOLIDATED BY SUITABLE MEANS DURING PLACEMENT AND SHALL BE THOROUGHLY WORKED AROUND REINFORCEMENT AND EMBEDDED FIXTURES AND INTO CORNERS OF FORMS.
4. THE MINIMUM 28 DAY STRENGTH SHALL BE PER MIX DESIGN SCHEDULE.
5. CEMENT SHALL CONFORM TO ASTM C150, TYPE I OR II.
6. CONCRETE AGGREGATES:
   A. NATURAL SAND AND ROCK AGGREGATES SHALL CONFORM TO ASTM C33.
   B. LIGHTWEIGHT AGGREGATES SHALL CONFORM TO ASTM C330.
7. MINERAL ADMIXTURES SHALL COMPLY WITH ASTM C618 CLASS F.
8. LIQUID ADMIXTURES SHALL COMPLY WITH THE FOLLOWING:
   A. WATER REDUCERS . . . . ASTM C494 TYPE A
   B. MID-RANGE WATER REDUCERS . . . . ASTM C494 TYPE A & F
   C. NON-CHLORIDE ACCELERATORS . . . . ASTM C494 TYPE C OR C & E
   D. RETARDING ADMIXTURES . . . . ASTM C494 TYPE B OR B & D
9. GENERAL:
   A. NO PIPES OR DUCT SHALL BE PLACED IN CONCRETE SLABS OR WALLS UNLESS SPECIFICALLY DETAILED.
   B. REFER TO ARCHITECTURAL, STRUCTURAL AND MECHANICAL DRAWINGS FOR ALL MOULDS, GROOVES, ORNAMENTS, CLIPS, ETC. TO BE CAST IN CONCRETE.
10. ALL CONSTRUCTION JOINTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ACI 318 SECTION 26.5.6 AND THE TYPICAL CONSTRUCTION JOINT DETAILS SHOWN ON THE STRUCTURAL DRAWINGS. ALL SURFACES OF CONSTRUCTION JOINTS SHALL BE CLEANED TO REMOVE DUST, CHIPS, OR OTHER FOREIGN MATTER PRIOR TO PLACING THE ADJACENT CONCRETE. THE CONTRACTOR SHALL SUBMIT THE PROPOSED LOCATIONS OF CONSTRUCTION JOINTS TO THE ENGINEER FOR REVIEW BY THE STRUCTURAL ENGINEER BEFORE STARTING CONSTRUCTION.
11. REMOVE ALL DEBRIS AND EXCESS WATER FROM THE FORMS BEFORE PLACING ANY CONCRETE.
12. REINFORCING, DOWELS, BOLTS, ANCHORS, SLEEVES, ETC. TO BE EMBEDDED IN CONCRETE SHALL BE SECURELY POSITIONED AND FREE OF EXCESSIVE SCALE, RUST, DIRT, GREASE, OIL OR ANY OTHER SUBSTANCES THAT WILL IMPAIR BOND WITH CONCRETE. OBTAIN APPROVAL OF ALL AFFECTED TRADES PRIOR TO PLACING CONCRETE.
13. WALLS SHALL BE PLACED IN HORIZONTAL LAYERS OF 2'-0" MAXIMUM DEPTH.
14. CONCRETE IN WALLS, PIERS OR COLUMNS SHALL SET AT LEAST 2 HOURS BEFORE PLACING CONCRETE IN BEAMS, SPANDRELS OR SLABS SUPPORTED THEREON.
15. NO WOOD SPREADERS ALLOWED. NO WOOD STAKES ALLOWED IN AREAS TO BE CONCRETED.
16. CONTRACTOR SHALL PREPARE AND SUBMIT CONCRETE MIX DESIGNS TO THE ARCHITECT/ENGINEER OF RECORD FOR REVIEW PRIOR TO PLACEMENT OF ANY CONCRETE. CONCRETE MIX DESIGNS SHALL BE PER ACI 318 CHAPTER 26 AND ACI 301 SECTION 4. CALCIUM CHLORIDE OR ADMIXTURES WHICH ADD CHLORIDES ARE NOT PERMITTED.
17. NOTIFY THE ENGINEER OF RECORD (AND BUILDING OFFICIAL WHEN REQUIRED) 2 BUSINESS DAYS PRIOR TO PLACING CONCRETE.
18. CAST-IN-PLACE CONCRETE (NON-PRESTRESSED). THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCEMENT:
   A. CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH . . . . . . 3"
   B. CONCRETE EXPOSED TO EARTH OR WEATHER:
      NO. 6 THROUGH NO. 11 BAR . . . . 2"
      NO. 5 BAR, W31 OR D31 WIRE, AND SMALLER . . . . 1½"
19. A. ALL BARS SHALL HAVE A CLASS B MINIMUM SPLICE LAP UNO. SEE REINFORCEMENT LAP SPLICES TABLE.
   B. SPLICES IN ADJACENT BARS SHALL BE NOT LESS THAN 5'-0" APART. UNO.
   C. DOWEL ALL VERTICAL REINFORCING IN WALLS AND COLUMNS FROM FOUNDATION WITH THE SAME SIZE REINFORCING, UNO.
   D. SPLICE CONTINUOUS BARS IN SPANDRELS, GRADE BEAMS, WALL BEAMS, ETC. AS FOLLOWS: TOP BARS AT MID-SPAN, BOTTOM BARS AT CENTERLINE SUPPORT UNO.
20. HORIZONTAL WALL REINFORCING IN DOUBLE LAYER WALLS SHALL BE STAGGERED. USE #2 SPREADERS APPROXIMATELY EVERY THIRD INTERSECTION EACH DIRECTION FOR ALL DOUBLE LAYER WALLS.
21. MINIMUM WALL REINFORCING SHALL BE:

WALL THICKNESS	SINGLE LAYER	DOUBLE LAYER
7" OR LESS	#4 @ 12" OC EA WAY	
8"	#4 @ 10" OC EA WAY	
9" & 10"		#4 @ 16" OC EA WAY
11" & 12"		#4 @ 12" OC EA WAY

22. REINFORCING STEEL SHALL BE DETAILED, FABRICATED AND INSTALLED IN ACCORDANCE WITH ACI 315. SEE REINFORCING STEEL NOTES FOR ADDITIONAL REQUIREMENTS.
23. FINAL PRODUCT AS INDICATED ON DRAWINGS SHALL COMPLY WITH THE FOLLOWING:
   A. ALL CONCRETE SHALL HAVE A "CLASS B" FINISH PER ACI 347 WITH GRADUAL IRREGULARITIES LIMITED TO ¼" IN 5'-0" AS MEASURED WITH A STRAIGHT EDGE.
   B. SURFACE IRREGULARITIES ATTRIBUTABLE TO PLACEMENT AND CONSOLIDATION DEFICIENCIES AS DEFINED IN ACI 309.2R (E.G., BUG HOLES, HONEYCOMB, ETC.) WILL BE REVIEWED BY THE ARCHITECT AND ENGINEER. UNSATISFACTORY WORK SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
   C. GRADUAL SURFACE IRREGULARITIES SHALL NOT BE CUMULATIVE.

