

Coastal Texas Protection and  
Restoration Feasibility Study  
Final Feasibility Report

---

## **Appendix D – Annex 7:**

### ***Pump Station and Floodgate Plates***

**August 2021**

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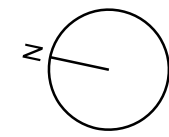
PLATE NUMBER	PLATE TITLE
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**COASTAL TEXAS PROTECTION AND RESTORATION FEASIBILITY STUDY**

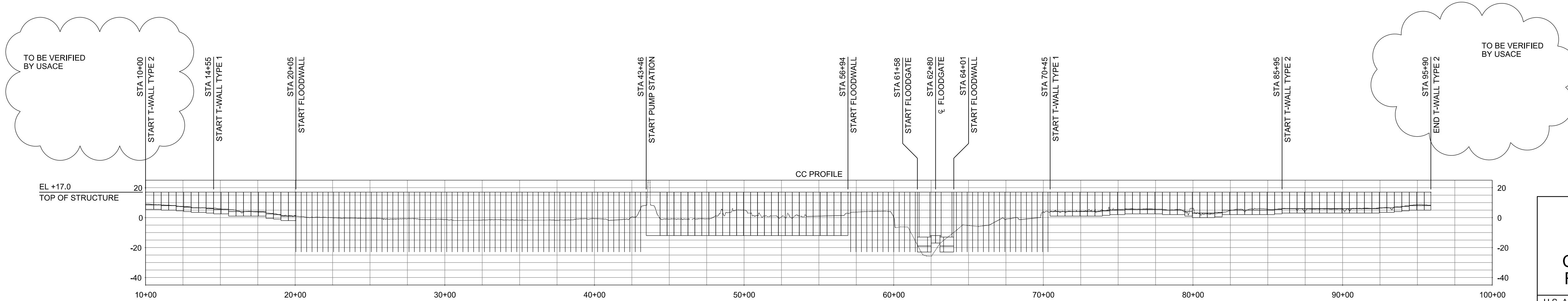
U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

ENGINEERING APPENDIX  
 DATED:  
 NOVEMBER 9, 2018  
 TETRA TECH, INC.



**CLEAR CREEK - GENERAL PLAN**

SCALE: 1" = 400'



**ELEVATION VIEW**

SCALE: 1" = 400' HORIZONTAL, 1"=40' VERTICAL

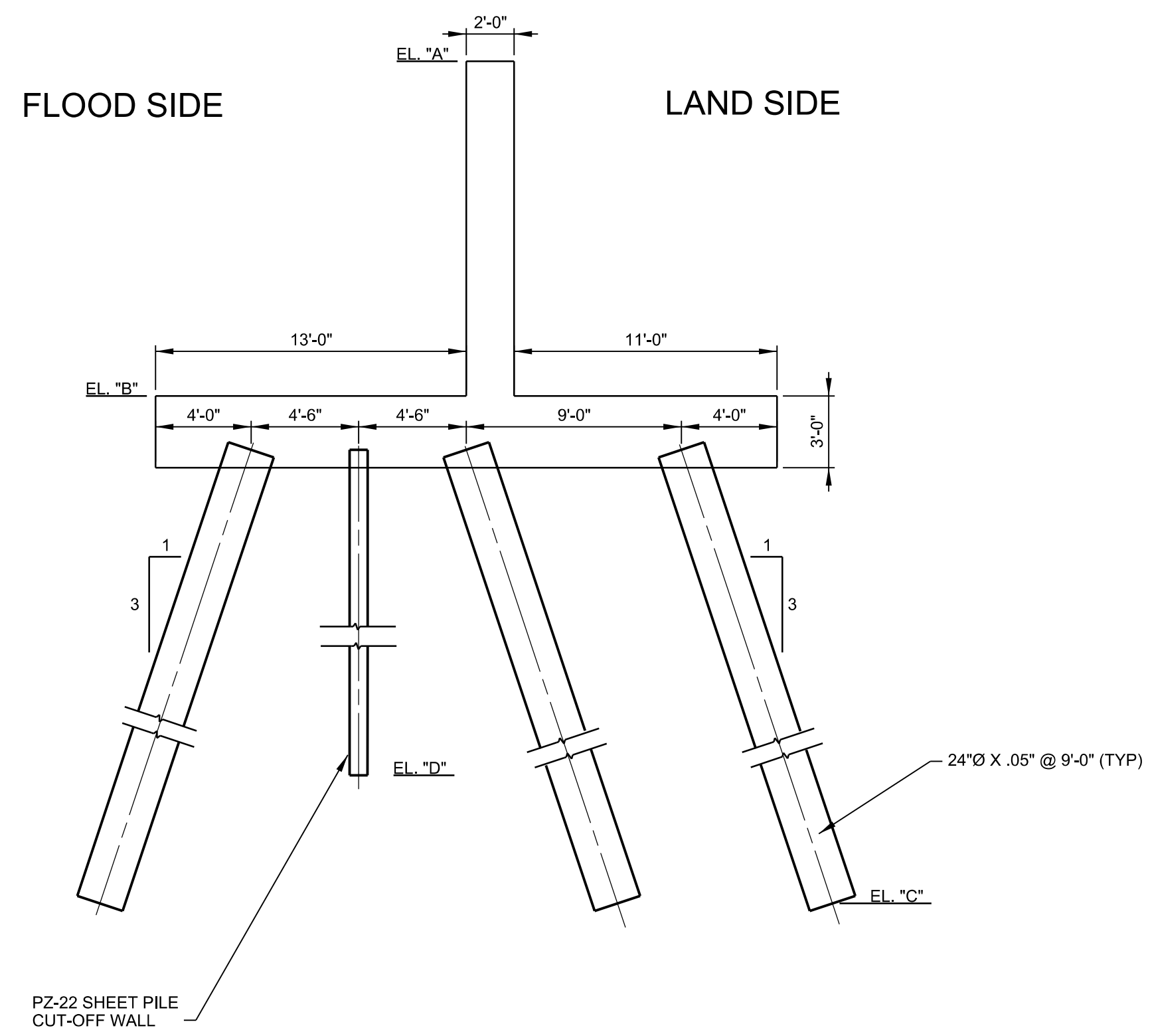


**CLEAR CREEK  
GENERAL PLAN & ELEVATION**

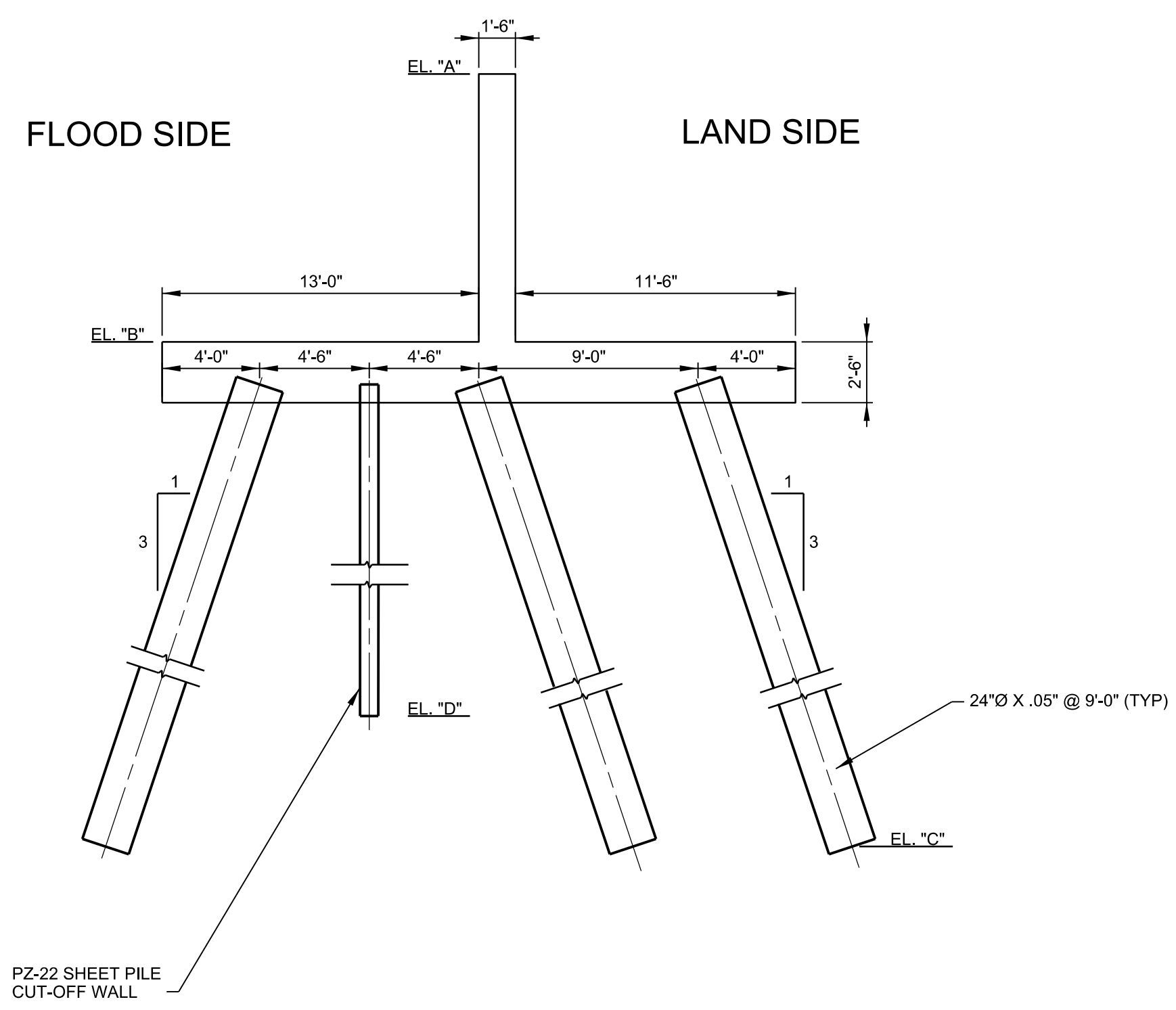
**COASTAL TEXAS PROTECTION AND  
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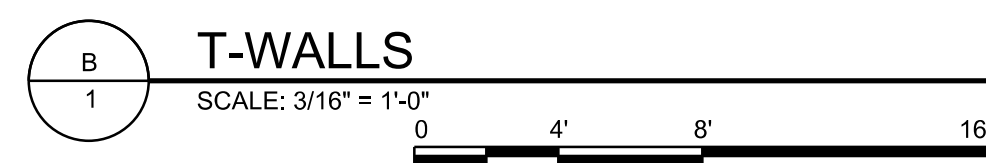
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**TYPE 1**



**TYPE 2**



LOCATION	TYPE	"A"	"B"	"C"	"D"
STA 10+00 TO STA 14+55	2	17.0	6.0	-51.5	-6.5
STA 14+55 TO STA 20+05	1	17.0	3.0	-60.0	-10.0
STA 70+45 TO STA 85+95	1	17.0	3.0	-60.0	-10.0
STA 85+95 TO STA 95+90	2	17.0	6.0	-51.5	-6.5

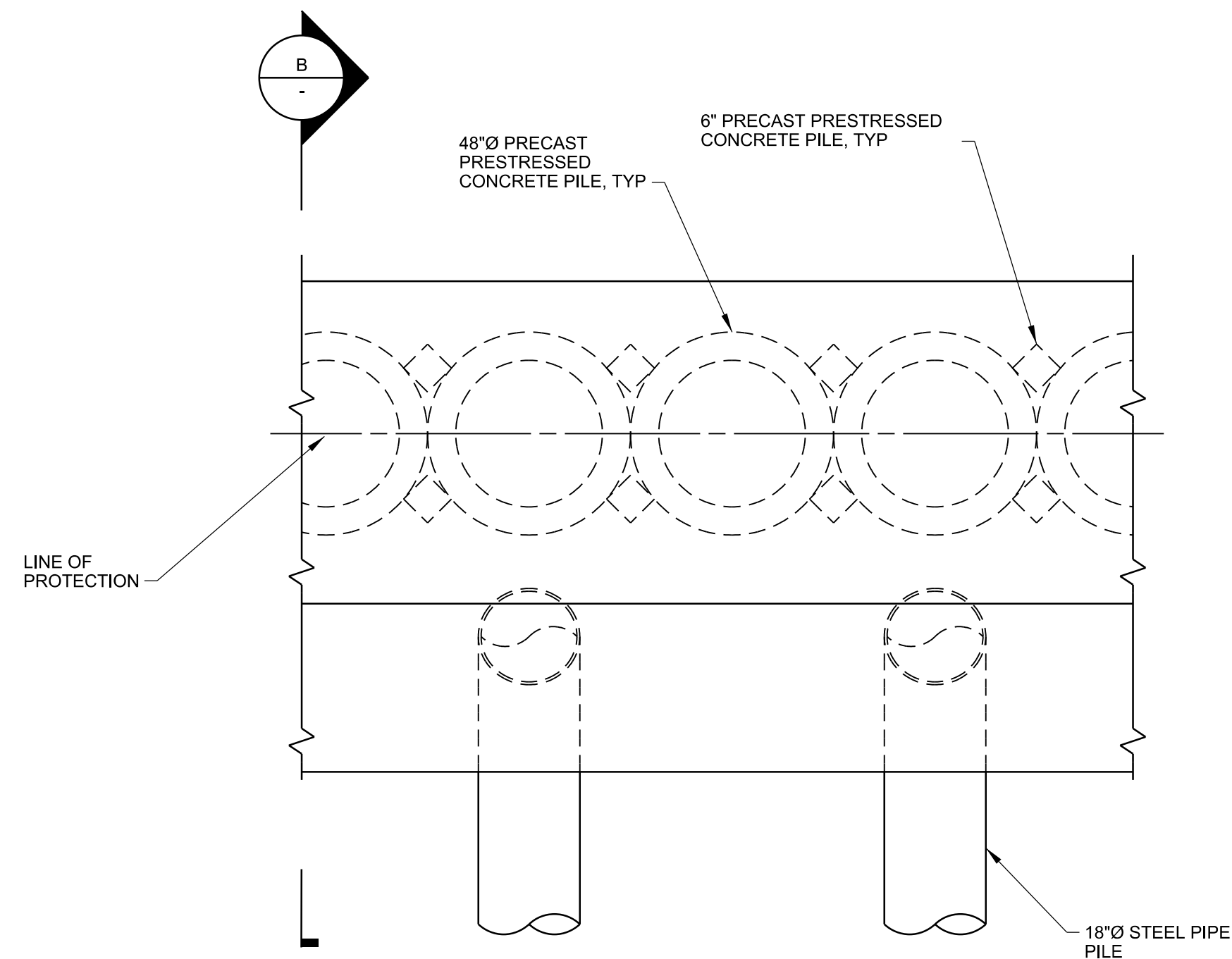
**NOTES:**

1. ALL CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 4,000 PSI.
2. SHEET PILES SHALL MEET THE REQUIREMENTS OF ASTM A328.
3. ALL PIPE PILES SHALL MEET THE REQUIREMENTS OF ASTM A252 GRADE 3.

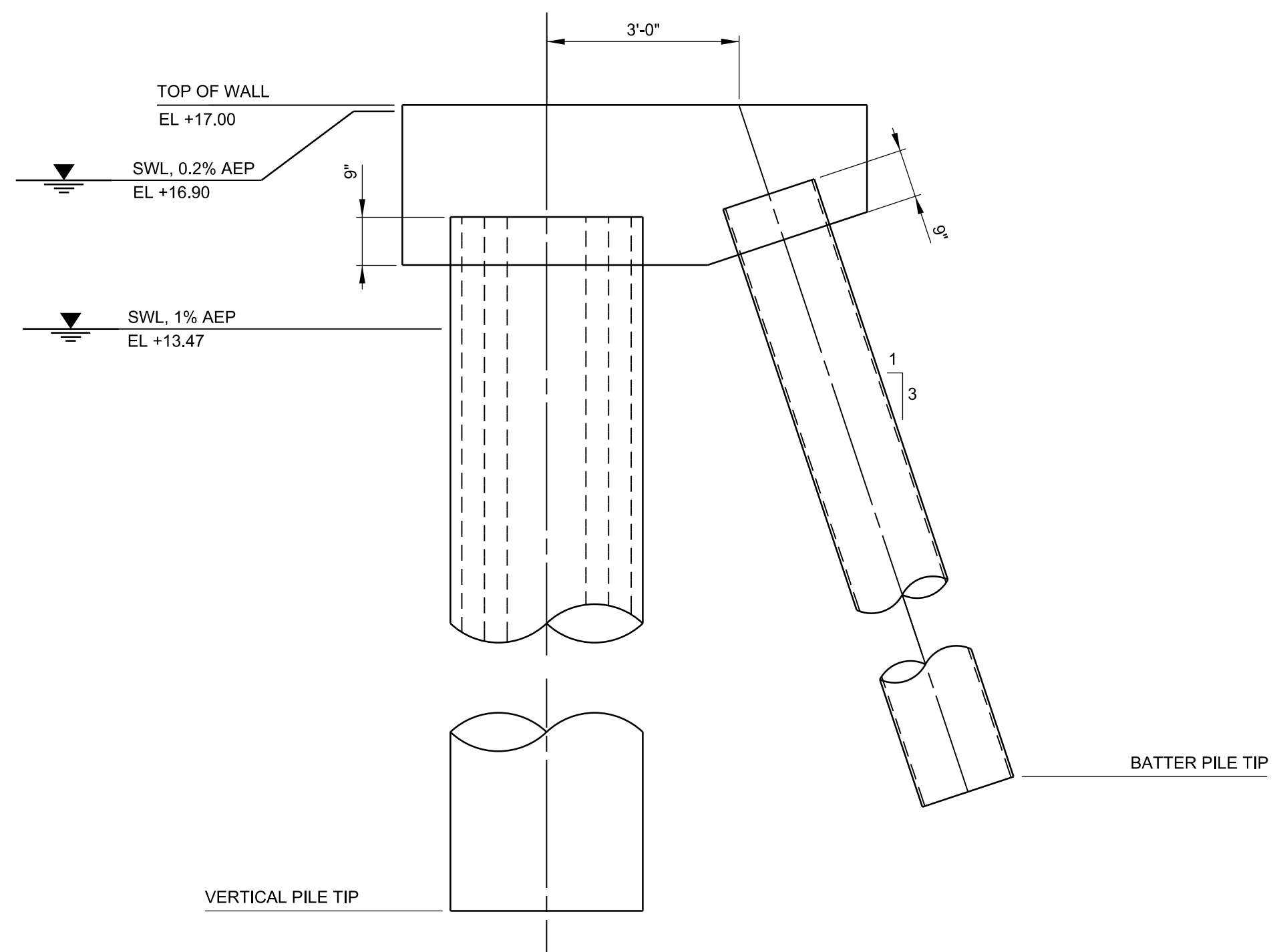
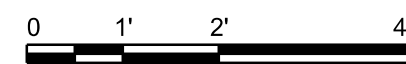
CLEAR CREEK  
T-WALL  
SECTIONS  
COASTAL TEXAS PROTECTION AND  
RESTORATION FEASIBILITY STUDY

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

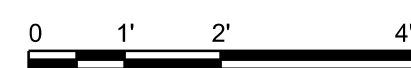
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**PLAN**  
SCALE: 1/2" = 1'-0"



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

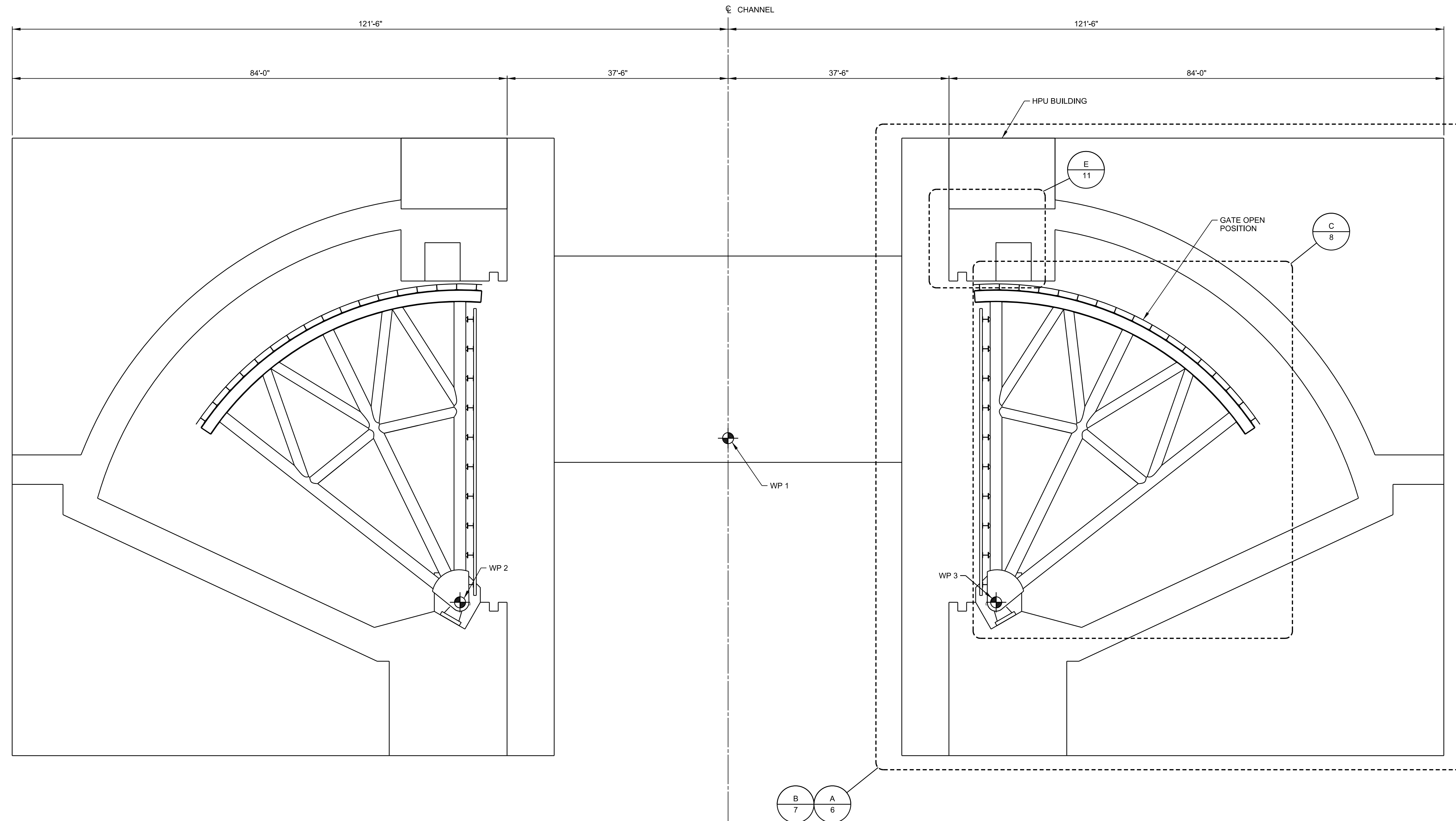
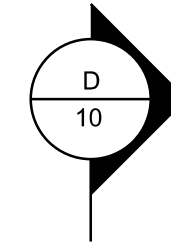
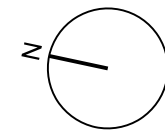


LOCATION	VERTICAL PILE TIP EL	BATTER PILE TIP EL
STA 20+05 TO STA 43+46	-70	-98
STA 56+94 TO STA 61+58	-70	-98
STA 64+01 TO STA 70+45	-70	-98

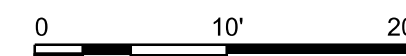
CLEAR CREEK  
FLOODWALL  
PLAN AND ELEVATION  
**COASTAL TEXAS PROTECTION AND  
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U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

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**CLEAR CREEK FLOODGATE TOP PLAN - OPEN**  
SCALE: 1" = 10'

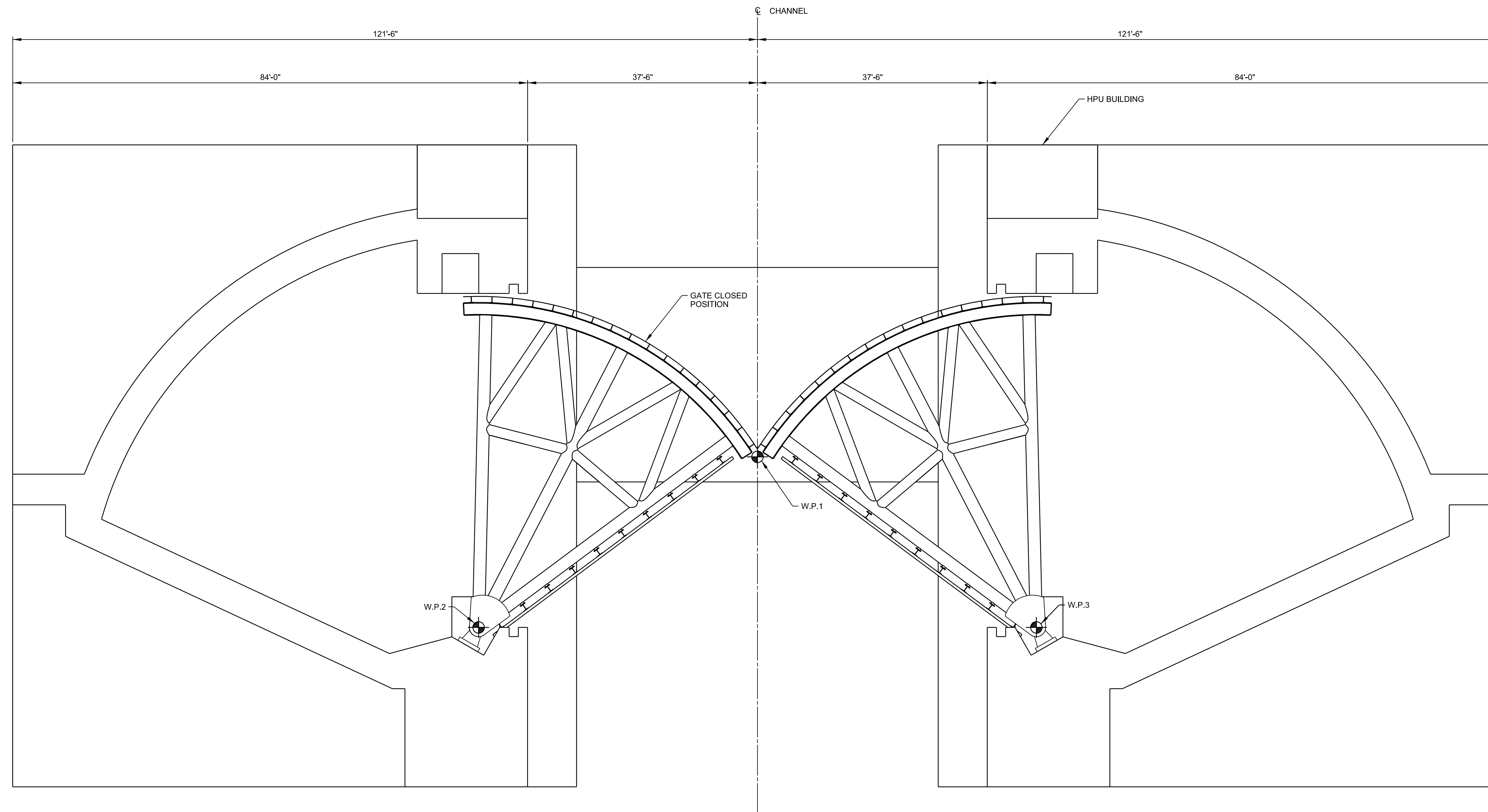
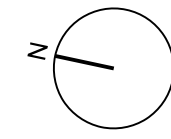


CLEAR CREEK  
FLOODGATE TOP PLAN  
OPEN

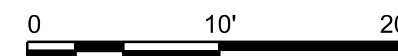
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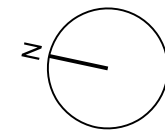
C  
1  
CLEAR CREEK FLOODGATE TOP PLAN - CLOSED  
SCALE: 1" = 10'



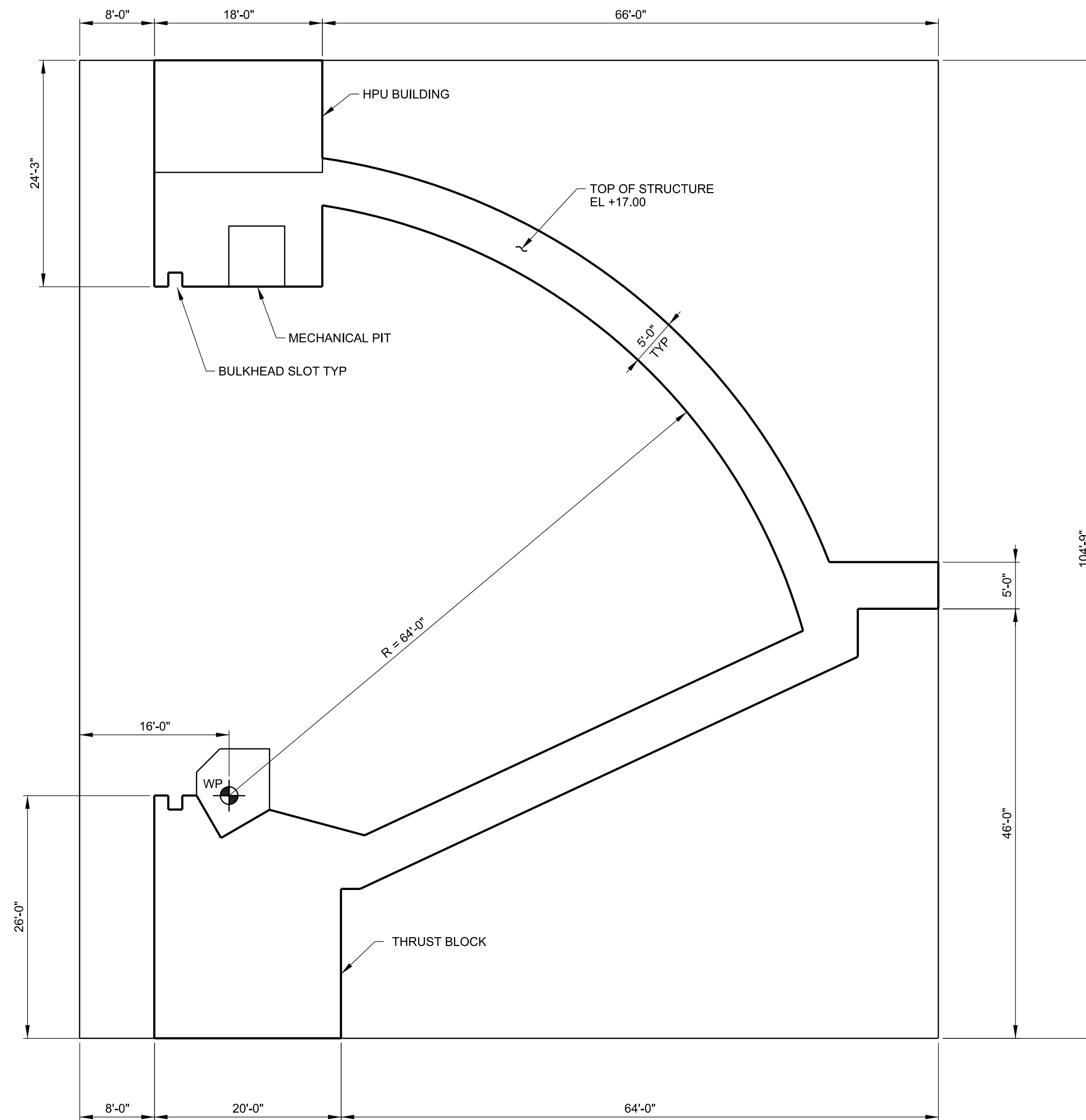
CLEAR CREEK  
FLOODGATE TOP PLAN  
CLOSED  
COASTAL TEXAS PROTECTION AND  
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U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS  
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TETRA TECH, INC.







