

# **Appendix G**

**Design Drawing Package**

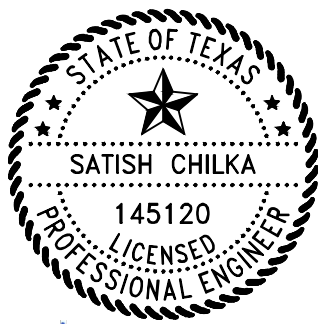


SAN JACINTO RIVER WASTE PITS  
NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS

MAY 2025  
11215702



5/23/25



5-23-2025

Latish Chalka  
05/23/2025



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Client  
**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

9 THIRD 100% EPA SUBMITTAL JC CRH 05/23/2025

No.	Issue	Drawn	Approved	Date
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Drawn	JC	Designer	RH
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Drafting	BS	Design	LL
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Project Coordinator	CM	Date	May 22, 2025
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Original Size	Arch D	Bar is one inch on original size drawing 0 1"
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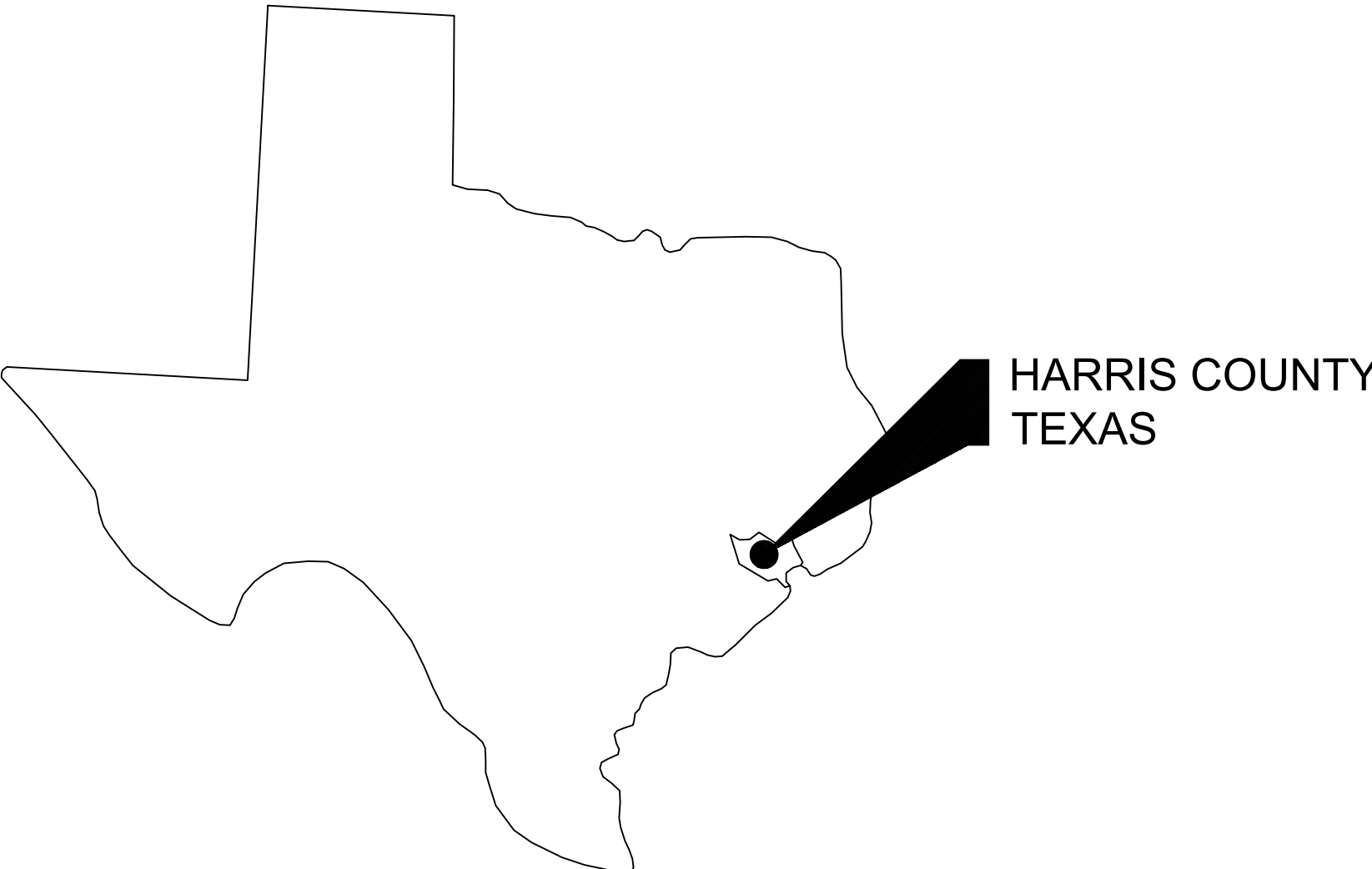
Project No. 11215702