MIX DESIGN SCHEDULE

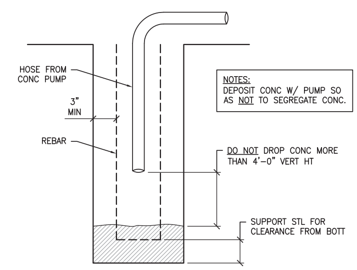
TYPE	USE CLASS	STRENGTH "f'c" MIN @ 28 DAYS (PSI)	CONCRETE UNIT WEIGHT (PCF)	MAX AGGREGATE SIZE (IN)	MAX (5) SLUMP (IN)	MAX WATER TO CEMENT RATIO (%)	FLY ASH (7) REPLACEMENT (%)
A	SLAB ON GRADE	4000	150	1"±¼"	4"±1"	.40	15% MIN 25% MAX
B	FOUNDATIONS	4000	150	1"±¼"	4"±1"	.50	15% MIN 25% MAX
C	WALLS	4000	150	1"±¼"	4"±1"	.50	15% MIN 25% MAX
D	ELEVATED SLABS	4000	150	1"±¼"	4"±1"	.40	15% MIN 25% MAX

FOOTNOTES:
1. ADD WATER REDUCING ADMIXTURES PER SPECIFICATIONS FOR PLACING.
2. FOR HOT WEATHER CONCRETING REFER TO ACI 305R.
3. FOR COLD WEATHER CONCRETING REFER TO ACI 306R.
4. OTHER ADMIXTURES SHALL BE REVIEWED BY THE ENGINEER OF RECORD AND TESTING LABORATORY UPON CONCRETE MIX DESIGN SUBMITTAL.
5. SLUMPS SHALL NOT EXCEED 8"±1½" WHEN USING MID-RANGE WATER REDUCERS.
6. ADDITIONAL WATER SHALL NOT BE ADDED TO THE CONCRETE ONCE THE TRUCK LEAVES THE BATCH PLANT.
7. MIX DESIGN SHALL NOT BE PROPORTIONED WITHOUT FIELD EXPERIENCE OR TRIAL MIXTURES PER ACI 318, SECTION 26.4.3 WHEN USING MORE THAN 15% FLY ASH REPLACEMENT BY WEIGHT.

SHOP DRAWINGS:

PRIOR TO FABRICATION, SHOP DRAWINGS SHALL BE SUBMITTED FOR REVIEW BY THE STRUCTURAL ENGINEER:

1. THE CONTRACTOR AGREES THAT SHOP DRAWING SUBMITTALS PROCESSED BY THE ENGINEER ARE NOT CHANGE ORDERS.
2. THE CONTRACTOR AGREES THAT THE PURPOSE OF SHOP DRAWING SUBMITTALS IS TO DEMONSTRATE TO THE ENGINEER THAT THE CONTRACTOR UNDERSTANDS THE DESIGN INTENT OF THE PROJECT AND COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS BY INDICATING WHICH MATERIAL THE CONTRACTOR INTENDS TO FURNISH AND INSTALL AND BY DETAILING THE FABRICATION AND INSTALLATION METHODS THE CONTRACTOR INTENDS TO USE.
3. THE CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS ON THE SHOP DRAWINGS, WHICH MUST BE CONFIRMED AND CORRELATED AT THE JOB SITE, FOR COORDINATION OF HIS OR HER WORK WITH THAT OF ALL OTHER TRADES AND FOR PERFORMING WORK IN A SAFE AND SATISFACTORY MANNER.
4. THE CONTRACTOR IS RESPONSIBLE FOR MATERIAL QUANTITIES ON THE SHOP DRAWINGS.
5. THE CONTRACTOR IS TO REVIEW AND BE IN AGREEMENT WITH COMMENTS BY THE STRUCTURAL ENGINEER PRIOR TO PROCEEDING WITH FABRICATION.
6. THE SHOP DRAWINGS SHALL BE PREPARED FROM FRESH WORK. REPRODUCTIONS OF THE APPROVED DRAWINGS IS NOT PERMITTED.
7. PRIOR TO SUBMISSION THE CONTRACTOR SHALL REVIEW ALL SUBMITTALS FOR CONFORMANCE WITH THE CONTRACT DOCUMENTS AND SHALL STAMP SUBMITTALS AS BEING "REVIEWED FOR CONFORMANCE".
8. ANY DETAIL ON THE SHOP DRAWING THAT DEVIATES FROM THE CONTRACT DOCUMENTS SHALL BE CLEARLY MARKED WITH THE NOTE "THIS IS A CHANGE". SEE GENERAL NOTES FOR MATERIAL SUBSTITUTIONS.
9. SHOP DRAWINGS OR CALCULATIONS SUBMITTED FOR REVIEW THAT REQUIRE MORE THAN ONE RESUBMITTAL FOR REVIEW SHALL BE BILLED HOURLY FOR SUCH TIME TO THE GENERAL CONTRACTOR. THE THIRD REVIEW WILL NOT PROCEED WITHOUT WRITTEN APPROVAL FROM THE GENERAL CONTRACTOR FOR ADDITIONAL ENGINEERING REVIEW SERVICES.
10. CAD FILES OF APPROVED DRAWINGS WILL NOT BE PROVIDED TO THE CONTRACTOR, SUBCONTRACTOR OR FABRICATOR FOR THE PREPARATION OF SHOP DRAWINGS.
11. SHOP DRAWING REVIEWS DO NOT CONSTITUTE AN APPROVAL FOR PURCHASE OR FABRICATION OF MATERIALS.



1
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CONC PUMP HOSE PLACEMENT
DETAIL
NTS

THESE DRAWINGS ARE PRELIMINARY AND NOT FOR CONSTRUCTION UNLESS STAMPED & SIGNED BY THE ENGINEER OF RECORD.

CYS STRUCTURAL ENGINEERS INC.

CYS Job No. 20054

65% SUBMITTAL

REVISIONS		
DESCRIPTION	DATE	BY

BENCH MARK ELEV. ______
DESCRIPTION:

FIELD BOOK 0000
SCALE:
H: ______
V: ______

1"
ON ORIGINAL SCALE DRAWING ADJUST SCALED DIMENSIONS IF THIS DOES NOT SCALE AT 1"

CITY OF SACRAMENTO
DEPARTMENT OF UTILITIES

DRAWN BY: E. TUTEJA DATE: 09/15/20
DESIGNED BY: B. JENSEN R.C.E. NO. C90949 DATE: 03/31/22
CHECKED BY: A. SMITH R.C.E. NO. C86512 DATE: 03/31/21