CHANNEL SYM



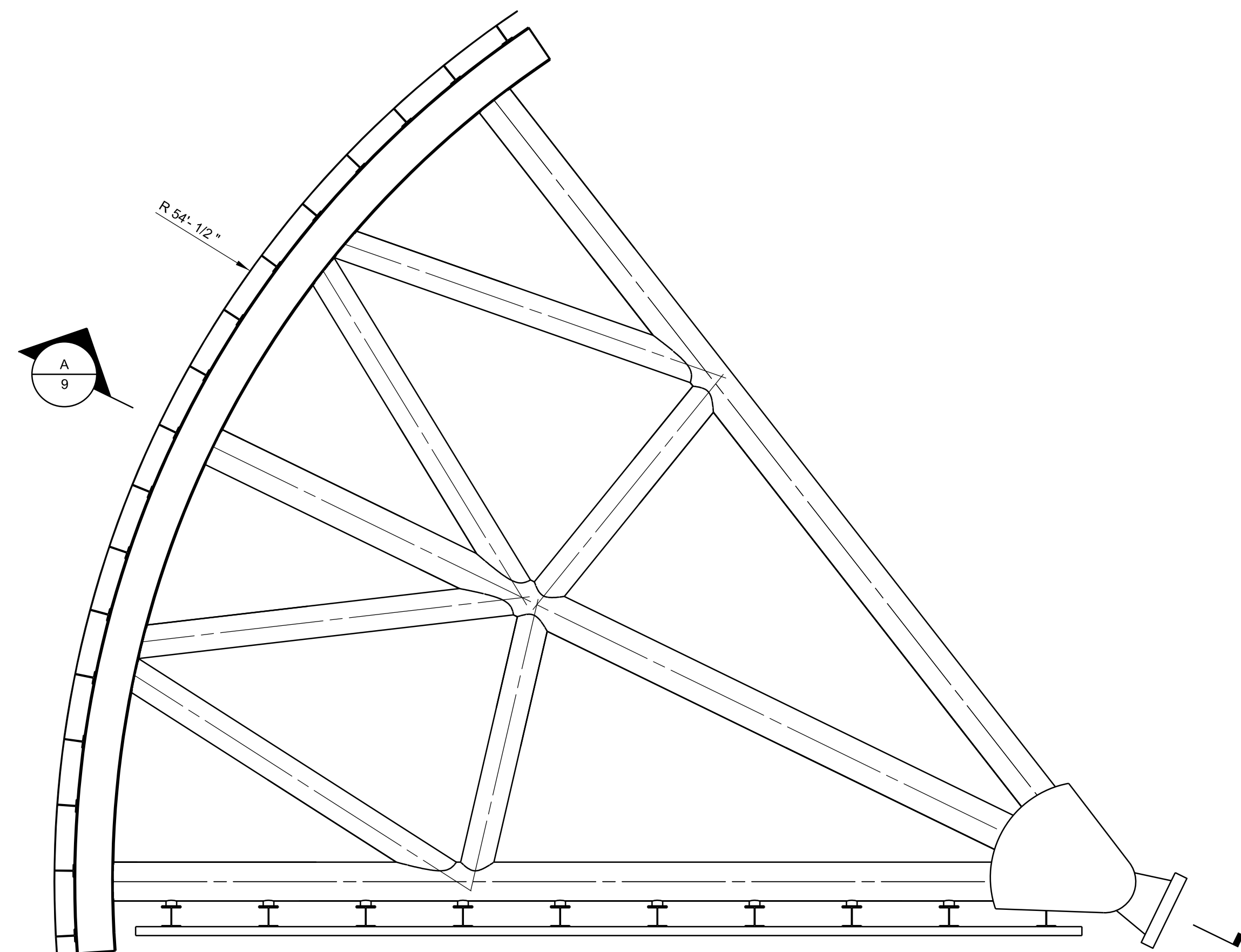
**MONOLITH PLAN**  
SCALE: 1" = 10'  
0 10' 20'

CLEAR CREEK  
FLOODGATE  
MONOLITH PLAN

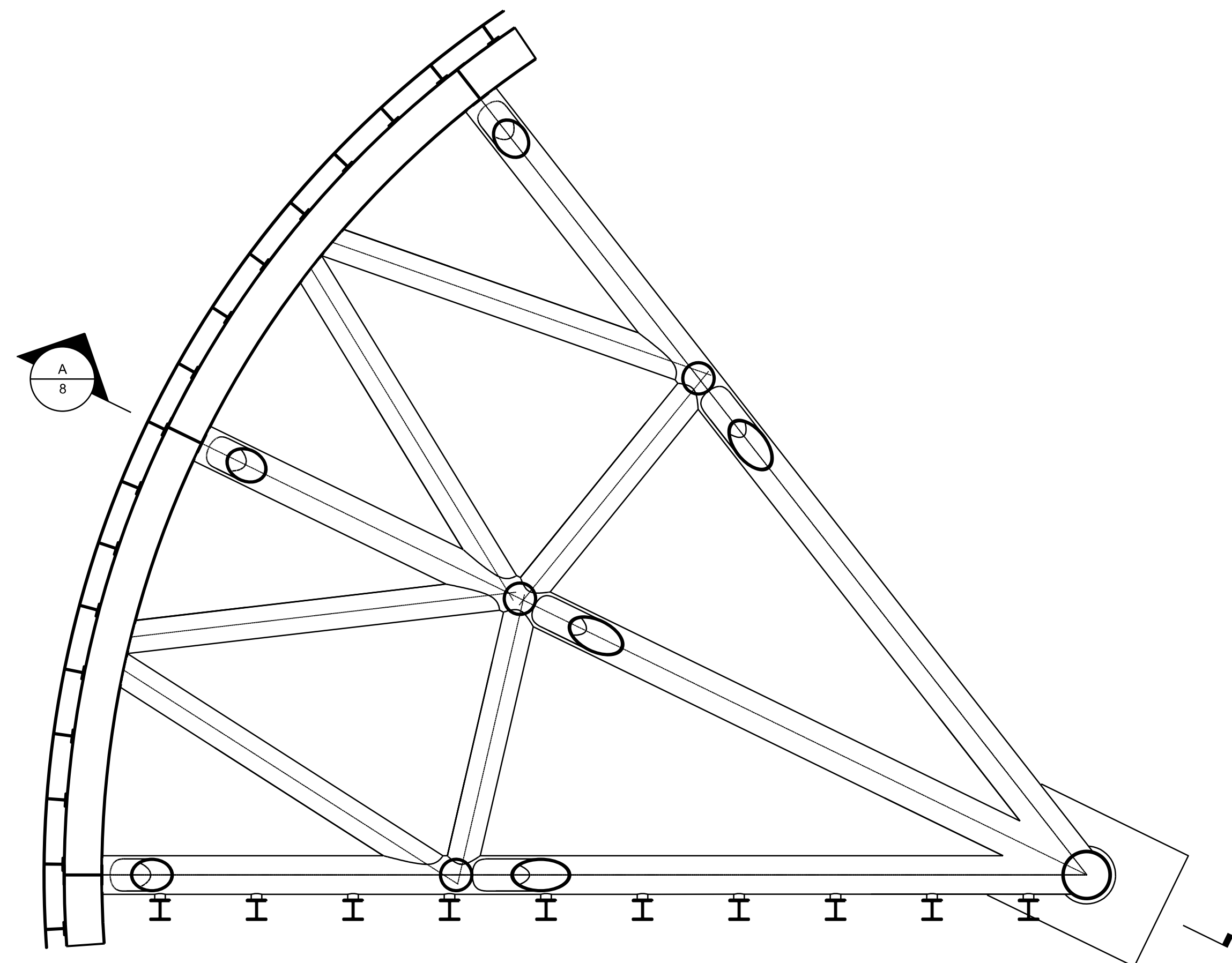
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RESTORATION FEASIBILITY STUDY**

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

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NOVEMBER 9, 2018  
TETRA TECH, INC.



c  
4
**GATE LEAF UPPER FRAME PLAN**  
 SCALE: 3/16" = 1'-0"

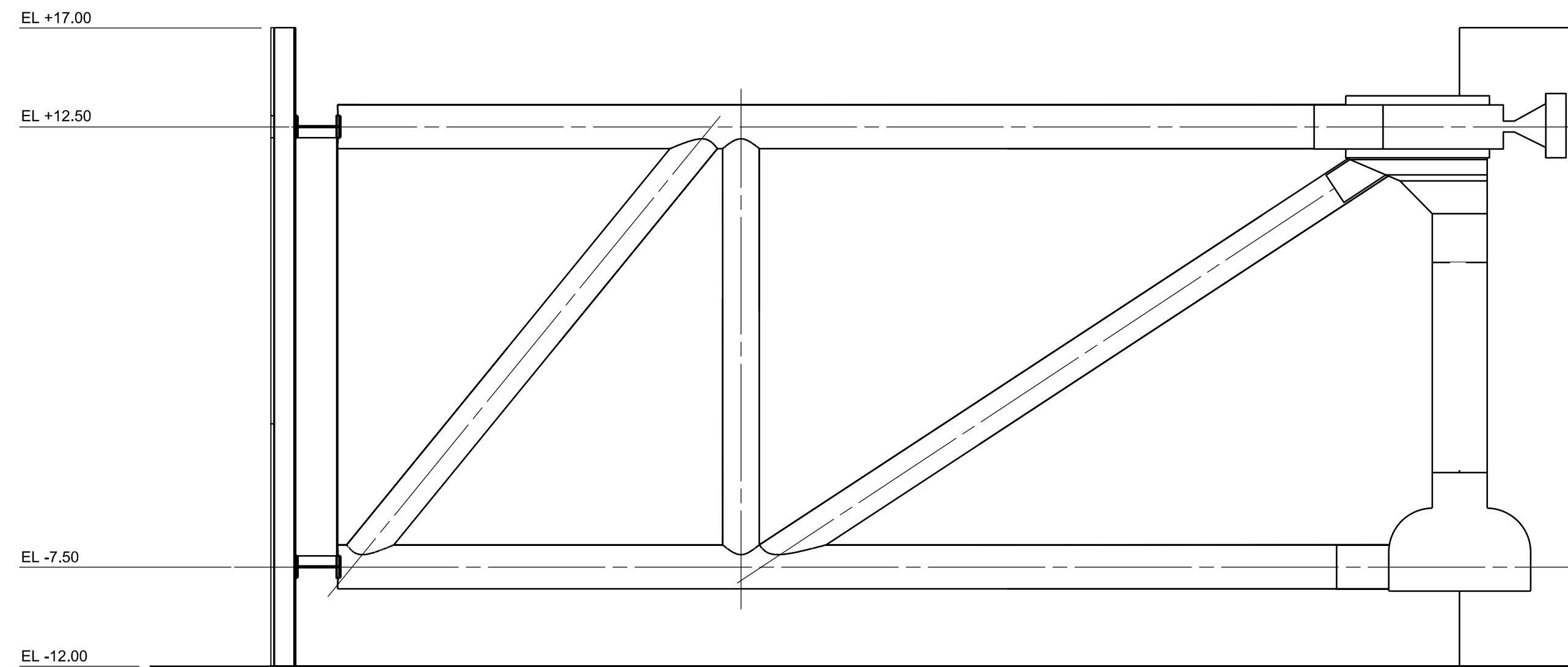


**GATE LEAF BOTTOM FRAME PLAN**  
 SCALE: 3/16" = 1'-0"

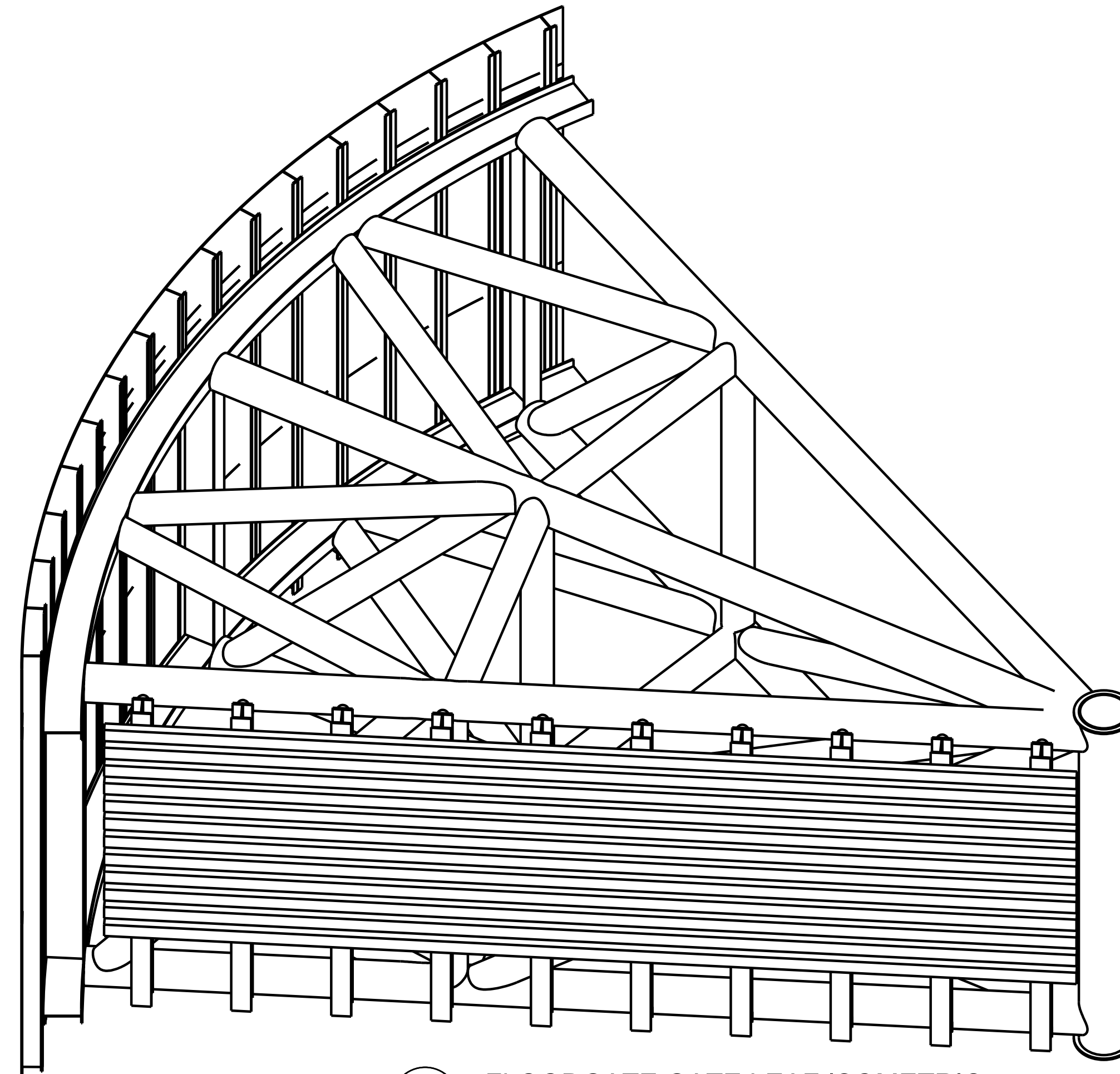
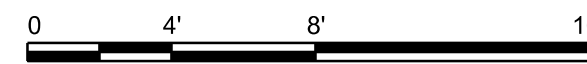
**CLEAR CREEK  
 FLOODGATE  
 GATE LEAF UPPER AND BOTTOM PLAN  
 COASTAL TEXAS PROTECTION AND  
 RESTORATION FEASIBILITY STUDY**

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

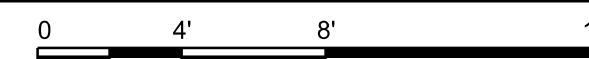
ENGINEERING APPENDIX  
 DATED:  
 NOVEMBER 9, 2018  
 TETRA TECH, INC.



A  
8
**FLOODGATE GATE LEAF SECTION**  
 SCALE: 3/16" = 1'-0"



A  
8
**FLOODGATE GATE LEAF ISOMETRIC**  
 SCALE: 3/16" = 1'-0"



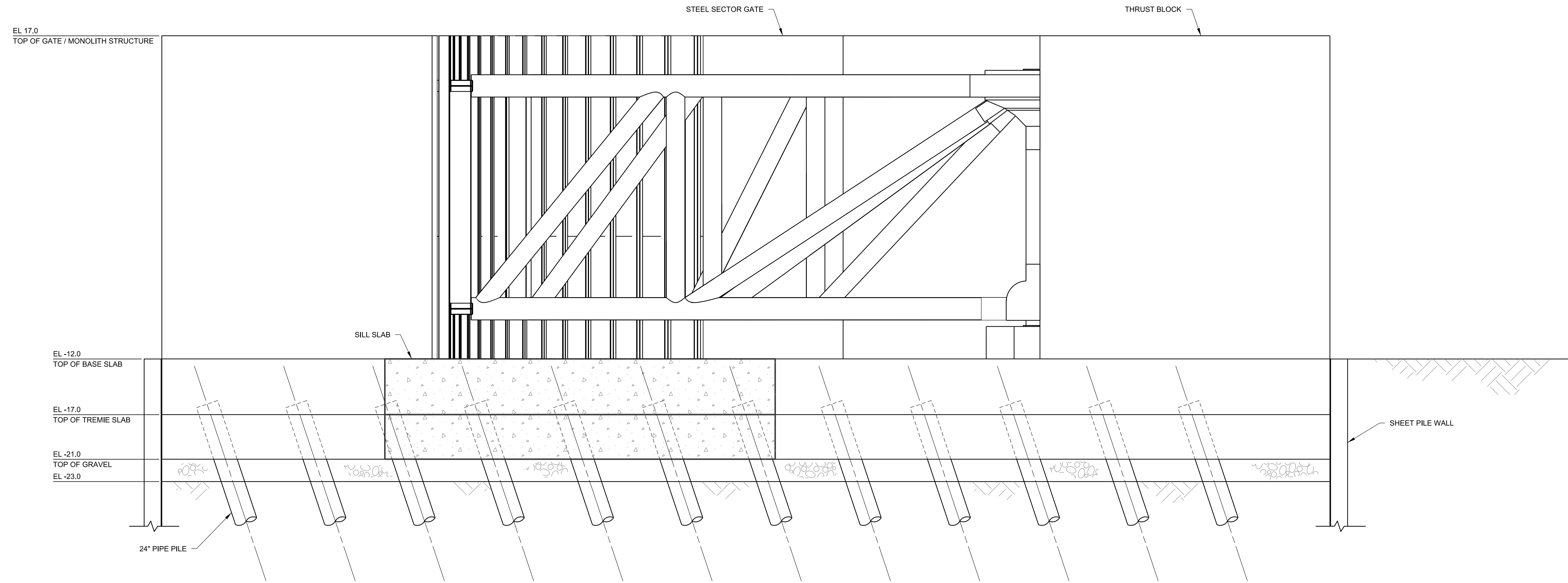
CLEAR CREEK FLOODGATE  
 GATE LEAF  
 SECTION & ISOMETRIC  
**COASTAL TEXAS PROTECTION AND  
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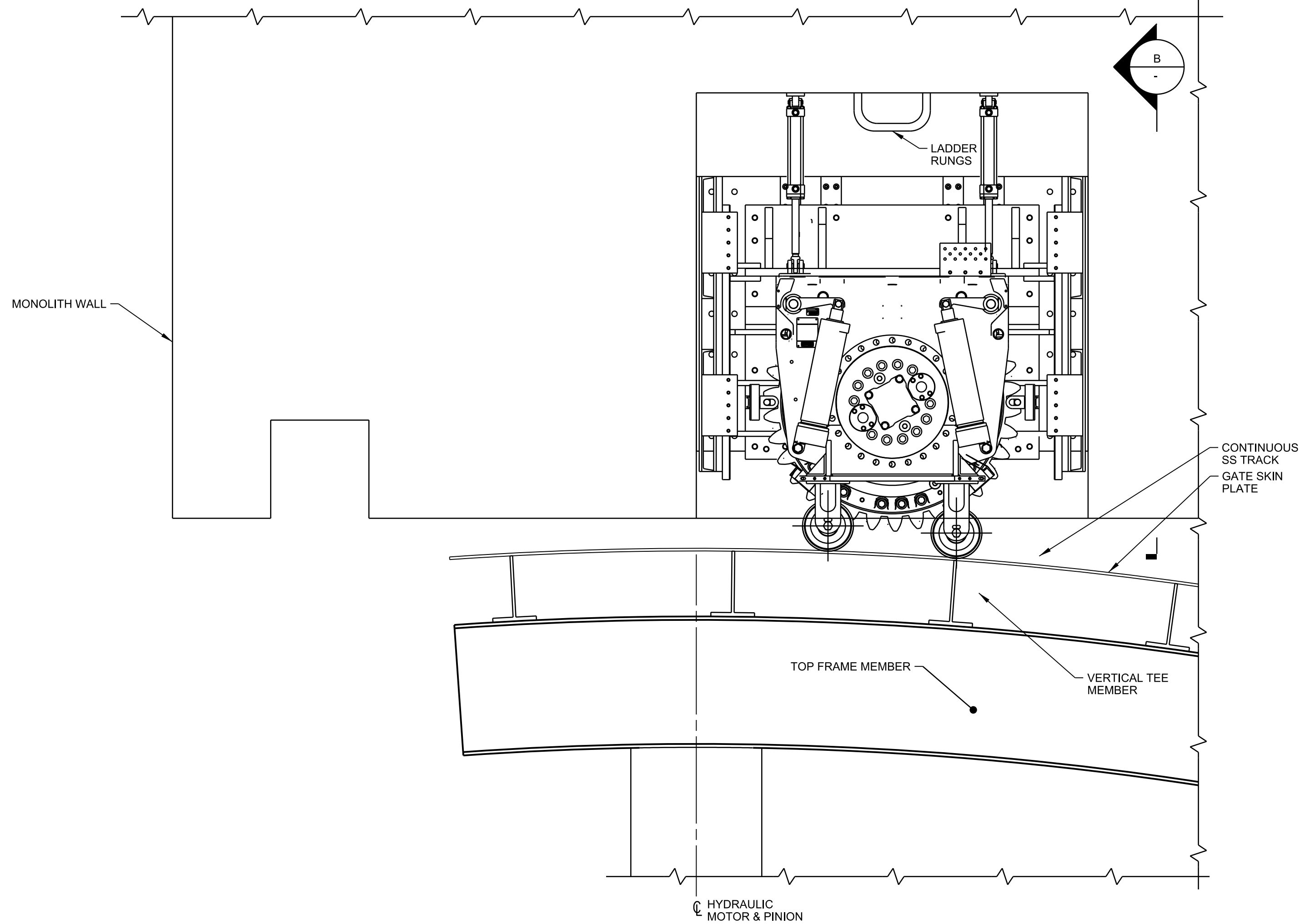
FLOOD SIDE

LAND SIDE

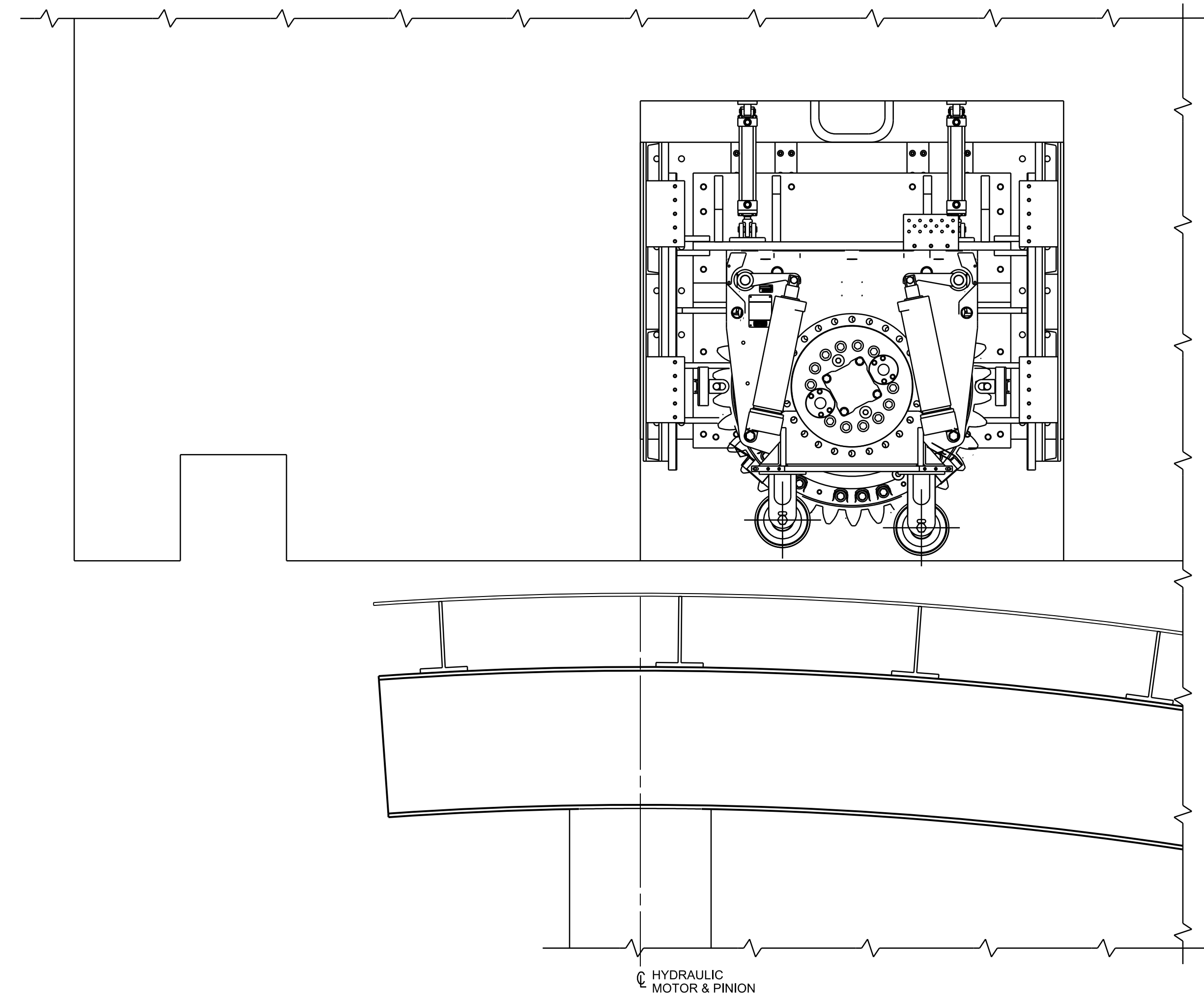


D  
4 SECTION  
SCALE: 1" = 5'-0"  
0 5' 10'

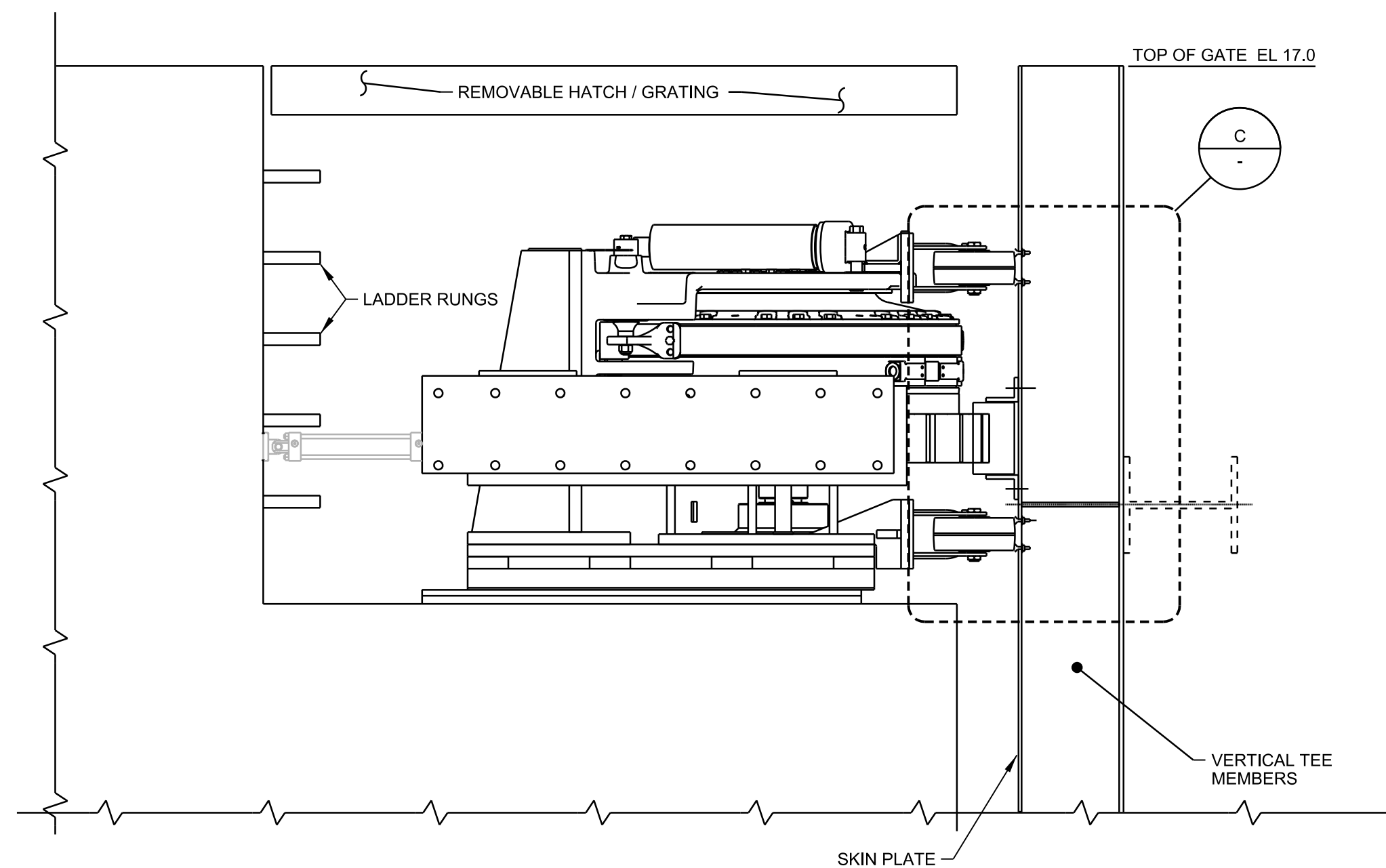
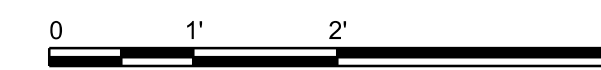
CLEAR CREEK  
FLOODGATE  
MONOLITH SECTION  
COASTAL TEXAS PROTECTION AND  
RESTORATION FEASIBILITY STUDY  
U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS  
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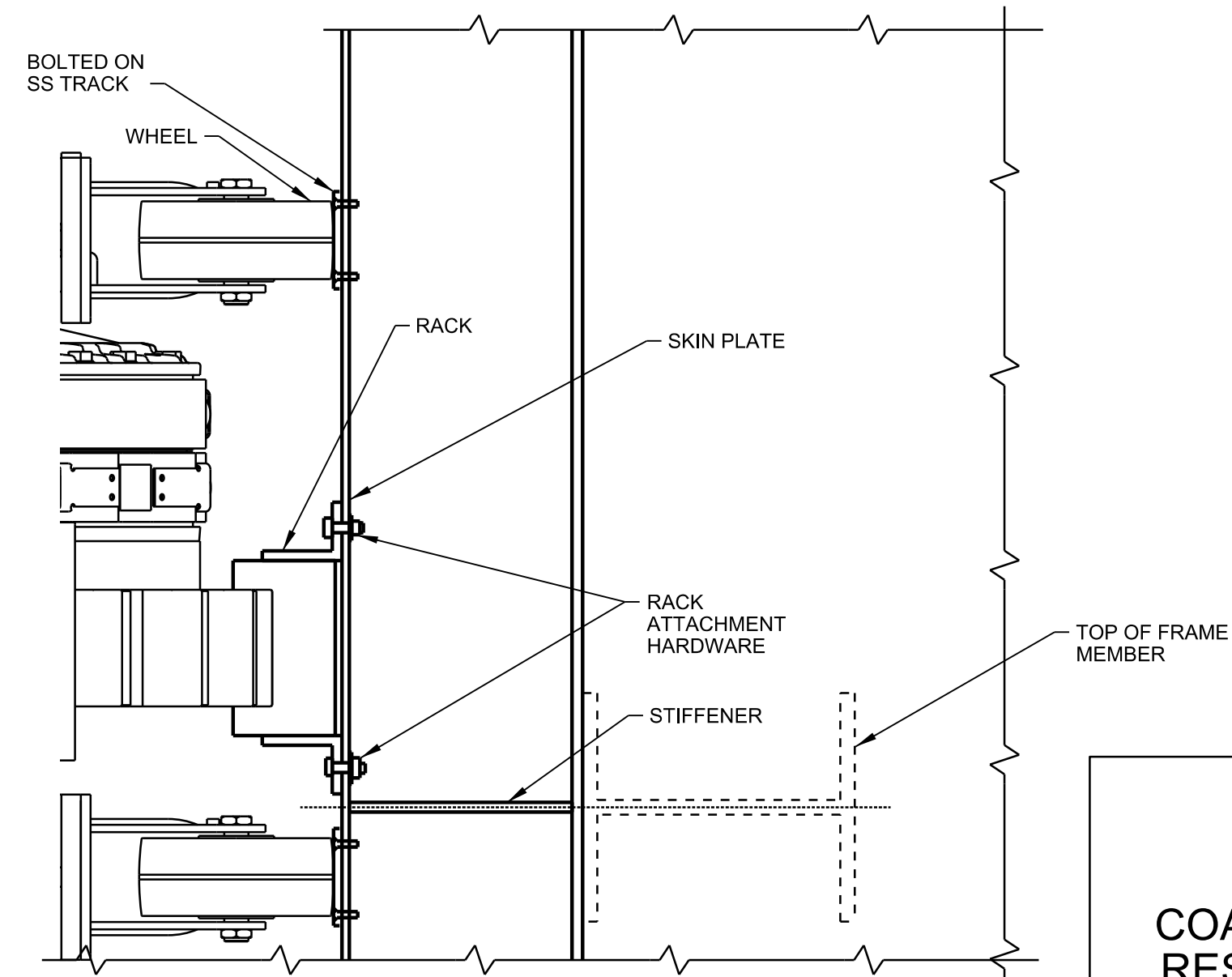
**E**  
4  
**OPERATOR IN EXTENDED POSITION**  
SCALE: 3/4" = 1'-0"



