

**American River Flood Control District
Central Valley Flood Protection Board Permit Application
Sump 154 Modifications (City of Sacramento)
Staff Report**

Discussion:

The City of Sacramento submitted this encroachment permit application to modify facilities at their Sump 154 Pump Station. The work proposed is to remove and replace approximately 160 ft of three (3) 36" welded steel pipes at the pump discharge locations and outfall structure.

Sump 154 is located adjacent to the Arcade Creek South Levee at the confluence with Steelhead Creek.

These modifications are required to upgrade the pipe outfall system at the pump station. Recent work conducted by SAFCA under the North Area Streams Project replaced only the segments of pipe that crossed through the levee. This work will complete the upgrade to the facility by replacing the pipe discharge sections at the pumps and also the pipe outfall sections and flap gates.

These modifications will be routine construction installations and do not present considerable engineering challenges. It is not anticipated that this work will pose significant operations and maintenance impacts to the District.

Recommendation:

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

**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 154 Modifications: Remove and replace approximately 160 ft of three (3) 36" welded steel pipes at the pump discharge locations and outfall structure.

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: 38.61943 Longitude: -121.46703
Stream: Arcade Creek, Levee: Left Bank Designated Floodway: Arcade Creek
APN: See Attachment A

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

4. Ashley Smith, PE of Peterson Brustad Inc.
Name of Applicant's Representative Company
Folsom CA 95630 (916) 608-2212 x 123
City State Zip Code 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 approve this plan, subject to the following conditions:
Name of LMA

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.

Table with 3 columns: Name, Address, Zip Code. Row 1: See Attachment A

7. Has an environmental determination been made of the proposed work under the California Environmental Quality Act of 1970? [] Yes [] No [x] 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. [x] Regional and vicinity maps showing the location of the proposed work.
B. [x] Drawings showing plan view(s) of the proposed work to include map scale.
C. [x] Drawings showing the cross section dimensions and elevations (vertical datum?) of levees, berms, stream banks, flood plain,
D. [x] Drawings showing the profile elevations (vertical datum?) of levees, berms, flood plain, low flow, etc.
E. [x] 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. The intent of this application is to modify the existing encroachment permit. The existing Permit number for Sump 154 is 1845-1.

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 partial replacement sump (Sump 154) that will need an updated Encroachment Permit from the CVFPB.

APN Parcels

Sump	Existing Permit #	APN
154	1845-1	263-0010-036-0000, 263-0051-001-0000, 263-0010-037-0000

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
263-0010-034-0000	NORWOOD AVE	SACTO & SAN JOAQUIN DRAINAGE DIS	PO BOX 942836	SACRAMENTO	94236
263-0051-030-0000	ARCADE BLVD	CITY OF SACRAMENTO	915 I ST FL5	SACRAMENTO	95814
263-0051-032-0000	75 ARCADE BLVD	ILSA MEDINA	75 ARCADE BLVD	SACRAMENTO	95815
263-0051-033-0000	83 ARCADE BLVD	ROHITESHWAR CHAND	83 ARCADE BLVD	SACRAMENTO	95815
263-0110-001-0000	N/A	CITY OF SACRAMENTO	915 I ST FL5	SACRAMENTO	95814
263-0260-008-0000	E LEVEE RD	WESTERN PACIFIC RAILROAD CO	1400 DOUGLAS ST 1640	OMAHA	68179
263-0260-021-0000	3201 NORWOOD AVE	WESTERN PACIFIC RAILROAD CO	1400 DOUGLAS ST 1640	OMAHA	68179
263-0341-001-0000	63 ARCADE BLVD	DAVID R BENNETTE	4813 HUTSON WAY	ELK GROVE	95757

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: Waterside toe near Sump 154 looking toward levee crest



Figure 2: View looking southwest toward the fenced Sump 154 facility on the land side of the levee



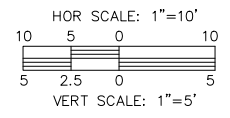
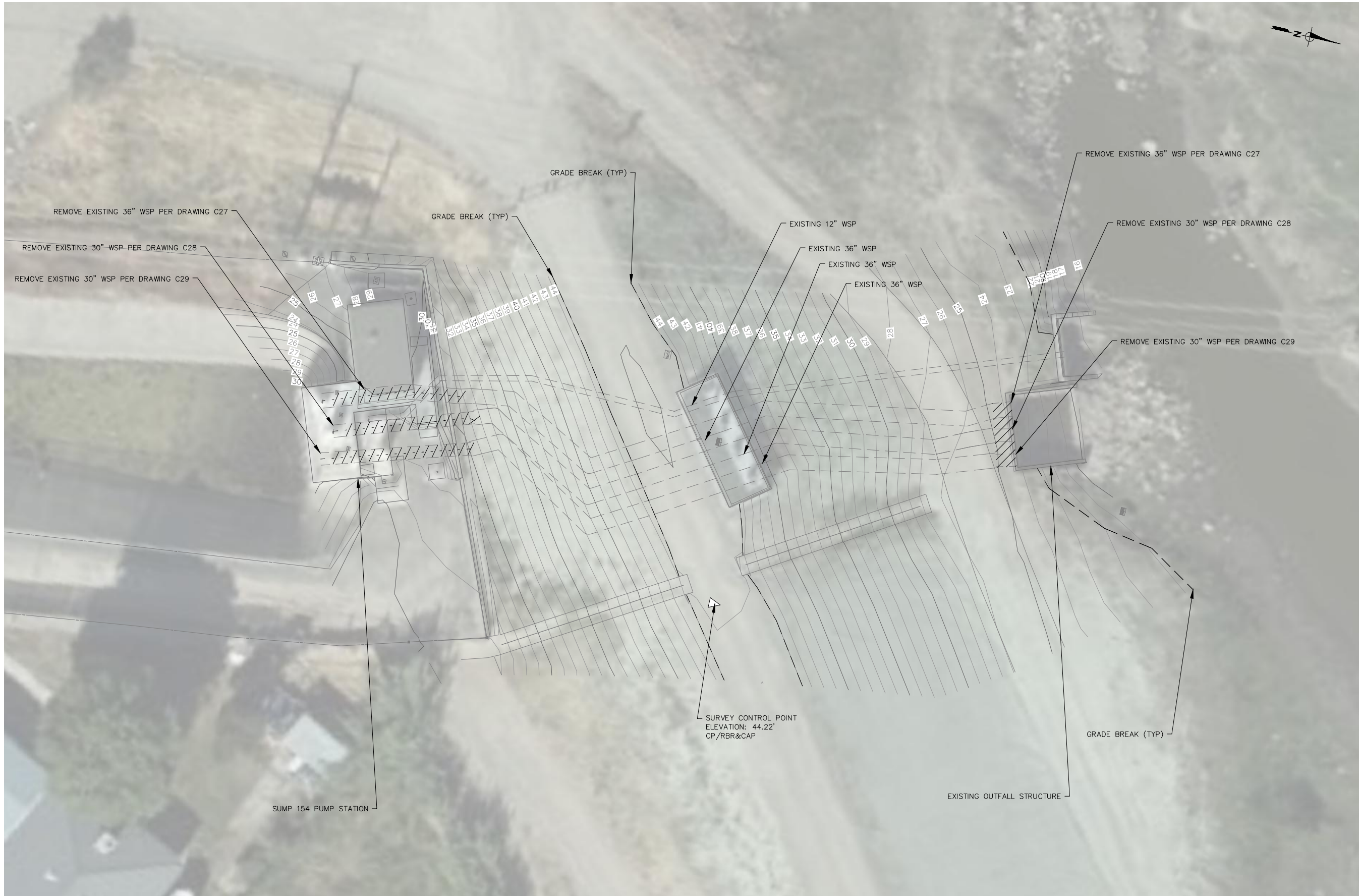
Figure 3: View looking south toward the Sump 154 concrete outfall structures from the dry bed of Arcade Creek.



Figure 4: Waterside slope near Sump 154 looking east

Attachment B – Plan Sheets

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



PN: W14130615

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REVISIONS			
NO.	DESCRIPTION	DATE	BY

BENCH MARK	ELEV. 44.22
DESCRIPTION:	CP/RBR&CAP

FIELD BOOK	0000
SCALE:	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



IMPROVEMENT PLANS FOR:

PUMP OUTFALLS REPLACEMENT PROJECT - A

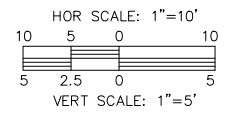
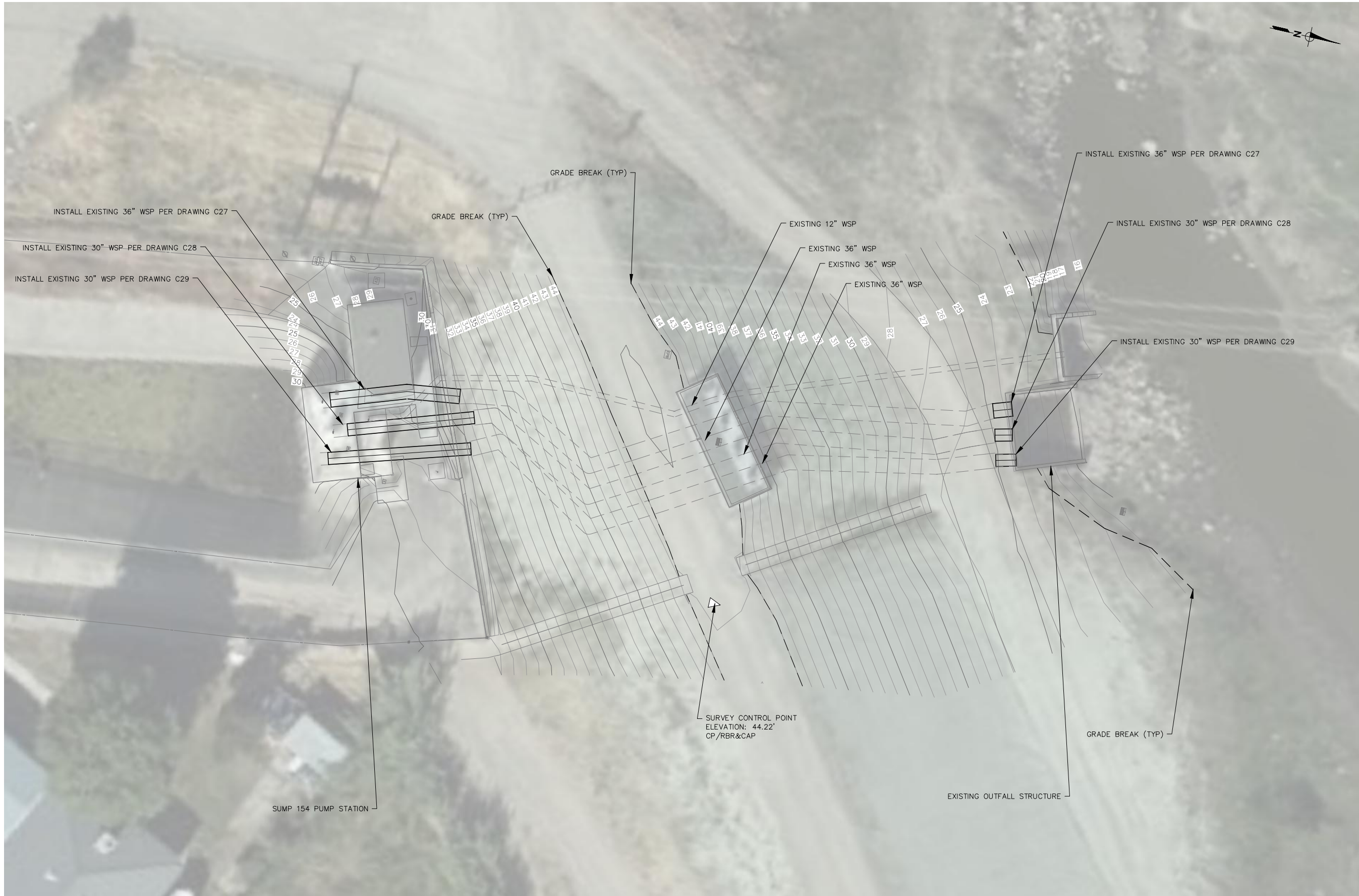
SUMP 154

DEMO PLAN

Page 11

DWG. NO. C25	SHEET 28 OF 47
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65% SUBMITTAL



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REVISIONS			
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SCALED DIMENSIONS	IF THIS DOES NOT
SCALE AT 1"	

CITY OF SACRAMENTO			
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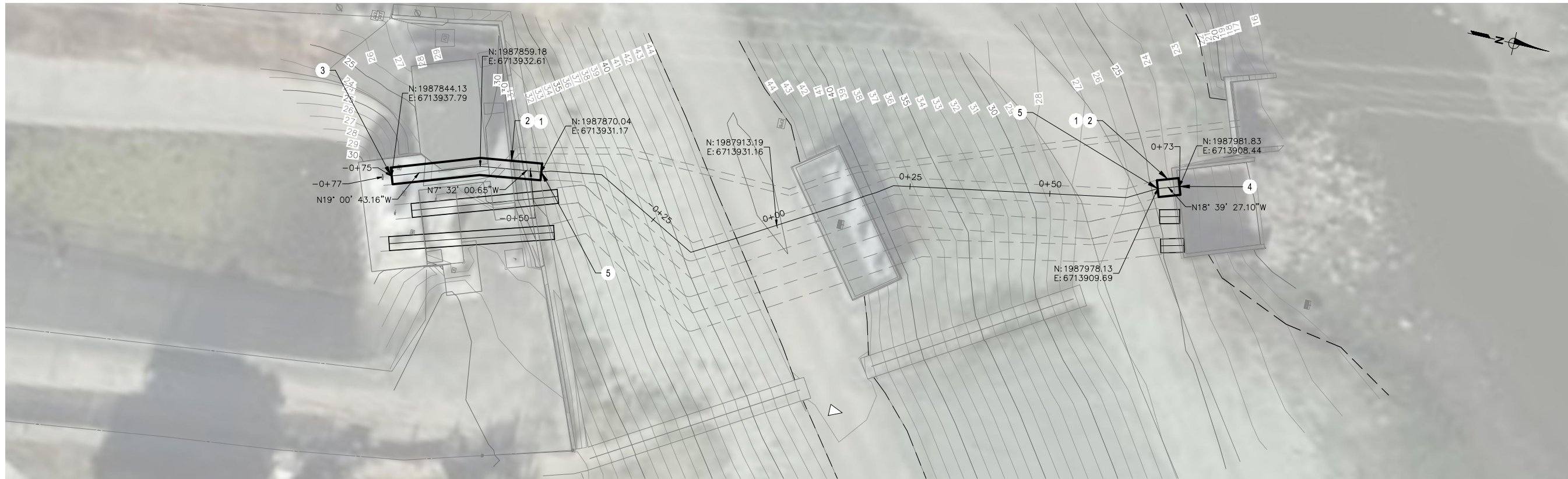


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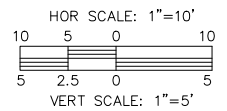
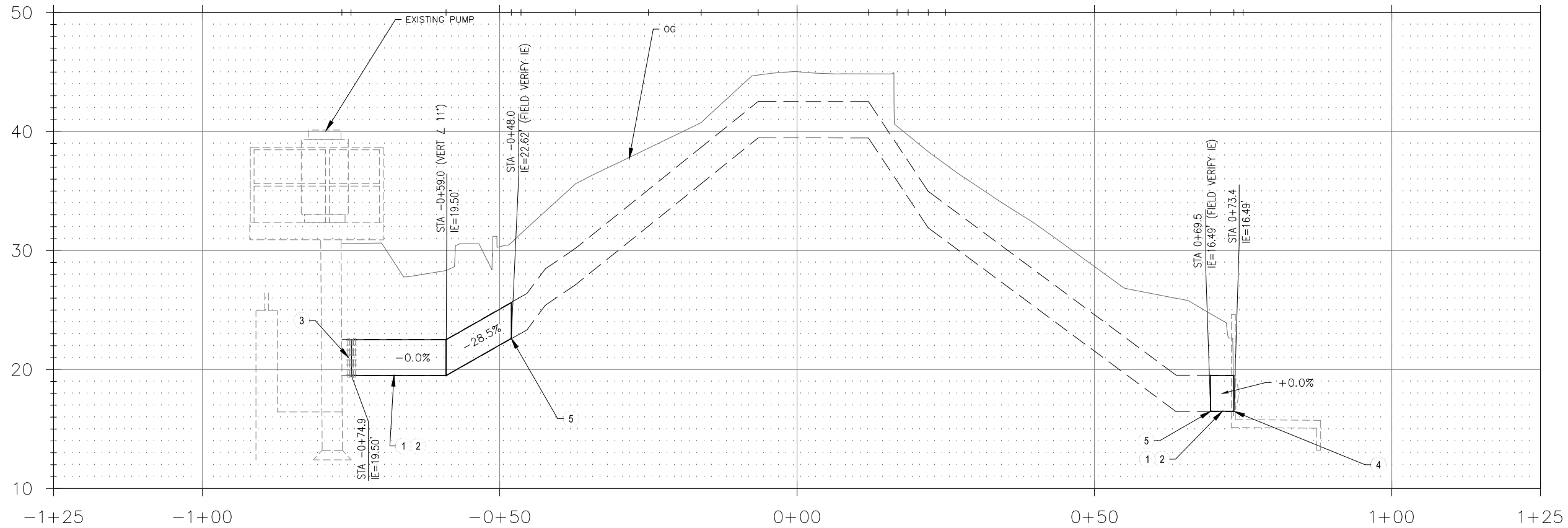
IMPROVEMENT PLANS FOR:
PUMP OUTFALLS REPLACEMENT PROJECT - A
SUMP 154
SITE PLAN

Page 12

DWG. NO.	C26
SHEET	29
OF	47



- NOTES:**
- 1 REMOVE AND DISPOSE OF EXISTING 36" WSP AND APPURTENANCES FROM STA -0+74.9 TO STA -0+48.0 AND STA 0+69.5 TO STA 0+73.4 PER DETAIL 2/C38
 - 2 INSTALL 36" WSP FROM STA -0+74.9 TO STA -0+48.0 AND STA 0+69.5 TO STA 0+73.4 PER DETAIL 3/C38
 - 3 CONNECT TO EXISTING STEEL COUPLING
 - 4 CONNECT TO EXISTING OUTFALL STRUCTURE PER DETAIL 1/C37
 - 5 CONNECT TO EXISTING PIPE PER DETAIL 3/C37
 - 6 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