Title

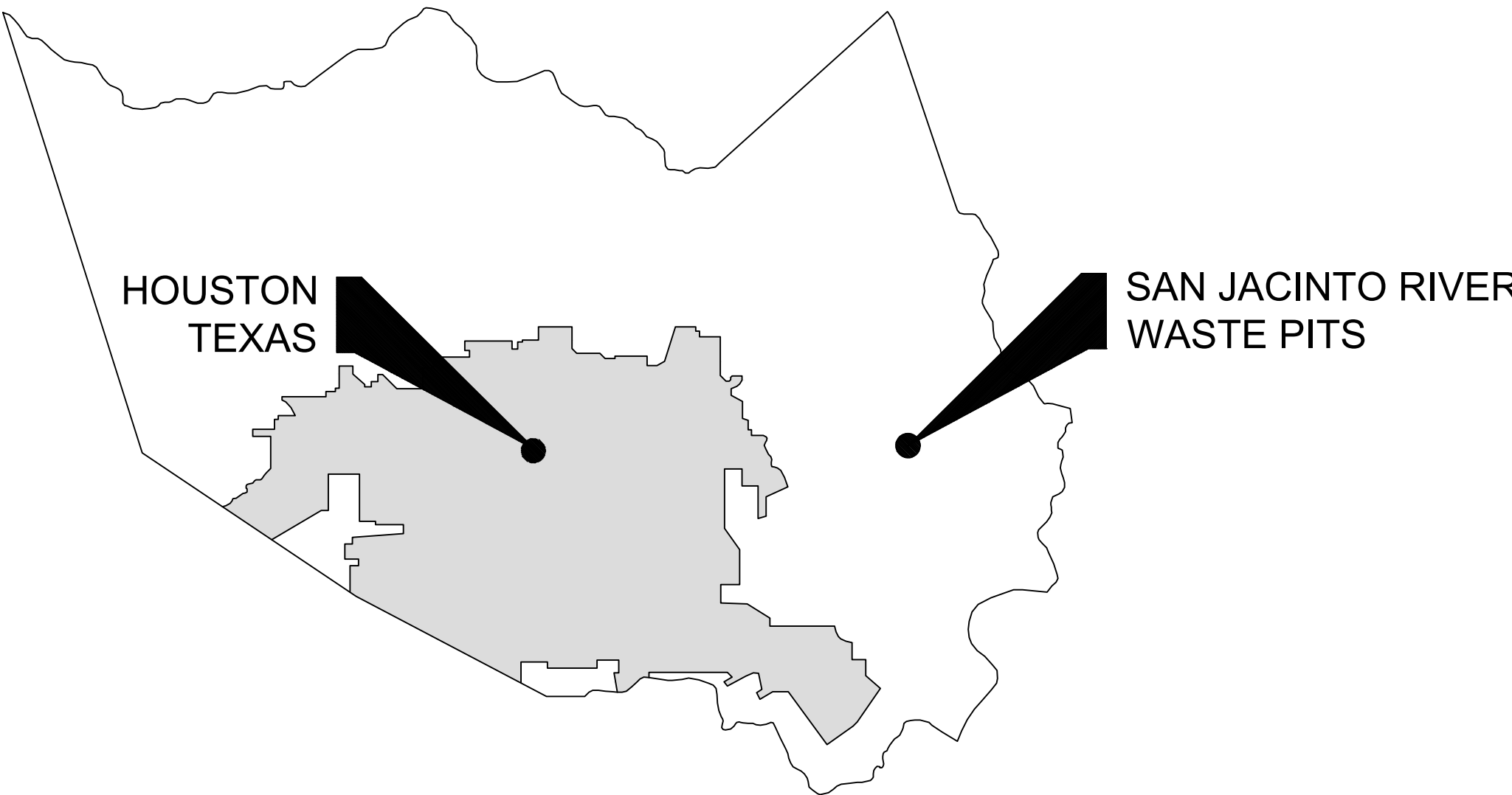
COVER SHEET

Sheet No.