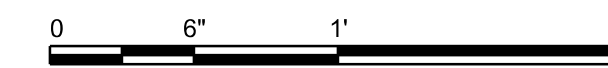
**A**  
-  
**OPERATOR IN RETRACTED POSITION**  
SCALE: 3/4" = 1'-0"



**B**  
-  
**SECTION**  
SCALE: 3/4" = 1'-0"



**C**  
-  
**DETAIL**  
SCALE: 1 1/2" = 1'-0"



CLEAR CREEK  
FLOODGATE  
MECHANICAL OPERATOR  
**COASTAL TEXAS PROTECTION AND  
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31 BAYS @ 46'-5" SPAN = 1438'-11"

20'-0" 55'-0"

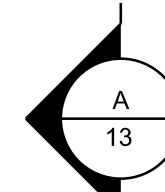
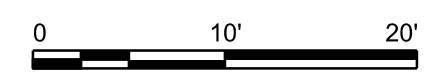
SAFE HOUSE/CONTROL ROOM

20'-9 1/8" 10'-9 1/2"

EQ TYP EQ TYP

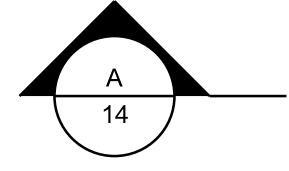
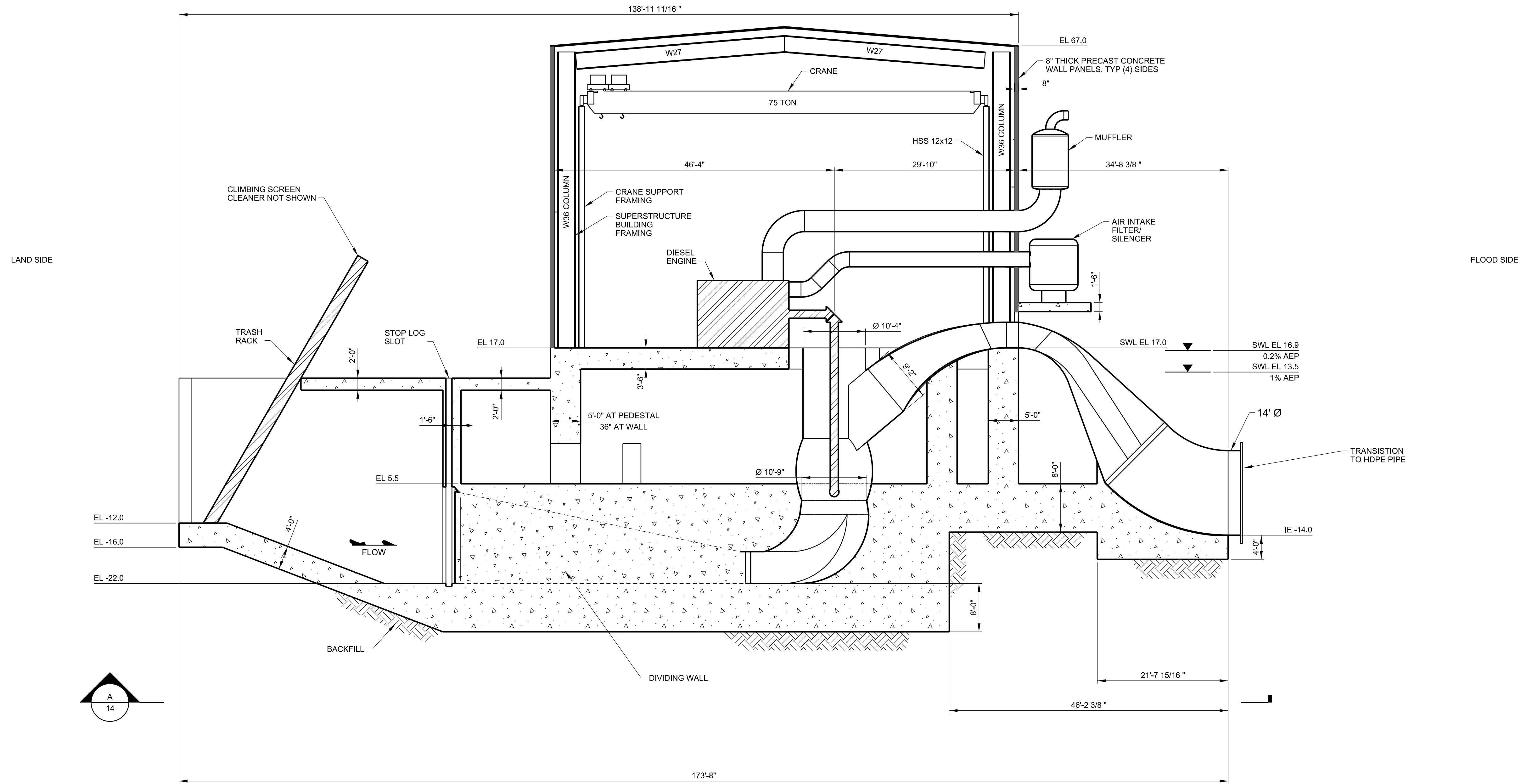
46'-5" TYP 23'-2 1/2"

D 1 CLEAR CREEK PUMP STATION - PLAN SCALE: 1" = 10'



CLEAR CREEK PUMP STATION PLAN  
COASTAL TEXAS PROTECTION AND RESTORATION FEASIBILITY STUDY  
U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

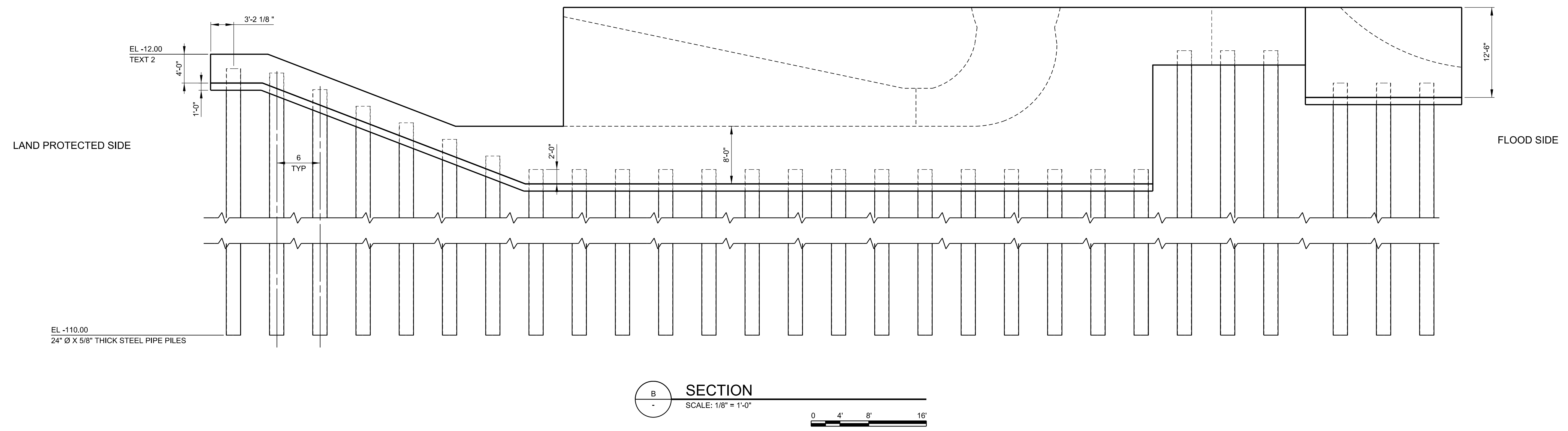
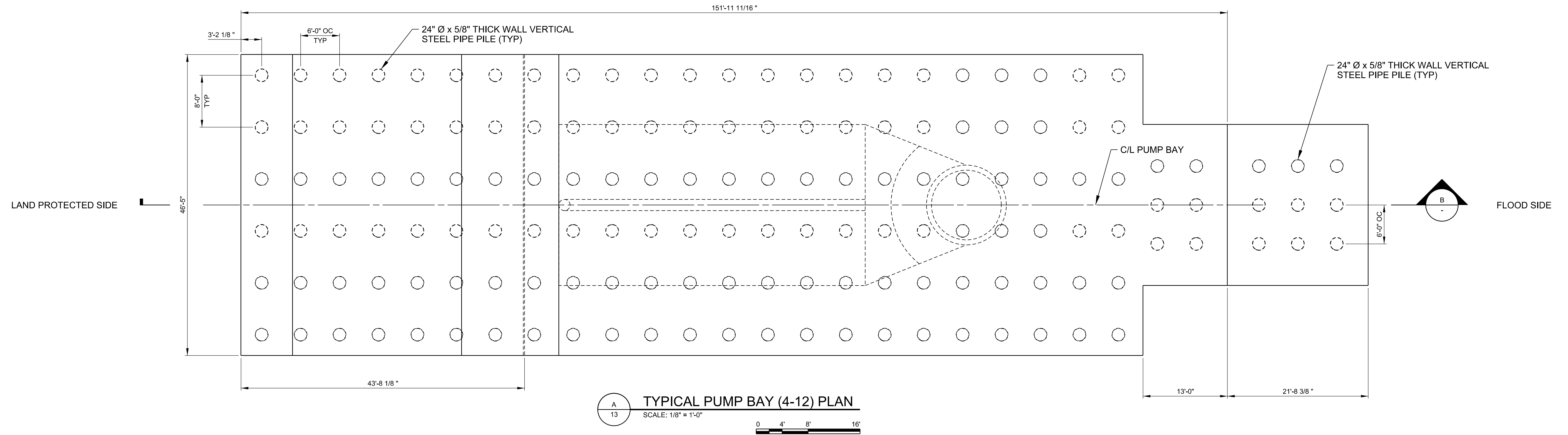
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TETRA TECH, INC.



A  
12
**CLEAR CREEK PUMP STATION - SECTION**  
 SCALE: 1" = 10'

**CLEAR CREEK PUMP STATION  
SECTION**  
  
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- NOTES:**
1. ALL PILES ARE 24"Ø. FOR FURTHER DETAILS, SEE CONTRACT SPECIFICATIONS
  2. MUD SLAB IS 2500 PSI LEAN CONCRETE 12" THICKNESS

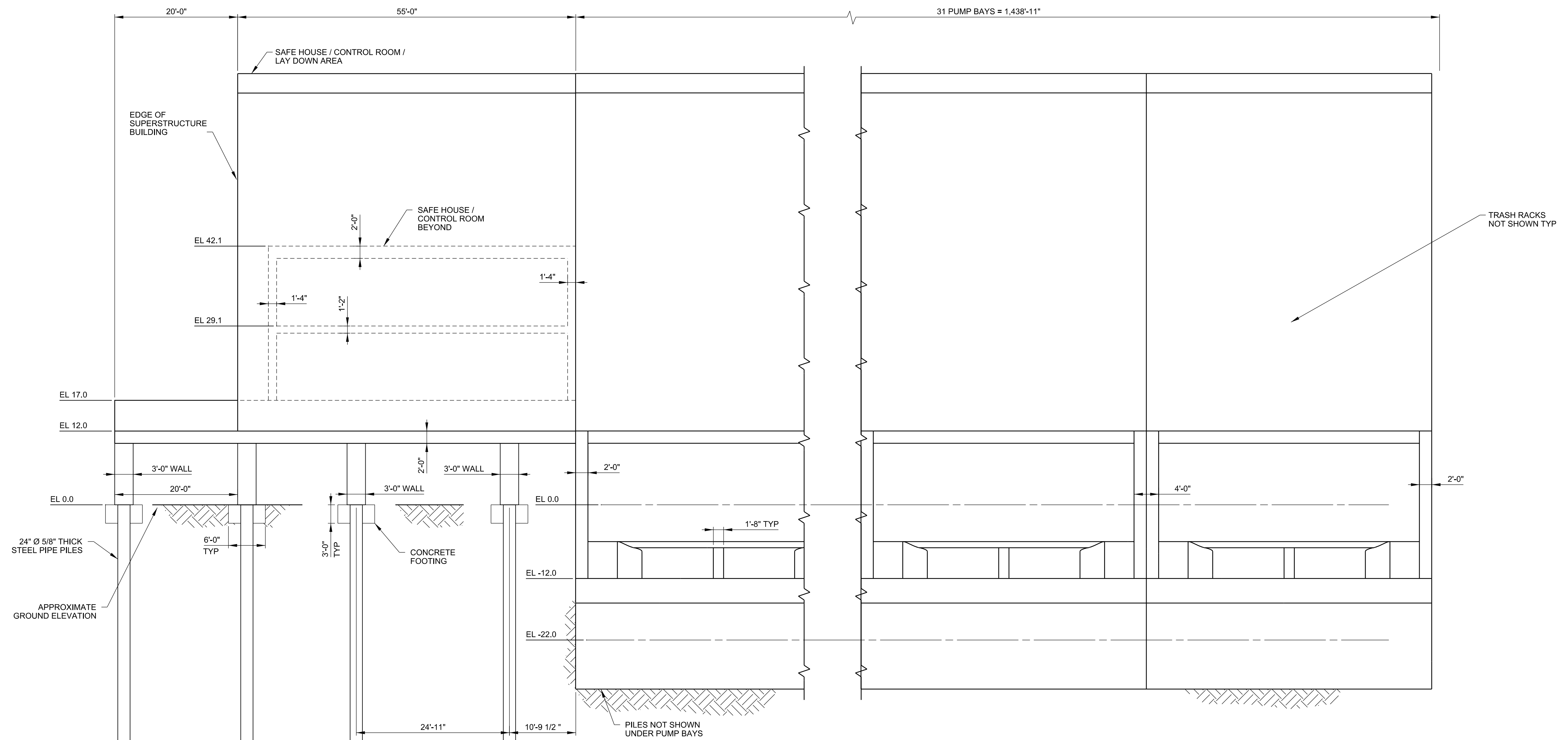
7. 1' HORIZONTAL TOLERANCE ON PUMP STATION PIPE PILE AND EXCAVATE AROUND PILE AND INCREASE FOOTING THICKNESS FOR VERTICAL TOLERANCE

**CLEAR CREEK PUMP STATION  
FOUNDATION PLAN**

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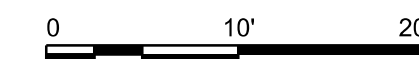


EL -80.00  
 24" Ø 5/8" THICK STEEL PIPE PILES @ 6'-0" O.C.  
 UNDER SAFE HOUSE SUPERSTRUCTURE BUILDING

B  
 13

**CLEAR CREEK PUMP STATION - LAND SIDE ELEVATION**

SCALE: 1" = 10'

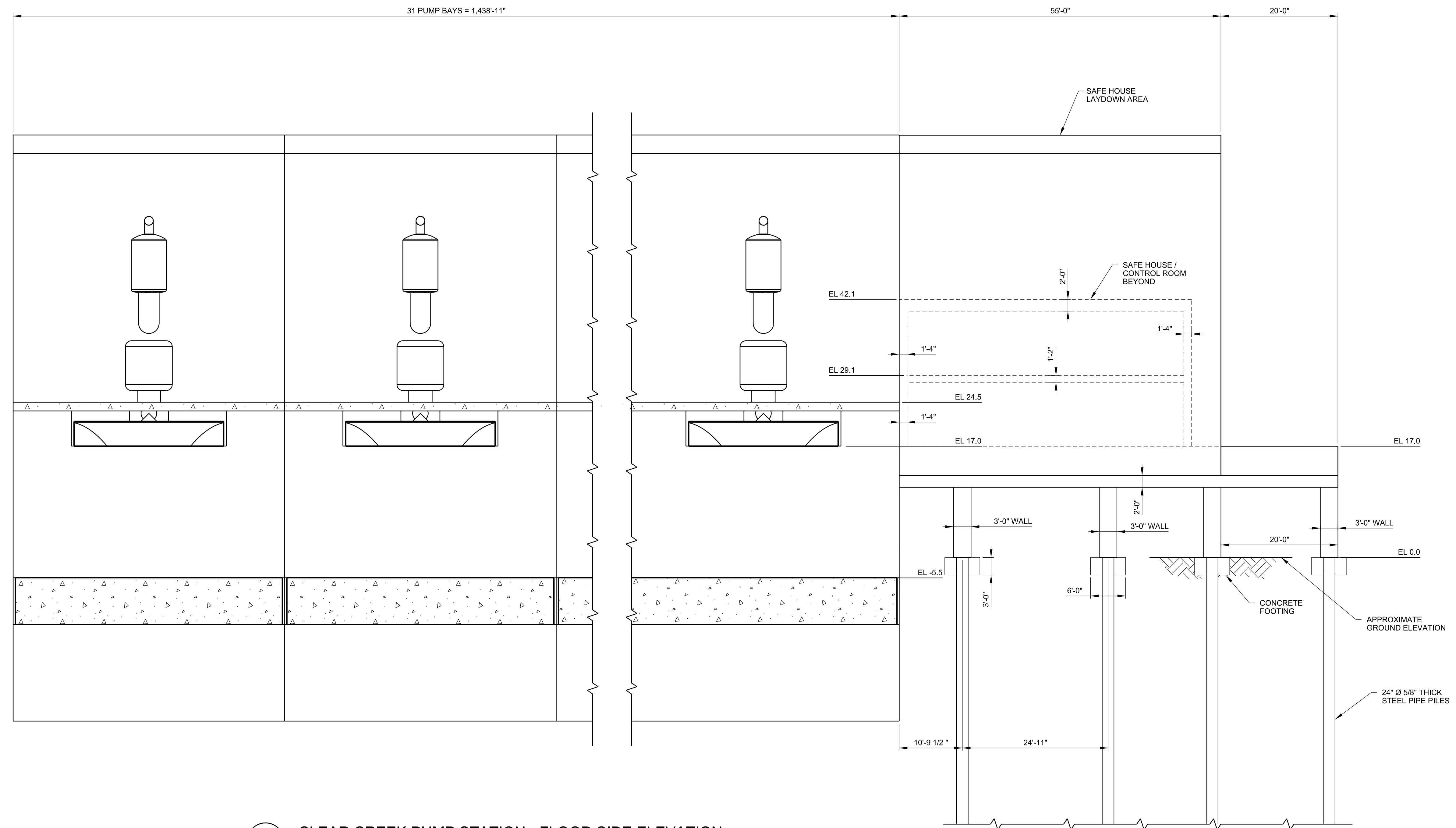


CLEAR CREEK PUMP STATION  
 UPSTREAM ELEVATION

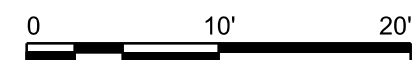
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 RESTORATION FEASIBILITY STUDY**

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 TETRA TECH, INC.



C  
13 CLEAR CREEK PUMP STATION - FLOOD SIDE ELEVATION  
SCALE: 1" = 10'



EL -80.00  
24" Ø 5/8" THICK STEEL PIPE PILES @ 6'-0" O.C.  
UNDER SAFE HOUSE SUPERSTRUCTURE BUILDING

CLEAR CREEK  
PUMP STATION  
DOWNSTREAM ELEVATION  
COASTAL TEXAS PROTECTION AND  
RESTORATION FEASIBILITY STUDY

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

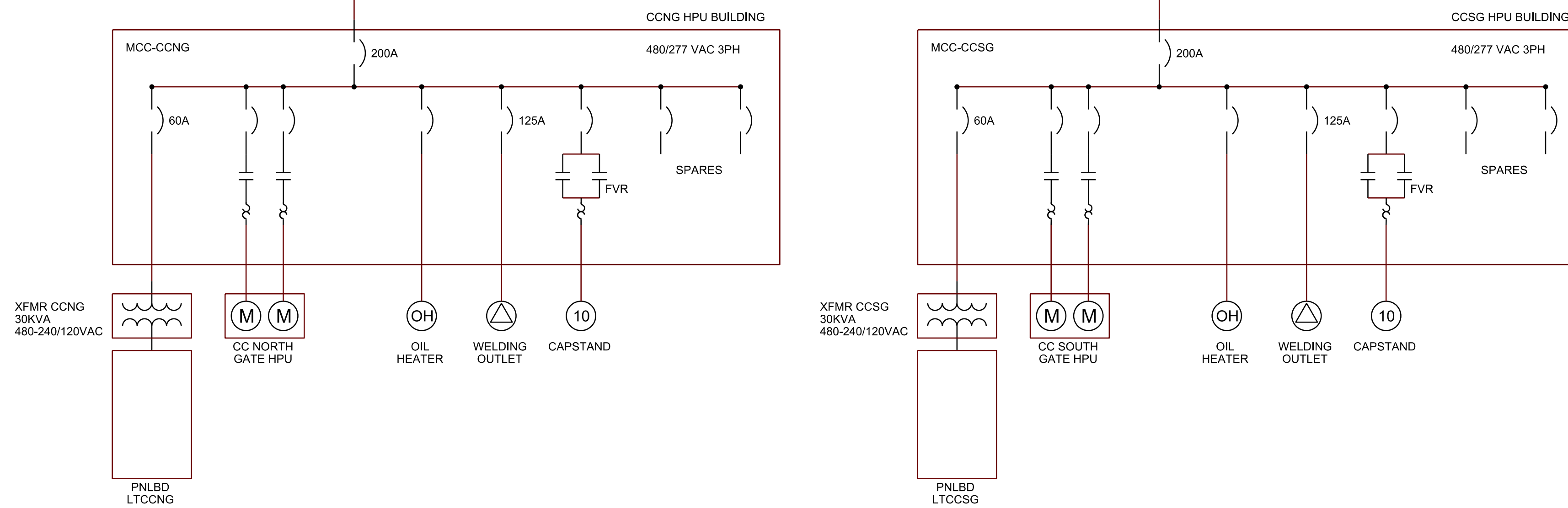
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PUMP STATION FLOODGATE

POWER FROM CC PUMP STATION SEE PLATE 18



480/277 VAC



**LEGEND**

CC - CLEAR CREEK  
NG - NORTH GATE  
SG - SOUTH GATE

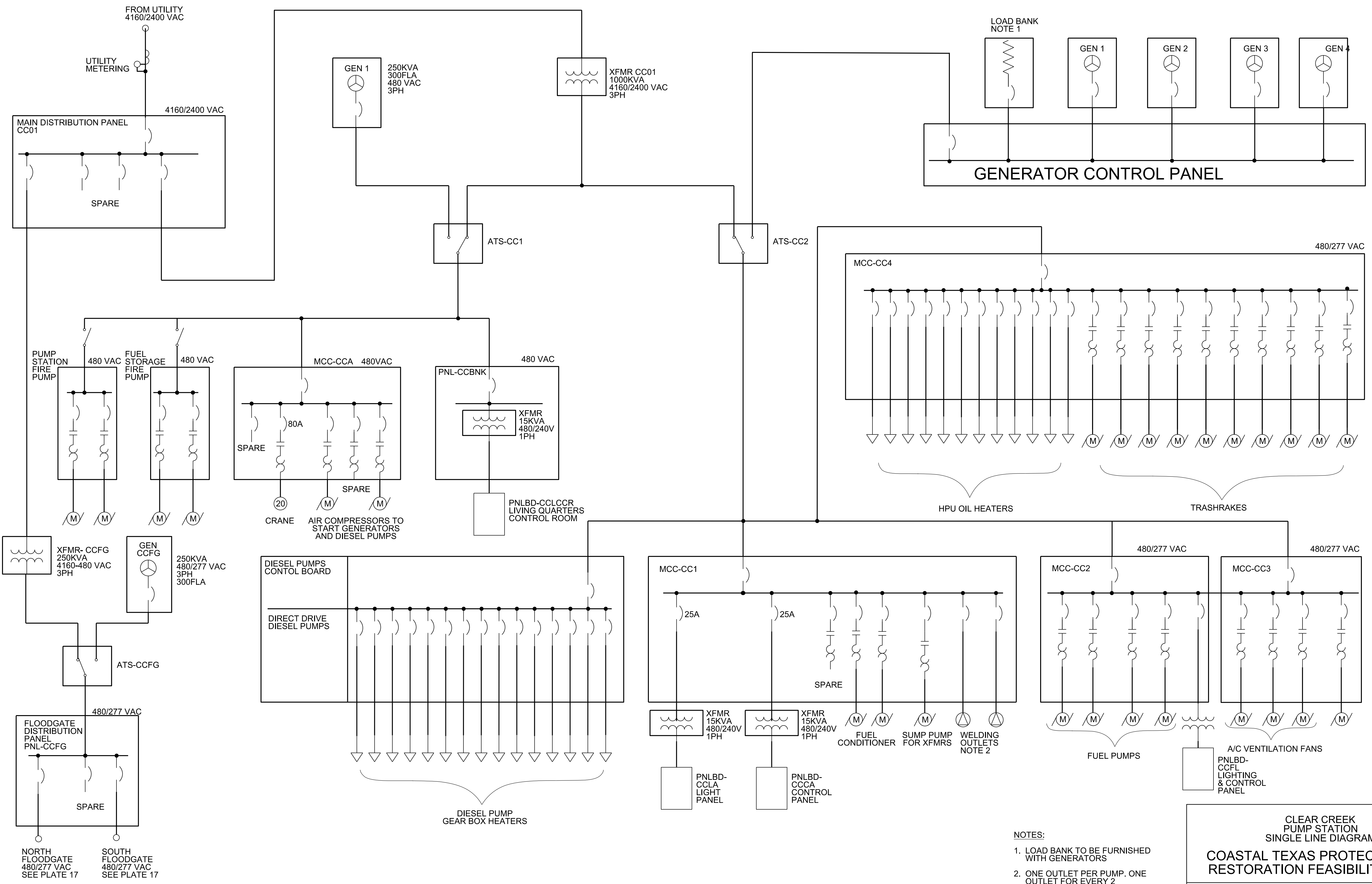
**CLEAR CREEK FLOODGATE - SINGLE LINE DIAGRAM**  
SCALE: NTS

CLEAR CREEK FLOODGATE  
SINGLE LINE DIAGRAM

COASTAL TEXAS PROTECTION AND  
RESTORATION FEASIBILITY STUDY

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TETRA TECH, INC.



%OPTIONAL VALUE 1%

**CLEAR CREEK PUMP STATION - SINGLE LINE DIAGRAM**  
SCALE: NTS

- NOTES:**
- LOAD BANK TO BE FURNISHED WITH GENERATORS
  - ONE OUTLET PER PUMP. ONE OUTLET FOR EVERY 2 TRASHRAKES

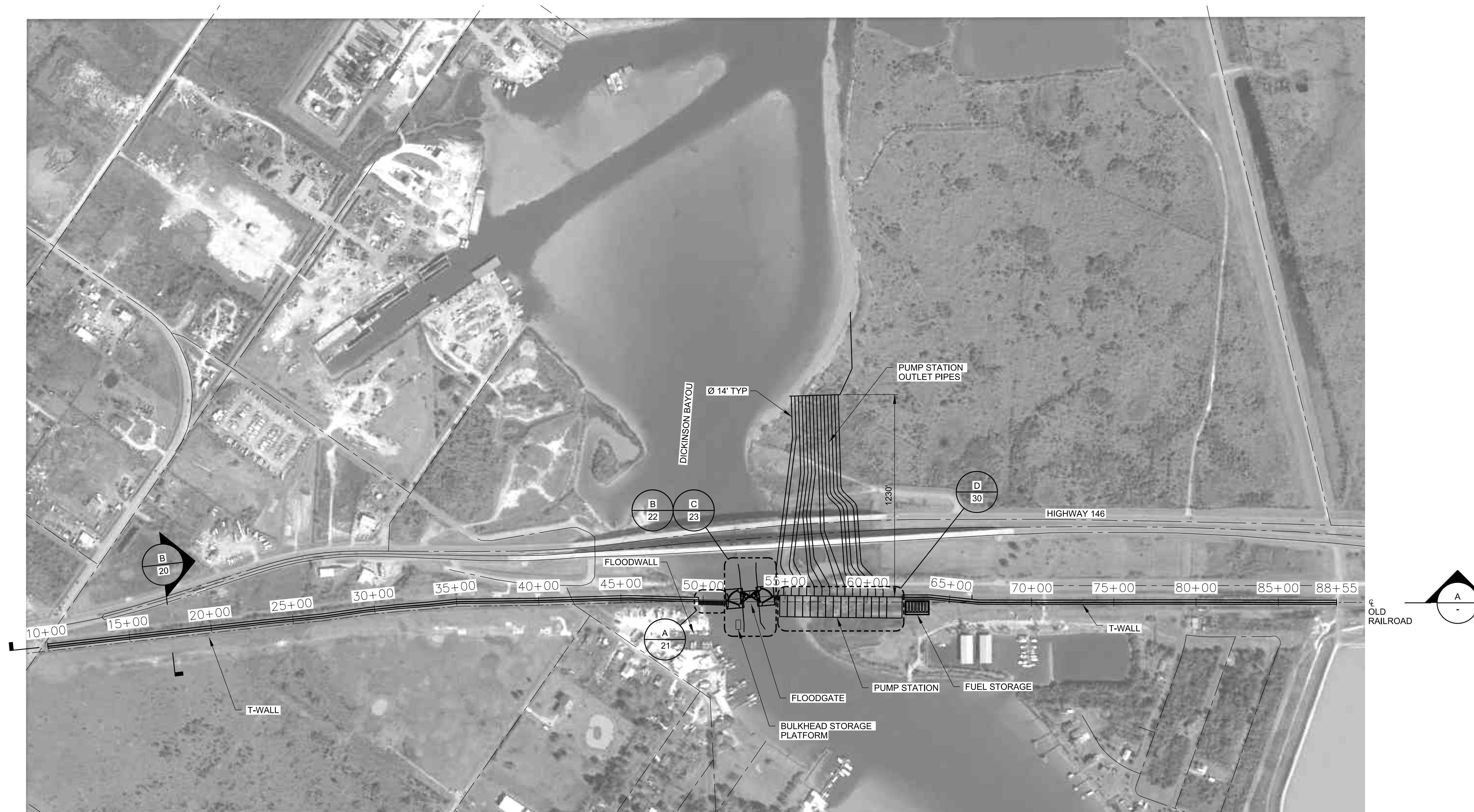
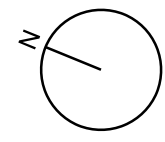
**CLEAR CREEK PUMP STATION  
SINGLE LINE DIAGRAM**

**COASTAL TEXAS PROTECTION AND RESTORATION FEASIBILITY STUDY**

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

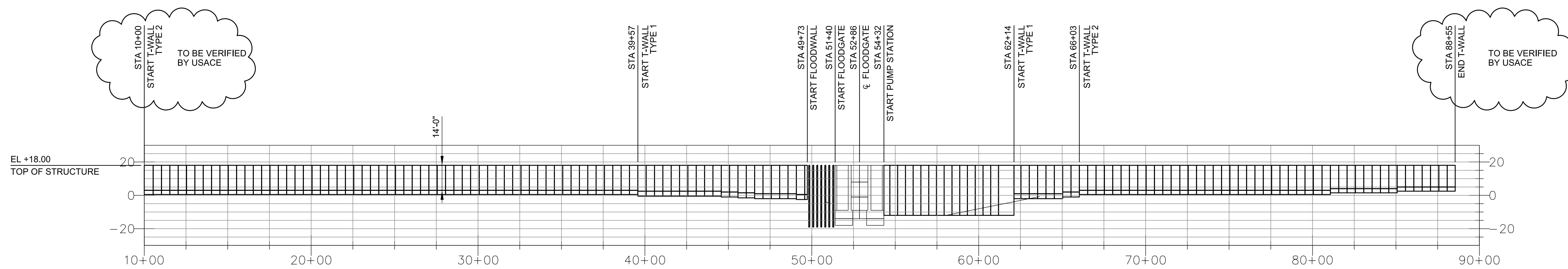
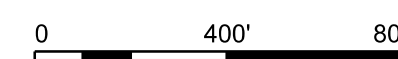
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ENGINEERING APPENDIX  
DATED:  
NOVEMBER 9, 2018  
TETRA TECH, INC.