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REVISIONS			
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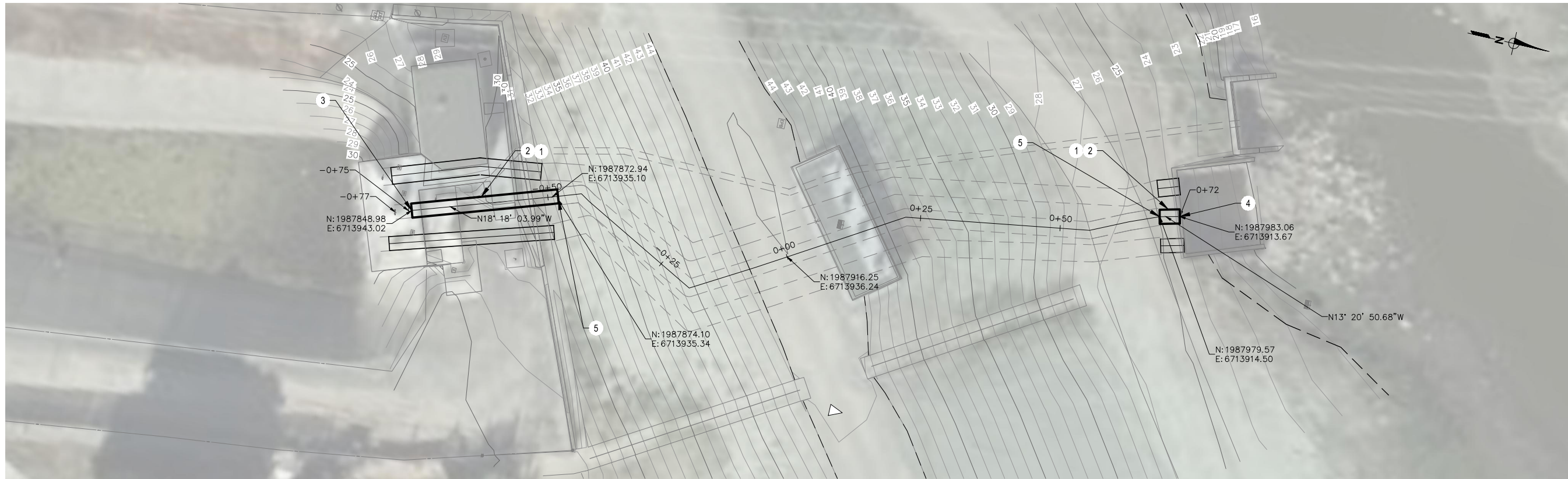
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DEPARTMENT OF UTILITIES			
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DATE:	09/15/20	R.C.E. NO.:	C90949
CHECKED BY:	A. SMITH	DATE:	03/31/22
R.C.E. NO.:	C86512	DATE:	03/31/21



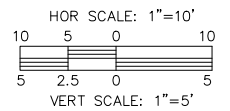
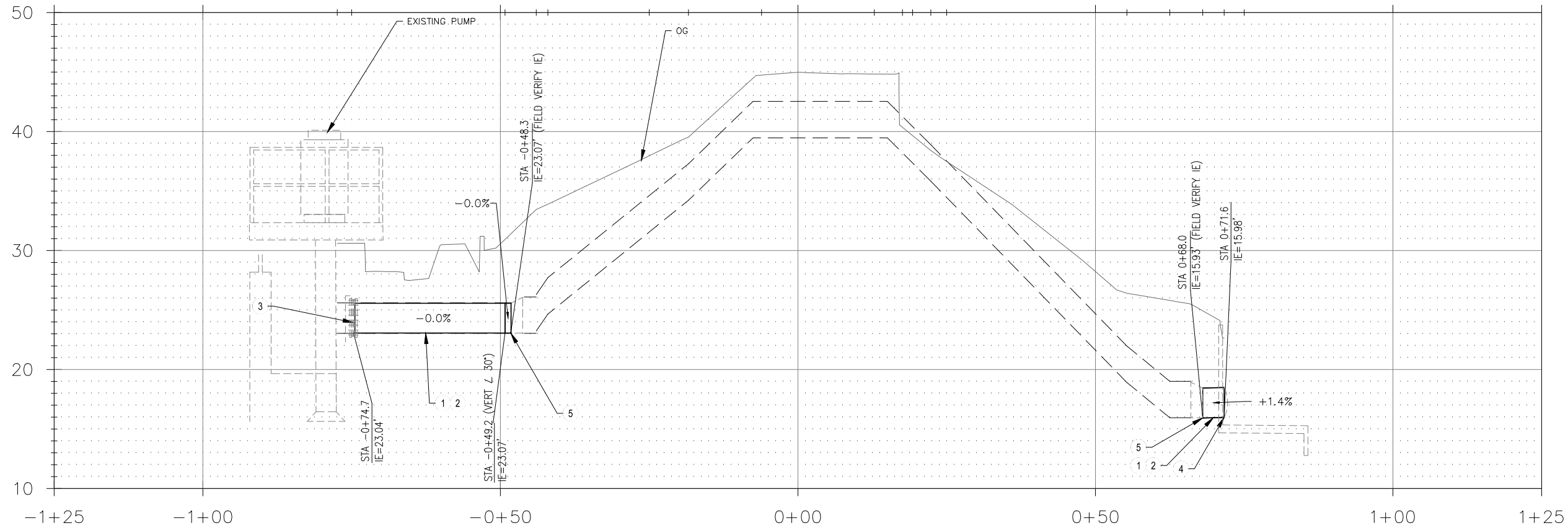
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PUMP OUTFALLS REPLACEMENT PROJECT - A
SUMP 154
PLAN AND PROFILE 1 - 36" WSP

65% SUBMITTAL

DWG. NO.	C27
SHEET	30
OF	47



- NOTES:**
- REMOVE AND DISPOSE OF EXISTING 30" WSP AND APPURTENANCES FROM STA -0+74.7 TO STA -0+48.3 AND STA 0+68.0 TO STA 0+71.6 PER DETAIL 2/C38
 - INSTALL 30" WSP FROM STA -0+74.7 TO STA -0+48.3 AND STA 0+68.0 TO STA 0+71.6 PER DETAIL 3/C38
 - CONNECT TO EXISTING STEEL COUPLING
 - CONNECT TO EXISTING OUTFALL STRUCTURE PER DETAIL 1/C37
 - CONNECT TO EXISTING PIPE PER DETAIL 3/C37
 - 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



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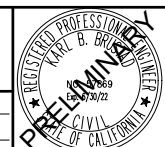
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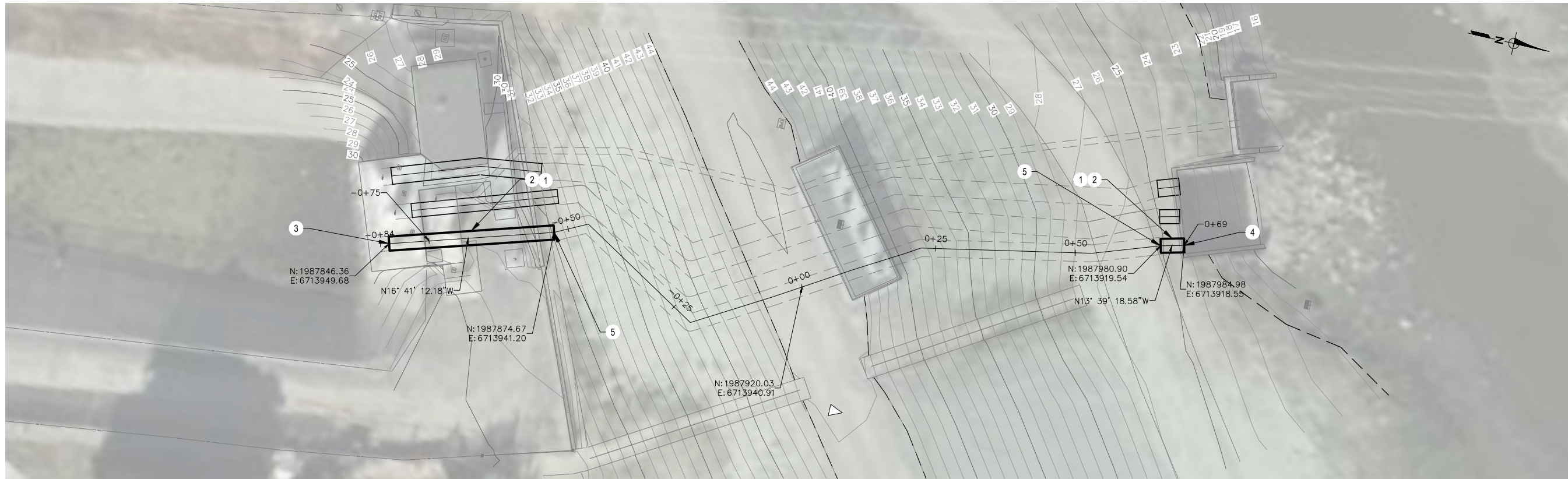
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CITY OF SACRAMENTO		DEPARTMENT OF UTILITIES	
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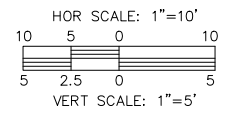
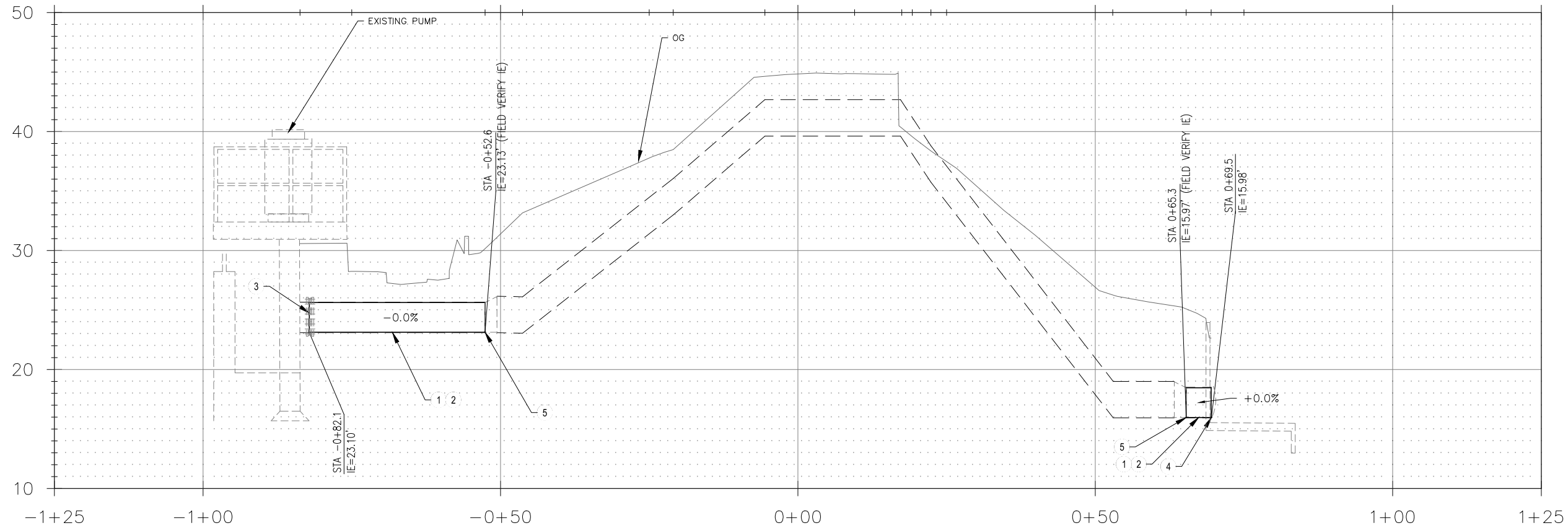