G-01



STATE OF TEXAS  
VICINITY MAP



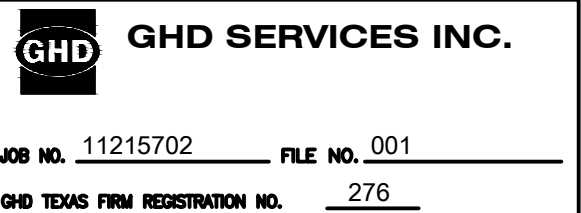
HARRIS COUNTY  
VICINITY MAP



LOCATION MAP

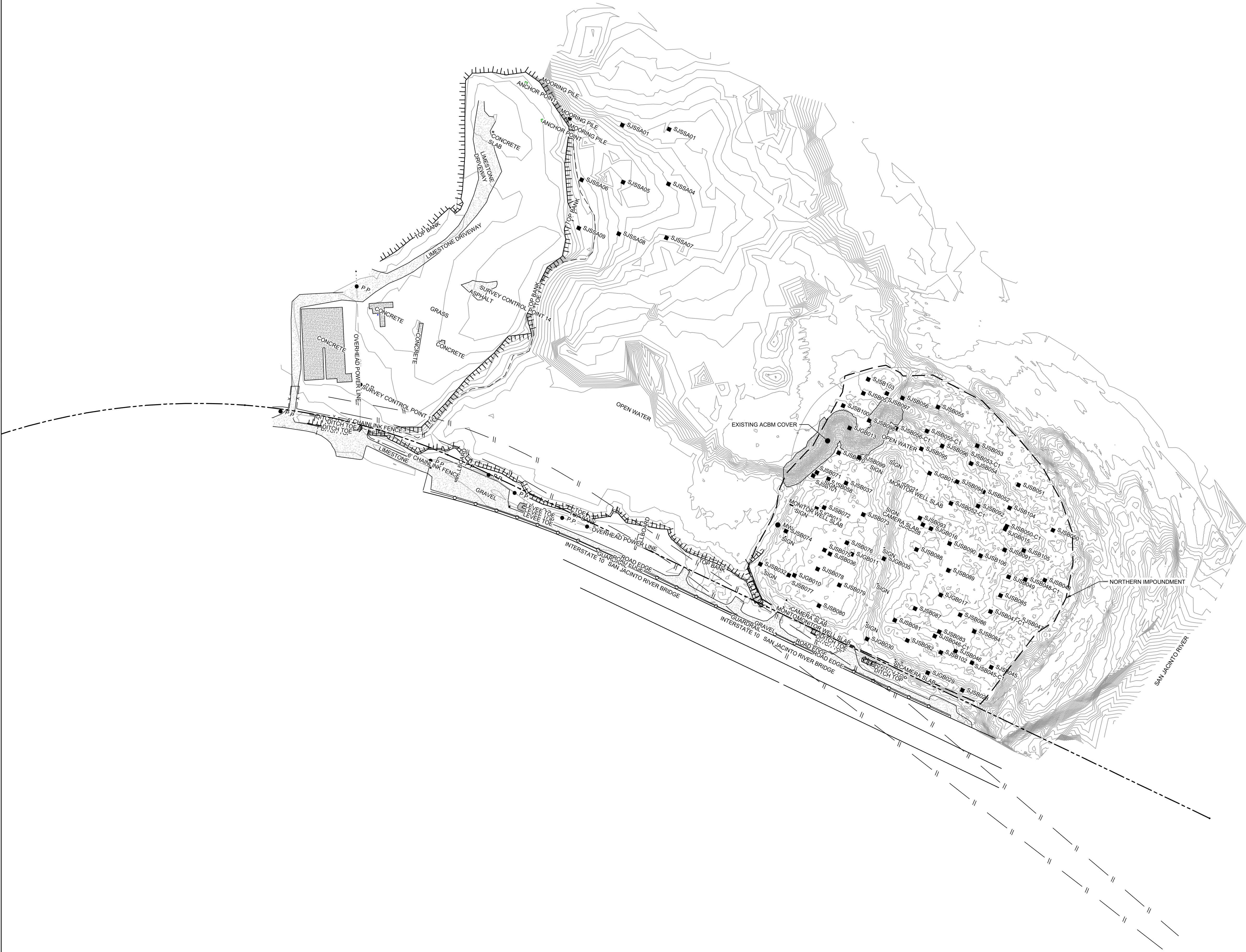
DRAWING NUMBER	DRAWING NAME
GENERAL SERIES	
G-01	COVER SHEET
CIVIL SERIES	
C-01	OVERALL PLAN
C-02	EXISTING CONDITIONS
C-03	SSA AREA AND NORTHERN IMPOUNDMENT WORKS
C-04	SOIL EROSION AND SEDIMENT CONTROL PLAN - OVERALL
C-05	SOIL EROSION AND SEDIMENT CONTROL PLAN - SEASONAL
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C-07	PROJECT TRAFFIC CONTROL PLAN
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TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608, JULY 8, 2019 TO AUGUST 2, 2019.  
UPDATED BATHYMETRY DATA PROVIDED BY ANCHOR O&A OCTOBER 2021.  
TXDOT RIGHT OF WAY FROM A BOUNDARY AND RIGHT-OF-WAY SURVEY OF PORT OF HOUSTON AUTHORITY PROPERTY & HOUSTON FLEETING SERVICES, LLC, PROPERTY ALONG INTERSTATE HIGHWAY 10 AT THE SAN JACINTO FLEET AREA, IN THE J. T. HARRELL SURVEY, A-330 HARRIS COUNTY, TEXAS, COBBFENDLEY, 2402-028-01, JUNE 28, 2024

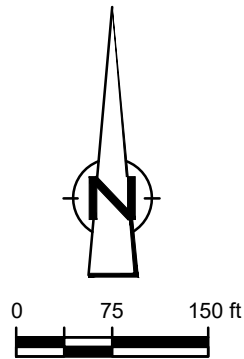
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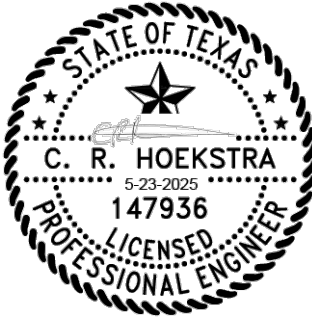
JOB NO. 11215702FILE NO. 001

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LEGEND	
---	TXDOT RIGHT OF WAY
---	TCRA CAP PERIMETER
---	EXISTING CONTOUR INTERVAL
---	FENCELINE
---	SHORELINE
---	TOP OF BANK
---	TOE OF SLOPE
---	OVERHEAD ELECTRICAL
---	GUARDRAIL
---	PIPELINE
---	BORING LOCATION
---	MONITORING WELL
---	POWER POLE
---	LIGHT POLE
---	WELL
---	ASPHALT
---	CONCRETE
---	GRAVEL

Client  
**SAN JACINTO RIVER WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

8	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	JC	Designer	RH	
Drafting Check	BS	Design Check	LL	
Project Coordinator	CM	Date	May 22, 2025	
Original Size	Scale 1" = 150'			
Arch D		Bar is one inch on original size drawing		