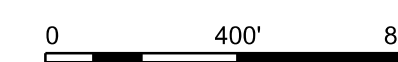
**DICKINSON BAYOU - GENERAL PLAN**

SCALE: 1" = 400'



**ELEVATION VIEW**

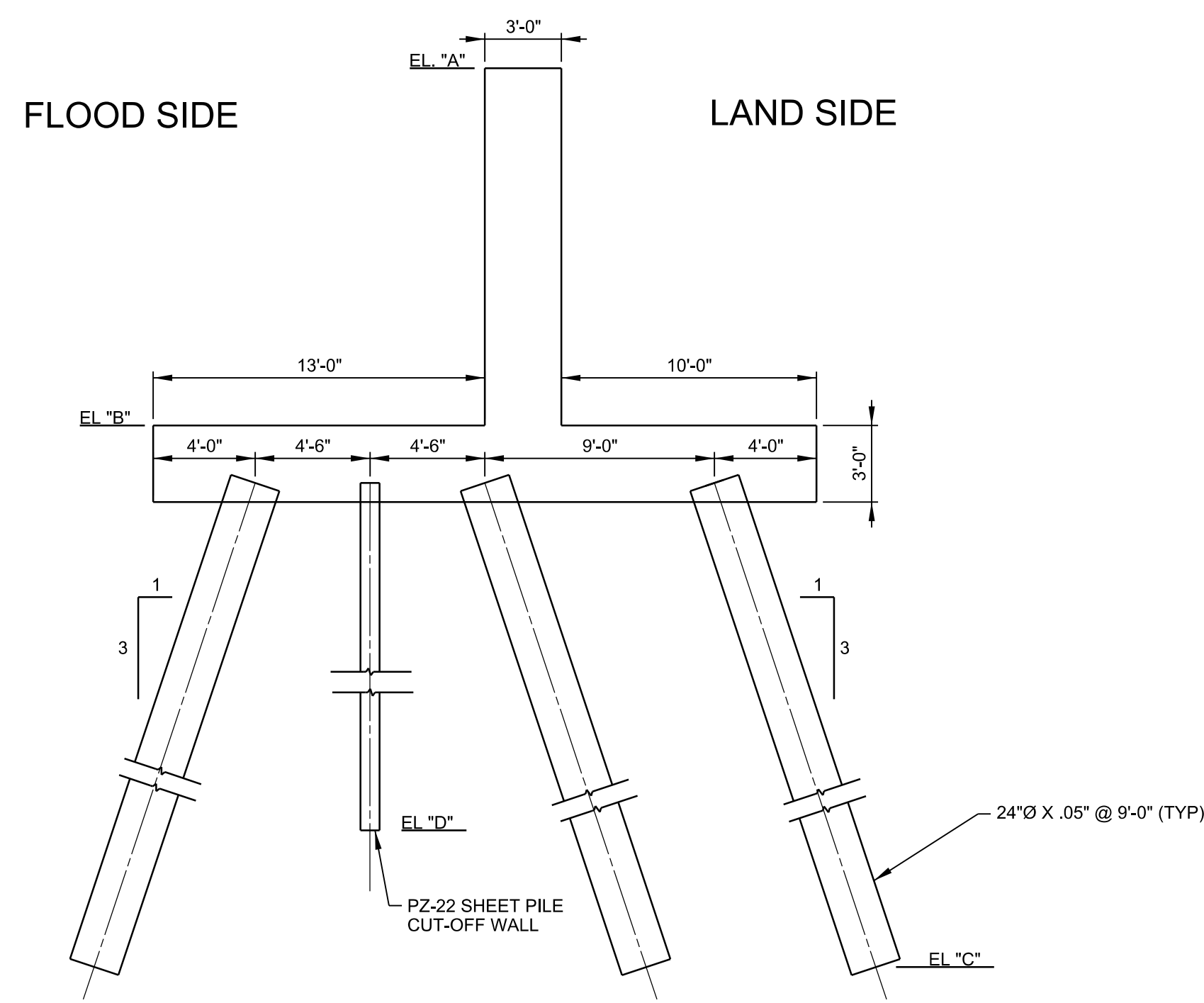
SCALE: 1" = 400'



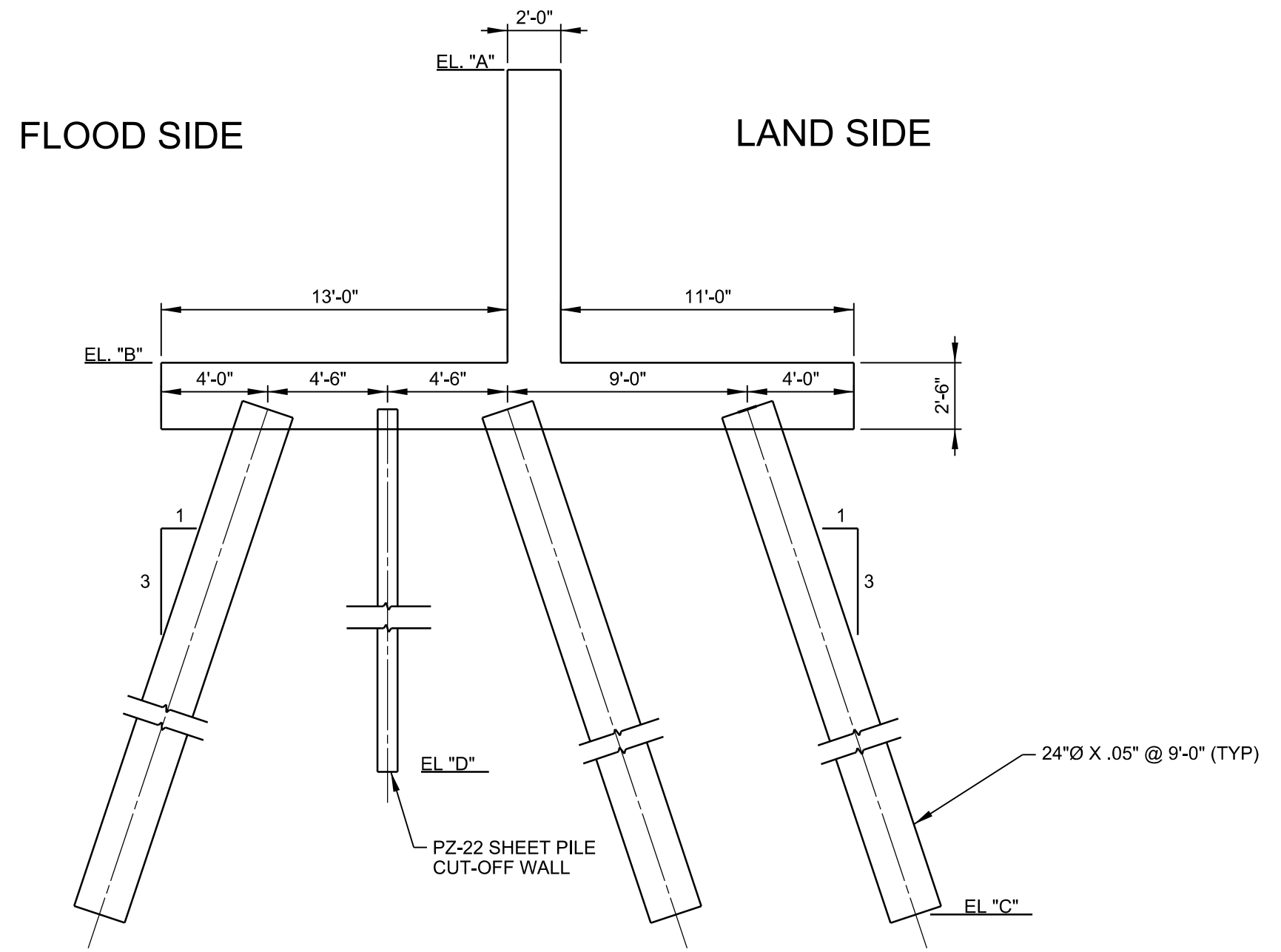
**DICKINSON BAYOU  
GENERAL PLAN AND ELEVATION  
COASTAL TEXAS PROTECTION AND  
RESTORATION FEASIBILITY STUDY**

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

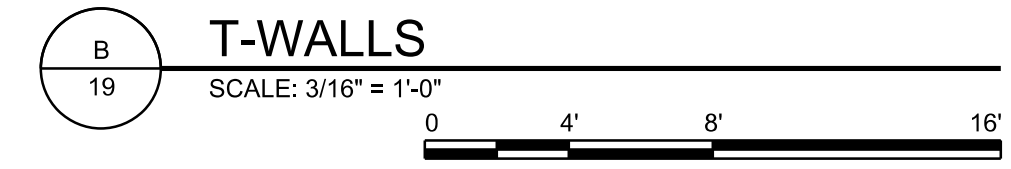
ENGINEERING APPENDIX  
DATED:  
NOVEMBER 9, 2018  
TETRA TECH, INC.



**TYPE 1**



**TYPE 2**



LOCATION	TYPE	"A"	"B"	"C"	"D"
STA 10+00 TO STA 39+57	1	18.0	1.0	-67.0	-12.0
STA 39+57 TO STA 49+73	2	18.0	3.0	-63.0	-9.5
STA 62+12 TO STA 66+03	2	18.0	3.0	-63.0	-9.5
STA 66+03 TO STA 88+55	1	18.0	1.0	-67.0	-12.0

- NOTES:**
1. ALL CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 4,000 PSI.
  2. SHEET PILES SHALL MEET THE REQUIREMENTS OF ASTM A328.
  3. ALL PIPE PILES SHALL MEET THE REQUIREMENTS OF ASTM A252 GRADE 3.

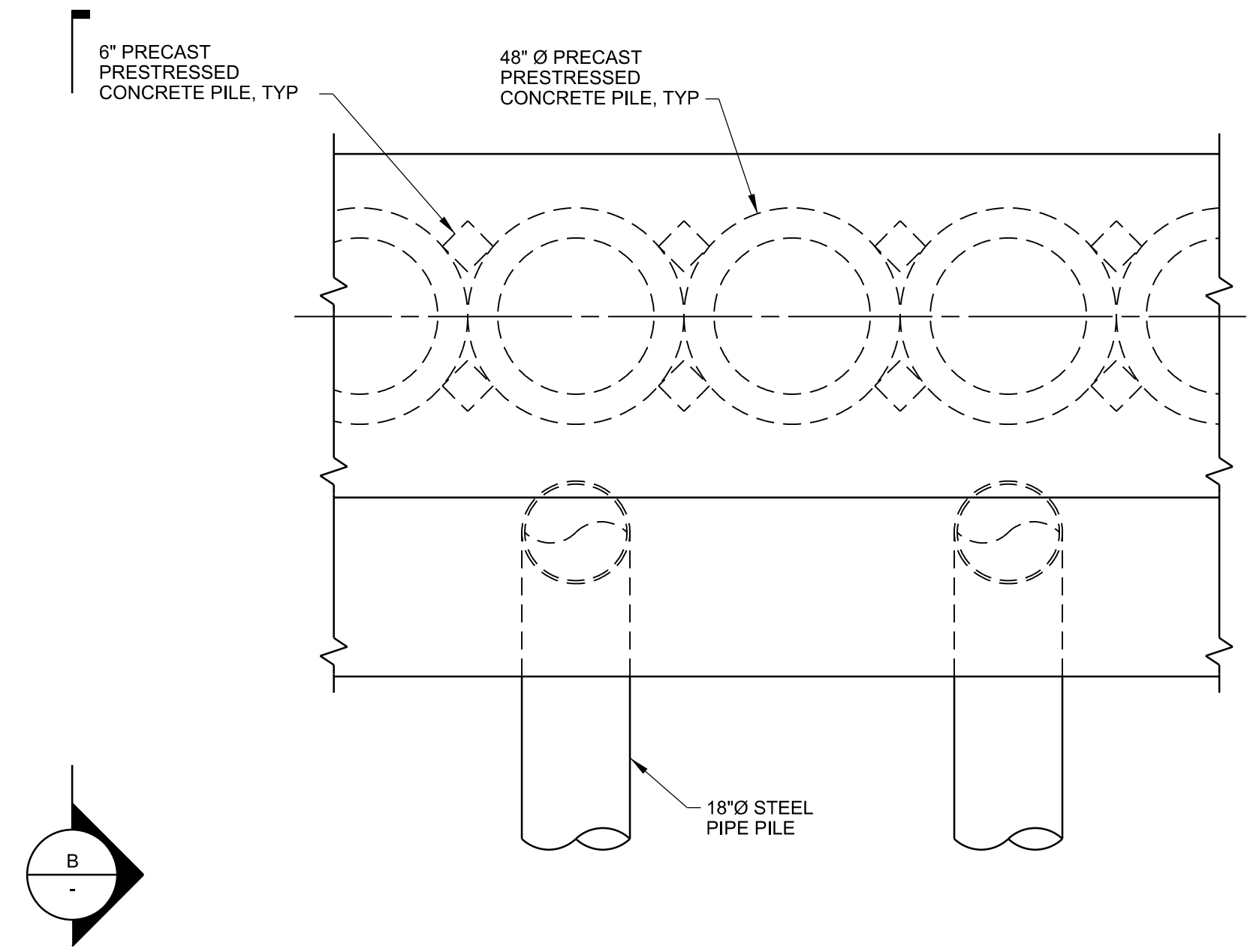
DICKINSON BAYOU  
T-WALL  
SECTIONS

**COASTAL TEXAS PROTECTION AND  
RESTORATION FEASIBILITY STUDY**

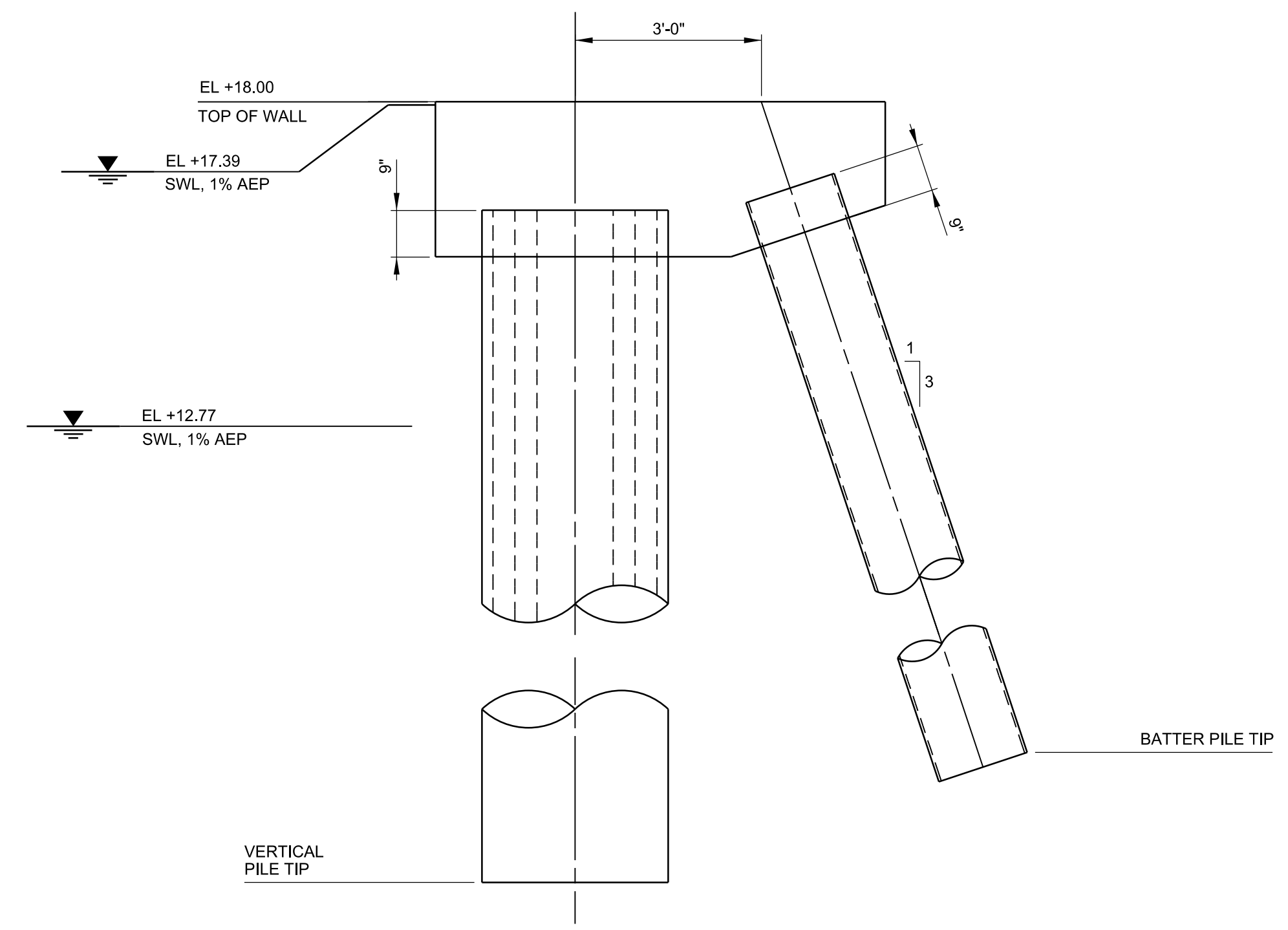
U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

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ENGINEERING APPENDIX  
DATED:  
NOVEMBER 9, 2018  
TETRA TECH, INC.



**PLAN**  
SCALE: 1/2" = 1'-0"  
0 1' 2' 4'

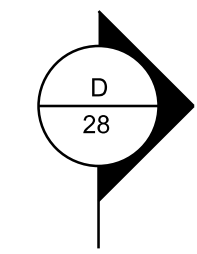
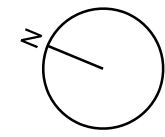


**SECTION**  
SCALE: 1/2" = 1'-0"  
0 1' 2' 4'

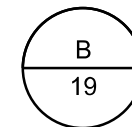
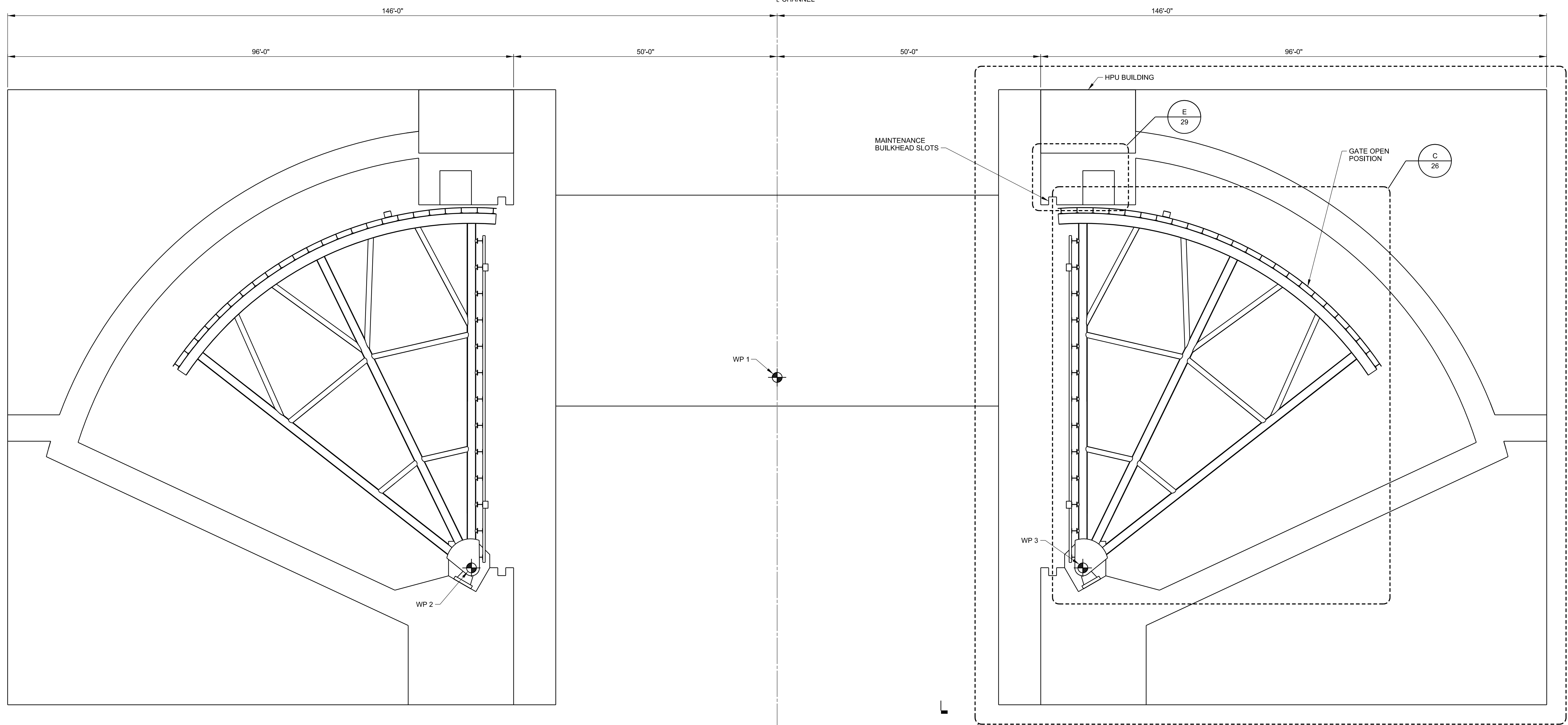
LOCATION	VERTICAL PILE TIP EL	BATTER PILE TIP EL
STA 30+20 TO STA 31+63	-59	-79

DICKINSON BAYOU  
FLOODWALL  
PLAN AND ELEVATION  
**COASTAL TEXAS PROTECTION AND  
RESTORATION FEASIBILITY STUDY**  
U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS  
ENGINEERING APPENDIX  
DATED:  
NOVEMBER 9, 2018  
TETRA TECH, INC.



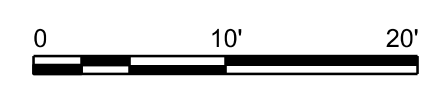


CHANNEL



DICKINSON BAYOU FLOODGATE TOP PLAN - OPEN

SCALE: 1" = 10'

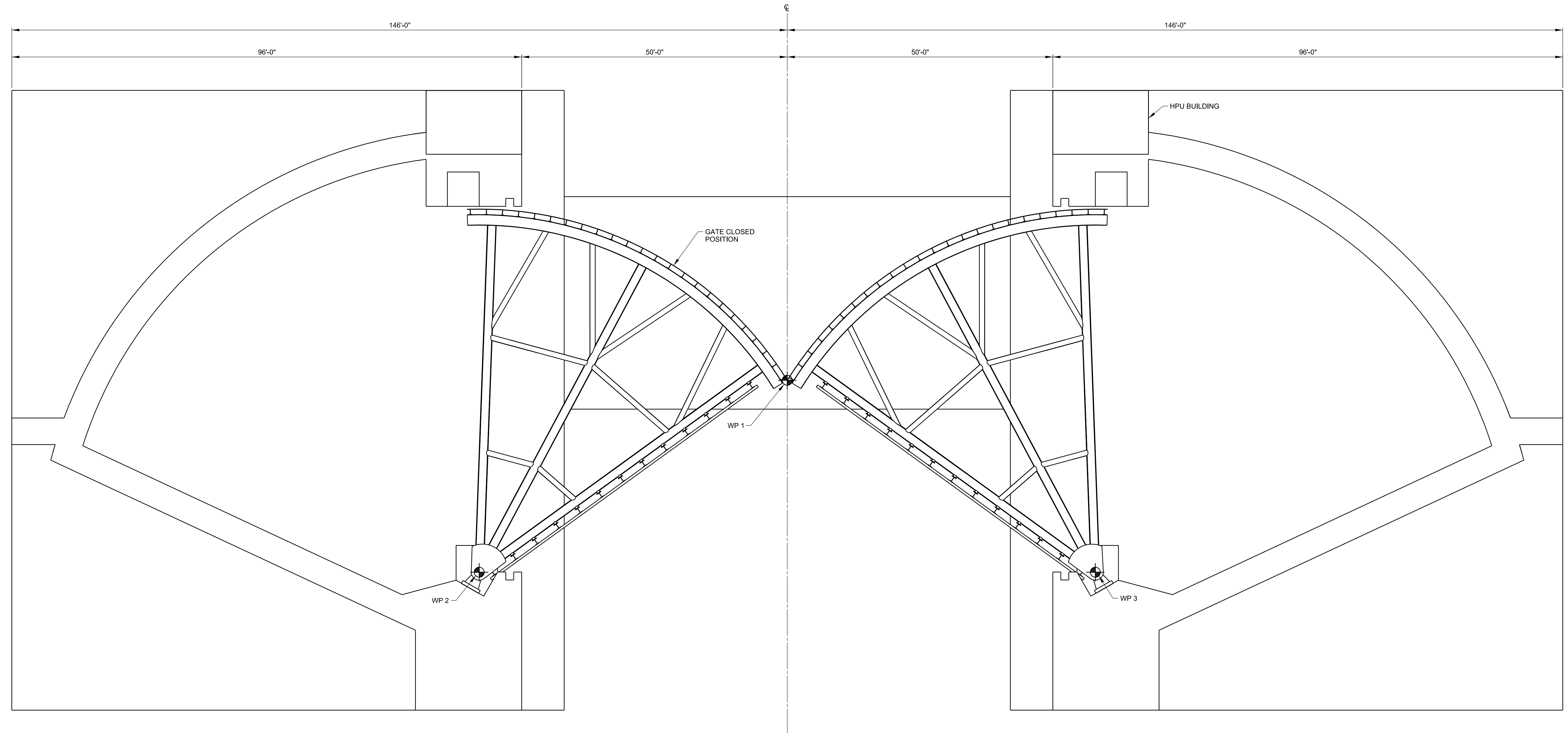
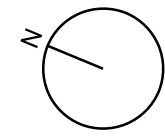


DICKINSON BAYOU  
FLOODGATE TOP PLAN  
OPEN

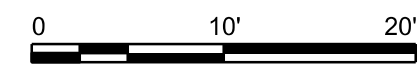
COASTAL TEXAS PROTECTION AND  
RESTORATION FEASIBILITY STUDY

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

ENGINEERING APPENDIX  
DATED:  
NOVEMBER 9, 2018  
TETRA TECH, INC.



C  
19  
DICKINSON BAYOU FLOODGATE TOP PLAN - CLOSED  
SCALE: 1" = 10'

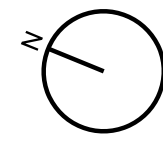


DICKINSON BAYOU  
FLOODGATE TOP PLAN  
CLOSED

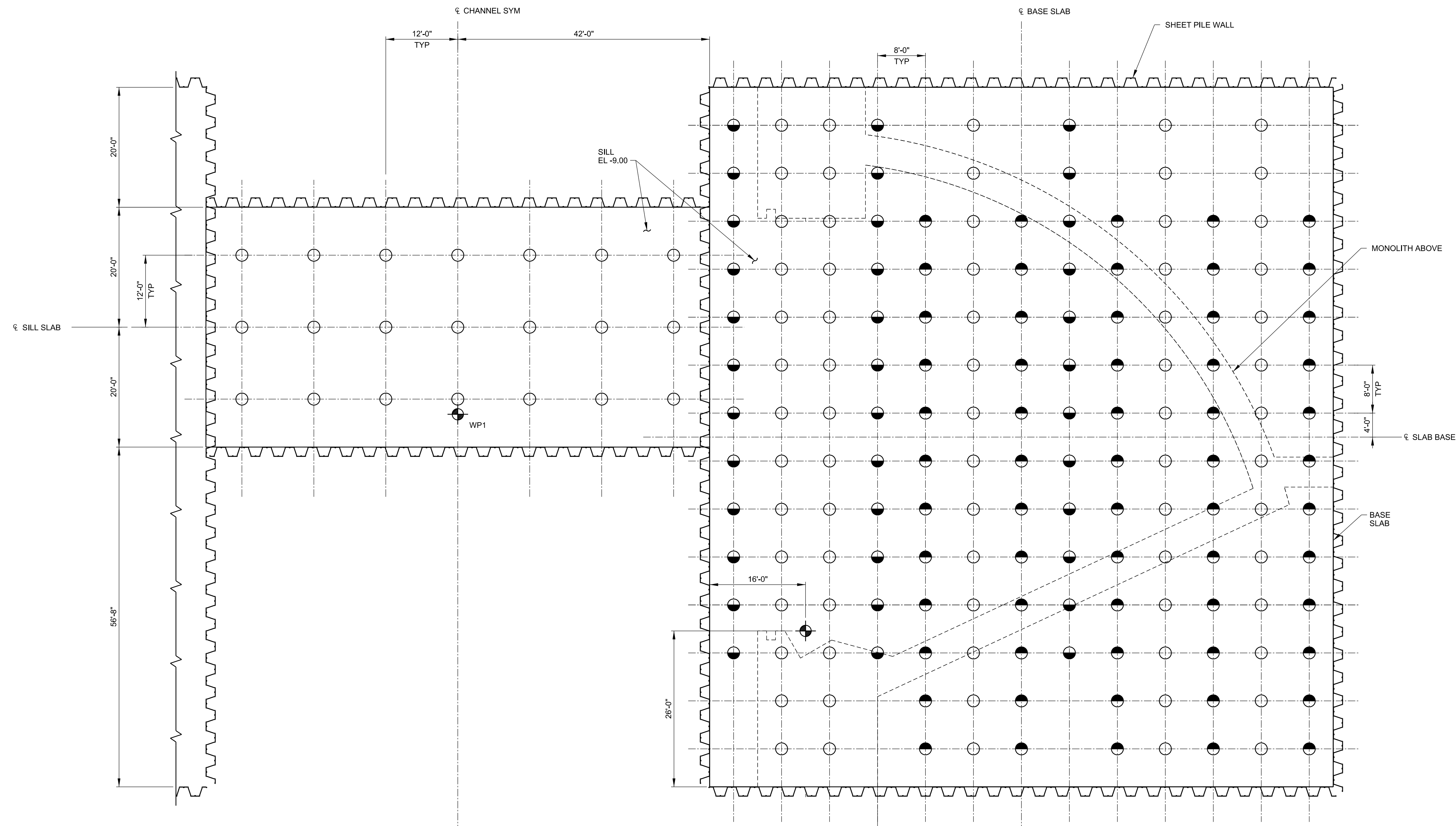
**COASTAL TEXAS PROTECTION AND  
RESTORATION FEASIBILITY STUDY**

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

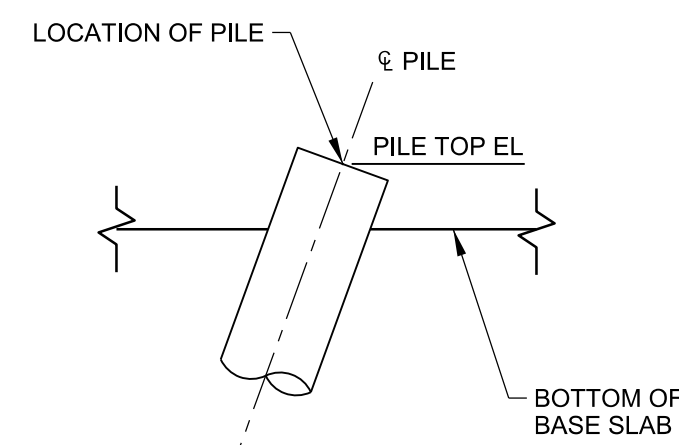
ENGINEERING APPENDIX  
DATED:  
NOVEMBER 9, 2018  
TETRA TECH, INC.