IMPROVEMENT PLANS FOR:
PUMP OUTFALLS REPLACEMENT PROJECT - A
SUMP 154
PLAN AND PROFILE 2 - 30" WSP

DWG. NO.	C28
SHEET	31 OF 47
Page	14



- NOTES:**
- 1 REMOVE AND DISPOSE OF EXISTING 30" WSP AND APPURTENANCES FROM STA -0+82.1 TO STA -0+52.6 AND STA 0+65.3 TO STA 0+69.5 PER DETAIL 2/C38
 - 2 INSTALL 30" WSP FROM STA -0+82.1 TO STA -0+52.6 AND STA 0+65.3 TO STA 0+69.5 PER DETAIL 3/C38
 - 3 CONNECT TO EXISTING STEEL COUPLING
 - 4 CONNECT TO EXISTING OUTFALL STRUCTURE PER DETAIL 1/C37
 - 5 CONNECT TO EXISTING PIPE PER DETAIL 3/C37
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PUMP OUTFALLS REPLACEMENT PROJECT
PN: W14130615

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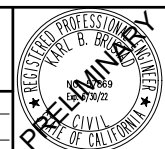
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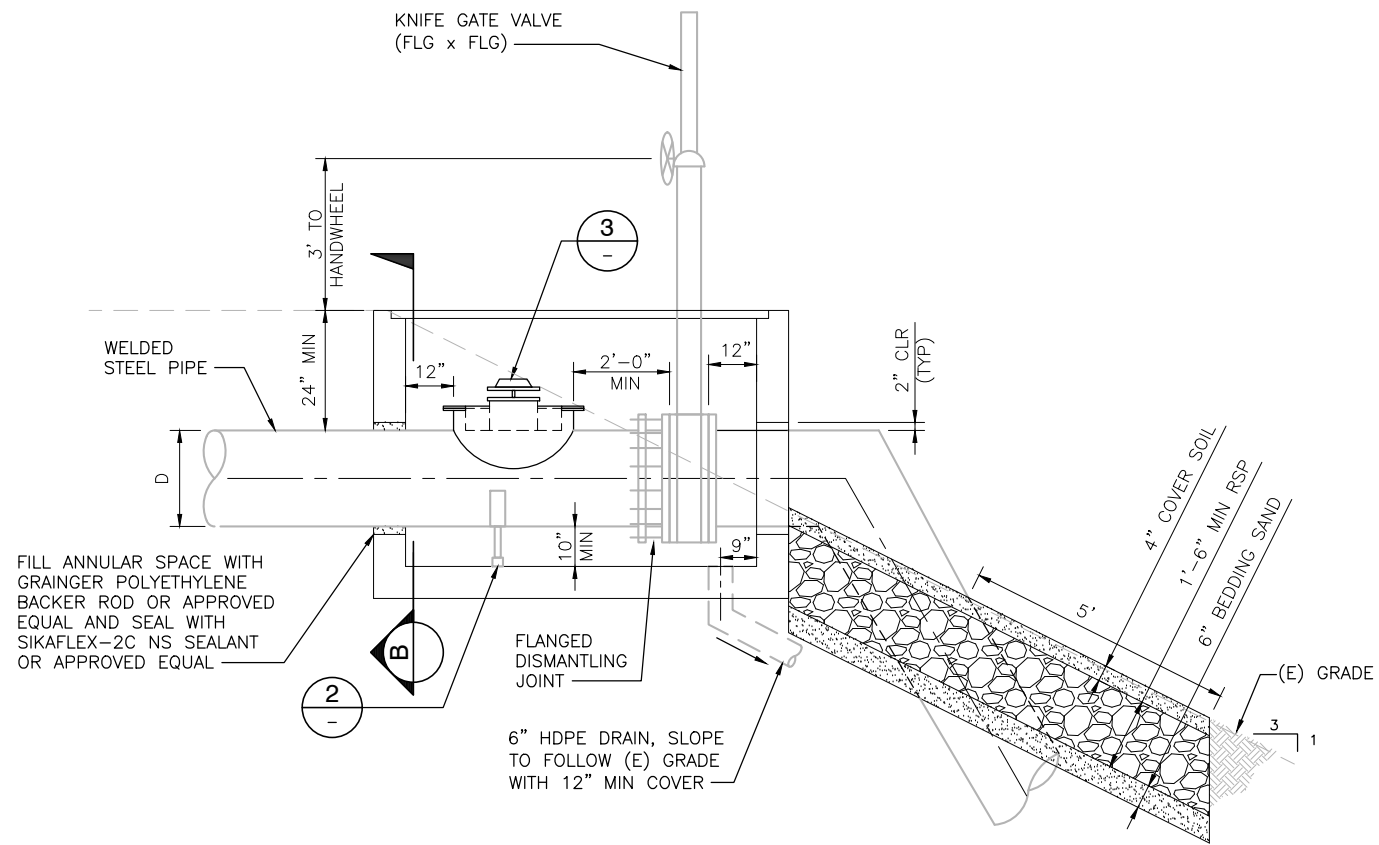
CITY OF SACRAMENTO
DEPARTMENT OF UTILITIES

DRAWN BY: E. TUTEJA DESIGNED BY: B. JENSEN CHECKED BY: A. SMITH
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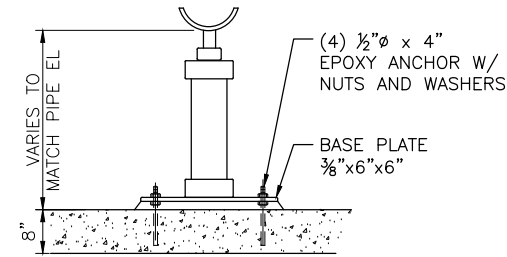


IMPROVEMENT PLANS FOR:
PUMP OUTFALLS REPLACEMENT PROJECT - A
SUMP 154
PLAN AND PROFILE 3 - 30" WSP

65% SUBMITTAL
 DWG. NO. C29
 SHEET 32 OF 47
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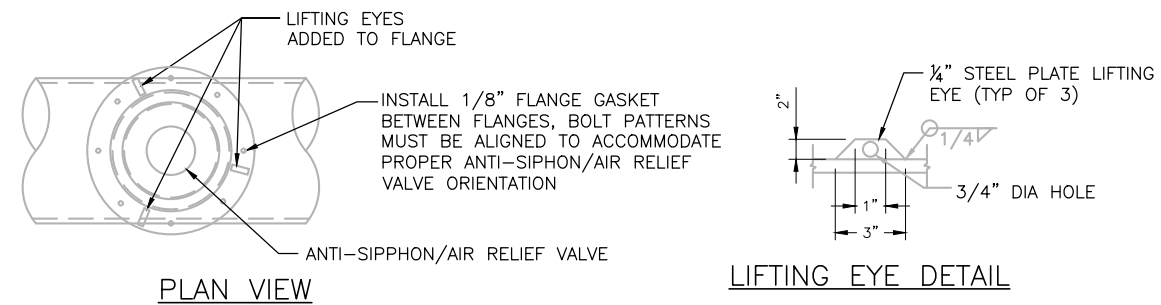