Project No. 11215702

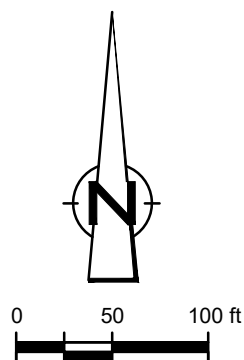
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**OVERALL PLAN**

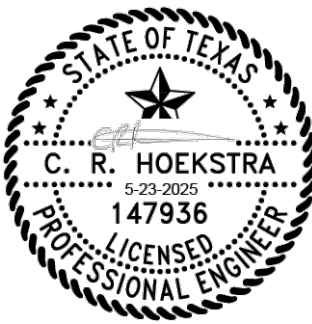
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C-01





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LEGEND	
---	TXDOT RIGHT OF WAY
---	TCRA CAP PERIMETER
---	EXISTING CONTOUR INTERVAL
---	FENCELINE
---	SHORELINE
---	TOP OF BANK
---	TOE OF SLOPE
---	OVERHEAD ELECTRICAL
---	GUARDRAIL
---	PIPELINE
---	BORING LOCATION
---	MONITORING WELL
---	POWER POLE
---	LIGHT POLE
---	WELL
---	MATERIAL TO BE EXCAVATED
---	EXISTING BERM TO BE EXCAVATED
---	FOR POTENTIAL TESTING AND REUSE
---	EXISTING BERM TO REMAIN
---	CONCRETE
---	GRAVEL
---	ASPHALT
---	ARMORED CAP
---	GEOMEMBRANE
---	GEOTEXTILE

Client  
**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

9	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
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No.	Issue	Drawn	Approved	Date
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Drawn	JC	Designer	RH
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Drafting	BS	Design	LL
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Project	CM	Date	May 22, 2025
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Drafting	BS	Design	LL
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Project	CM	Date	May 22, 2025
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Original Size	Scale	1" = 100'
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Arch D	Bar is one inch on original size drawing
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Project No.	11215702
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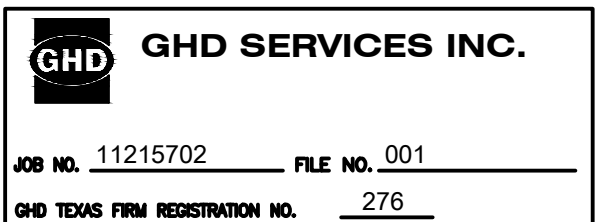
Title	EXISTING CONDITIONS
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Sheet No.	C-02
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Sheet No.	C-02
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SOURCE:  
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GEOMEMBRANE LIMITS FROM ANCHOR QEA DRAWING C-1, GEOMEMBRANE LOCATION PLAN, SAN JACINTO RIVER WASTE PITS SUPERFUND SITE, DECEMBER 2010  
GEOTEXTILE LIMITS FROM ANCHOR QEA DRAWING C-2, CAPPING PLAN, SAN JACINTO RIVER WASTE PITS SUPERFUND SITE, DECEMBER 2010  
UPDATED GEOTEXTILE LIMITS FROM ANCHOR QEA FIGURE 5-1, WATER-SIDE GEOTEXTILE AS-BUILT, REVISED DRAFT FINAL REMEDIAL ACTION COMPLETION REPORT (RACR), SAN JACINTO RIVER WASTE PITS SUPERFUND SITE, MARCH 9, 2012.

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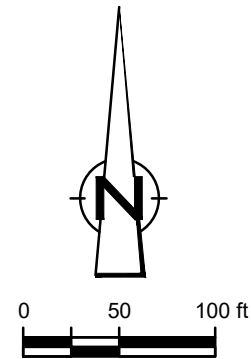


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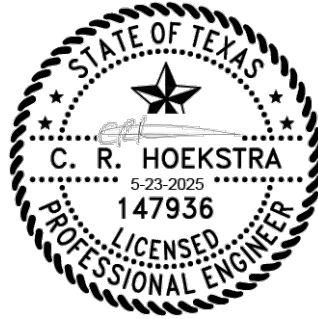








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LEGEND	
	TxDOT RIGHT OF WAY
	TORA CAP PERIMETER
	EXISTING CONTOUR INTERVAL
	FENCELINE
	SHORELINE
	TOP OF BANK
	TOE OF SLOPE
	OVERHEAD ELECTRICAL
	GUARDRAIL
	PIPELINE
	BORING LOCATION
	MONITORING WELL
	POWER POLE
	LIGHT POLE
	WELL
	MATERIAL TO BE EXCAVATED
	EXISTING BERM TO BE EXCAVATED
	EXISTING BERM TO REMAIN
	CONCRETE
	GRAVEL
	ASPHALT
	AZ26-700 PILE
	AZ26-700 PILE
	AZ26-700 PILE
	FRP BARRIER WALL
	TURBIDITY CURTAIN
	OIL BOOM
	PLANNED IMPROVEMENTS FOR NORTHERN IMPOUNDMENT ACCESS
	RAISED BENCH
	EXTERIOR SCOUR PROTECTION
	INTERIOR SCOUR PROTECTION

Client  
**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**


9	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
No.	Issue	Drawn	Approved	Date

Drawn	JC	Designer	RH
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Drafting	BS	Design	LL
Check		Check	