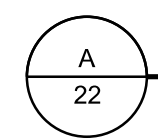
FLOOD SIDE



LAND SIDE

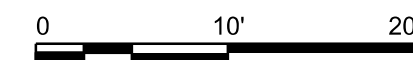


**PILE HEAD DETAIL**  
SCALE: NTS



**FOUNDATION PLAN @ EL -9.00**

SCALE: 1" = 10'



DESCRIPTION	TOP EL	TIP EL	BAT (V:H)
VERTICAL PILES	-13.25	-84.0	N/A
BATTERED PILES	-13.25	-84.0	3:1
SHEET PILE	-9.0	-58.0	N/A

**LEGEND:**

- PIPE PILE BATTERED AT 3V:1H IN DIRECTION OF SOLID HATCHING
- VERTICAL PILE

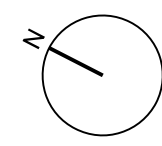
**NOTES:**

1. ALL PILES SHALL BE 24" DIA. STEEL PIPE.
2. UNLESS NOTED OTHERWISE, ALL PILES SHALL HAVE TENSION CONNECTORS.

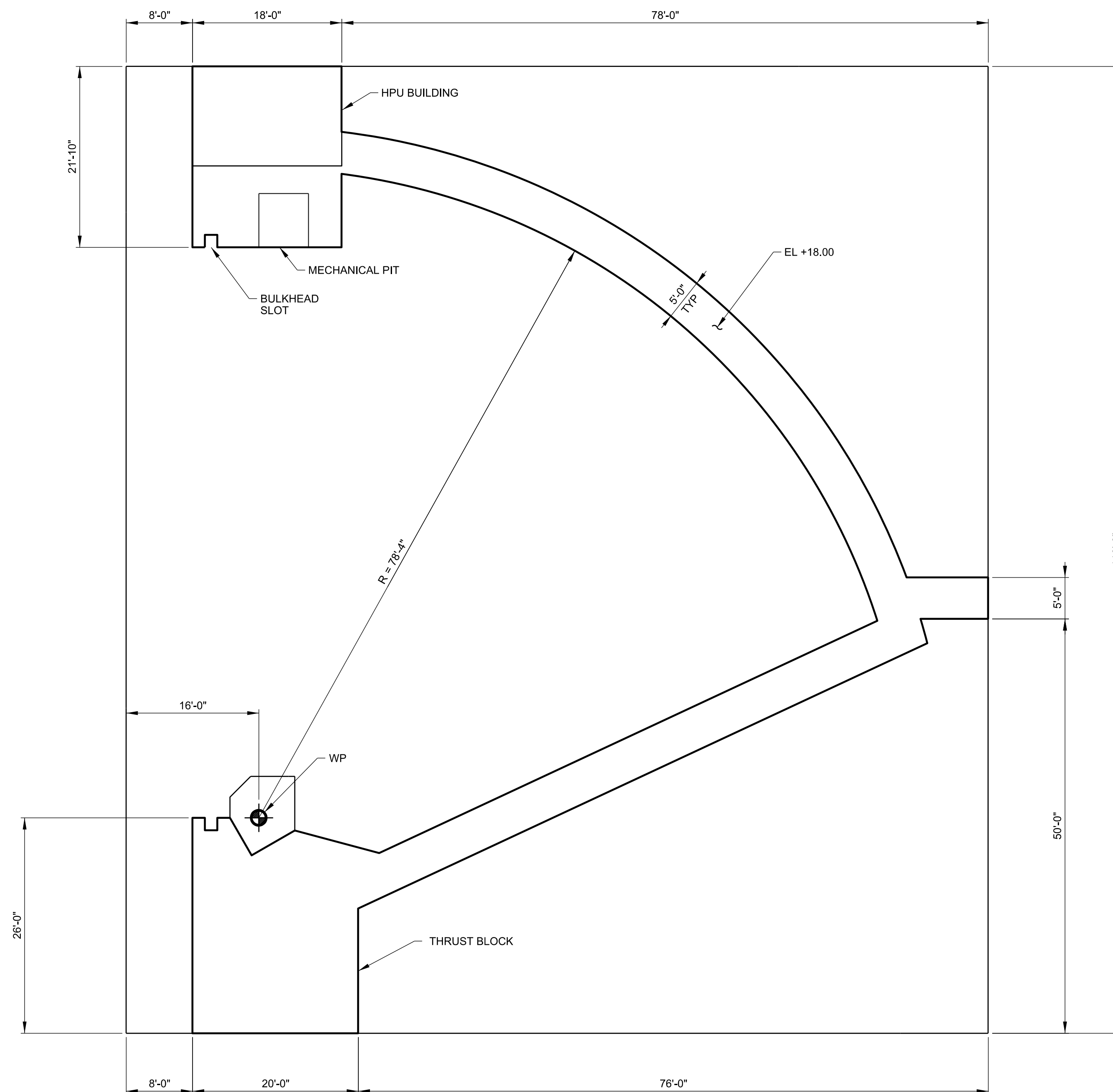
DICKINSON BAYOU  
FLOODGATE  
FOUNDATION PLAN  
**COASTAL TEXAS PROTECTION AND  
RESTORATION FEASIBILITY STUDY**

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

ENGINEERING APPENDIX  
DATED:  
NOVEMBER 9, 2018  
TETRA TECH, INC.



CHANNEL SYM



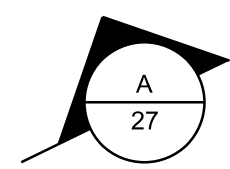
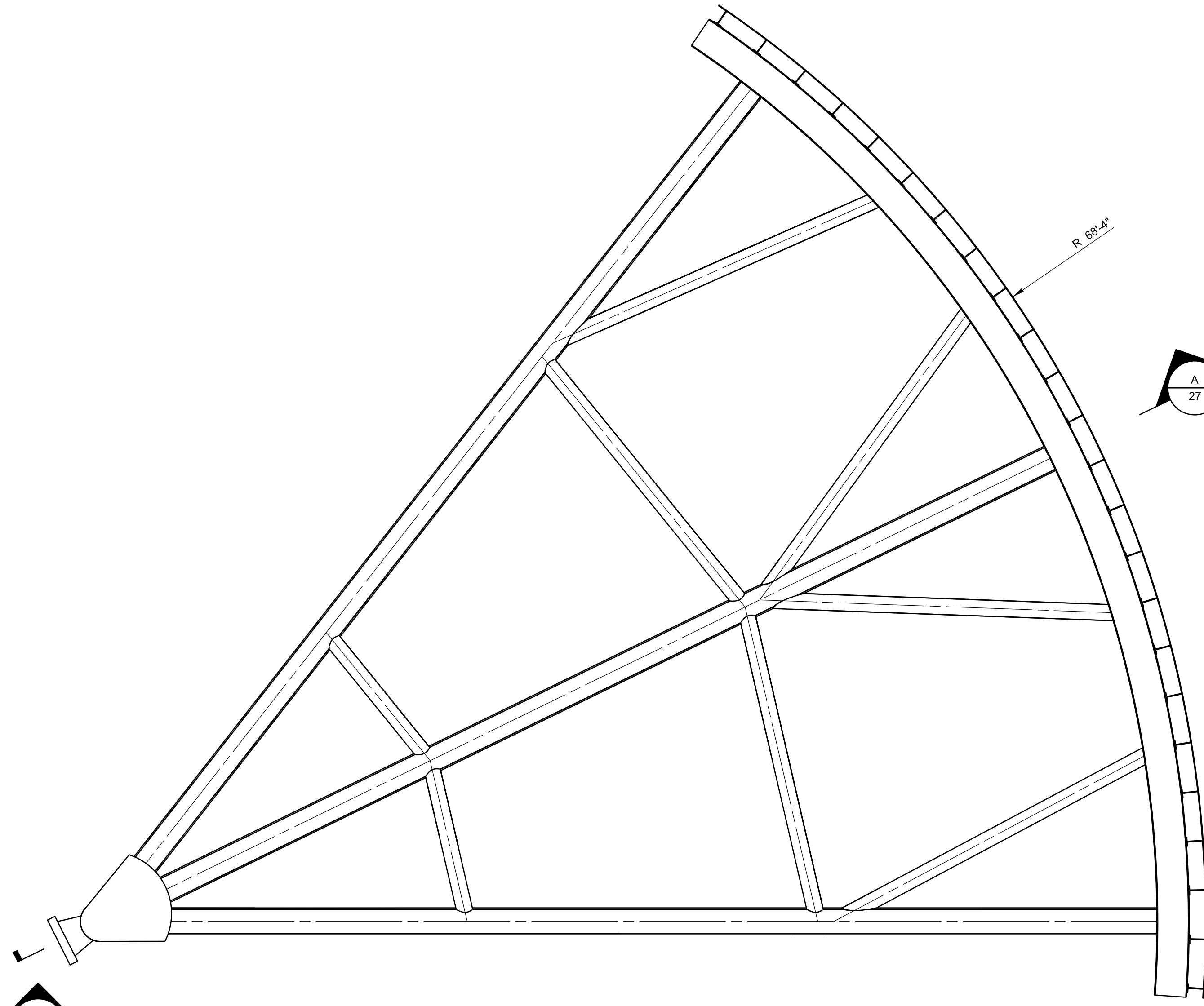
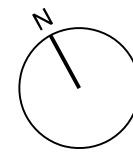
**B**  
22  
**MONOLITH PLAN**  
SCALE: 1" = 10'

DICKINSON BAYOU  
FLOODGATE  
MONOLITH PLAN

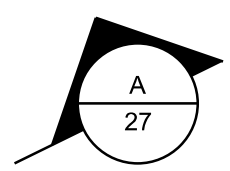
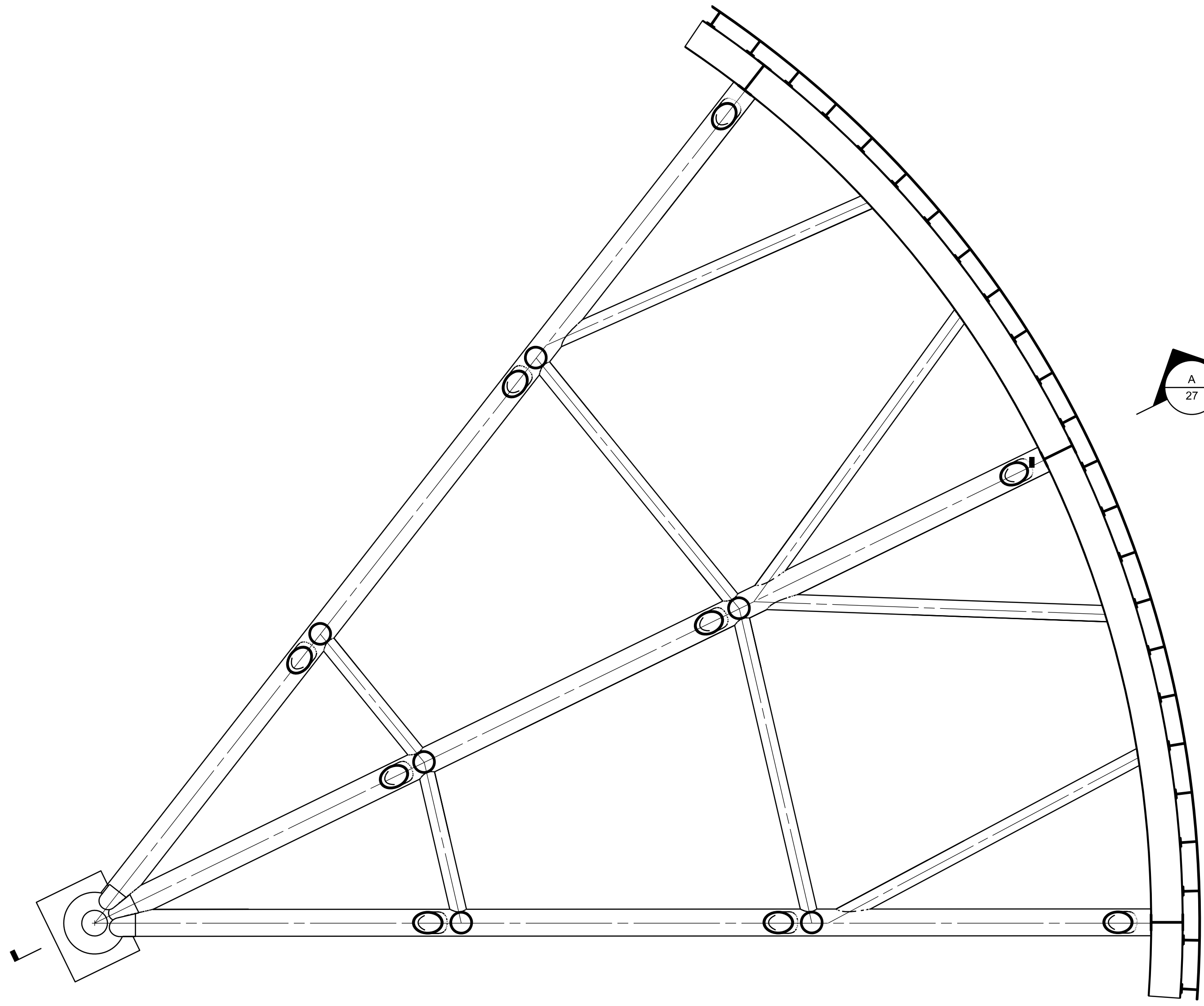
**COASTAL TEXAS PROTECTION AND  
RESTORATION FEASIBILITY STUDY**

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

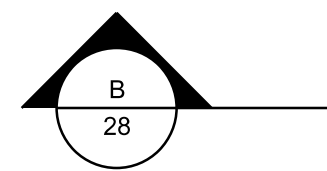
ENGINEERING APPENDIX  
DATED:  
NOVEMBER 9, 2018  
TETRA TECH, INC.



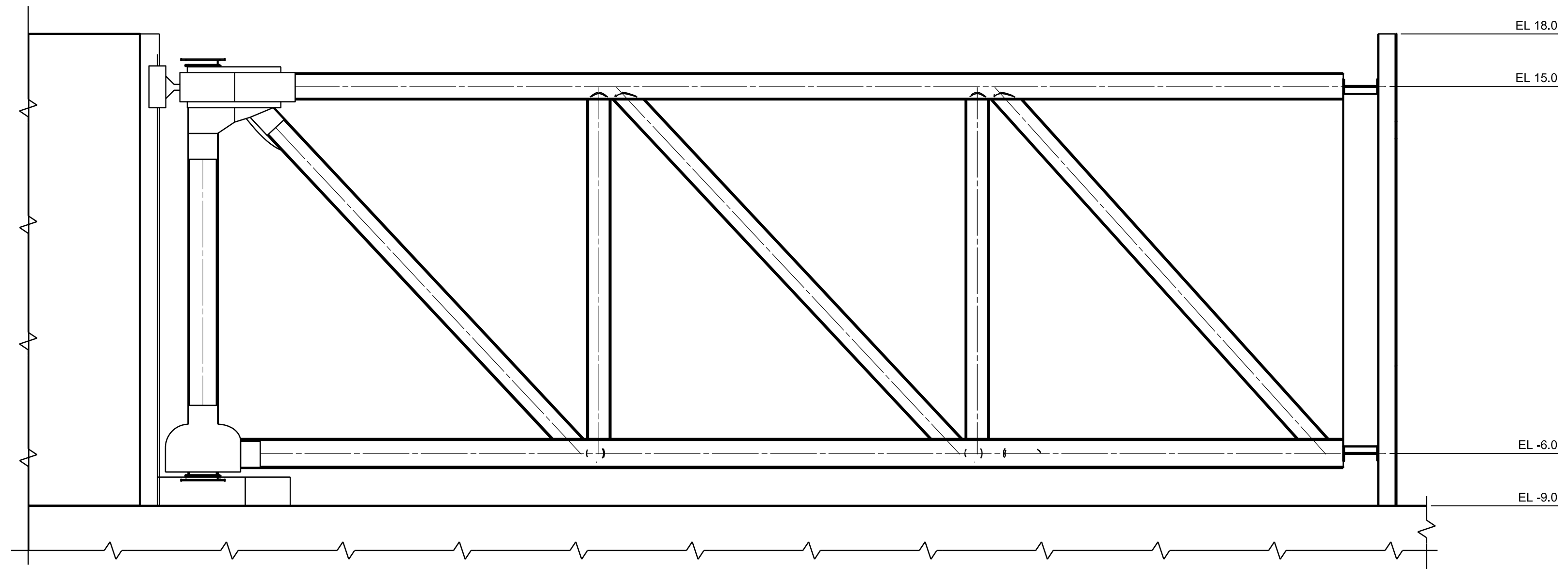
**GATE LEAF UPPER PLAN**  
SCALE: 3/16" = 1'-0"  
0 4' 8' 16'



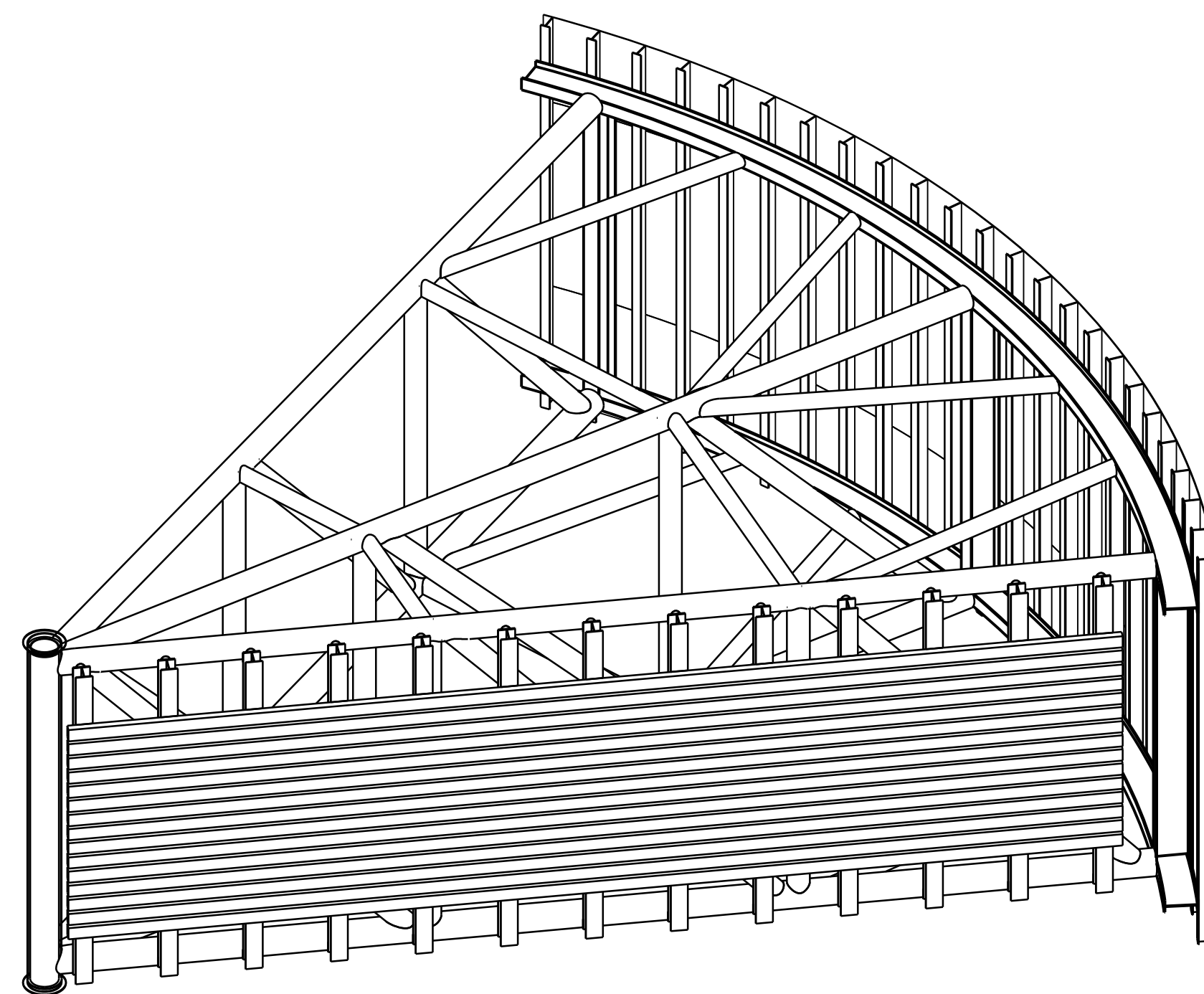
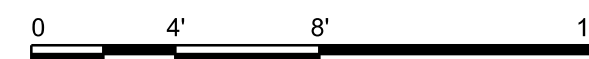
**GATE LEAF BOTTOM PLAN**  
SCALE: 3/16" = 1'-0"  
0 4' 8' 16'



DICKINSON BAYOU  
FLOODGATE  
GATE LEAF UPPER AND BOTTOM PLAN  
**COASTAL TEXAS PROTECTION AND  
RESTORATION FEASIBILITY STUDY**  
U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS  
ENGINEERING APPENDIX  
DATED:  
NOVEMBER 9, 2018  
TETRA TECH, INC.



A  
26 FLOODGATE GATE LEAF SECTION  
SCALE: 3/16" = 1'-0"



B  
- FLOODGATE GATE LEAF ISOMETRIC  
SCALE: NTS

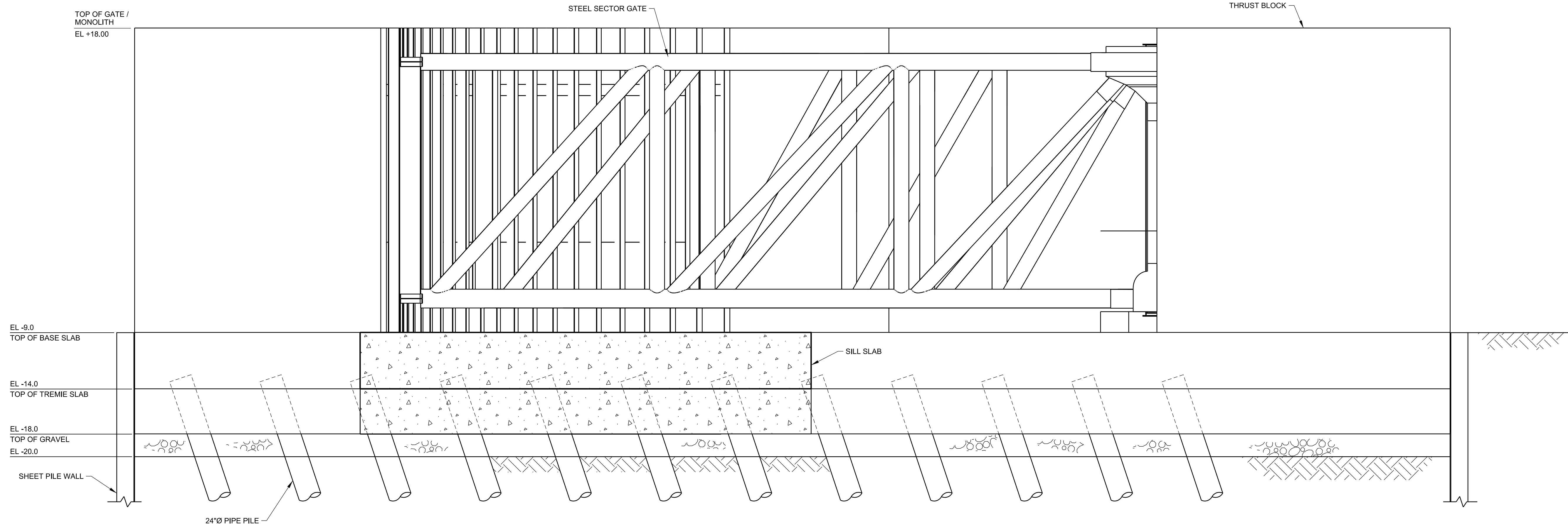
DICKINSON BAYOU  
FLOODGATE GATE LEAF  
SECTION & ISOMETRIC  
COASTAL TEXAS PROTECTION AND  
RESTORATION FEASIBILITY STUDY

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

ENGINEERING APPENDIX  
DATED:  
NOVEMBER 9, 2018  
TETRA TECH, INC.

FLOOD SIDE

LAND SIDE

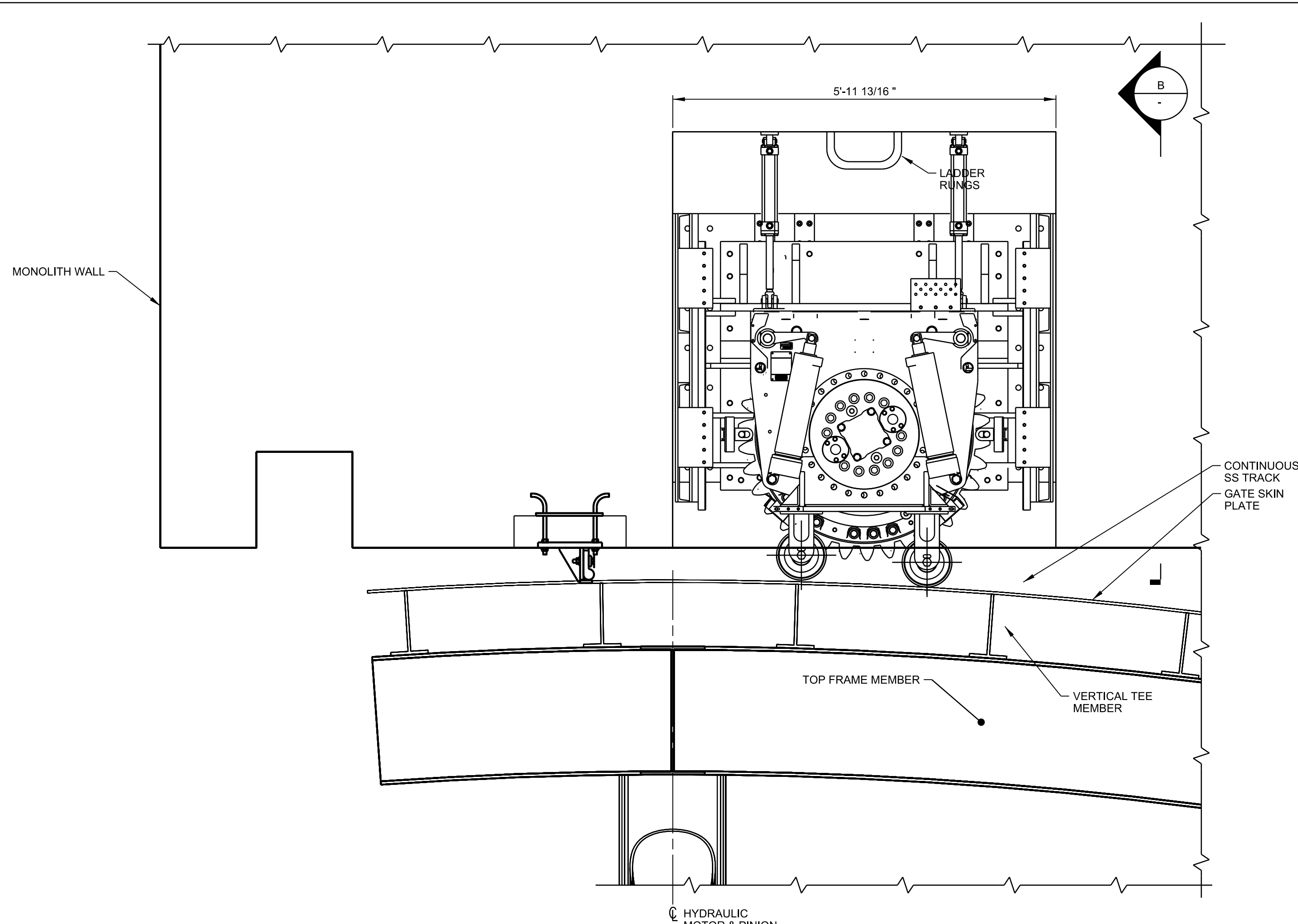


D  
22 SECTION  
SCALE: 1" = 5'  
0 5' 10'

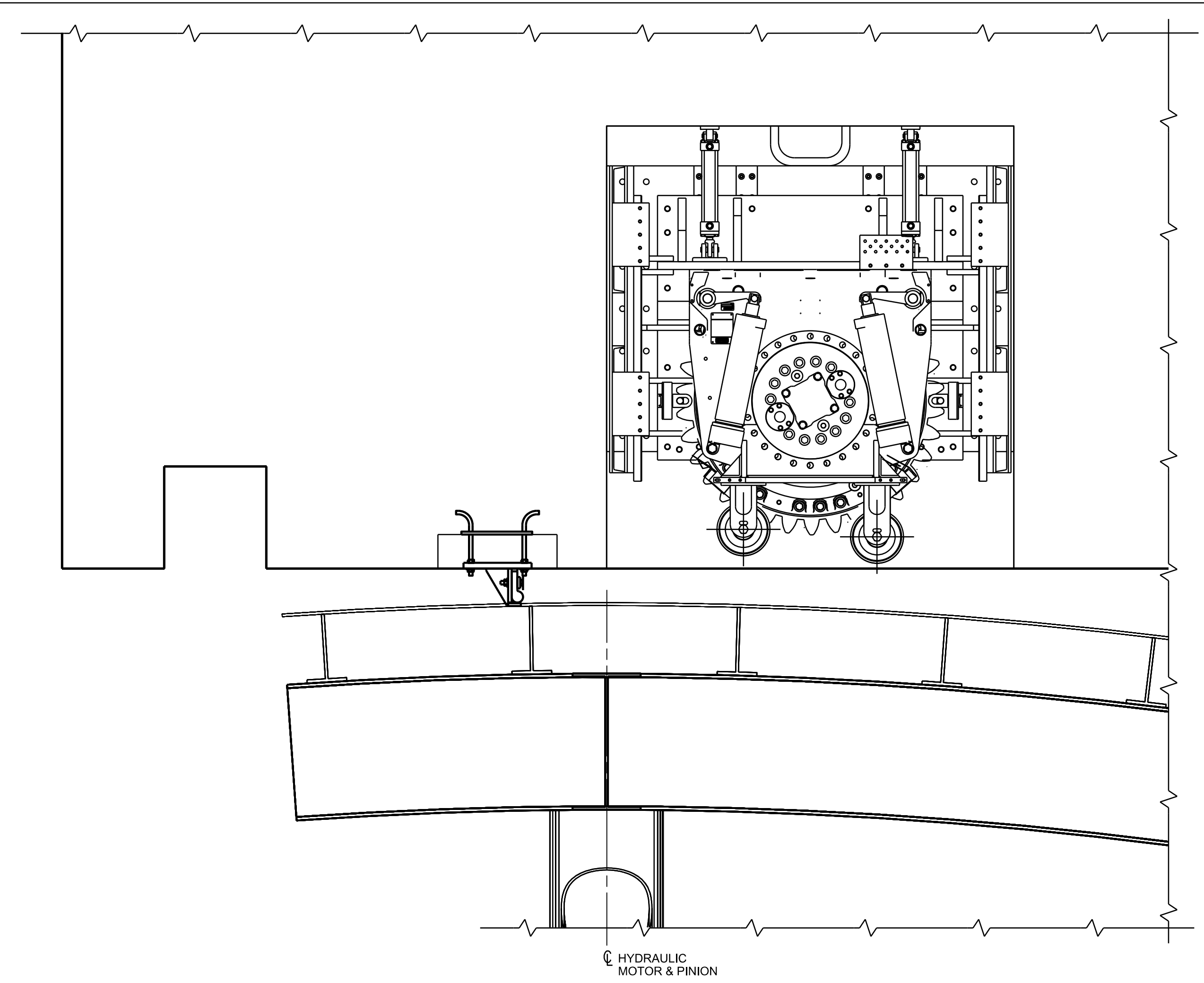
DICKINSON BAYOU  
FLOODGATE  
MONOLITH SECTION  
COASTAL TEXAS PROTECTION AND  
RESTORATION FEASIBILITY STUDY