PRELIMINARY

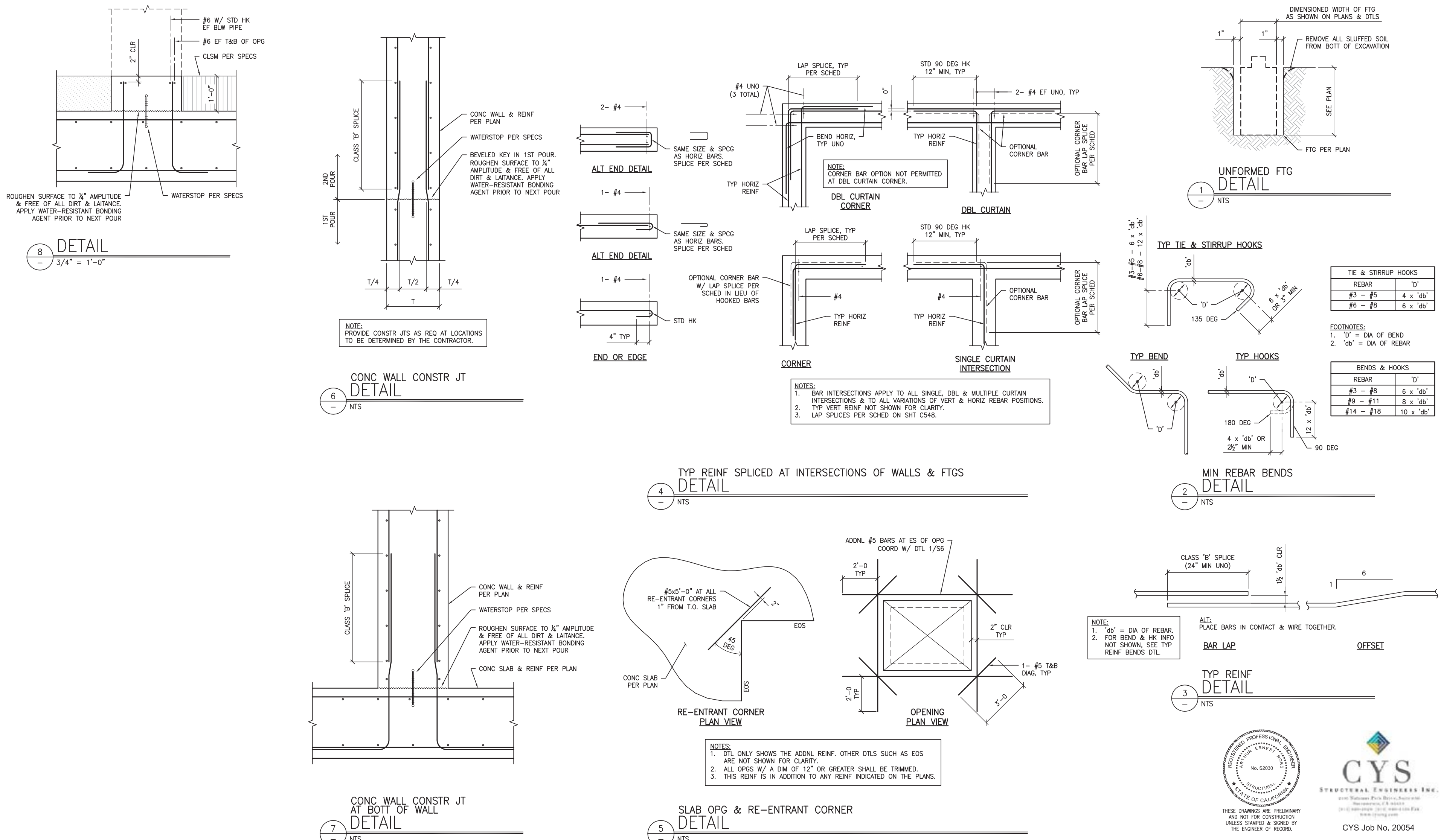
IMPROVEMENT PLANS FOR:
PUMP OUTFALLS REPLACEMENT PROJECT – B
GENERAL STRUCTURAL NOTES & TYPICAL DETAILS

DWG. NO. S2
SHEET 24 OF 30

PN: W14130615

Item 7

PUMP OUTFALLS REPLACEMENT PROJECT
PN: W14130615



#6 W/ STD HK EF BLW PIPE
#6 EF T&B OF OPG
CLSM PER SPECS
2" CLR
1'-0"
ROUGHEN SURFACE TO ¼" AMPLITUDE & FREE OF ALL DIRT & LAITANCE. APPLY WATER-RESISTANT BONDING AGENT PRIOR TO NEXT POUR
WATERSTOP PER SPECS
8 DETAIL 3/4" = 1'-0"
CLASS 'B' SPLICE
2ND POUR
1ST POUR
CONC WALL & REINF PER PLAN
WATERSTOP PER SPECS
BEVELED KEY IN 1ST POUR. ROUGHEN SURFACE TO ¼" AMPLITUDE & FREE OF ALL DIRT & LAITANCE. APPLY WATER-RESISTANT BONDING AGENT PRIOR TO NEXT POUR
T/4
T/2
T/4
T
NOTE: PROVIDE CONSTR JTS AS REQ AT LOCATIONS TO BE DETERMINED BY THE CONTRACTOR.
6 CONC WALL CONSTR JT DETAIL NTS
2- #4
ALT END DETAIL
1- #4
ALT END DETAIL
1- #4
4" TYP
END OR EDGE
SAME SIZE & SPCG AS HORIZ BARS. SPLICE PER SCHED
SAME SIZE & SPCG AS HORIZ BARS. SPLICE PER SCHED
STD HK
LAP SPLICE, TYP PER SCHED
#4 UNO (3 TOTAL)
0"
BEND HORIZ, TYP UNO
TYP HORIZ REINF
NOTE: CORNER BAR OPTION NOT PERMITTED AT DBL CURTAIN CORNER.
DBL CURTAIN CORNER
STD 90 DEG HK 12" MIN, TYP
2- #4 EF UNO, TYP
TYP HORIZ REINF
OPTIONAL CORNER BAR
OPTIONAL CORNER BAR LAP SPLICE PER SCHED
DBL CURTAIN
LAP SPLICE, TYP PER SCHED
OPTIONAL CORNER BAR W/ LAP SPLICE PER SCHED IN LIEU OF HOOKED BARS
#4
TYP HORIZ REINF
CORNER
STD 90 DEG HK 12" MIN, TYP
#4
OPTIONAL CORNER BAR
TYP HORIZ REINF
OPTIONAL CORNER BAR LAP SPLICE PER SCHED
SINGLE CURTAIN INTERSECTION
NOTES:
1. BAR INTERSECTIONS APPLY TO ALL SINGLE, DBL & MULTIPLE CURTAIN INTERSECTIONS & TO ALL VARIATIONS OF VERT & HORIZ REBAR POSITIONS.
2. TYP VERT REINF NOT SHOWN FOR CLARITY.
3. LAP SPLICES PER SCHED ON SHT C548.
4 TYP REINF SPLICED AT INTERSECTIONS OF WALLS & FTGS DETAIL NTS
DIMENSIONED WIDTH OF FTG AS SHOWN ON PLANS & DTLS
1"
1"
REMOVE ALL SLUFFED SOIL FROM BOTT OF EXCAVATION
SEE PLAN
FTG PER PLAN
1 UNFORMED FTG DETAIL NTS
#3-#5 – 6 x 'db'
#6-#8 – 12 x 'db'
TYP TIE & STIRRUP HOOKS
'db'
'D'
135 DEG
6 x 'db' OR 3" MIN
TYP BEND
'db'
'D'
TYP HOOKS
'db'
'D'
180 DEG
4 x 'db' OR 2½" MIN
12 x 'db'
90 DEG
2 MIN REBAR BENDS DETAIL NTS
ADDNL #5 BARS AT ES OF OPG COORD W/ DTL 1/S6
2'-0 TYP
2" CLR TYP
1- #5 T&B DIAG, TYP
3'-0
2'-0 TYP
OPENING PLAN VIEW
#5x5'-0" AT ALL RE-ENTRANT CORNERS 1" FROM T.O. SLAB
2"
45 DEG
EOS
EOS
CONC SLAB PER PLAN
RE-ENTRANT CORNER PLAN VIEW
NOTES:
1. DTL ONLY SHOWS THE ADDNL REINF. OTHER DTLS SUCH AS EOS ARE NOT SHOWN FOR CLARITY.
2. ALL OPGS W/ A DIM OF 12" OR GREATER SHALL BE TRIMMED.
3. THIS REINF IS IN ADDITION TO ANY REINF INDICATED ON THE PLANS.
5 SLAB OPG & RE-ENTRANT CORNER DETAIL NTS
CLASS 'B' SPLICE
CONC WALL & REINF PER PLAN
WATERSTOP PER SPECS
ROUGHEN SURFACE TO ¼" AMPLITUDE & FREE OF ALL DIRT & LAITANCE. APPLY WATER-RESISTANT BONDING AGENT PRIOR TO NEXT POUR
CONC SLAB & REINF PER PLAN
7 CONC WALL CONSTR JT AT BOTT OF WALL DETAIL NTS
CLASS 'B' SPLICE (24" MIN UNO)
1½ 'db' CLR
1
6
NOTE:
1. 'db' = DIA OF REBAR.
2. FOR BEND & HK INFO NOT SHOWN, SEE TYP REINF BENDS DTL.
ALT: PLACE BARS IN CONTACT & WIRE TOGETHER.
BAR LAP
OFFSET
3 TYP REINF DETAIL NTS

TIE & STIRRUP HOOKS	
REBAR	'D'
#3 – #5	4 x 'db'
#6 – #8	6 x 'db'

FOOTNOTES:
1. 'D' = DIA OF BEND
2. 'db' = DIA OF REBAR

BENDS & HOOKS	
REBAR	'D'
#3 – #8	6 x 'db'
#9 – #11	8 x 'db'
#14 – #18	10 x 'db'

REGISTERED PROFESSIONAL ENGINEER ARTHUR ERNEST ROSS No. S2030 STRUCTURAL STATE OF CALIFORNIA

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CYS STRUCTURAL ENGINEERS INC.