Project Coordinator	CM	Date	May 23, 2025
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Original Size	Arch D
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Project No.	11215702
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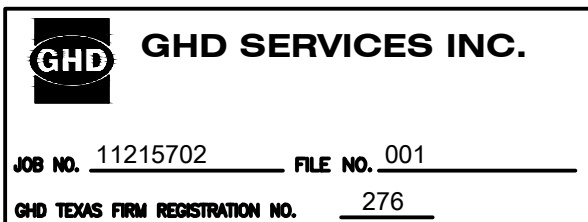
Title  
**SOIL EROSION AND  
SEDIMENT CONTROL PLAN  
OVERALL**

Sheet No.	
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C-04

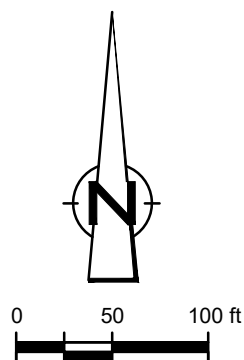
- SOURCE:  
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UPDATED BATHYMETRY DATA PROVIDED BY ANCHOR GEA OCTOBER 2021
- NOTES:  
1. TxDOT RIGHT OF WAY IS BASED ON LJA ENGINEERING INC. SURVEY PROVIDED APRIL 3, 2023. TxDOT PRELIMINARY SCHEMATIC IH 10 - HARRIS COUNTY.  
2. LOCATION AND TYPE OF SOIL EROSION AND SEDIMENT CONTROLS ARE SUBJECT TO CHANGE AND CAN VARY FROM SEASON TO SEASON.  
3. TURBIDITY CONTROLS AND OIL BOOM ONLY TO BE IMPLEMENTED DURING BMP, FRP BARRIER WALL, AND SCOUR PROTECTION INSTALLATION AND REMOVAL.  
4. TURBIDITY CURTAIN AND OIL BOOM ONLY TO BE DEPLOYED IN IMMEDIATE AREA AROUND BMP, FRP BARRIER WALL, AND SCOUR PROTECTION INSTALLATION AND REMOVAL; LOCATION TO VARY DURING CONSTRUCTION PHASE.

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LEGEND	
	TxDOT RIGHT OF WAY
	TORA CAP PERIMETER
	EXISTING CONTOUR INTERVAL
	FENCELINE
	SHORELINE
	TOP OF BANK
	TOE OF SLOPE
	OVERHEAD ELECTRICAL
	GUARDRAIL
	PIPELINE
	BORING LOCATION
	MONITORING WELL
	POWER POLE
	LIGHT POLE
	WELL
	MATERIAL TO BE EXCAVATED
	EXISTING BERM TO BE REUSED
	EXISTING BERM TO REMAIN
	CONCRETE
	GRAVEL
	ASPHALT
	A226-700 PILE
	A236-700 PILE
	A242-700 PILE
	FRP BARRIER WALL
	TURBIDITY CURTAIN
	OIL BOOM
	PLANNED IMPROVEMENTS FOR NORTHERN IMPOUNDMENT ACCESS
	RAISED BENCH
	EXTERIOR SCOUR PROTECTION
	INTERIOR SCOUR PROTECTION

Client  
**SAN JACINTO RIVER WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT THIRD FINAL 100% REMEDIAL DESIGN HARRIS COUNTY, TEXAS**

9	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
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Original Size		Bar is one inch on original size drawing 0 1"		
Arch D				

Project No. 11215702

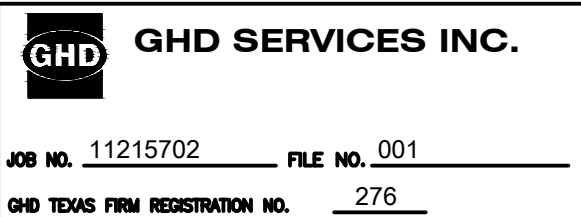
Title  
**SOIL EROSION AND SEDIMENT CONTROL PLAN SEASONAL**

Sheet No.

**C-05**

- SOURCE:  
TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608, JULY 8, 2019 TO AUGUST 2, 2019  
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- NOTES:  
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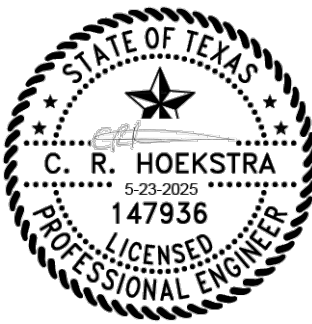


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WASTE PITS**  
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THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