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

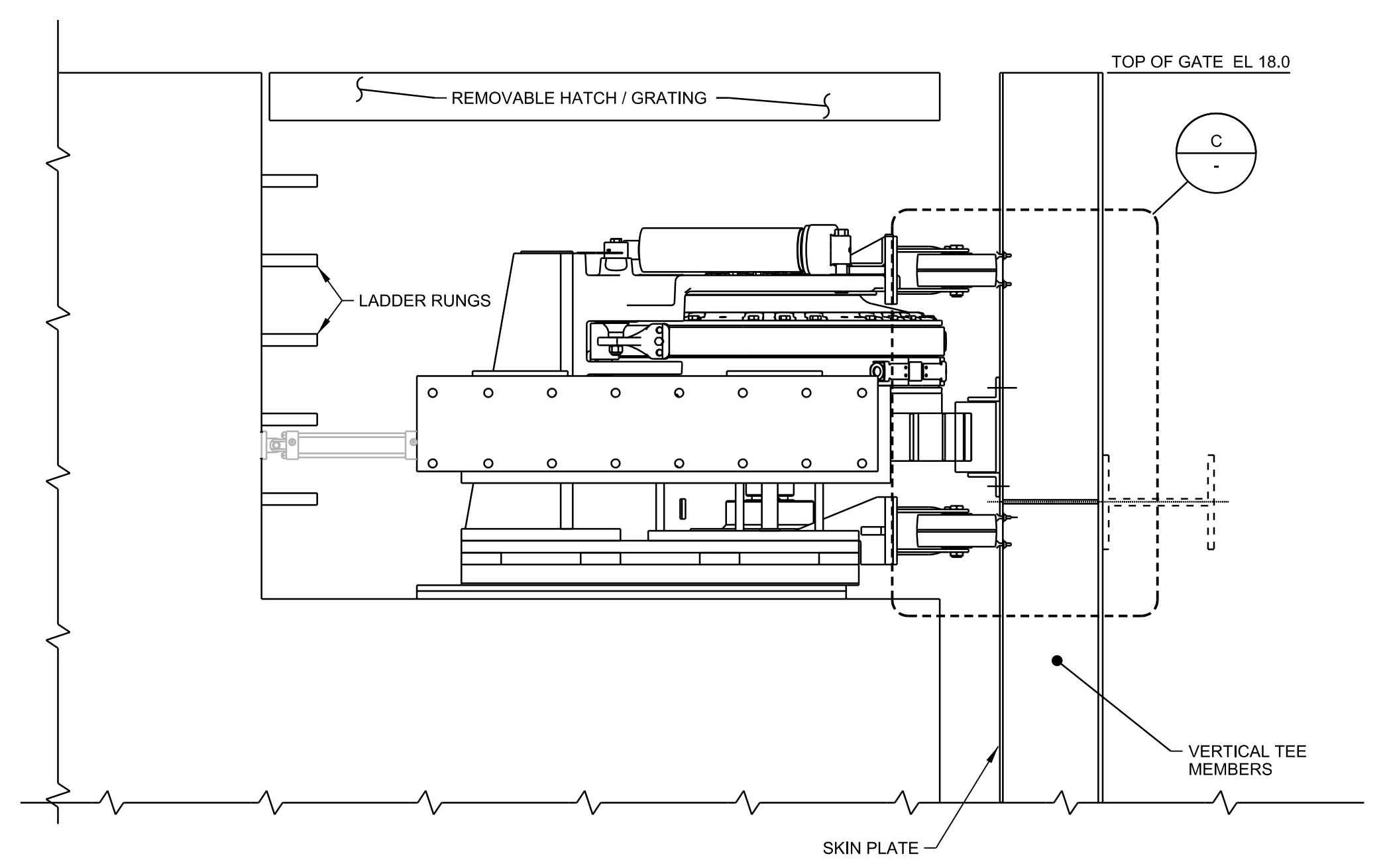
ENGINEERING APPENDIX  
DATED:  
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TETRA TECH, INC.



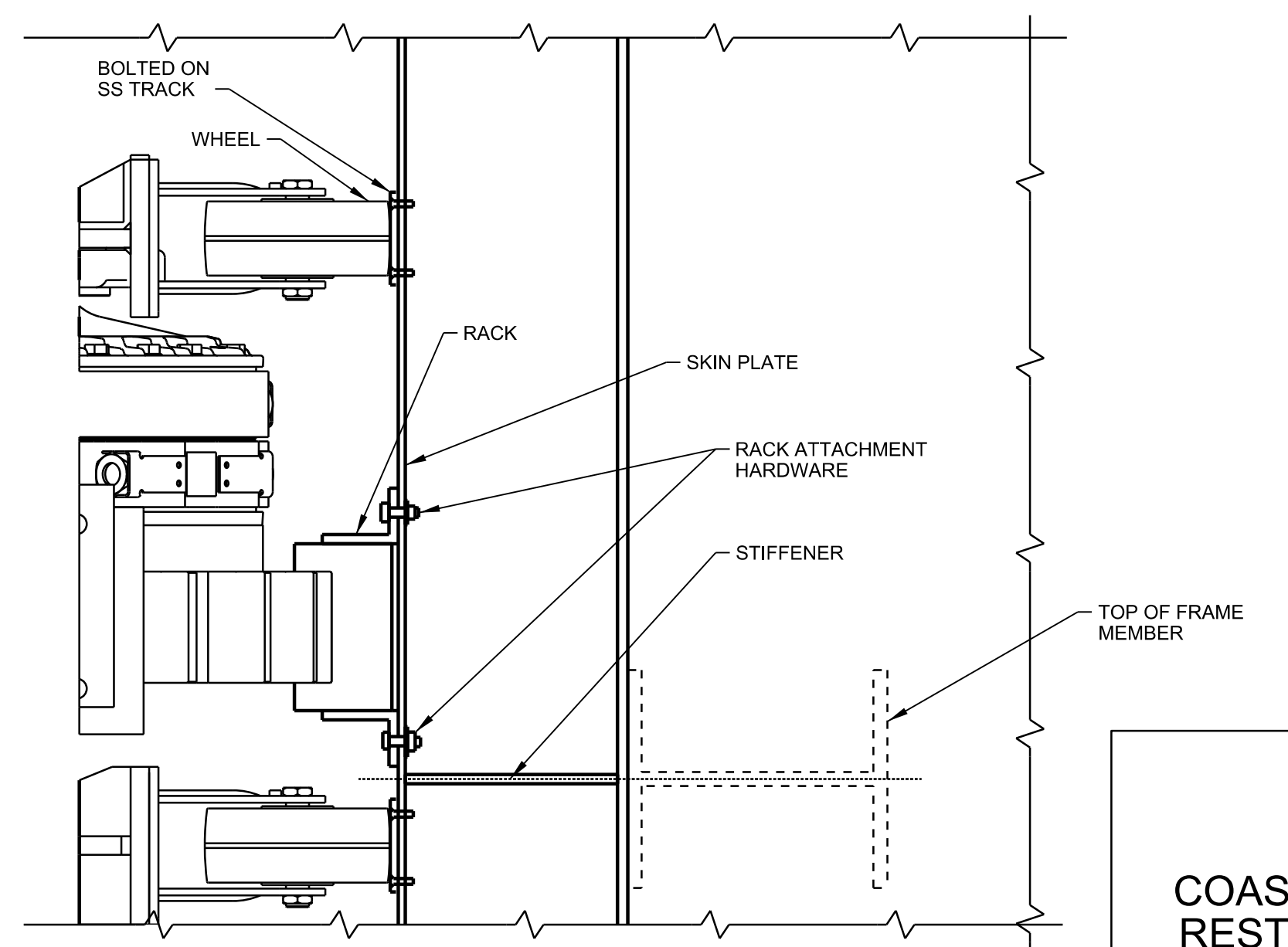
**E**  
22  
**OPERATOR IN EXTENDED POSITION**  
SCALE: 3/4" = 1'-0"  
0 1' 2' 4'



**A**  
**OPERATOR IN RETRACTED POSITION**  
SCALE: 3/4" = 1'-0"  
0 1' 2' 4'



**B**  
**SECTION**  
SCALE: 3/4" = 1'-0"  
0 1' 2' 4'



**C**  
**DETAIL**  
SCALE: 1 1/2" = 1'-0"  
0 6" 1' 2'

DICKINSON BAYOU  
FLOODGATE  
MECHANICAL OPERATOR  
**COASTAL TEXAS PROTECTION AND  
RESTORATION FEASIBILITY STUDY**  
U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS  
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TETRA TECH, INC.



31 BAYS @ 46'-5" SPAN = 1438'-11"

20'-0" 55'-0"

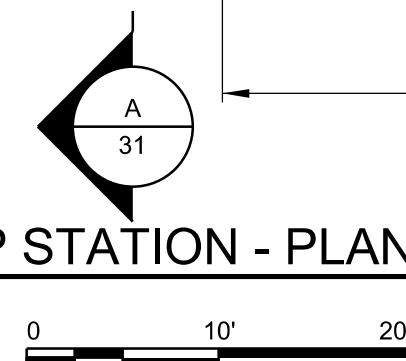
SAFE HOUSE/CONTROL ROOM

20'-9 1/8" 10'-9 1/2"

EQ TYP EQ TYP

46'-5" TYP 23'-2 1/2"

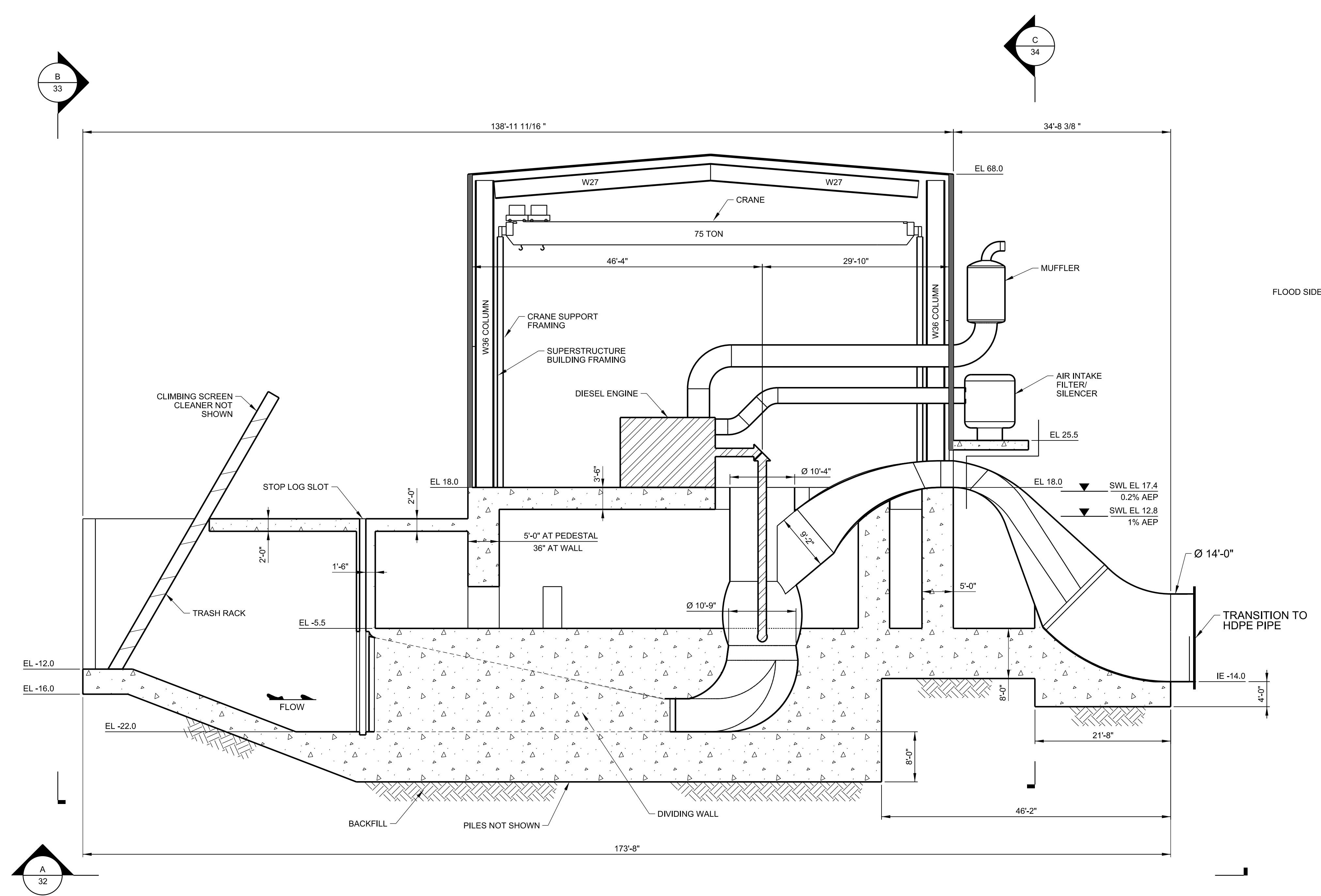
D 19 DICKINSON BAYOU PUMP STATION - PLAN SCALE: 1" = 10'



DICKINSON BAYOU PUMP STATION PLAN  
COASTAL TEXAS PROTECTION AND RESTORATION FEASIBILITY STUDY

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

ENGINEERING APPENDIX  
DATED:  
NOVEMBER 9, 2018  
TETRA TECH, INC.



LAND SIDE

FLOOD SIDE

B  
33

C  
34

A  
32

**DICKINSON BAYOU PUMP STATION - SECTION**  
 SCALE: 1" = 10'

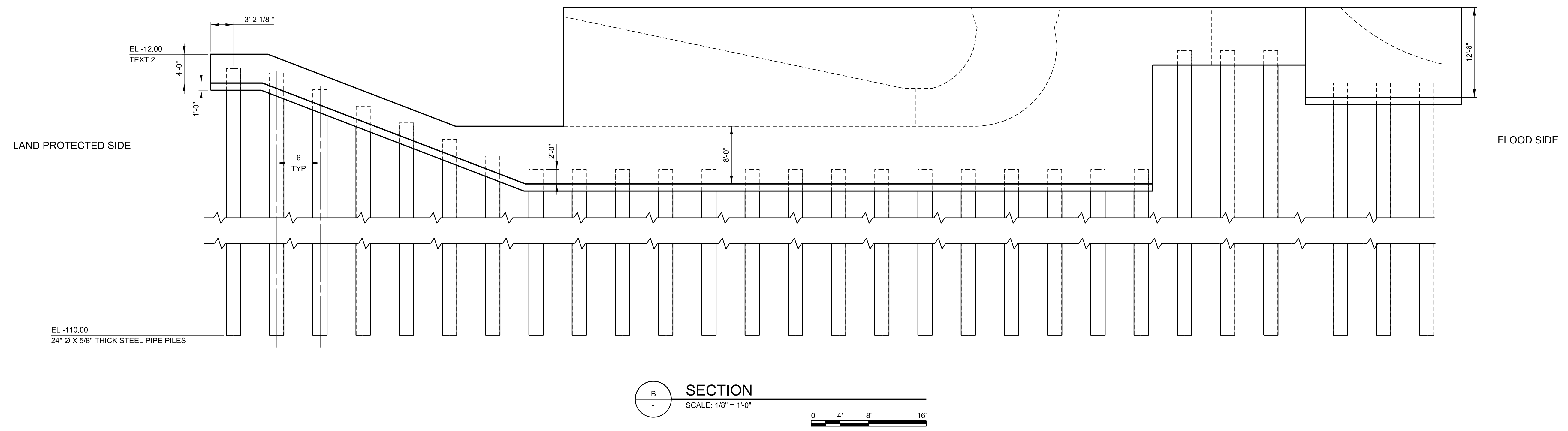
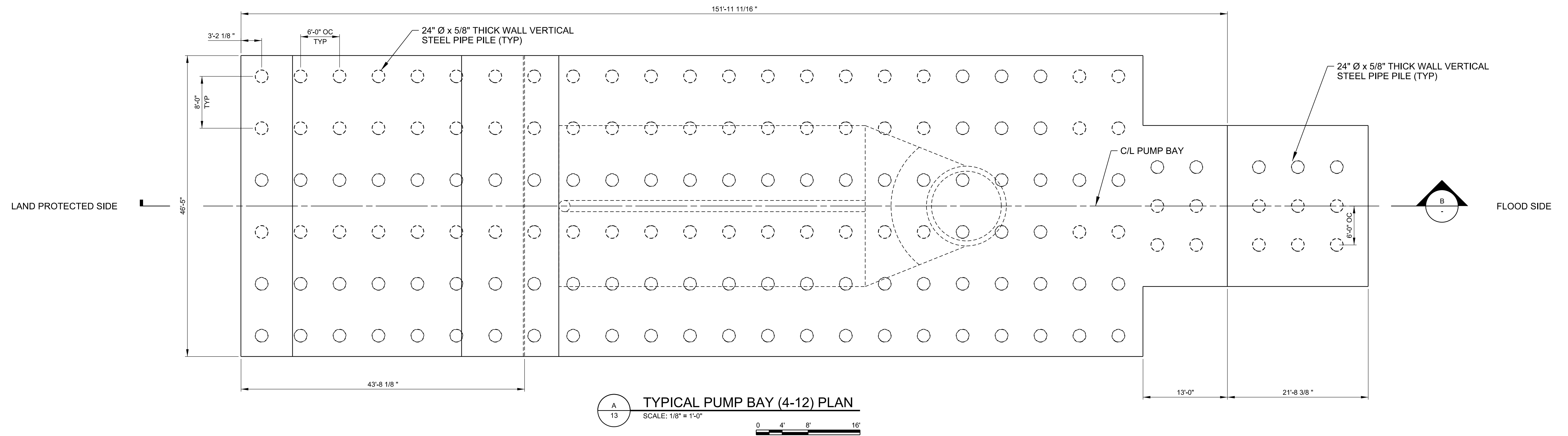
NOTES:  
 1. WATER LEVELS SHOWN ARE 90% CONFIDENCE LEVEL, 2085.

DICKINSON BAYOU PUMP STATION  
SECTION

**COASTAL TEXAS PROTECTION AND  
RESTORATION FEASIBILITY STUDY**

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

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 TETRA TECH, INC.



- NOTES:**
1. ALL PILES ARE 24"Ø. FOR FURTHER DETAILS, SEE CONTRACT SPECIFICATIONS
  2. MUD SLAB IS 2500 PSI LEAN CONCRETE 12" THICKNESS

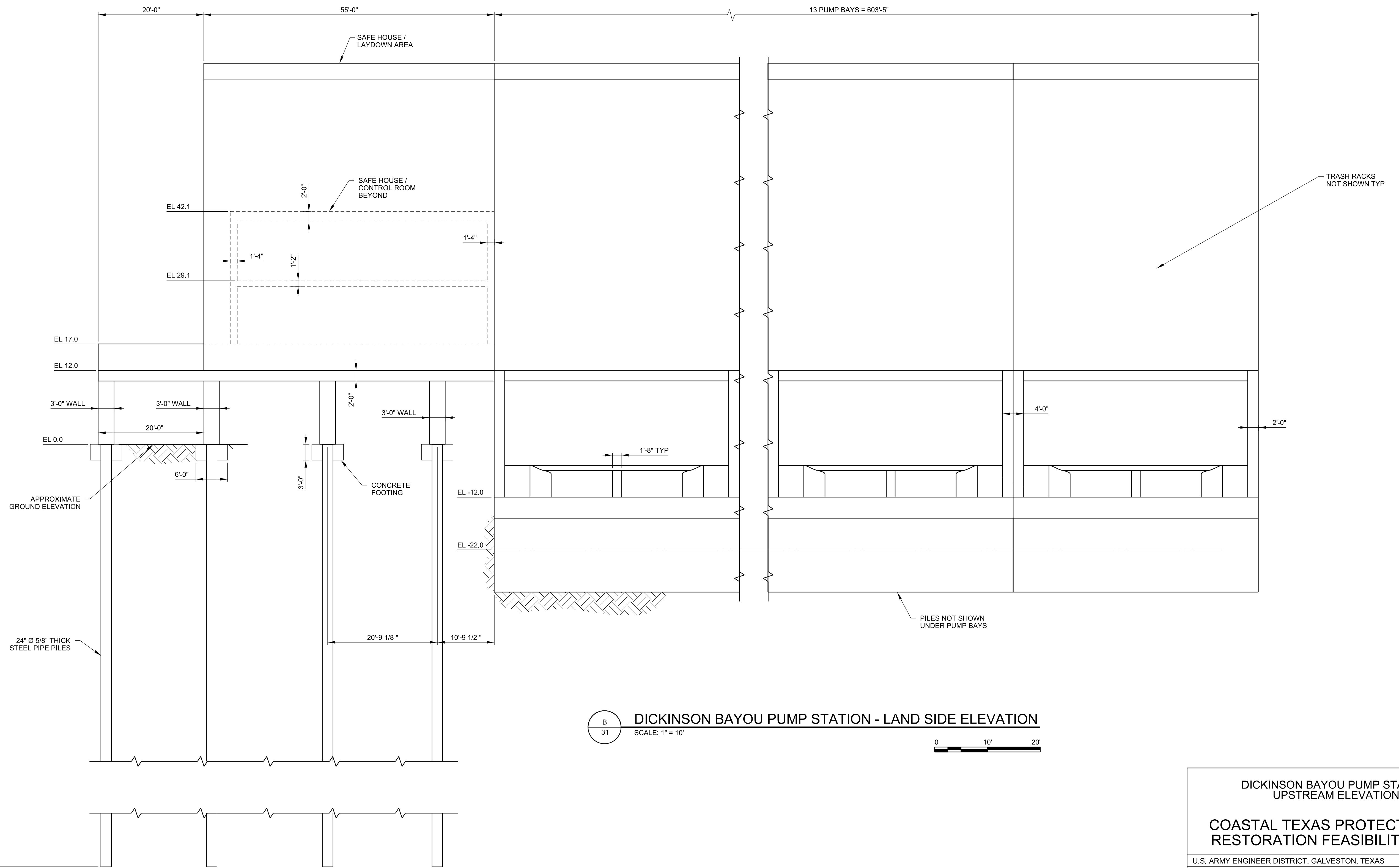
7. 1' HORIZONTAL TOLERANCE ON PUMP STATION PIPE PILE AND EXCAVATE AROUND PILE AND INCREASE FOOTING THICKNESS FOR VERTICAL TOLERANCE

**DICKINSON BAYOU PUMP STATION  
FOUNDATION PLAN**

**COASTAL TEXAS PROTECTION AND  
RESTORATION FEASIBILITY STUDY**

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

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DATED:  
NOVEMBER 9, 2018  
TETRA TECH, INC.



**DICKINSON BAYOU PUMP STATION - LAND SIDE ELEVATION**  
 SCALE: 1" = 10'

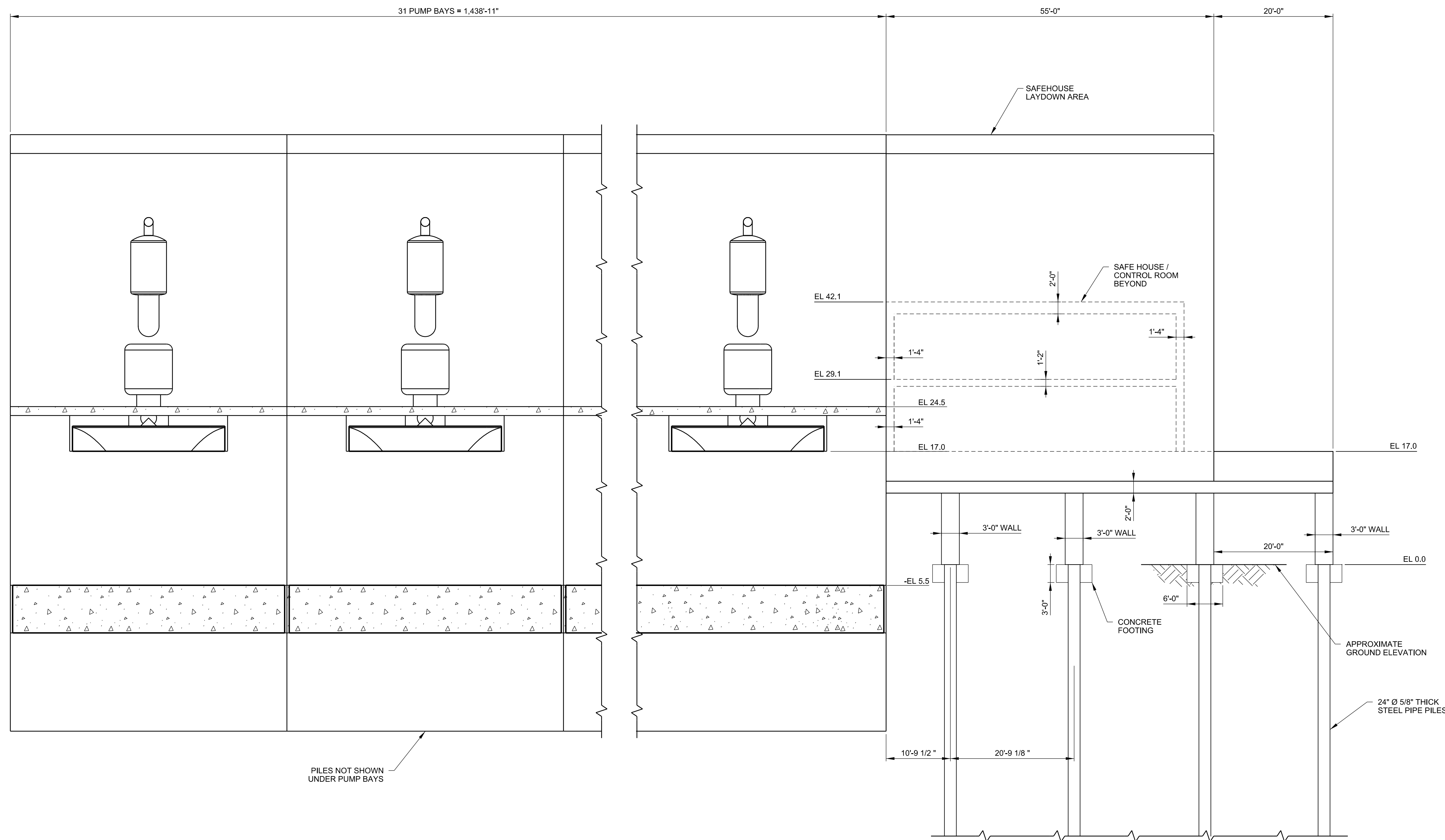
EL -80.00  
 24" Ø 5/8" THICK STEEL PIPE PILES @ 6'-0" O.C.  
 UNDER SAFE HOUSE SUPERSTRUCTURE BUILDING

**DICKINSON BAYOU PUMP STATION  
 UPSTREAM ELEVATION**

**COASTAL TEXAS PROTECTION AND  
 RESTORATION FEASIBILITY STUDY**

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

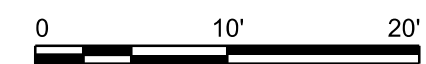
ENGINEERING APPENDIX  
 DATED:  
 NOVEMBER 9, 2018  
 TETRA TECH, INC.