CYS Job No. 20054

65% SUBMITTAL

REVISIONS			BENCH MARK	ELEV.	FIELD BOOK
NO. DESCRIPTION	DATE	BY	DESCRIPTION:		0000

SCALE: H: V:

1" ON ORIGINAL SCALE DRAWING ADJUST SCALED DIMENSIONS IF THIS DOES NOT SCALE AT 1"

CITY OF SACRAMENTO
DEPARTMENT OF UTILITIES

DRAWN BY: E. TUTEJA DATE: 09/15/20
DESIGNED BY: B. JENSEN R.C.E. NO. C90949 DATE: 03/31/22
CHECKED BY: A. SMITH R.C.E. NO. C86512 DATE: 03/31/21

PRELIMINARY

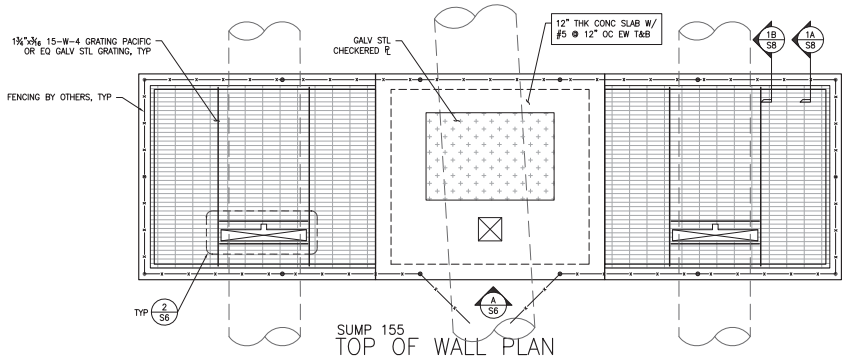
IMPROVEMENT PLANS FOR:
PUMP OUTFALLS REPLACEMENT PROJECT – B
TYPICAL DETAILS - CONCRETE

DWG. NO. S3
SHEET 25 OF 30

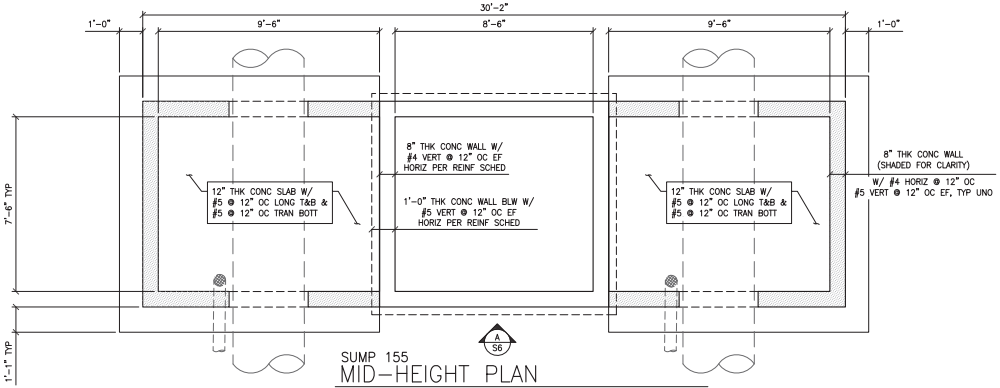
Item 7

PN: W14130615

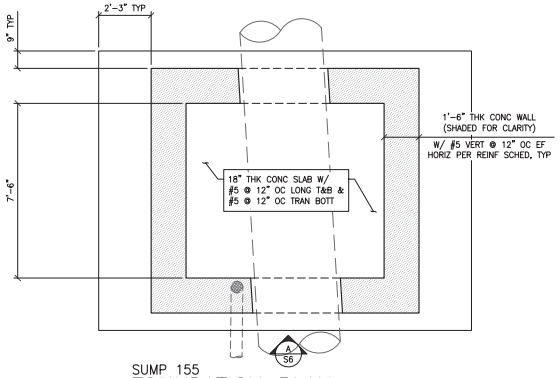
PUMP OUTFALLS REPLACEMENT PROJECT
PN: W14130615



SUMP 155
TOP OF WALL PLAN
3/8" = 1'-0"



SUMP 155
MID-HEIGHT PLAN
3/8" = 1'-0"



SUMP 155
FOUNDATION PLAN
3/8" = 1'-0"

NOTES

1. SEE DWG S1 & S2 FOR GENERAL NOTES.
2. SEE DWG S3 FOR TYPICAL DETAILS.
3. SEE DWG S6 FOR SECTIONS.
4. SEE OTHER CONSULTANT DWGS FOR UTILITIES THAT WILL AFFECT FTGS & COMPLY W/ TYPICAL DETAILS.

REGISTERED PROFESSIONAL ENGINEER — ANTHONY CHRISTOPHER SMITH — No. S2030 — STRUCTURAL — STATE OF CALIFORNIA

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CYS STRUCTURAL ENGINEERS INC.

CYS Job No. 20054

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PN: W14130615

L:\Jobs\2020\20054 Pump Outfall Replacement Valve Vaults\ACAD\STRUP\PKG B\S4_PKG B.dwg Time:Sep15,2020-02:08pm Login:csamshom Dimscale:32 LTS:scale:16

PUMP OUTFALLS REPLACEMENT PROJECT
PN: W14130615

PN: W14130615

Page 47 Item 7

REVISIONS			BENCH MARK	ELEV.	FIELD BOOK	1"
NO.	DESCRIPTION	DATE	BY	DESCRIPTION:	0000	ON ORIGINAL SCALE DRAWING ADJUST SCALED DIMENSIONS IF THIS DOES NOT SCALE AT 1"
					SCALE: H: V:	