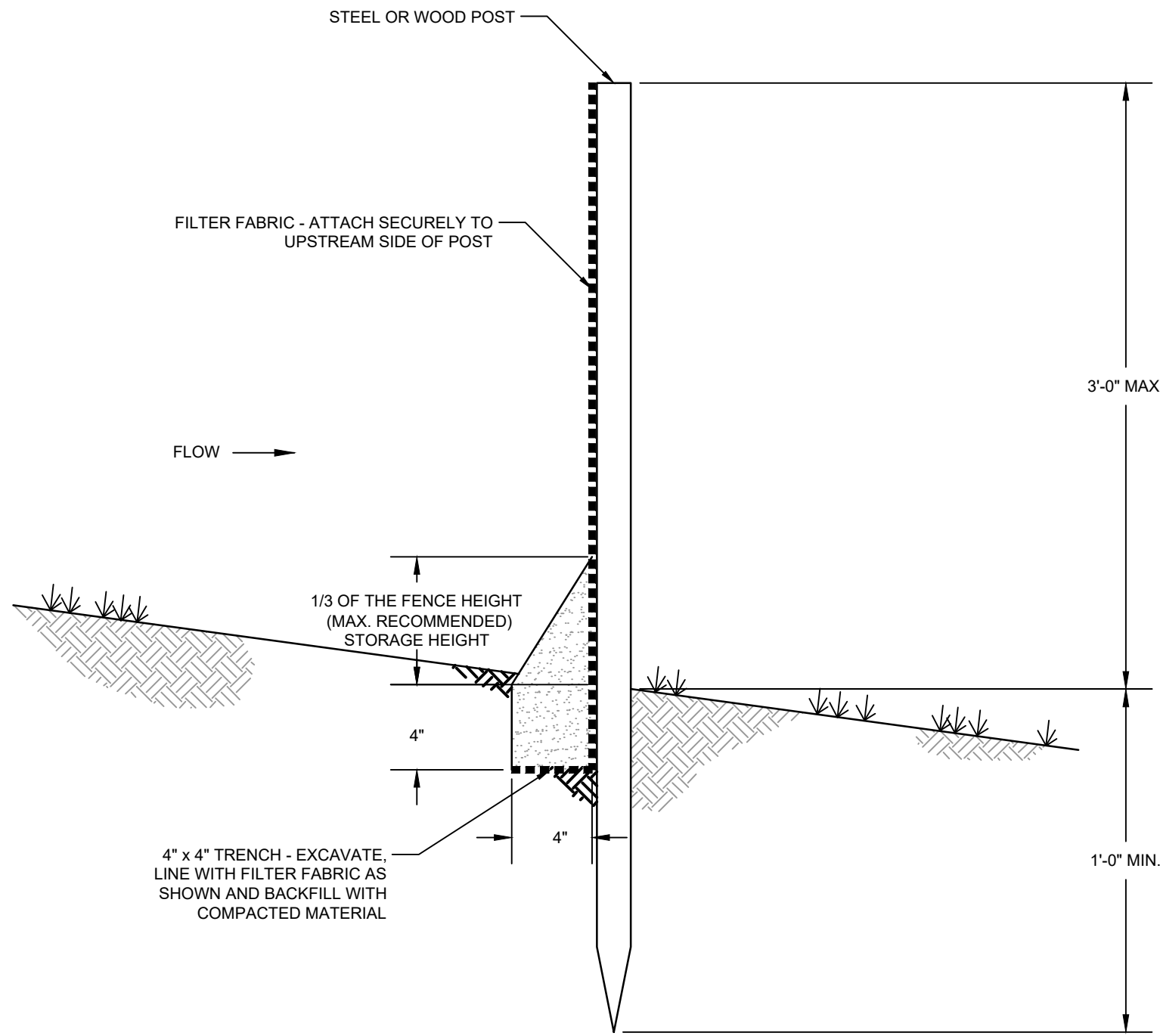
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<b>Arch D</b>				

Project No. 11215702  
Title

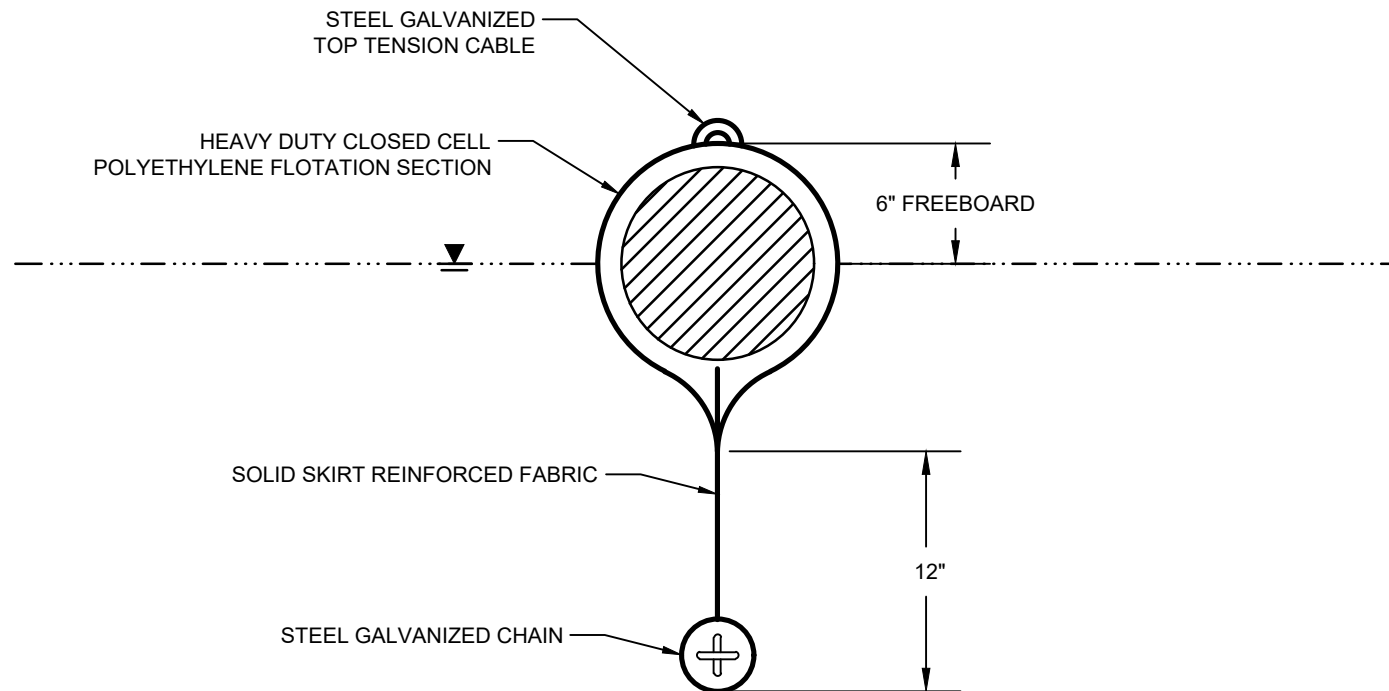
**SOIL EROSION AND  
SEDIMENT CONTROL DETAILS**