**DICKINSON BAYOU PUMP STATION - FLOOD SIDE (DOWNSTREAM) ELEVATION**

C  
31

SCALE: 1" = 10'

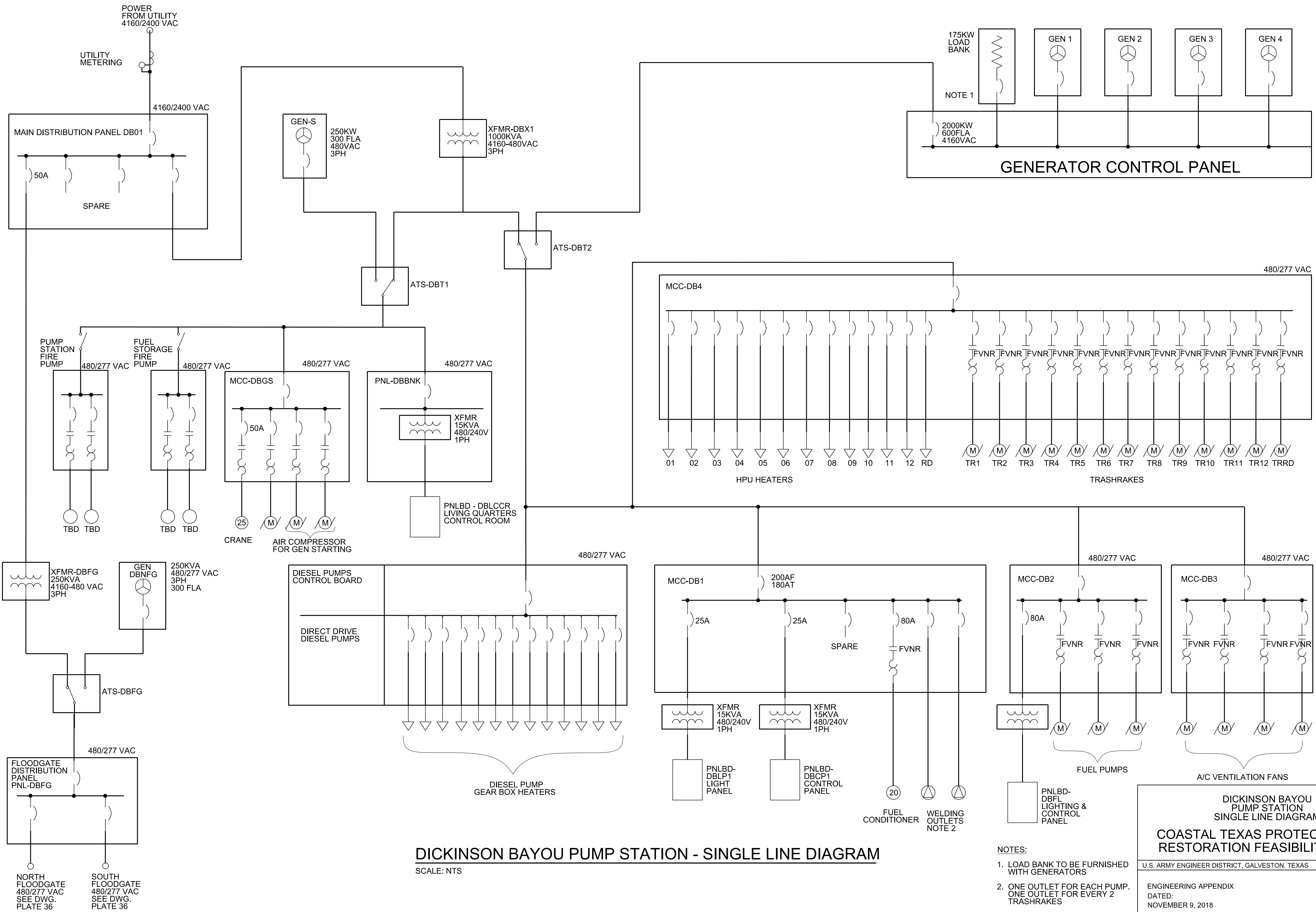


EL -80.00  
24" Ø 5/8" THICK STEEL PIPE PILES @ 6'-0" O.C.  
UNDER SAFE HOUSE SUPERSTRUCTURE BUILDING

DICKINSON BAYOU  
PUMP STATION  
DOWNSTREAM ELEVATION  
**COASTAL TEXAS PROTECTION AND  
RESTORATION FEASIBILITY STUDY**

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

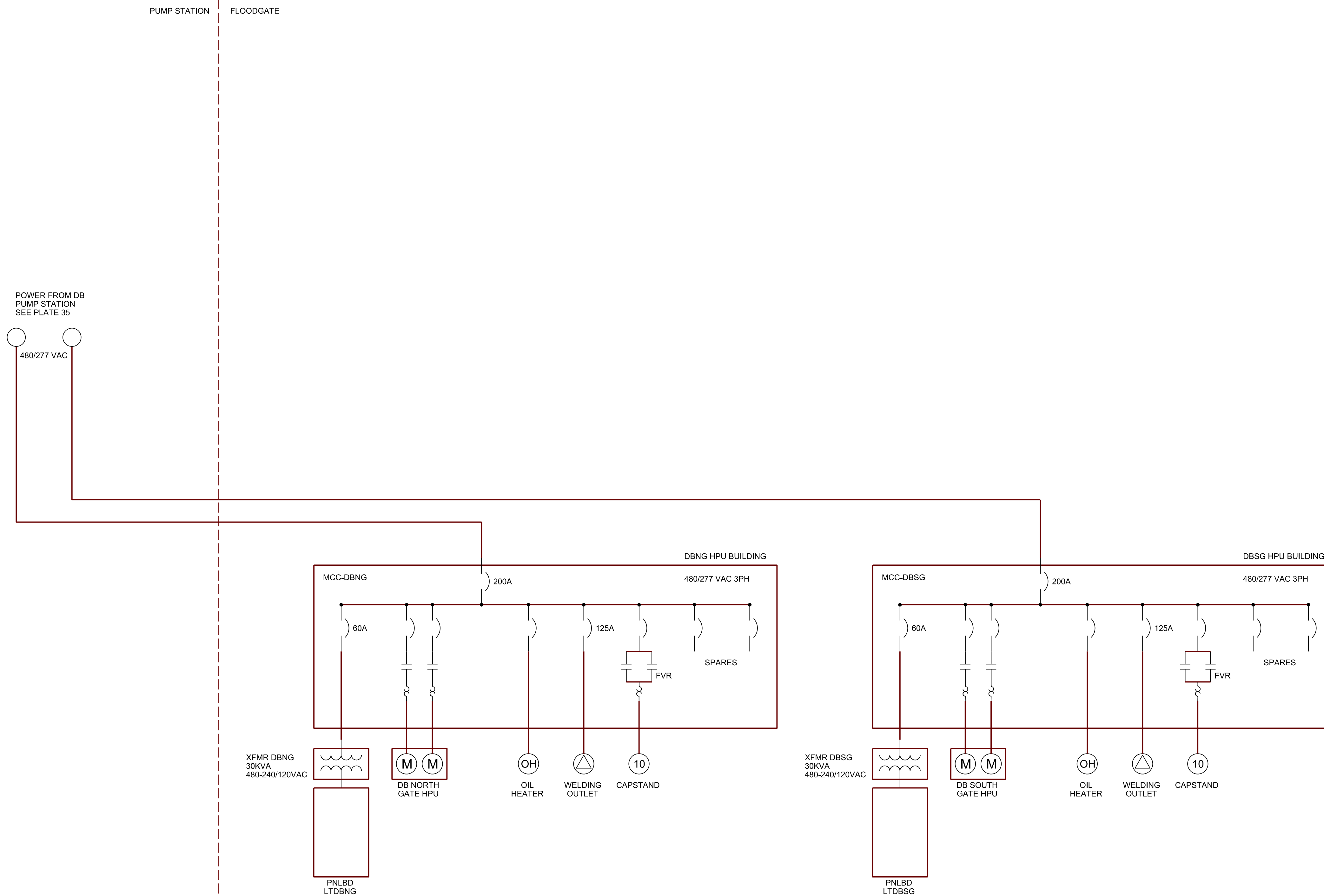
ENGINEERING APPENDIX  
DATED:  
NOVEMBER 9, 2018  
TETRA TECH, INC.



**DICKINSON BAYOU PUMP STATION - SINGLE LINE DIAGRAM**  
 SCALE: NTS

- NOTES:**
- LOAD BANK TO BE FURNISHED WITH GENERATORS
  - ONE OUTLET FOR EACH PUMP. ONE OUTLET FOR EVERY 2 TRASHRAKES

DICKINSON BAYOU PUMP STATION  
 SINGLE LINE DIAGRAM  
**COASTAL TEXAS PROTECTION AND RESTORATION FEASIBILITY STUDY**  
 U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS  
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 TETRA TECH, INC.



**DICKINSON BAYOU - FLOODGATE - SINGLE LINE DIAGRAM**  
 SCALE: NTS

**LEGEND**  
 DB - DICKINSON BAYOU  
 NG - NORTH GATE  
 SG - SOUTH GATE

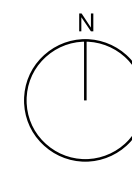
DICKINSON BAYOU  
 FLOODGATE  
 SINGLE LINE DIAGRAM

**COASTAL TEXAS PROTECTION AND  
 RESTORATION FEASIBILITY STUDY**

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

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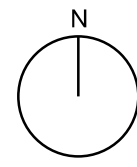
ENGINEERING APPENDIX  
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 NOVEMBER 9, 2018  
 TETRA TECH, INC.



**GALVESTON ISLAND - VICINITY PLAN**  
SCALE: 1" = 2000'

<b>GALVESTON ISLAND PUMP STATIONS VICINITY PLAN</b>
<b>COASTAL TEXAS PROTECTION AND RESTORATION FEASIBILITY STUDY</b>
U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS
ENGINEERING APPENDIX DATED: NOVEMBER 9, 2018 TETRA TECH, INC.





1  
39



OFFATTS  
BAYOU



GALVESTON ISLAND PUMP STATION 1

KEYPLAN

G11  
37

**GALVESTON ISLAND PUMP STATION 1 - GENERAL PLAN**

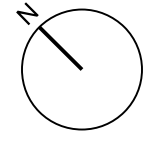
SCALE: 1" = 200'

0 200' 400'

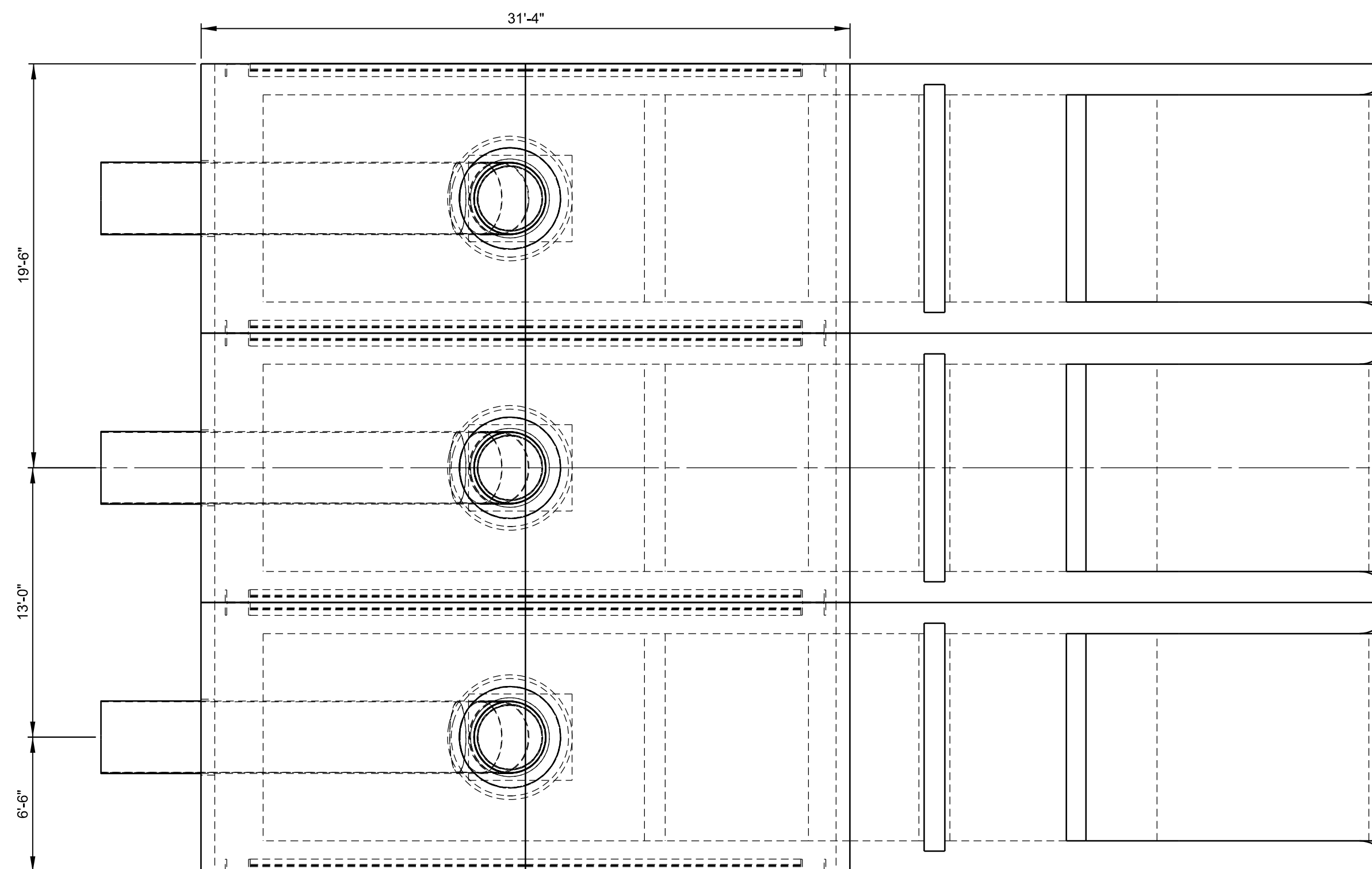
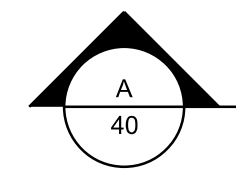
GALVESTON ISLAND  
PUMP STATION 1  
GENERAL PLAN  
**COASTAL TEXAS PROTECTION AND  
RESTORATION FEASIBILITY STUDY**

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

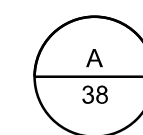
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GALVESTON BAY SIDE

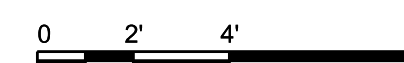


OFFATTS BAYOU SIDE



**GALVESTON ISLAND - PUMP STATION 1 - PLAN**

SCALE: 3/16" = 1'-0"



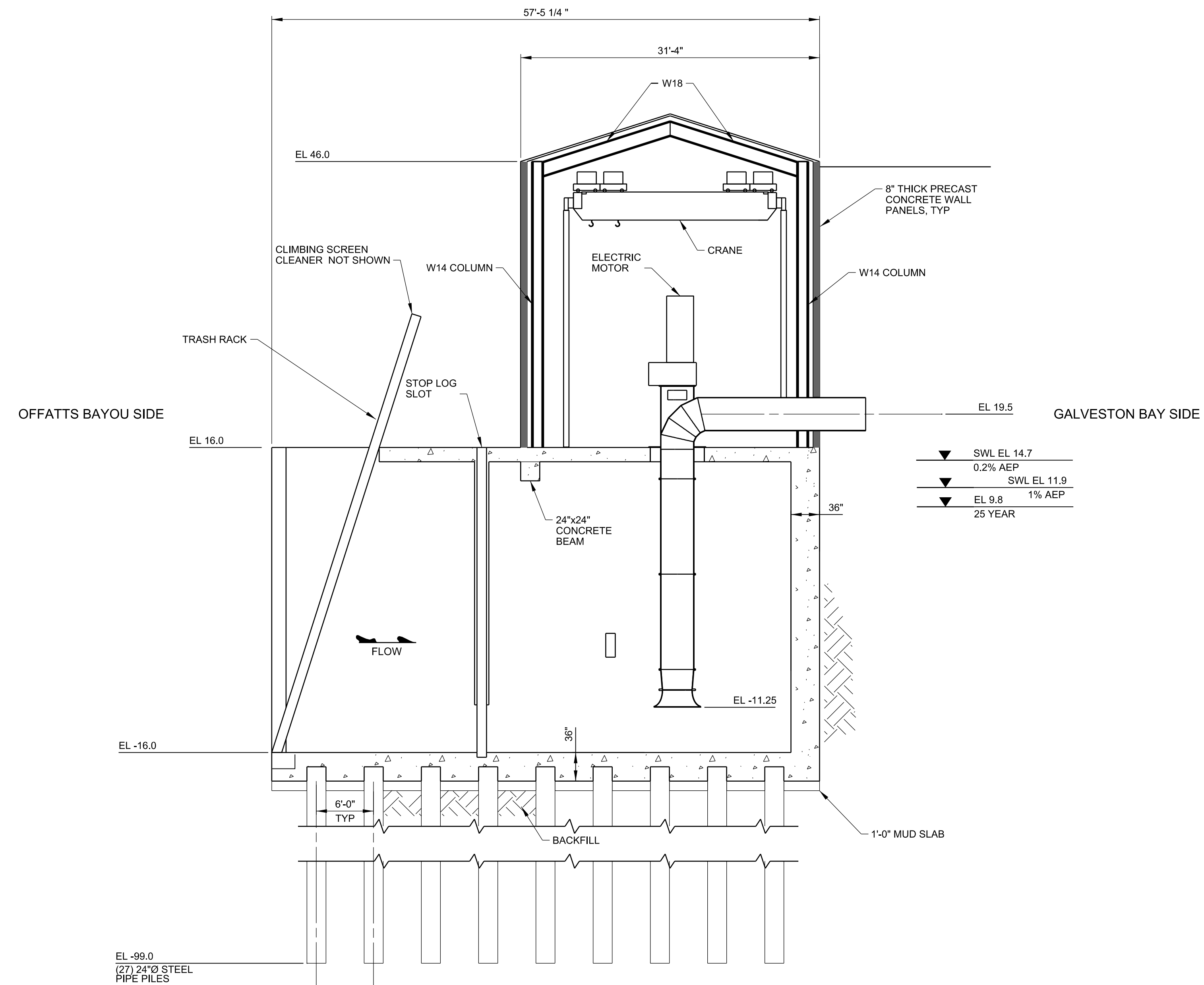
GALVESTON ISLAND  
PUMP STATION 1  
PLAN  
COASTAL TEXAS PROTECTION AND  
RESTORATION FEASIBILITY STUDY

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TETRA TECH, INC.

NOTES:

- 1. ALL PILES ARE 24"Ø.
- 2. MUD SLAB IS 2500 PSI LEAN CONCRETE, 12" THICKNESS.

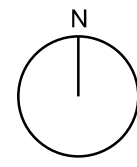


**A**  
39 GALVESTON ISLAND PUMP STATION 1 - SECTION  
SCALE: 1/8" = 1'-0"

GALVESTON ISLAND  
PUMP STATION 1  
SECTION  
COASTAL TEXAS PROTECTION AND  
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U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

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**KEYPLAN**



G12  
37

**GALVESTON ISLAND PUMP STATION 2 - GENERAL PLAN**

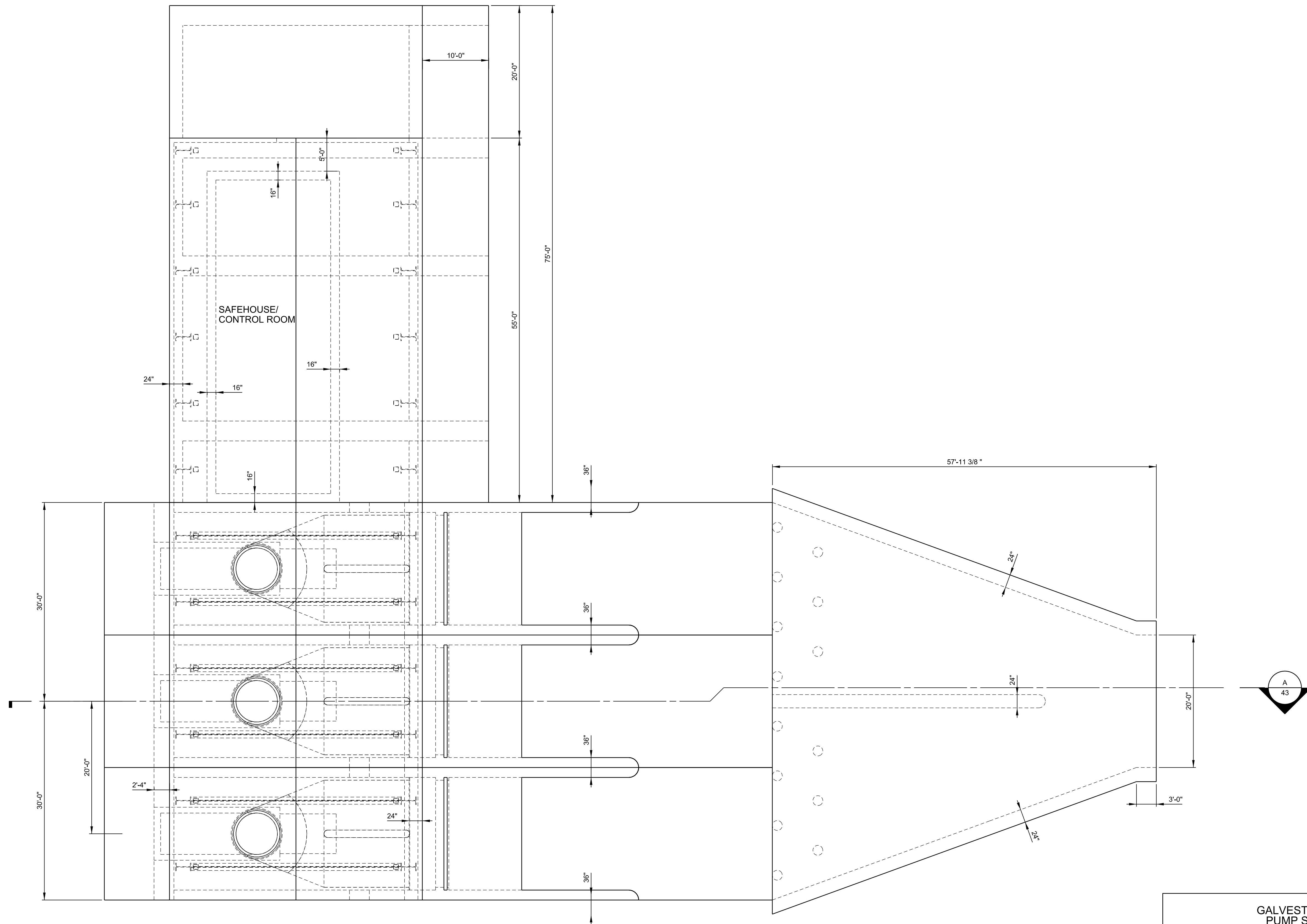
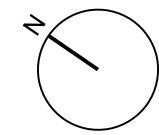
SCALE: 1" = 200'



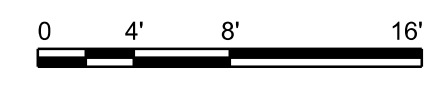
**GALVESTON ISLAND  
PUMP STATION 2  
GENERAL PLAN**  
**COASTAL TEXAS PROTECTION AND  
RESTORATION FEASIBILITY STUDY**

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

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TETRA TECH, INC.

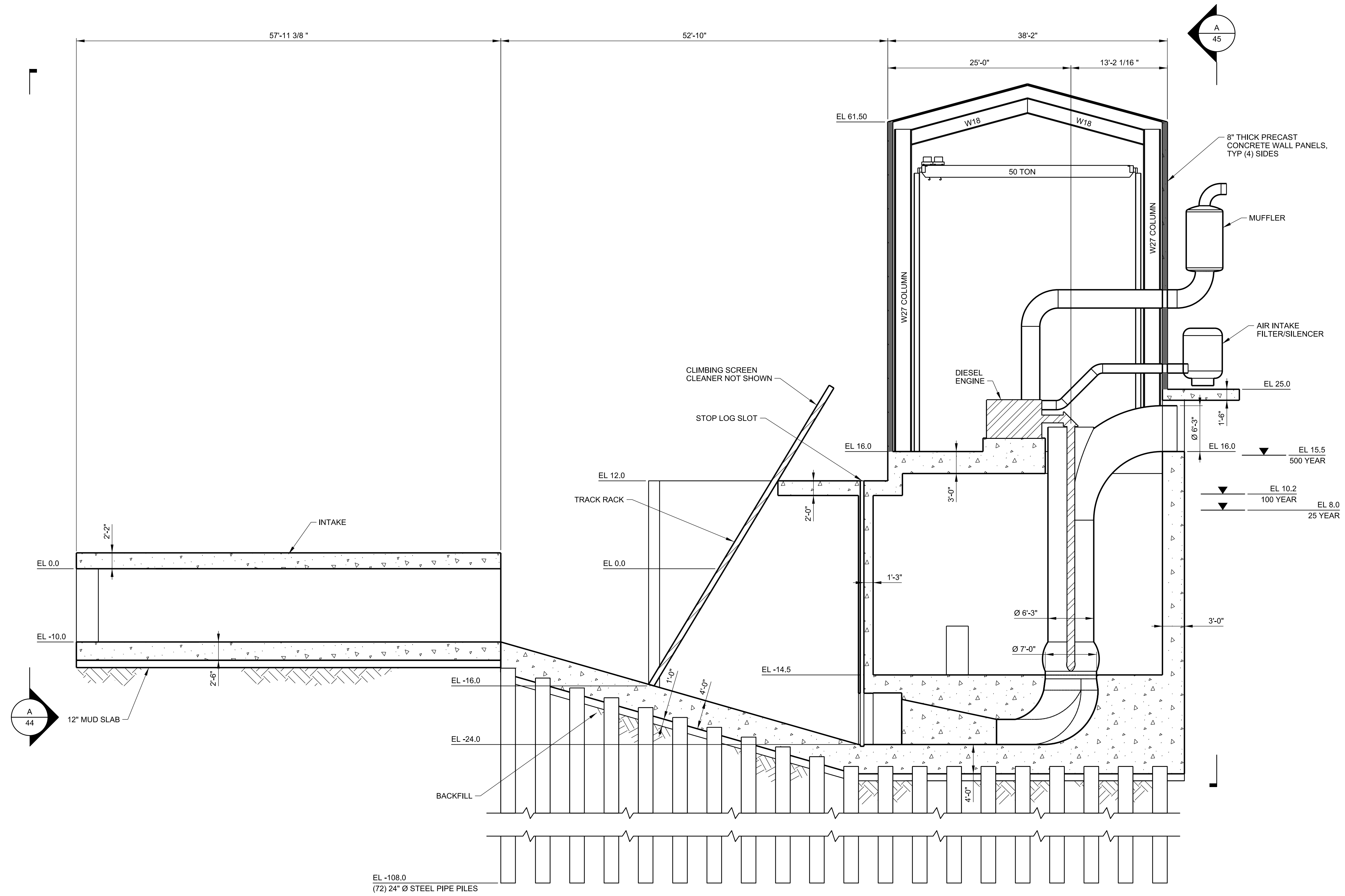


A  
41 GALVESTON ISLAND PUMP STATION 2 - PLAN  
SCALE: 1/8" = 1'-0"

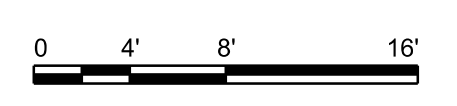


GALVESTON ISLAND  
PUMP STATION 2  
PLAN  
COASTAL TEXAS PROTECTION AND  
RESTORATION FEASIBILITY STUDY  
U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

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TETRA TECH, INC.



GALVESTON ISLAND PUMP STATION 2 - SECTION  
 SCALE: 1/8" = 1'-0"

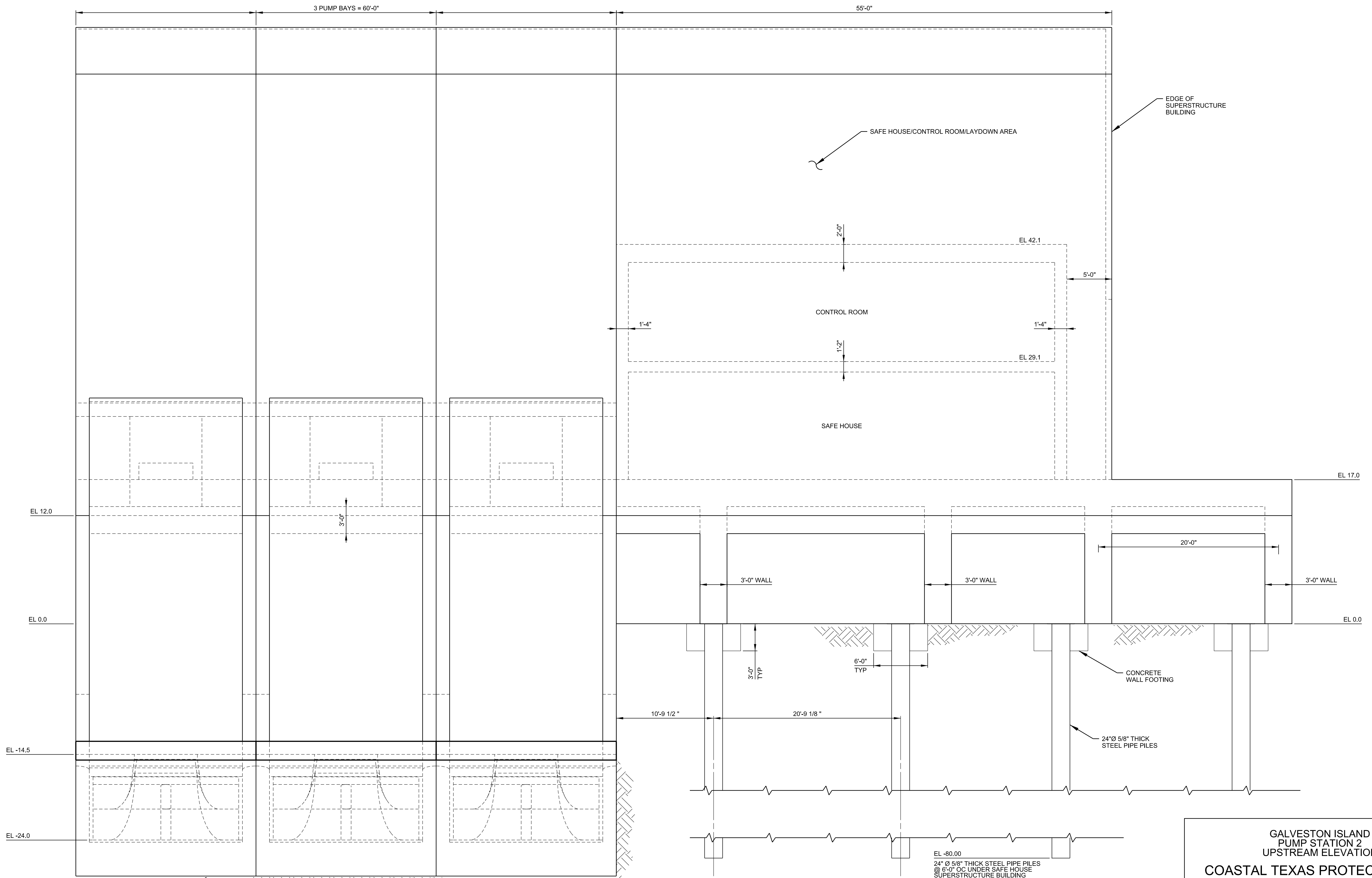


GALVESTON ISLAND  
 PUMP STATION 2  
 SECTION

COASTAL TEXAS PROTECTION AND  
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U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

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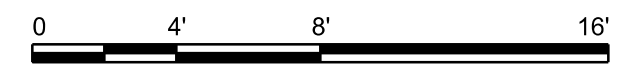


PILES NOT SHOWN UNDER PUMP BAYS

A  
43

**GALVESTON ISLAND PUMP STATION 2 - UPSTREAM ELEVATION**

SCALE: 3/16" = 1'-0"

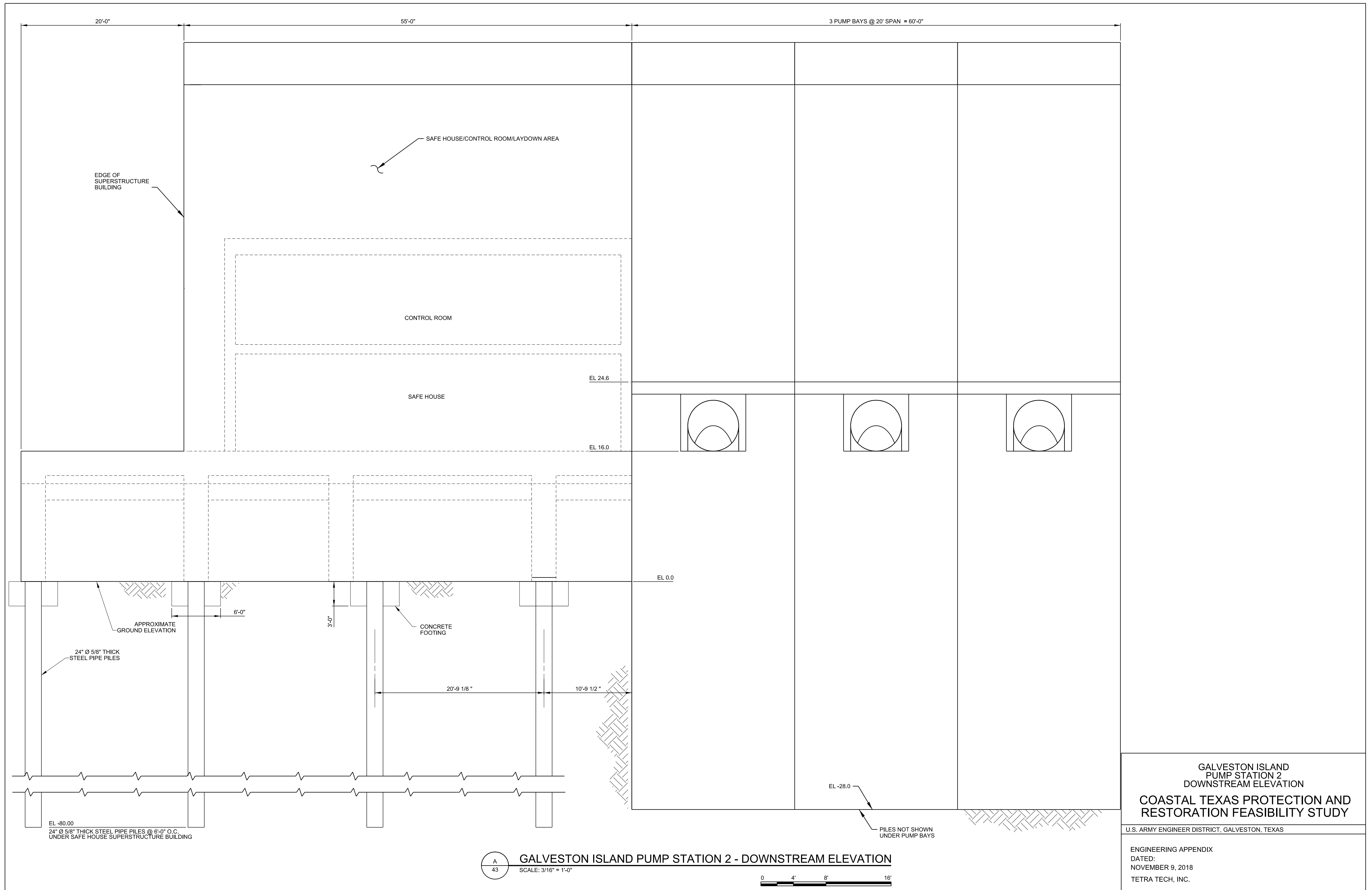


EL -80.00  
24" Ø 5/8" THICK STEEL PIPE PILES @ 6'-0" OC UNDER SAFE HOUSE SUPERSTRUCTURE BUILDING

**GALVESTON ISLAND PUMP STATION 2 UPSTREAM ELEVATION**  
**COASTAL TEXAS PROTECTION AND RESTORATION FEASIBILITY STUDY**

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

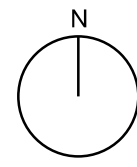
ENGINEERING APPENDIX  
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TETRA TECH, INC.