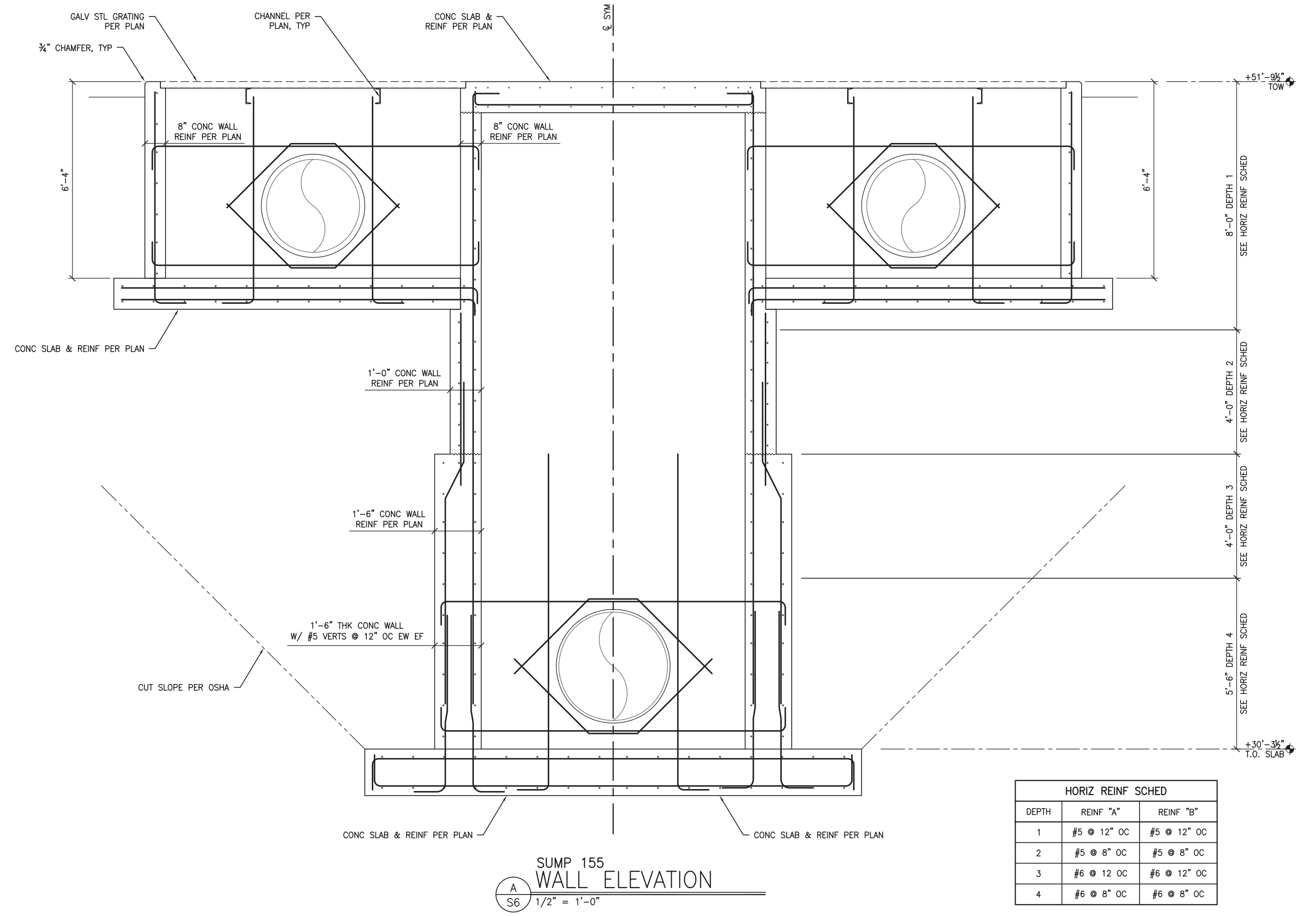
CITY OF SACRAMENTO
DEPARTMENT OF UTILITIES

DRAWN BY: E. TUTEJA — DATE: 09/15/20
DESIGNED BY: B. JENSEN — R.C.E. NO. C90949 — DATE: 03/31/22
CHECKED BY: A. SMITH — R.C.E. NO. C86512 — DATE: 03/31/21

PRELIMINARY

IMPROVEMENT PLANS FOR:
PUMP OUTFALLS REPLACEMENT PROJECT – B
FOUNDATION & FRAMING PLANS
SUMP 155

PN: W14130615 — DWG. NO. S4 — SHEET 26 OF 30


GALV STL GRATING PER PLAN
¾" CHAMFER, TYP
CHANNEL PER PLAN, TYP
CONC SLAB & REINF PER PLAN
℄ SYM
8" CONC WALL REINF PER PLAN
8" CONC WALL REINF PER PLAN
6'-4"
6'-4"
+51'-9½" TOW
8'-0" DEPTH 1 SEE HORIZ REINF SCHED
4'-0" DEPTH 2 SEE HORIZ REINF SCHED
4'-0" DEPTH 3 SEE HORIZ REINF SCHED
5'-6" DEPTH 4 SEE HORIZ REINF SCHED
+30'-3½" T.O. SLAB
CONC SLAB & REINF PER PLAN
1'-0" CONC WALL REINF PER PLAN
1'-6" CONC WALL REINF PER PLAN
1'-6" THK CONC WALL W/ #5 VERTS @ 12" OC EW EF
CUT SLOPE PER OSHA
CONC SLAB & REINF PER PLAN
CONC SLAB & REINF PER PLAN

SUMP 155
WALL ELEVATION
(A / S6) 1/2" = 1'-0"

HORIZ REINF SCHED

DEPTH	REINF "A"	REINF "B"
1	#5 @ 12" OC	#5 @ 12" OC
2	#5 @ 8" OC	#5 @ 8" OC
3	#6 @ 12 OC	#6 @ 12" OC
4	#6 @ 8" OC	#6 @ 8" OC

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REVISIONS			
NO.	DESCRIPTION	DATE	BY

BENCH MARK ELEV. ______
DESCRIPTION:

FIELD BOOK 0000
SCALE:
H: ______
V: ______

1"
ON ORIGINAL SCALE DRAWING ADJUST SCALED DIMENSIONS IF THIS DOES NOT SCALE AT 1"

CITY OF SACRAMENTO
DEPARTMENT OF UTILITIES

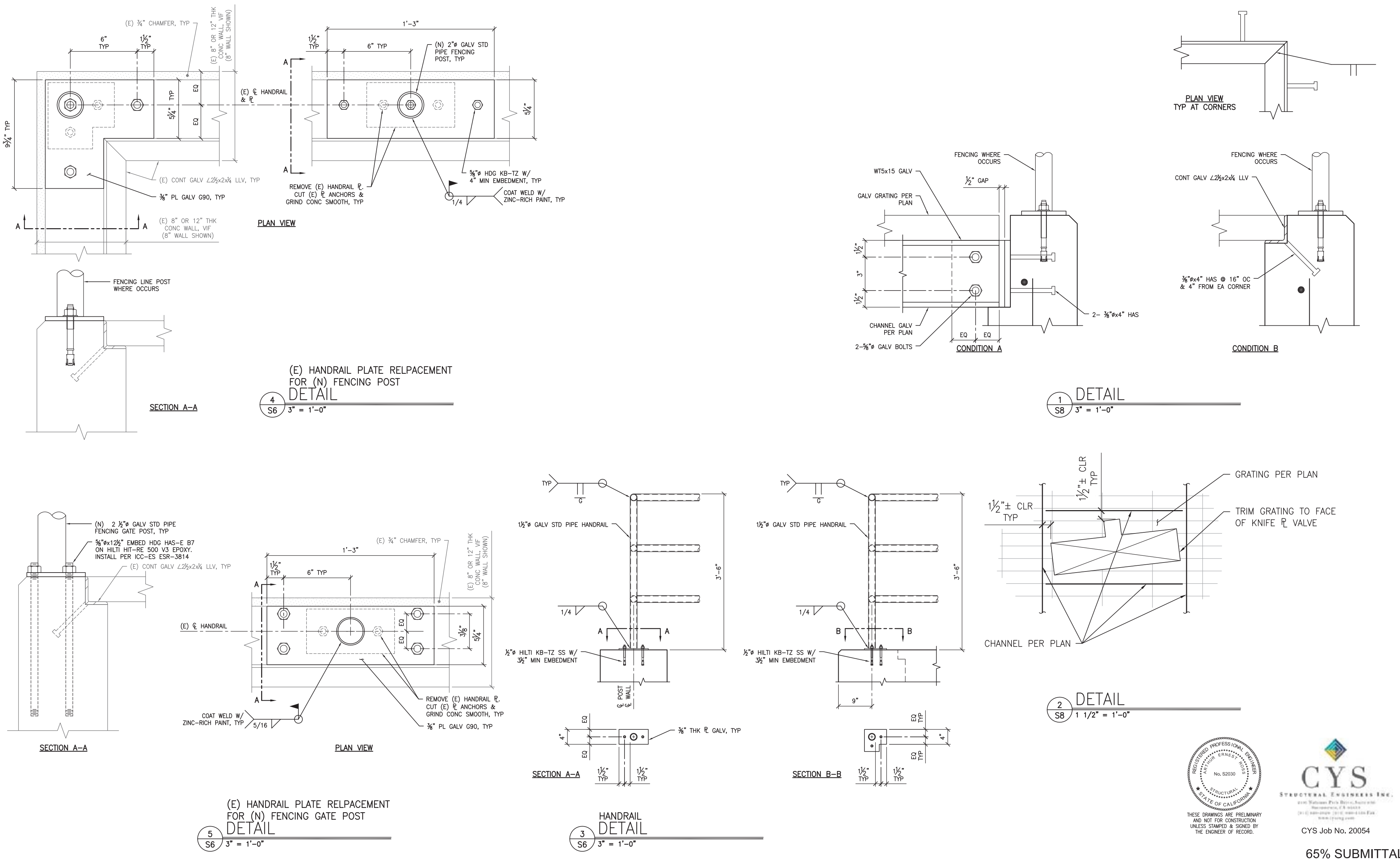
DRAWN BY: E. TUTEJA DATE: 09/15/20
DESIGNED BY: B. JENSEN R.C.E. NO. C90949 DATE: 03/31/22
CHECKED BY: A. SMITH R.C.E. NO. C86512 DATE: 03/31/21