SUMP 155 ANTI SIPHON VAULT DETAIL 1
NTS



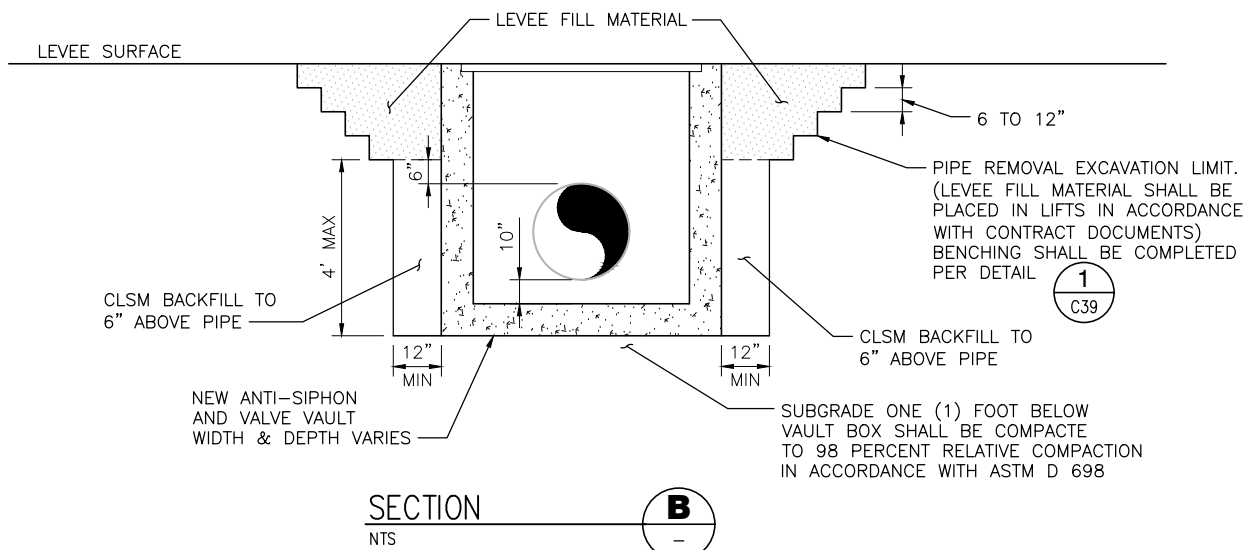
NOTE: PIPE SUPPORT TO BE STANDON S92 OR APPROVED EQUAL

PIPE SUPPORT 2
NTS

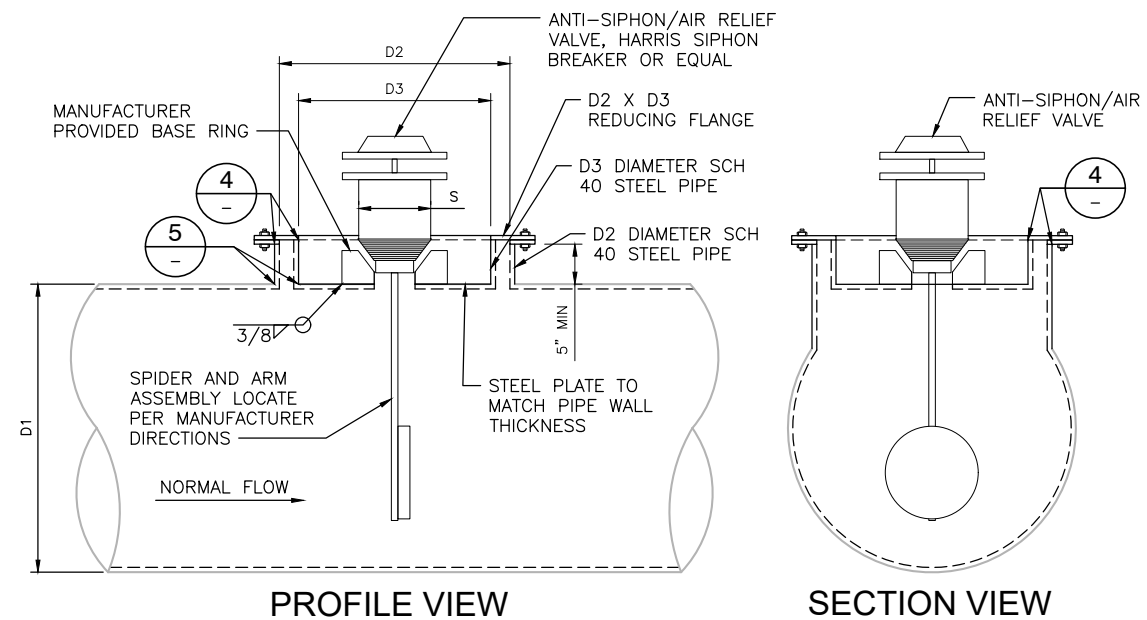


TYPICAL ANTI-SIPHON VALVE SIZE

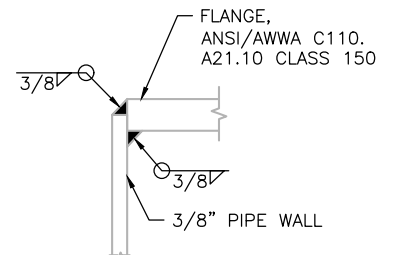
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18"	16"	12"	3"	HSB-03-A-18
30"	24"	20"	7"	HSB-07-B-30
36"	30"	24"	5"	HSB-05-A-36
42"	30"	24"	8"	HSB-08-B-42
54"	30"	24"	8"	HSB-08-B-54



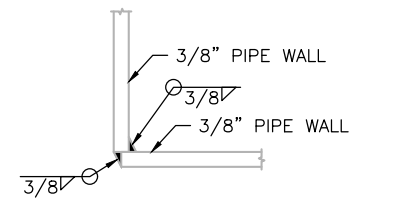
SECTION B
NTS



PROFILE VIEW SECTION VIEW



WELD DETAIL 4
NTS



WELD DETAIL 5
NTS

ANTI-SIPHON AND AIR RELIEF VALVE CONNECTION DETAIL 3
NTS

PUMP OUTFALLS REPLACEMENT PROJECT
PN: W14130615

PN: W14130615

REVISIONS			
NO.	DESCRIPTION	DATE	BY

BENCH MARK	ELEV.

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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



IMPROVEMENT PLANS FOR:
PUMP OUTFALLS REPLACEMENT PROJECT - A
ANTI SIPHON AND VALVE VAULT
SECTION AND DETAILS

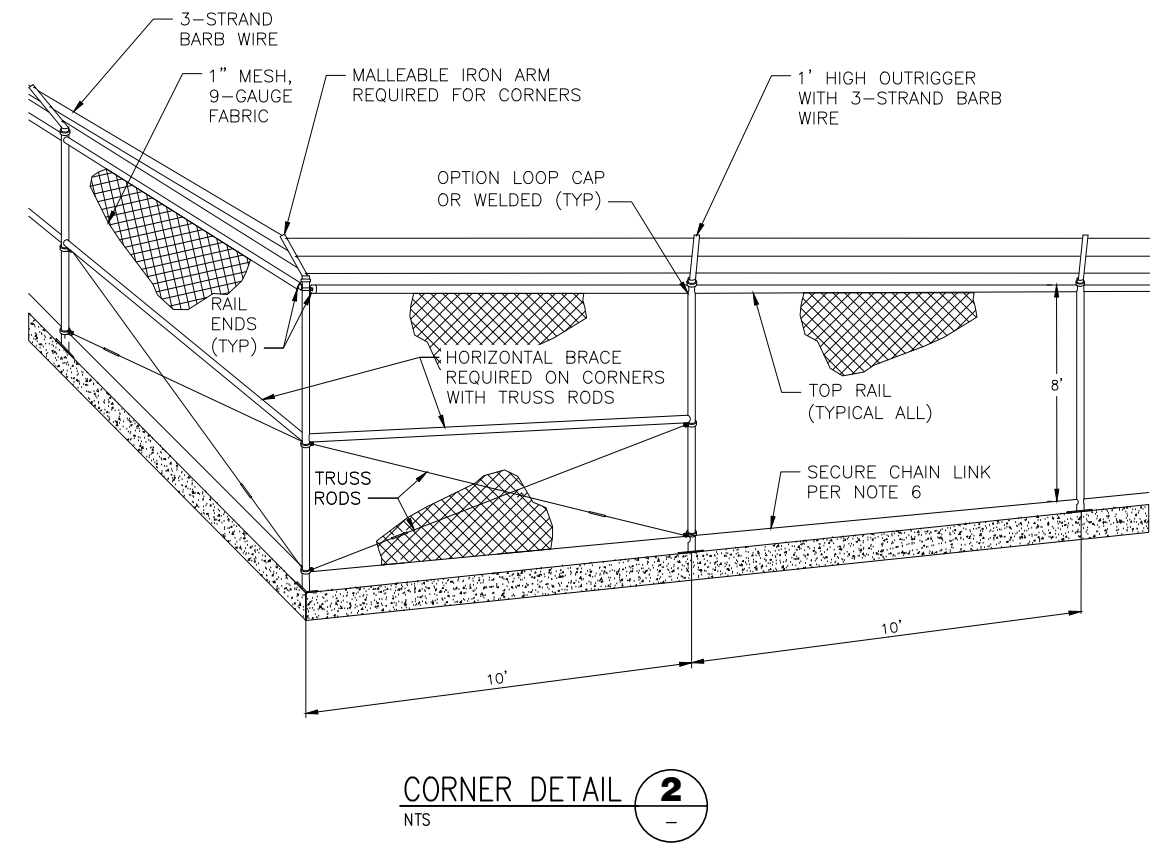
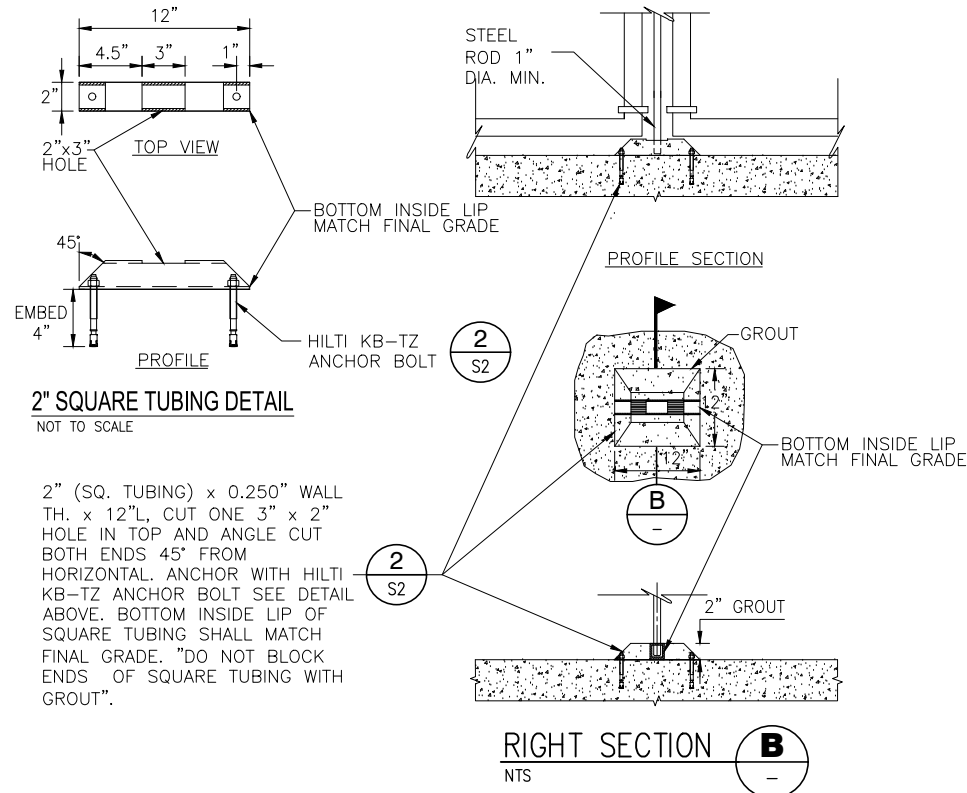
65% SUBMITTAL