Sheet No.

**C-06**

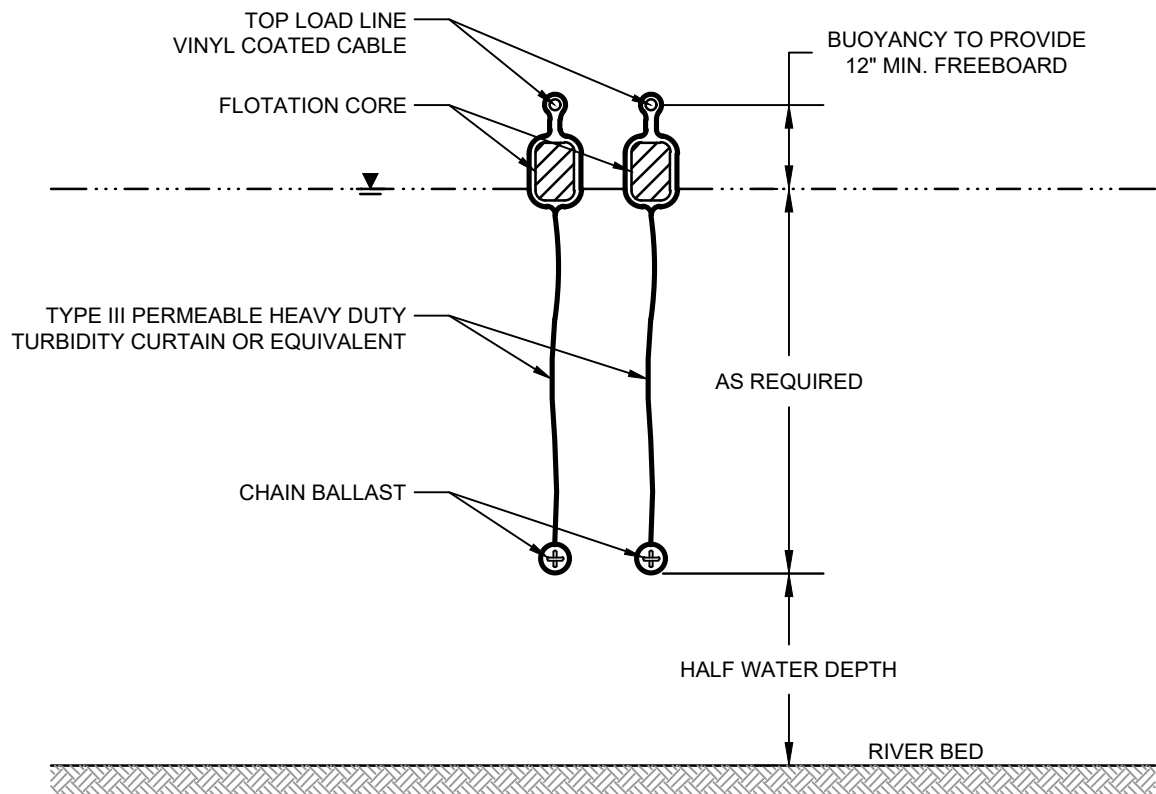


DETAIL 1 TEMPORARY SILT FENCE  
N.T.S. C-05



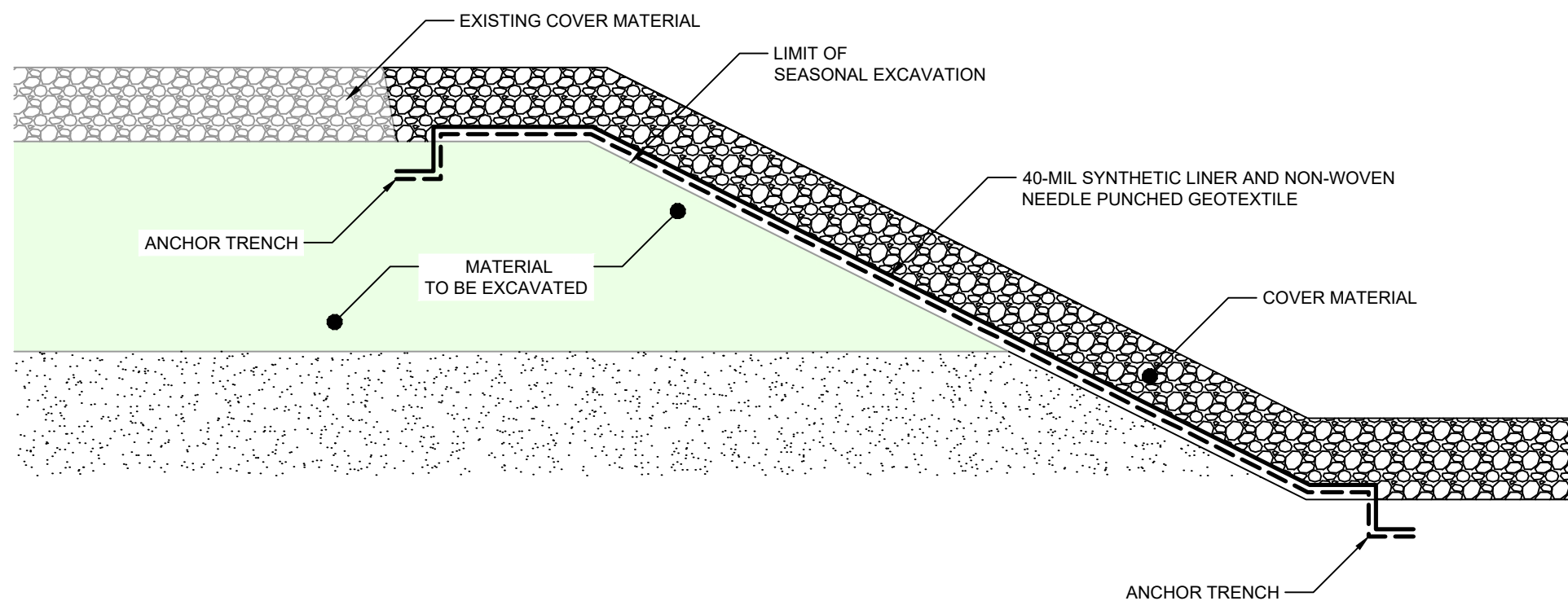
- NOTES
- OIL BOOM SHALL CONFORM TO COAST GUARD OPA 90 REGULATION AND ASTM F-1523
  - OIL BOOM SHALL BE CONTINUOUS TYPE.

DETAIL 2 NON-ABSORBENT OIL BOOM  
N.T.S. C-04