PRELIMINARY

IMPROVEMENT PLANS FOR:
PUMP OUTFALLS REPLACEMENT PROJECT – B
WALL ELEVATIONS & SECTIONS
SUMP 155

DWG. NO. S6
SHEET 28 OF 30

PN: W14130615
PN: W14130615


(E) ¾" CHAMFER, TYP
(E) 8" OR 12" THK CONC WALL, VIF (8" WALL SHOWN)
(E) ℄ HANDRAIL & ℄
(E) CONT GALV ∠2½x2x¼ LLV, TYP
⅜" PL GALV G90, TYP
PLAN VIEW
(N) 2"ø GALV STD PIPE FENCING POST, TYP
REMOVE (E) HANDRAIL ℄ CUT (E) ℄ ANCHORS & GRIND CONC SMOOTH, TYP
⅝"ø HDG KB-TZ W/ 4" MIN EMBEDMENT, TYP
COAT WELD W/ ZINC-RICH PAINT, TYP
FENCING LINE POST WHERE OCCURS
SECTION A-A
(E) HANDRAIL PLATE RELPACEMENT FOR (N) FENCING POST
DETAIL
3" = 1'-0"
PLAN VIEW TYP AT CORNERS
FENCING WHERE OCCURS
WT5x15 GALV
½" GAP
GALV GRATING PER PLAN
CHANNEL GALV PER PLAN
2-⅝"ø GALV BOLTS
2- ⅜"øx4" HAS
CONDITION A
CONT GALV ∠2½x2x¼ LLV
⅜"øx4" HAS @ 16" OC & 4" FROM EA CORNER
CONDITION B
DETAIL
3" = 1'-0"
(N) 2 ½"ø GALV STD PIPE FENCING GATE POST, TYP
⅝"øx12½" EMBED HDG HAS-E B7 ON HILTI HIT-RE 500 V3 EPOXY. INSTALL PER ICC-ES ESR-3814
(E) ℄ HANDRAIL
COAT WELD W/ ZINC-RICH PAINT, TYP
⅜" PL GALV G90, TYP
1½"ø GALV STD PIPE HANDRAIL
½"ø HILTI KB-TZ SS W/ 3½" MIN EMBEDMENT
⅜" THK ℄ GALV, TYP
SECTION A-A
SECTION B-B
(E) HANDRAIL PLATE RELPACEMENT FOR (N) FENCING GATE POST
DETAIL
3" = 1'-0"
HANDRAIL DETAIL
3" = 1'-0"
GRATING PER PLAN
TRIM GRATING TO FACE OF KNIFE ℄ VALVE
1½"± CLR TYP
CHANNEL PER PLAN
DETAIL
1 1/2" = 1'-0"
REGISTERED PROFESSIONAL ENGINEER ARTHUR ERNEST ROSS No. S2030 STRUCTURAL STATE OF CALIFORNIA
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CYS Job No. 20054

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REVISIONS			BENCH MARK	FIELD BOOK	
DESCRIPTION	DATE	BY	DESCRIPTION: ELEV.	0000 SCALE: H: V:	1" ON ORIGINAL SCALE DRAWING ADJUST SCALED DIMENSIONS IF THIS DOES NOT SCALE AT 1"

CITY OF SACRAMENTO
DEPARTMENT OF UTILITIES

DRAWN BY: E. TUTEJA DATE: 09/15/20
DESIGNED BY: B. JENSEN R.C.E. NO. C90949 DATE: 03/31/22
CHECKED BY: A. SMITH R.C.E. NO. C86512 DATE: 03/31/21

PRELIMINARY

IMPROVEMENT PLANS FOR:
PUMP OUTFALLS REPLACEMENT PROJECT – B
DETAILS

DWG. NO. S8
SHEET 30 OF 30

PN: W14130615

L:\Jobs20\20054 Pump Outfall Replacement Valve Vaults\ACAD\STRU\PKG B\S8_PKG B.dwg Time:Sep15,2020-02:08pm Login:camachom Dimscale:4 LTScale:6
PUMP OUTFALLS REPLACEMENT PROJECT
PN: W14130615

Attachment C – Categorical Permission Checklist

(Pressurized Pipe)

Categorical Permission Alteration Description – 16. Pressurized Pipes

The categorical permission covers the installation, modification, and replacement of pressurized pipes that comply with certain terms and conditions. Particularly, all pressurized pipes must be designed and installed in accordance with current USACE standards. The total area of disturbance, including staging and access areas, must not exceed 5 acres. Pressurized pipes must also be designed to prevent, (1) flotation from uplift, (2) scour or erosion, (3) damage from debris on the waterside, particularly during flood flows, (4) leakage, (5) seepage along proposed pipes, (6) corrosion, and (7) damage from vehicular loads.

All new pressurized pipes should go up and over the levee DWSE. Pressurized pipes passing over or within the freeboard zone of a levee (i.e., above the levee DWSE), should be made of metal, preferably ductile iron or coated steel, suitable for use with flexible couplings.

Backfill under and around (to 1 foot over) the proposed pipe must be controlled low-strength material (CLSM). Pipes that pass above the DWSE must have 2 feet of cover (low permeability or CLSM) to prevent damage by vehicles and equipment. Cover material on the levee crown must be placed at a ratio of 10H:1V, in the upstream/downstream direction of the levee. Pipes on the sides of the levee should be covered with a minimum of 1 foot of low permeability material, compacted in 4- to 6-inch lifts or CLSM to protect them from debris during high water (waterside) or to keep them from interfering with or being damaged by operations or maintenance of the levee (landside). Fill must be free of deleterious materials and construction debris and placed in 4- to 6-inch-thick loose lifts and compacted to not less than 95% of the maximum density at moistures between -2 and +3 percent of optimum moisture content obtained from ASTM D698 (USACE preferred method), or alternately, 90% of the maximum density at moistures between -2 and +3 percent of optimum moisture content obtained from ASTM D1557. At the sponsor and levee maintaining agency's discretion, pipes on the levee slopes may be left exposed.