DWG. NO. C35	SHEET
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Page 16	47

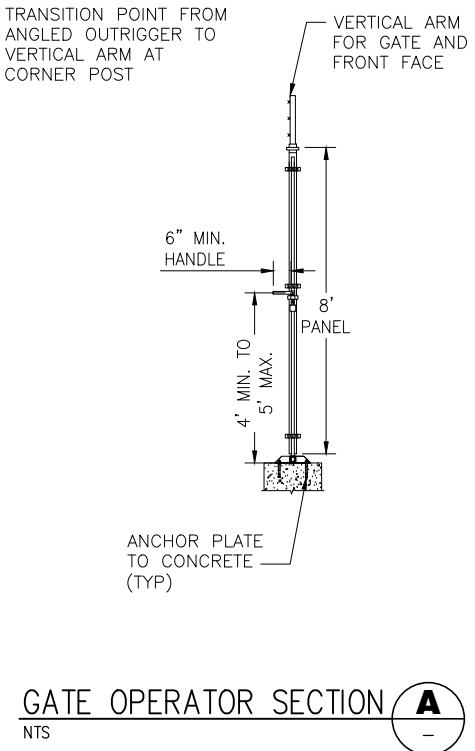
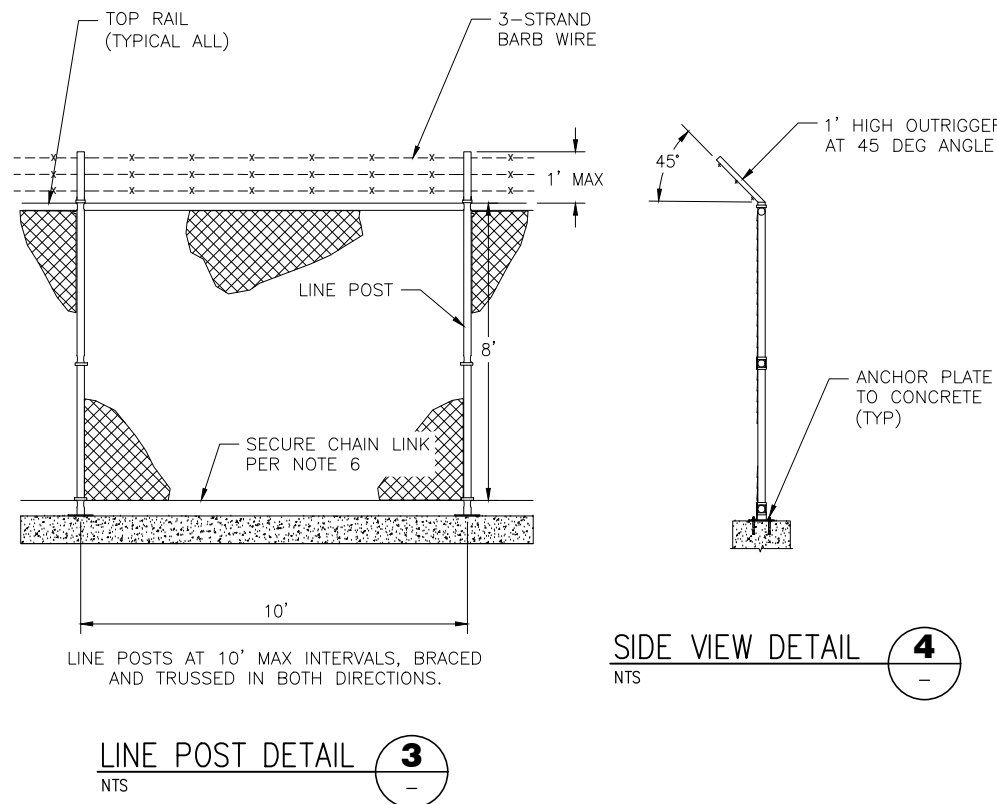
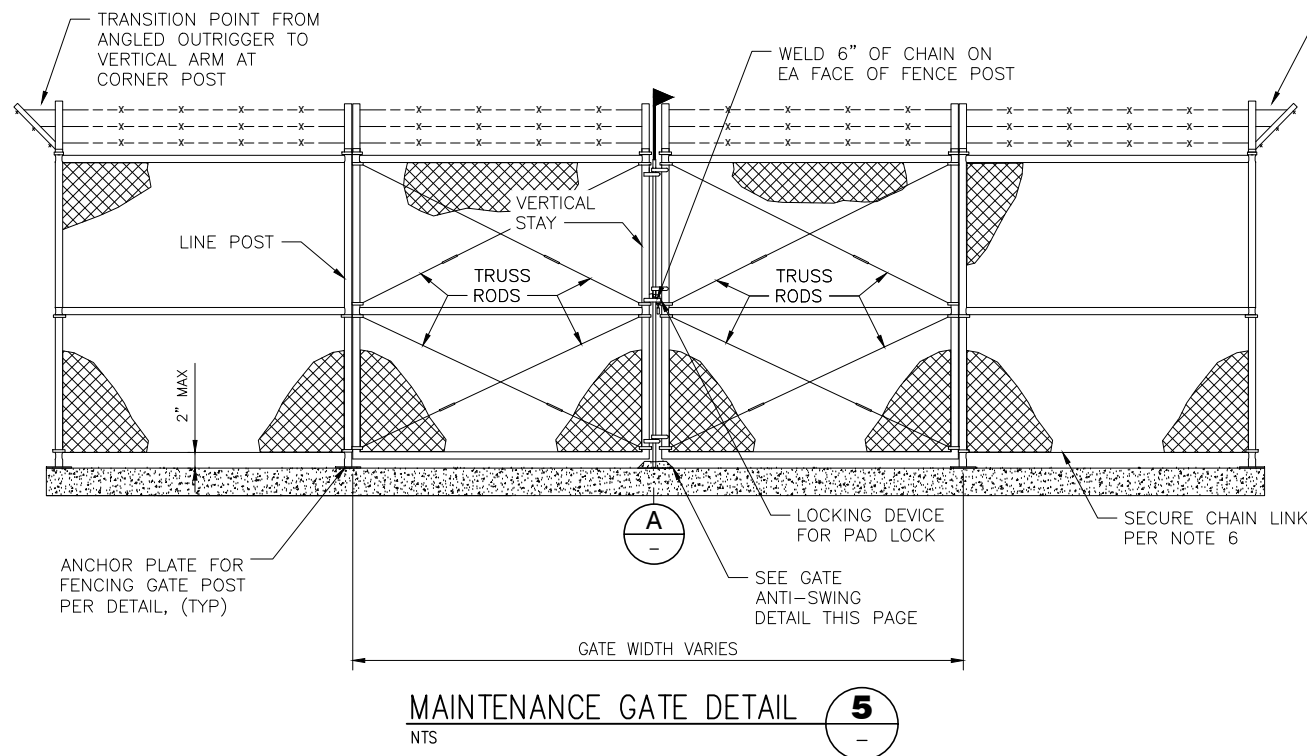
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GENERAL NOTES:

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 1½" DIA.
3. END, CORNER, AND GATE POSTS SHALL BE MIN 2½" O.D. WITH 1½" O.D. BRACE RAIL, ¾" 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.