GALVESTON ISLAND  
 PUMP STATION 2  
 DOWNSTREAM ELEVATION  
**COASTAL TEXAS PROTECTION AND  
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 DATED:  
 NOVEMBER 9, 2018  
 TETRA TECH, INC.





KEYPLAN

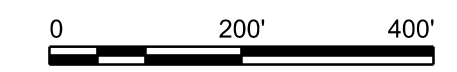
GALVESTON ISLAND PUMP STATION 3



G13  
37

**GALVESTON ISLAND PUMP STATION 3 - GENERAL PLAN**

SCALE: 1" = 200'

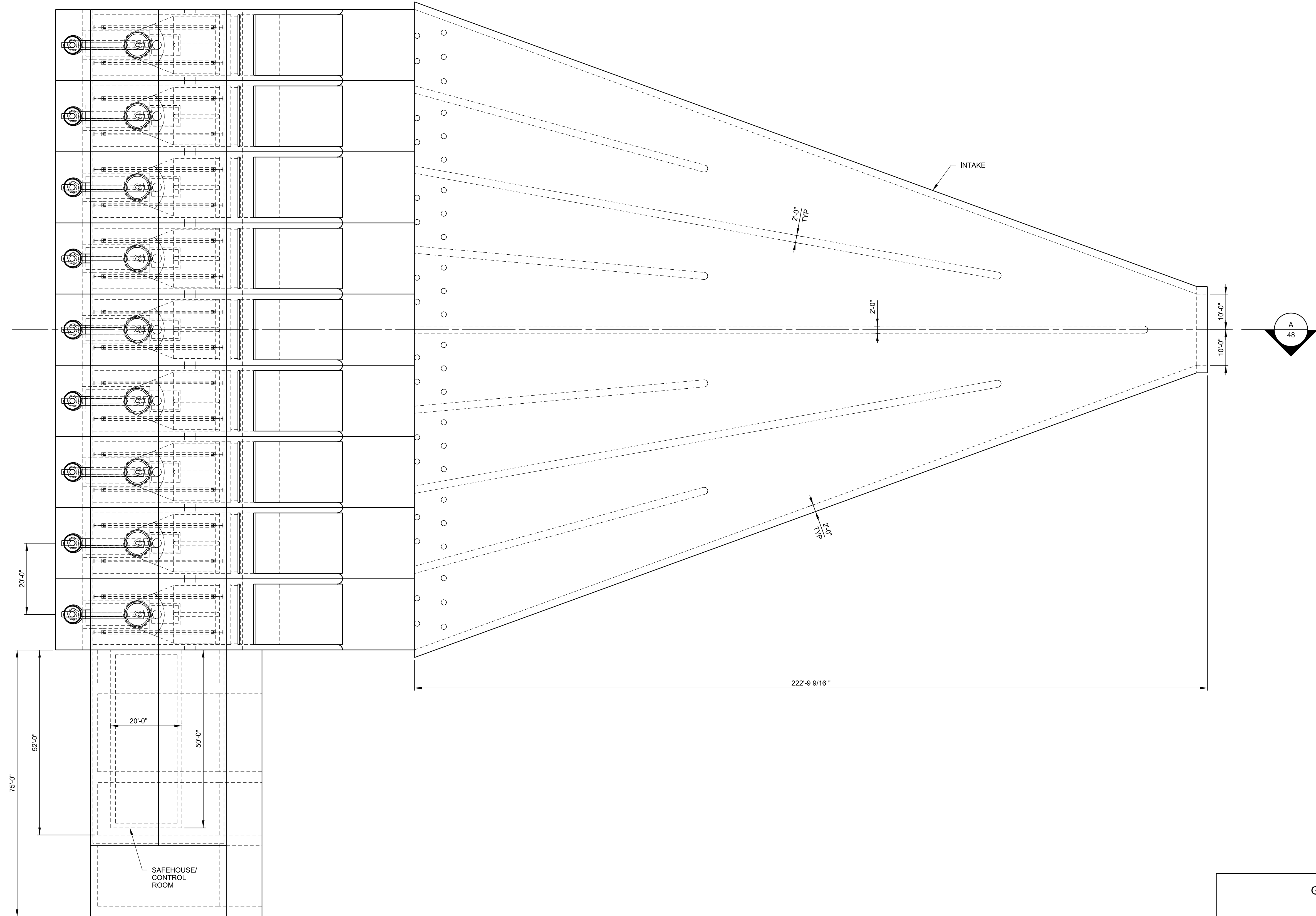
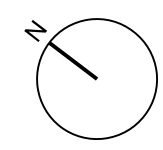


1  
47

**GALVESTON ISLAND  
PUMP STATION 3  
GENERAL PLAN**  
**COASTAL TEXAS PROTECTION AND  
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TETRA TECH, INC.



20'-0"

75'-0"

52'-0"

20'-0"

50'-0"

SAFEHOUSE/  
CONTROL  
ROOM

INTAKE

2'-0"  
TYP

2'-0"

2'-0"  
TYP

222'-9 9/16"

A  
48

A  
46

GALVESTON ISLAND PUMP STATION 3 - PLAN

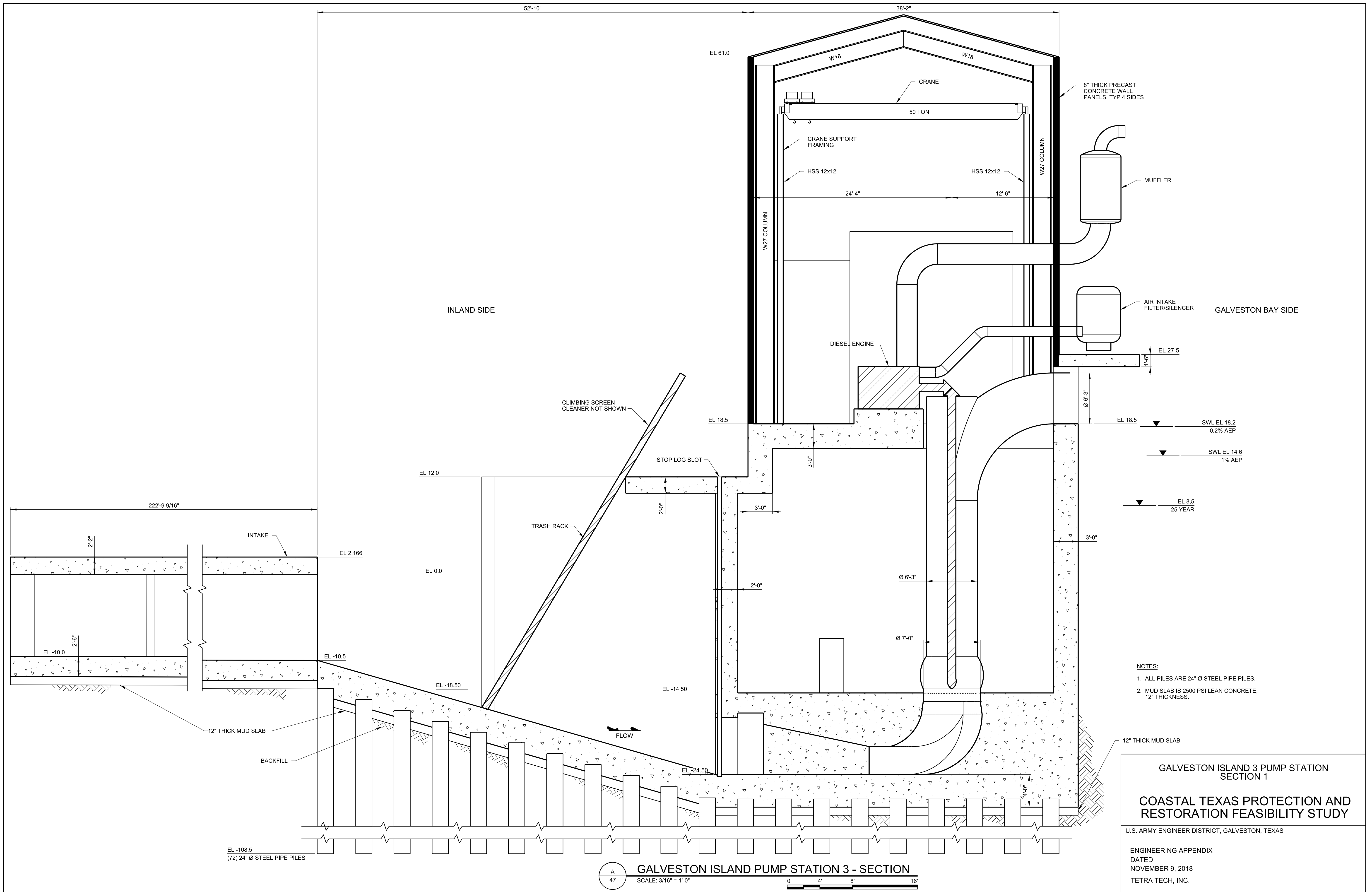
SCALE: 1" = 15'



GALVESTON ISLAND  
PUMP STATION 3  
PLAN  
COASTAL TEXAS PROTECTION AND  
RESTORATION FEASIBILITY STUDY

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

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TETRA TECH, INC.



- NOTES:
1. ALL PILES ARE 24" Ø STEEL PIPE PILES.
  2. MUD SLAB IS 2500 PSI LEAN CONCRETE, 12" THICKNESS.

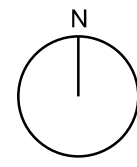
GALVESTON ISLAND 3 PUMP STATION  
SECTION 1

**COASTAL TEXAS PROTECTION AND  
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**GALVESTON ISLAND PUMP STATION 3 - SECTION**  
SCALE: 3/16" = 1'-0"



KEYPLAN



G14  
37

**GALVESTON ISLAND PUMP STATION 4 - GENERAL PLAN**

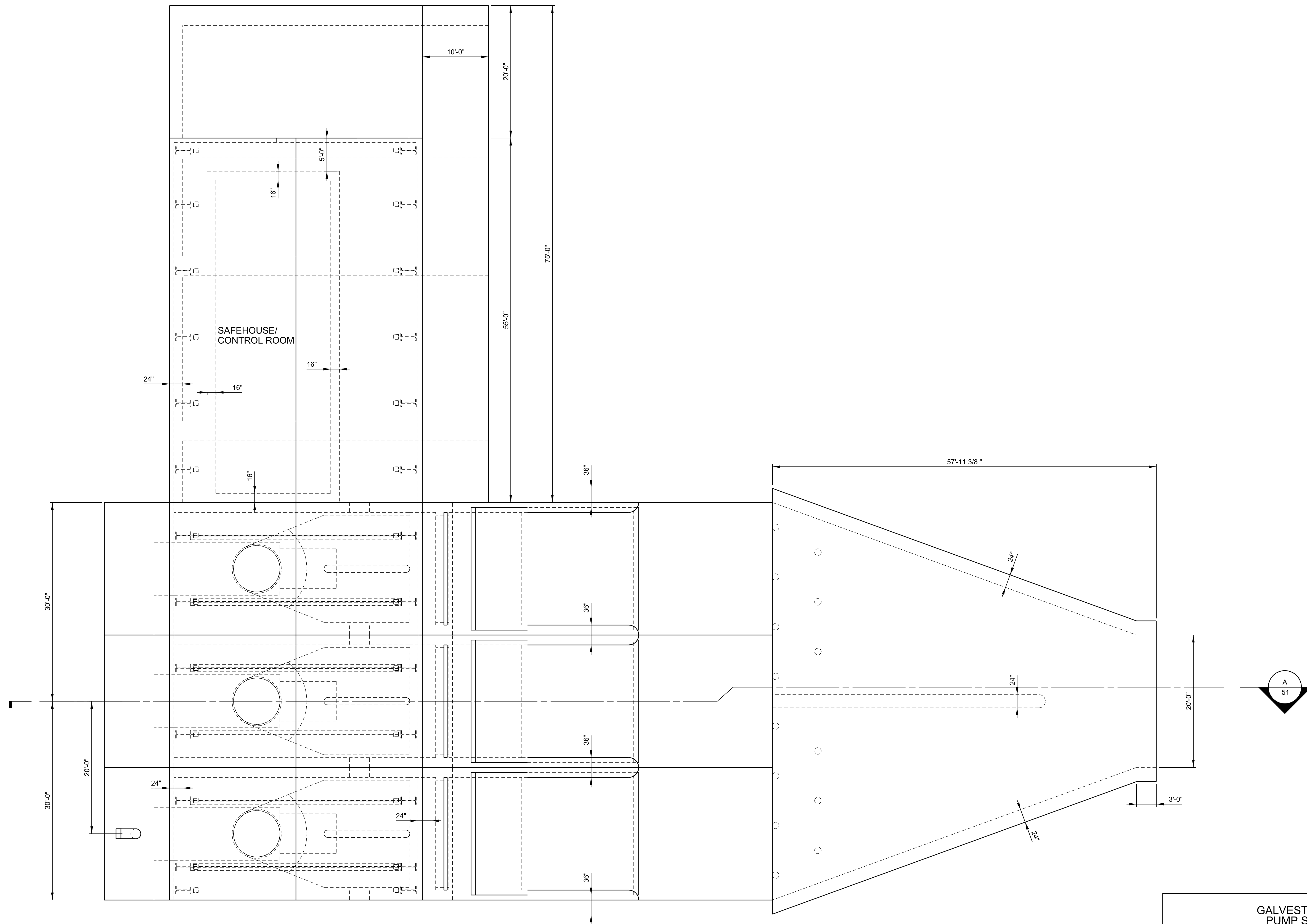
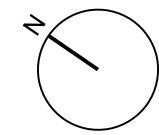
SCALE: 1" = 200'



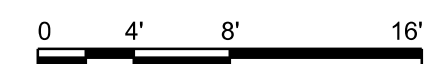
GALVESTON ISLAND  
PUMP STATION 4  
GENERAL PLAN  
**COASTAL TEXAS PROTECTION AND  
RESTORATION FEASIBILITY STUDY**

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

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TETRA TECH, INC.



**A**  
50  
**GALVESTON ISLAND PUMP STATION 4 - PLAN**  
SCALE: 1/8" = 1'-0"

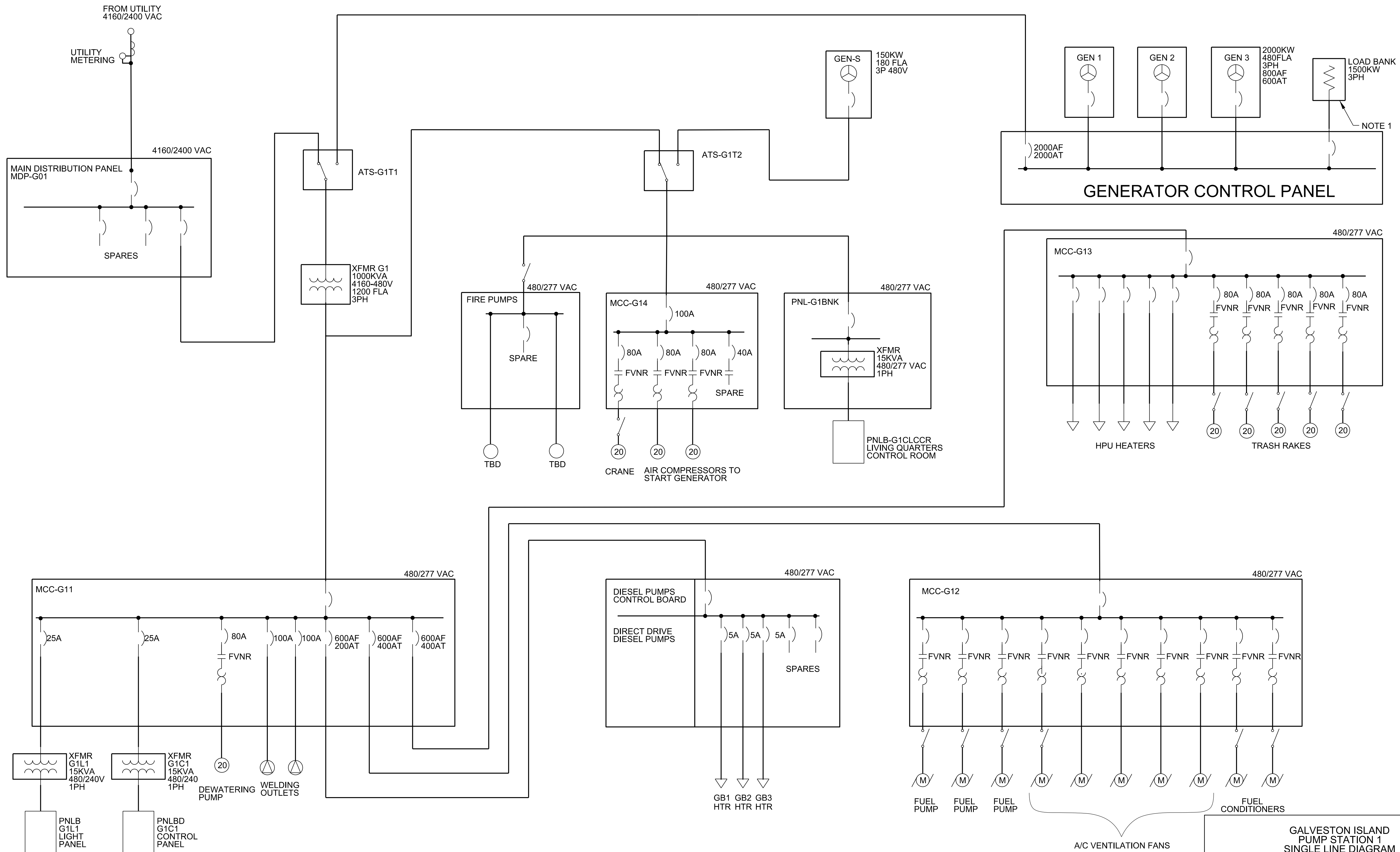


**GALVESTON ISLAND  
PUMP STATION 4  
PLAN**  
**COASTAL TEXAS PROTECTION AND  
RESTORATION FEASIBILITY STUDY**

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

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TETRA TECH, INC.





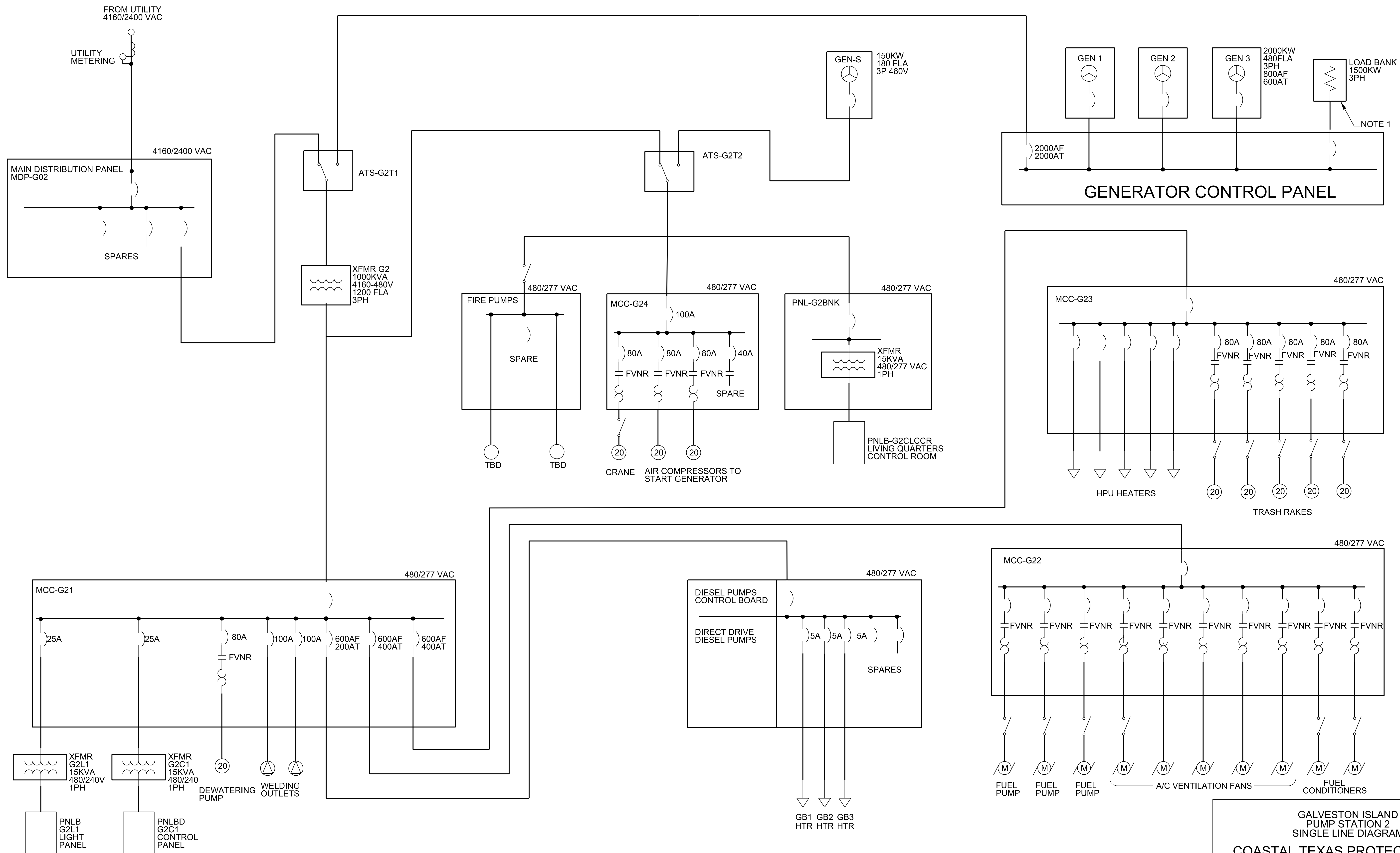
**GALVESTON PUMP STATION 1 - SINGLE LINE DIAGRAM**  
SCALE: NTS

- NOTES:**
1. LOAD BANK TO BE FURNISHED WITH GENERATORS.

GALVESTON ISLAND  
PUMP STATION 1  
SINGLE LINE DIAGRAM  
**COASTAL TEXAS PROTECTION AND  
RESTORATION FEASIBILITY STUDY**  
U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

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DATED:  
NOVEMBER 9, 2018  
TETRA TECH, INC.

%OPTIONAL VALUE 1%



**GALVESTON PUMP STATION 2 - SINGLE LINE DIAGRAM**

SCALE: NTS

**NOTES:**

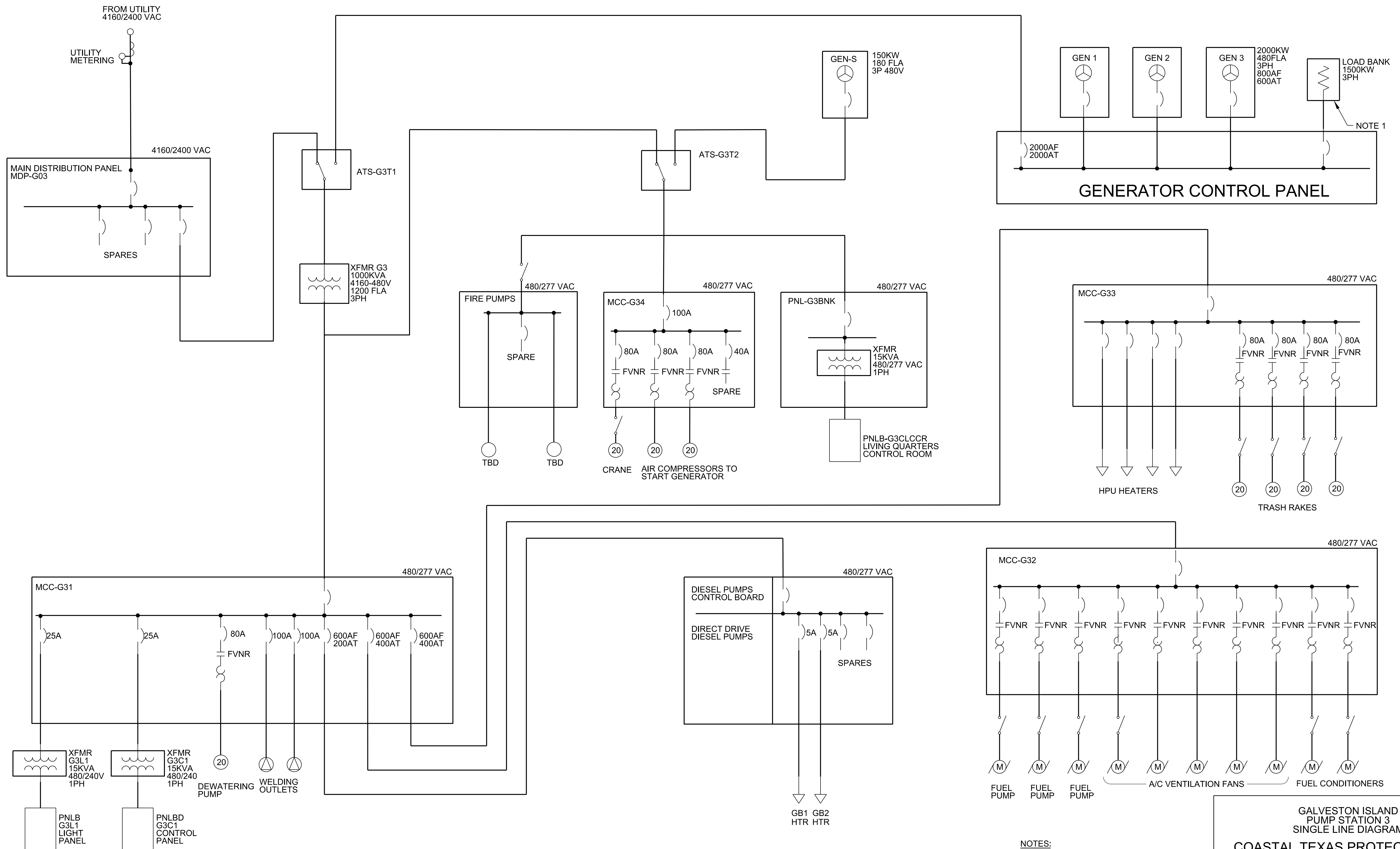
- 1. LOAD BANK TO BE FURNISHED WITH GENERATORS.

GALVESTON ISLAND  
PUMP STATION 2  
SINGLE LINE DIAGRAM  
**COASTAL TEXAS PROTECTION AND RESTORATION FEASIBILITY STUDY**

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

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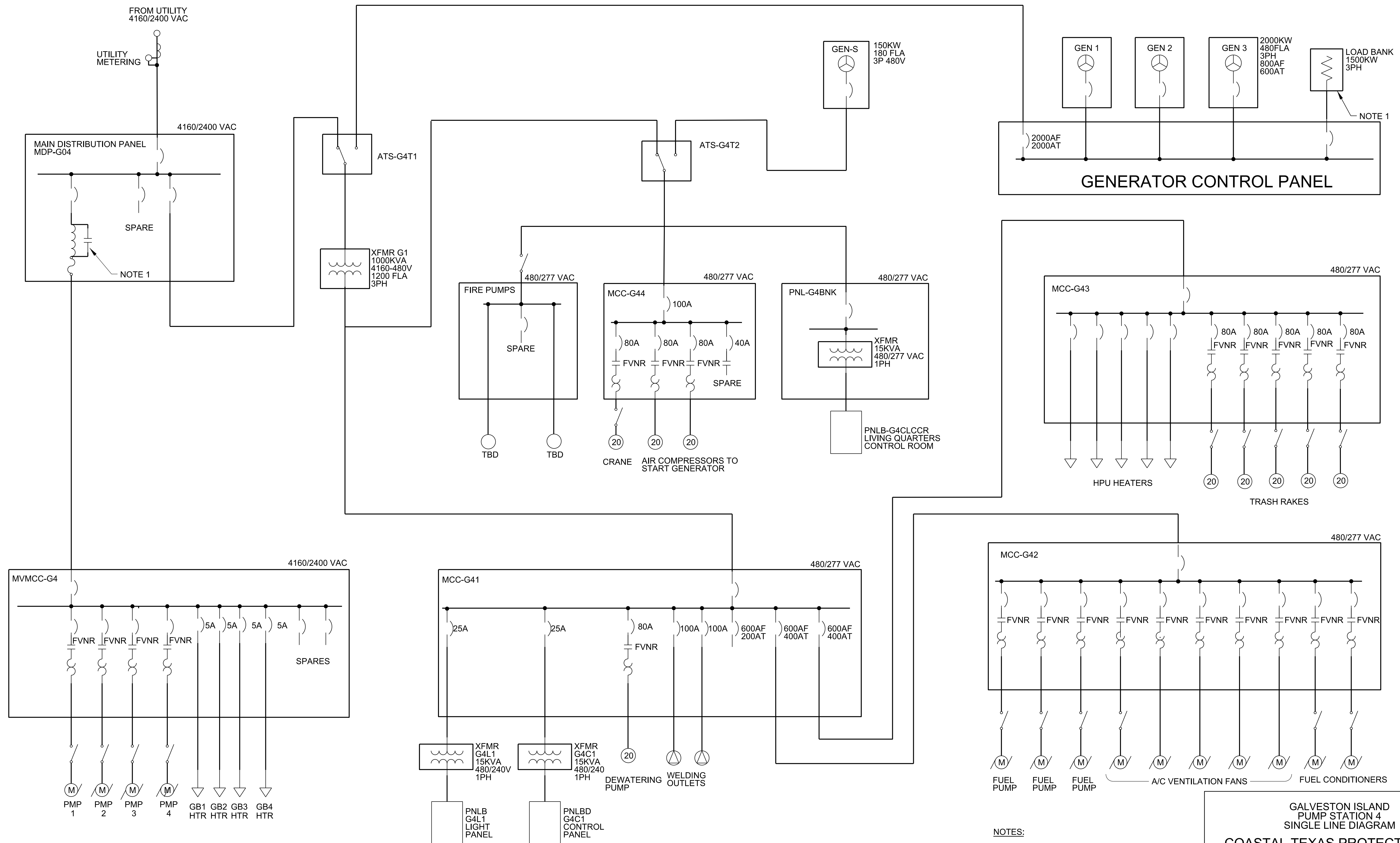




**GALVESTON PUMP STATION 3 - SINGLE LINE DIAGRAM**  
 SCALE: NTS

- NOTES:**  
 1. LOAD BANK TO BE FURNISHED WITH GENERATORS.

GALVESTON ISLAND  
 PUMP STATION 3  
 SINGLE LINE DIAGRAM  
**COASTAL TEXAS PROTECTION AND RESTORATION FEASIBILITY STUDY**  
 U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS  
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 TETRA TECH, INC.



**GALVESTON PUMP STATION 4 - SINGLE LINE DIAGRAM**

SCALE: NTS

- NOTES:**
- LOAD BANK TO BE FURNISHED WITH GENERATORS.
  - HARMONICS/TRANSIENTS FILTERING AND ISOLATION.

**GALVESTON ISLAND  
PUMP STATION 4  
SINGLE LINE DIAGRAM**

**COASTAL TEXAS PROTECTION AND  
RESTORATION FEASIBILITY STUDY**

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

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TETRA TECH, INC.