Only suitable material must be used as levee fill materials. Fill must be free from: roots and other organic matter, contaminated hazardous or toxic material, trash, debris, and frozen materials. Satisfactory fill material must have a plasticity index between 8 and 25, have a liquid limit less than 45, a minimum fines content of 20%, and 100% passing the 3-inch sieve.

Pressurized pipes terminating in the channel require a positive closure device on the waterside that is accessible from the levee crown. Pressurized pipes transporting product completely across or through the federal project easement require positive closure devices located landward of any levees and channel. The positive closure device shall be located within one mile on both sides of the federal project. If the invert of the pipe is over the levee crown, the combination of a pump station on the waterside and a siphon breaker is considered an appropriate means of closure. Pipes located within or beneath a levee must have watertight joints that can accommodate movements resulting from settlement.

All pressurized pipes that cross the levee foundation at a depth less than or equal to two times the height of the levee should be evaluated for uplift. Pipes crossing the surface of the levee must be designed to counteract buoyancy forces of an empty pipe, with water at the DWSE.

Pressurized pipelines running parallel to flood risk management projects should be located at least 15 feet beyond the levee toes. Pipe location and orientation must be clearly marked in the field so they can be easily identified for flood fighting crews.

If appropriate, the requester should prepare an excavation plan demonstrating the effects of excavation on the stability of the embankments.

The site layout should provide adequate access for maintenance vehicles to refill fuel tanks and service/replace pumps, generators, etc. Pressurized pipes must also allow easy access for rapid closure in the event of leakage or rupture.

No plastic pipes (HDPE, PVC, etc.) are allowed in the levee embankment or its foundation unless they are embedded in concrete.

If an electrochemical or chemical reaction between the substratum or groundwater and pipe materials is expected, the pipe and pipe couplings must be protected.

After installation of pressurized pipes, the requester must demonstrate 0% pipe leakage in pipes in the levee. Pipes must be pressure tested to industry standards. Pipes must be regularly inspected, including the interior, if possible, looking for signs of maintenance issues. If an inspection indicates corrosion, alignment sag or heave, or separation at joints, corrective action must be taken as soon as possible to avoid failure. Pipe valves must be periodically inspected and pressure tested to ensure that they are functioning properly. Pressure tests must show no significant loss in pressure. Leaks and other deficiencies must be addressed as soon as possible. All replacement parts must be of equivalent or better quality than those being replaced.

The preferred method for abandoning pipes that pass through or over a levee is complete removal. If removal is not feasible, the pipes and other structures may be filled with a cement/bentonite-based grout or flowable fill. The grout needs to be sufficiently fluid so that it can be pumped to completely fill the pipe leaving no voids.

Categorical Permission Alteration Checklist – 16. Pressurized Pipes

Note: The following checklist is intended for planning purposes only, and includes information that USACE reviewers look for when considering a Section 408 request for pressurized pipes under the Categorical Permission. To be reviewed under the Categorical Permission, the proposed project must adhere to all requirements of the Categorical Permission, including the full alteration description (see previous page). The plans and narrative project description should reflect this information.

1.	☐ New Construction ☒ Replacement ☐ Modification ☐ Authorize Existing
2.	Maximum total area of disturbance is 5 acres: Yes ☒ No ☐ Reference: [Click to enter document source. Example – plan sheet (p. 4), specs, report.] Comment: Area of disturbance is 0.07 acre.
3.	Pipes are designed to prevent flotation from uplift, scour or erosion, damage from debris on the waterside (particularly during flood flows), seepage along proposed pipes, corrosion, leakage, and damage from vehicular loads: Yes ☒ No ☐ Reference: Refer to detail 3 on sheet 41. Comment: [Click to enter rationale, explanation, unique situation, etc.]
4.	Backfill under and around (to 1 foot over) the proposed pipe must be controlled low-strength material (CLSM): Yes ☒ No ☐ Reference: Refer to detail 3 on sheet 41 Comment: [Click to enter rationale, explanation, unique situation, etc.]
5.	Pipes passing over the DWSE will have a minimum of 2 feet of cover (low permeability or CLSM): Yes ☒ N/A ☐ Reference: Refer to profiles on sheets 14-16 in Bid Set B Comment: [Click to enter rationale, explanation, unique situation, etc.]
6.	If material must be added to the levee crown, the added material must be sloped at a ratio of 10H:1V horizontal to vertical, in the upstream/downstream direction to prevent a “speed bump” effect and facilitate vehicle access: Yes ☐ N/A ☒ Reference: [Click to enter document source. Example – plan sheet (p. 4), specs, report.] Comment: [Click to enter rationale, explanation, unique situation, etc.]
7.	Fill will be compacted to at least 95% of maximum density as determined by ASTM D698, between -2 and +3% of optimum moisture content: Yes ☒ No ☐ Reference: Refer to Spec section 31 00 00 3.6B. Comment: [Click to enter rationale, explanation, unique situation, etc.]
8.	Satisfactory fill material must have a plasticity index between 8 and 25, have a liquid limit less than 45, a minimum fines content of 20%, and 100% passing the 3-inch sieve: Yes ☒ No ☐ Reference: Refer to Spec section 31 00 00 2.2A. Comment:
9.	All fill will be free of organics or other inappropriate materials: Yes ☒ N/A ☐ Reference: Refer to Spec section 31 00 00 3.9.B.1.6. Comment: [Click to enter rationale, explanation, unique situation, etc.]

10. Pipes terminating in the channel have a positive closure device on the waterside that is accessible from the levee crown: Yes ☒ N/A ☐
Reference: Refer to profiles on Sheets 14-16 and Detail 6 on Sheet 18 in Bid Set B
Comment: [Click to enter rationale, explanation, unique situation, etc.]

11. Pipes transporting product completely across the federal project have a positive closure devices located within 1 mile on both sides of the federal project: Yes ☐ N/A ☒
Reference: [Click to enter document source. Example – plan sheet (p. 4), specs, report.]
Comment: [Click to enter rationale, explanation, unique situation, etc.]

12. Pipes located within or beneath a levee have watertight joints that can accommodate movements resulting from settlement: Yes ☒ No ☐
Reference: Refer to detail 2 on Sheet 40
Comment: [Click to enter rationale, explanation, unique situation, etc.]

13. Pipes crossing the surface of the levee are designed to counteract buoyancy forces of an empty pipe, with water at the DWSE: Yes ☒ N/A ☐
Reference: Refer to detail 3 on sheet 41
Comment: [Click to enter rationale, explanation, unique situation, etc.]

14. Pipe location and orientation will be clearly marked in the field: Yes ☒ No ☐
Reference: [Click to enter document source. Example – plan sheet (p. 4), specs, report.]
Comment: Pipe location and orientation can be identified by vault structure and outfall location

15. Pipes will allow easy access for rapid closure: Yes ☒ No ☐
Reference: [Click to enter document source. Example – plan sheet (p. 4), specs, report.]
Comment: Positive valve closures on the levee crest will ensure easy access for rapid closure

16. Plastic pipes within the levee embankment or its foundation are embedded in concrete: Yes ☐ N/A ☒
Reference: [Click to enter document source. Example – plan sheet (p. 4), specs, report.]
Comment: [Click to enter rationale, explanation, unique situation, etc.]

17. If a chemical or electrochemical reaction is expected, the pipe and pipe couplings must be protected: Yes ☐ N/A ☒
Reference: [Click to enter document source. Example – plan sheet (p. 4), specs, report.]
Comment: [Click to enter rationale, explanation, unique situation, etc.]