GATE ANTI-SWING FOOTING DETAIL 1
NTS



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

PN: W14130615

REVISIONS			
NO.	DESCRIPTION	DATE	BY

BENCH MARK DESCRIPTION:	ELEV. _____
FIELD BOOK 0000	SCALE: _____
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CITY OF SACRAMENTO
DEPARTMENT OF UTILITIES

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

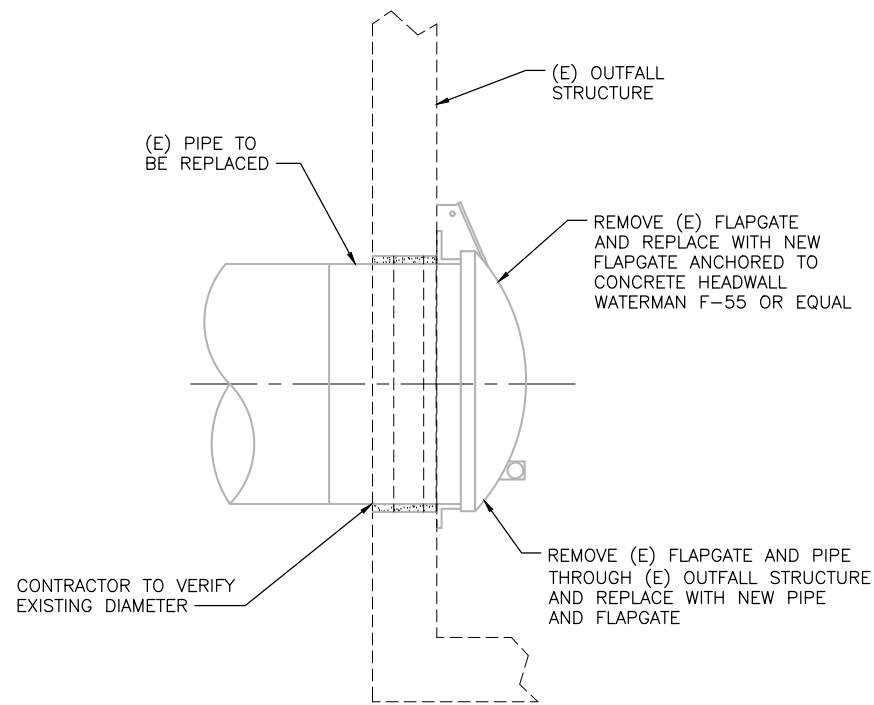
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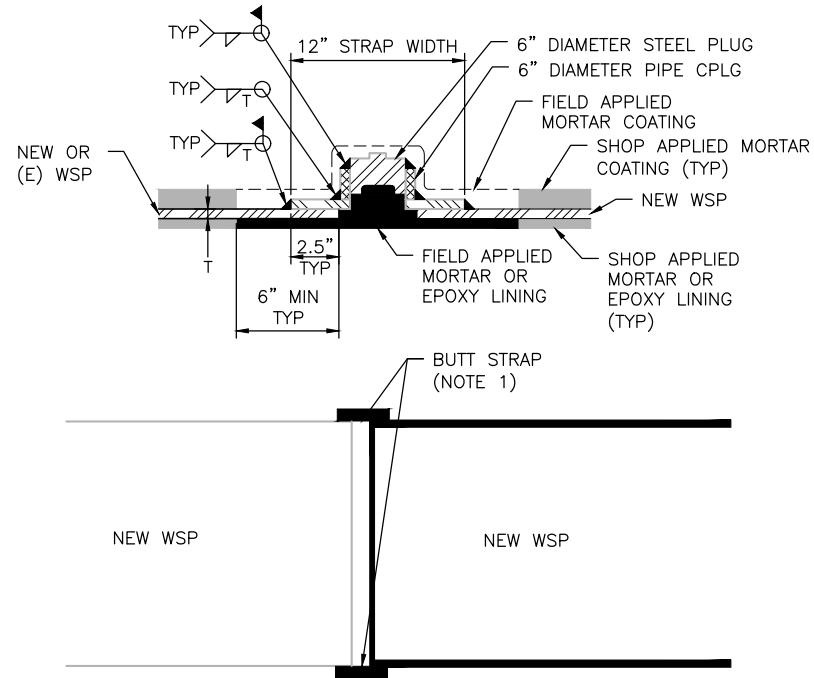
65% SUBMITTAL

IMPROVEMENT PLANS FOR:
PUMP OUTFALLS REPLACEMENT PROJECT - A
MISCELLANEOUS VAULT SECURITY DETAILS Page 17

DWG. NO. C36
SHEET 39 OF 47

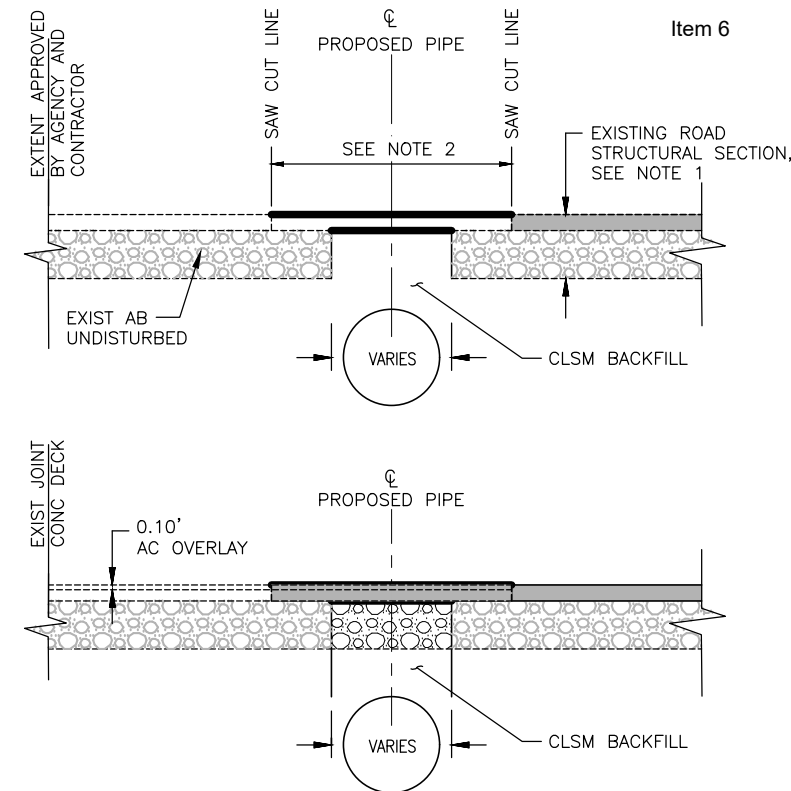


OUTFALL STRUCTURE CONNECTION DETAIL **1**
NTS



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



TRENCH SECTION AND SEQUENCING **3**
NTS

NOTES:

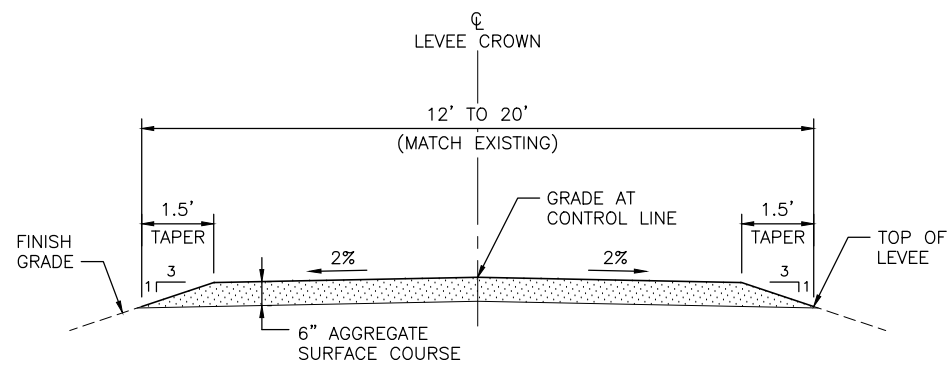
- CONTRACTOR SHALL REPLACE EXISTING PAVEMENT IN KIND. BASED ON LIMITED FIELD INVESTIGATIONS, EXISTING PAVEMENT SECTION ARE ASSUMED 2" AC ON 6" AB
- THE OWNER AND THE CONTRACTOR SHALL JOINTLY DETERMINE THE FINAL WIDTH AND LENGTH OF THE BIKE PATH CROSSING BASED ON FIELD CONDITIONS AND CONSTRUCTION PROCEDURES.
- CONTRACTOR SHALL REMOVE EXISTING BIKE PATH AS NEEDED TO CONSTRUCT PROPOSED PIPE. IMPACTED AREAS SHALL BE REPLACED IN ACCORDANCE WITH CITY OF SACRAMENTO STANDARD DETAIL T-21

CONSTRUCTION SEQUENCE:

- STEP 1: SAWCUT LIMITS 09F TRENCH EXCAVATION TO CLEAN CUT LIMITS. REMOVE EXISTING ASPHALT CONCRETE TO THE MIN EXTENT REQUIRED TO CONSTRUCT PROPOSED PIPE. PROPOSED PIPE SHALL BE CONSTRUCTED A MIN OF 2' FROM FG. TRENCH PLATES SHALL BE PROVIDED TO MAINTAIN ACCESS OVER CUTOFF WALL DURING CONSTRUCTION IN ACCORDANCE WITH THE SPECIFICATIONS.
- STEP 2: PLACE AB TO MATCH EXISTING THICKNESS. PLACE AC OVERLAY FROM EXTENT APPROVED BY AGENCY AND CONTRACTOR TO LIMITS OF SAWCUT. PROVIDE PAVEMENT MARKING AND STRIPING TO MATCH EXISTING.