18. Any work within the levee embankment or foundation? Yes ☒ No ☐
Reference: Detail 1 on Sheet 22 in Bid Set B
Comment: [Click to enter rationale, explanation, unique situation, etc.]

19. Any work ≤50 feet beneath the channel invert? Yes ☐ No ☒
Reference: [Click to enter document source. Example – plan sheet (p. 4), specs, report.]
Comment: [Click to enter rationale, explanation, unique situation, etc.]

20. Hydraulic blockage calculation ≥1%? Yes ☐ No ☒ N/A ☐
Reference: [Click to enter document source. Example – plan sheet (p. 4), specs, report.]
Comment: Rip Rap cross-sectional area below ordinary high watermark is anticipated to be significantly less than the cross-sectional area of the American River and therefore negligible.

21. Hydraulic model used for hydraulic analysis? Yes ☐ No ☐ N/A ☒

Reference: [Click to enter document source. Example – plan sheet (p. 4), specs, report.]

Comment: [Click to enter rationale, explanation, unique situation, etc.]

– For Official Use Only below this line –

Comment

CP Eligibility Review

Yes	No	Add'l. Info Requested		
☐	☐	☐	Environmental Reviewer: _____	Date: Click date
☐	☐	☐	Engineering Reviewer: _____	Date: Click date

Attachment D – Categorical Permission Checklist

(Gravity Pipe)

Categorical Permission Alteration Description – 13. Gravity Pipes

The categorical permission covers the installation, modification, and replacement of gravity pipes and culverts that comply with certain terms and conditions. The total area of disturbance, including staging and access areas, must not exceed 5 acres.

Generally, cast-in-place reinforced concrete pipes are preferable for gravity lines where considerable settlement is expected. No plastic pipes are allowed in the levee embankment or its foundation unless they are embedded in concrete or encased in a steel conduit with the annular space completely grouted.

Backfill under and around (to 1 foot over) the proposed pipe must be controlled low-strength material (CLSM).

Suitable material must be used as levee fill materials. Fill must be free from: roots and other organic matter, contaminated hazardous or toxic material, trash, debris, and frozen materials. Satisfactory fill material must have a plasticity index between 8 and 25, have a liquid limit less than 45, a minimum fines content of 20%, and 100% passing the 3-inch sieve.

Fill must be free of deleterious materials and construction debris and placed in 4- to 6-inch-thick loose lifts and compacted to not less than 95% of the maximum density at moistures between -2 and +3 percent of optimum moisture content obtained from ASTM D698 (USACE preferred method), or alternately, 90% of the maximum density at moistures between -2 and +3 percent of optimum moisture content obtained from ASTM D1557.

Pipe joints must have sufficient flexibility to adjust under expected settlement and stretching of the pipe. Pipes should be designed to counteract uplift of the empty pipe at the design high water stage. If a chemical or electrochemical reaction is expected, the pipe and pipe couplings must be protected.

All new and existing gravity-flowing culverts must have a flap gate on the waterside end with provisions for positive closure (slide gate or sluice gate). The slide gate or sluice gate should be housed in a gatewell at the waterside edge of the levee crown to provide access.

Internal inspections must occur to ensure the pipes are in good condition. Video inspection of the internal condition of the pipe or pressure testing should be undertaken at least once every five years. Valves and gates should be periodically inspected and tested to ensure they are functioning properly. If the inspection indicates corrosion, alignment sag or heave, or separation at joints, corrective action must be taken as soon as possible. In most cases, once a pipe begins to oval or flatten at the crown or has lost more than 5% of its original interior height, it should be replaced.

Periodically, debris must be removed and corrosion or other damage on trash screens repaired.

If maintenance indicates that pipe replacement is necessary, all replacement parts must be of equivalent or better quality than those to be replaced. All repairs must restore pipes and associated equipment to the standards of the original design, or better.

Categorical Permission Alteration Checklist – 13. Gravity Pipes

Note: The following checklist is intended for planning purposes only, and includes information that USACE reviewers look for when considering a Section 408 request for gravity pipes under the Categorical Permission. To be reviewed under the Categorical Permission, the proposed project must adhere to all requirements of the Categorical Permission, including the full alteration description (see previous page). The plans and narrative project description should reflect this information.

1.	☐ New Installation ☒ Replacement ☐ Modification ☐ Authorize Existing
2.	Maximum total area of disturbance is 5 acres: ☒ Reference: [Click to enter document source. Example – plan sheet (p. 4), specs, report.] Comment: Area of disturbance is 0.07 acre.
3.	Plastic pipes within the levee embankment or foundation will be embedded in concrete or encased in a steel conduit with the annular space completely grouted: Yes ☐ N/A ☒ Reference: [Click to enter document source. Example – plan sheet (p. 4), specs, report.] Comment: [Click to enter rationale, explanation, unique situation, etc.]
4.	Pipe joints will have sufficient flexibility to adjust under the expected settlement and stretching of the pipe: ☒ Reference: Detail 3 on Sheet 21 (Bid Set B) Comment: [Click to enter rationale, explanation, unique situation, etc.]
5.	Backfill under and around (to 1 foot over) the proposed pipe must be controlled low-strength material (CLSM): ☒ Reference: Refer to detail 3 on sheet 41 Comment: [Click to enter rationale, explanation, unique situation, etc.]
6.	Fill will be compacted to at least 95% of maximum density as determined by ASTM D698, between -2 and +3% of optimum moisture content: ☒ Reference: Refer to Spec section 31 00 00 3.6B. Comment: [Click to enter rationale, explanation, unique situation, etc.]
7.	Satisfactory fill material must have a plasticity index between 8 and 25, have a liquid limit less than 45, a minimum fines content of 20%, and 100% passing the 3-inch sieve: ☒ Reference: Refer to Spec section 31 00 00 2.2A. Comment: [Click to enter rationale, explanation, unique situation, etc.]
8.	All fill will be free of organics or other inappropriate materials: ☒ Reference: Refer to Spec section 31 00 00 3.9.B.1.6. Comment: [Click to enter rationale, explanation, unique situation, etc.]
9.	New and existing gravity-flowing culverts will have a flap gate on the waterside end with provisions for positive closure: Yes ☒ N/A ☐ Reference: Detail 1 on Sheet 21 in Bid Set B Comment: 42” CMP pipe

- Continued on next page –

10.	If a chemical or electrochemical reaction is expected, the pipe and pipe couplings must be protected:	Yes ☐	N/A ☒
	Reference: [Click to enter document source. Example – plan sheet (p. 4), specs, report.]		
	Comment: [Click to enter rationale, explanation, unique situation, etc.]		
11.	Any work within the levee embankment or foundation?	Yes ☐	No ☒
	Reference: [Click to enter document source. Example – plan sheet (p. 4), specs, report.]		
	Comment: [Click to enter rationale, explanation, unique situation, etc.]		
12.	Hydraulic blockage calculation ≥1%?	Yes ☐ No ☒	N/A ☐
	Reference: [Click to enter document source. Example – plan sheet (p. 4), specs, report.]		
	Comment: Rip Rap cross-sectional area below ordinary high watermark is anticipated to be significantly less than the cross-sectional area of the American River and therefore negligible.		
13.	Hydraulic model used for hydraulic analysis?	Yes ☐ No ☐	N/A ☒
	Reference: [Click to enter document source. Example – plan sheet (p. 4), specs, report.]		
	Comment: [Click to enter rationale, explanation, unique situation, etc.]		

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Comment

CP Eligibility Review

Yes	No	Add'l. Info Requested		
☐	☐	☐	Environmental Reviewer: _____	Date: Click date
☐	☐	☐	Engineering Reviewer: _____	Date: Click date