LEGEND:

EXISTING	PROPOSED
GRIND AND OVERLAY ASPHALT CONCRETE	
AGGREGATE BASE (AB)	
ASPHALT CONCRETE (AC)	



CROWN SURFACING DETAIL **4**
NTS

PN: W14130615

REVISIONS			
NO.	DESCRIPTION	DATE	BY

BENCH MARK DESCRIPTION:	ELEV. _____

FIELD BOOK	0000
SCALE:	1"
H:	
V:	

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

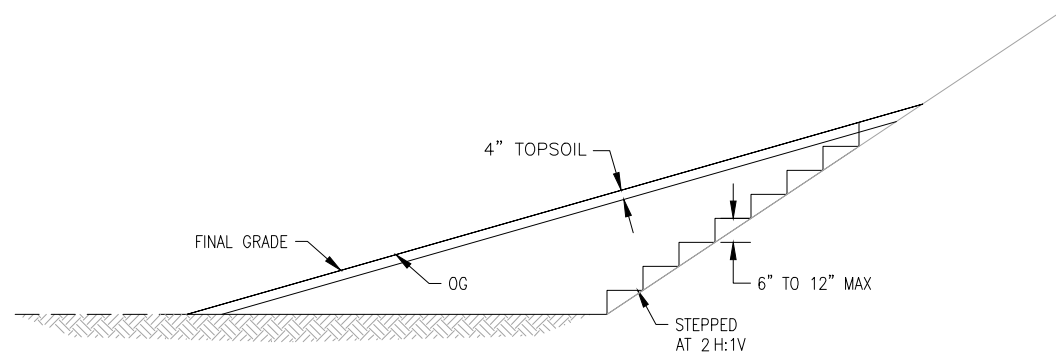
CITY OF SACRAMENTO DEPARTMENT OF UTILITIES			
DRAWN BY: E. TUTEJA	DESIGNED BY: B. JENSEN	CHECKED BY: A. SMITH	
DATE: 09/15/20	R.C.E. NO. C90949 DATE: 03/31/22	R.C.E. NO. C86512 DATE: 03/31/21	



IMPROVEMENT PLANS FOR:
PUMP OUTFALLS REPLACEMENT PROJECT - A
MISCELLANEOUS DETAILS I

65% SUBMITTAL

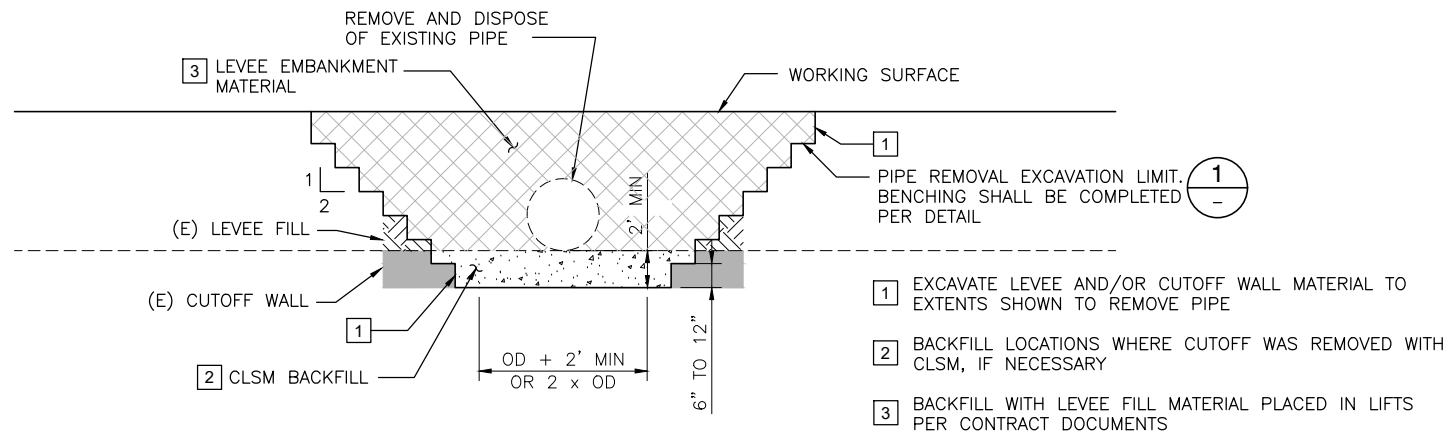
PN: W14130615	DWG. NO. C37
	SHEET 40 OF 47
	Page 18



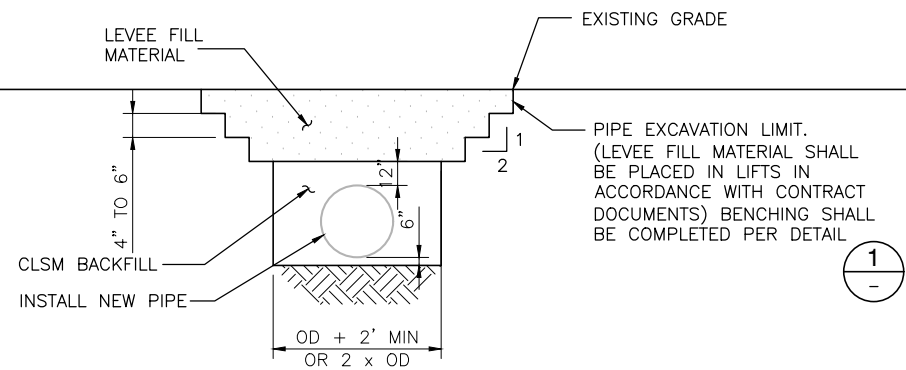
TYPICAL SLOPE BENCHING NOTES:

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



TYPICAL REMOVAL OF EXISTING PIPE DETAIL **2**
NTS



INSTALLATION OF NEW PIPE DETAIL **3**
NTS

PUMP OUTFALLS REPLACEMENT PROJECT
PN: W14130615

PN: W14130615

REVISIONS			
NO.	DESCRIPTION	DATE	BY

BENCH MARK	ELEV.
DESCRIPTION:	

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

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	



IMPROVEMENT PLANS FOR:

PUMP OUTFALLS REPLACEMENT PROJECT - A

MISCELLANEOUS DETAILS II

Page 19

65% SUBMITTAL

DWG. NO. C38
SHEET 41 OF 47

PN: W14130615

Attachment C – Categorical Permission Checklist

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.	<input type="checkbox"/> New Construction <input checked="" type="checkbox"/> Replacement <input type="checkbox"/> Modification <input type="checkbox"/> Authorize Existing		
2.	Maximum total area of disturbance is 5 acres:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
	Reference: [Click to enter document source. Example – plan sheet (p. 4), specs, report.]		
	Comment: <u>Area of disturbance is 0.02 acre.</u>		
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 <input checked="" type="checkbox"/>	No <input type="checkbox"/>
	Reference: <u>Refer to detail 3 on sheet 41.</u>		
	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 <input checked="" type="checkbox"/>	No <input type="checkbox"/>
	Reference: <u>Refer to detail 3 on sheet 41</u>		
	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 <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
	Reference: [Click to enter document source. Example – plan sheet (p. 4), specs, report.]		
	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 <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
	Reference: [Click to enter document source. Example – plan sheet (p. 4), specs, report.]		
	Comment:		
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 <input checked="" type="checkbox"/>	No <input type="checkbox"/>
	Reference: <u>Refer to Spec section 31 00 00 3.6B.</u>		
	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 <input checked="" type="checkbox"/>	No <input type="checkbox"/>
	Reference: <u>Refer to Spec section 31 00 00 2.2A.</u>		
	Comment: [Click to enter rationale, explanation, unique situation, etc.]		
9.	All fill will be free of organics or other inappropriate materials:	Yes <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>
	Reference: <u>Refer to Spec section 31 00 00 3.9.B.1.6.</u>		
	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 <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	
	Reference: [Click to enter document source. Example – plan sheet (p. 4), specs, report.]			
	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 <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	
	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 <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
	Reference: <u>Refer to detail 2 on Sheet 40</u>			
	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 <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>	
	Reference: <u>Refer to detail 3 on sheet 41</u>			
	Comment: [Click to enter rationale, explanation, unique situation, etc.]			
14.	Pipe location and orientation will be clearly marked in the field:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
	Reference: <u>pipe location and orientation can be identified by vault structure and outfall location</u>			
	Comment: [Click to enter rationale, explanation, unique situation, etc.]			
15.	Pipes will allow easy access for rapid closure:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
	Reference: [Click to enter document source. Example – plan sheet (p. 4), specs, report.]			
	Comment: <u>Positive valve closures on the levee crest will ensure easy access for rapid closure.</u>			
16.	Plastic pipes within the levee embankment or its foundation are embedded in concrete:	Yes <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	
	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 <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	
	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 <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
	Reference: [Click to enter document source. Example – plan sheet (p. 4), specs, report.]			
	Comment: [Click to enter rationale, explanation, unique situation, etc.]			
19.	Any work ≤50 feet beneath the channel invert?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
	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 <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
	Reference: [Click to enter document source. Example – plan sheet (p. 4), specs, report.]			
	Comment: [Click to enter rationale, explanation, unique situation, etc.]			
21.	Hydraulic model used for hydraulic analysis?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
	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

<u>Yes</u>	<u>No</u>	<u>Add'l. Info Requested</u>		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Environmental Reviewer: _____	Date: <small>Click date</small> _____
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Engineering Reviewer: _____	Date: <small>Click date</small> _____