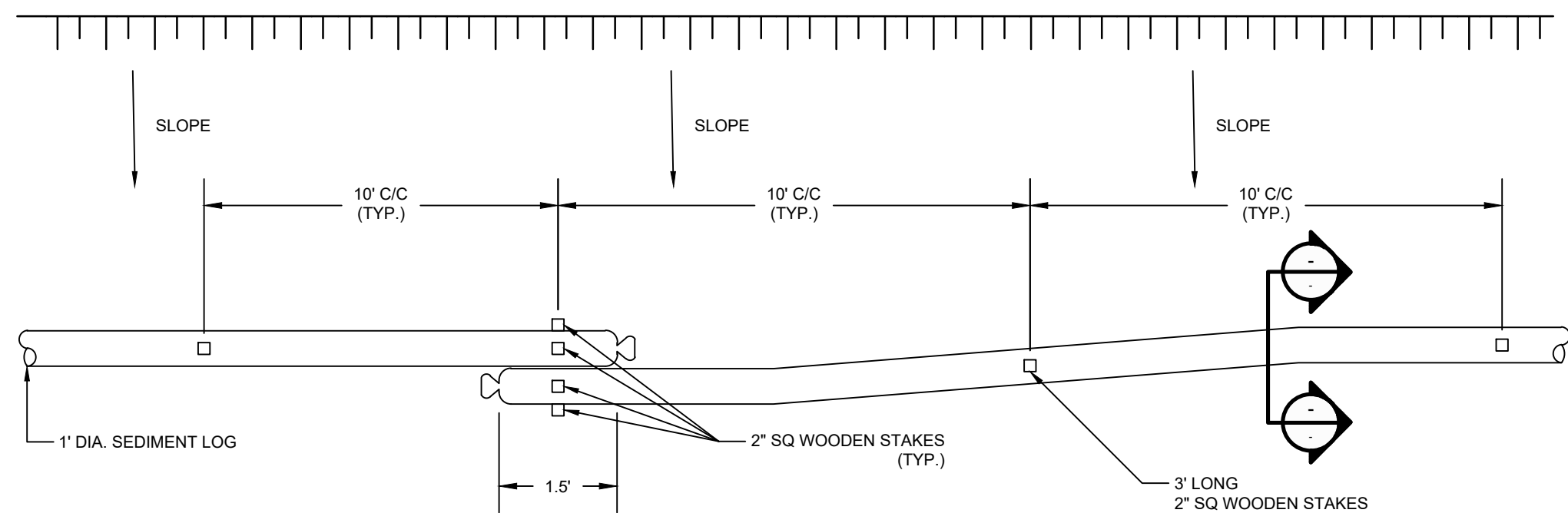


- NOTES
- TURBIDITY CURTAIN SHALL BE TYPE III ACCORDING TO DEPARTMENT OF THE ARMY, US ARMY CORPS OF ENGINEERS WASHINGTON, DC, ENGINEERING AND DESIGN "HANDBOOK FOR THE PREPARATION OF STORM WATER POLLUTION PREVENTION PLANS FOR CONSTRUCTION ACTIVITIES", APPENDIX "C" BMP 27 TURBIDITY CURTAIN, DOCUMENT EP1110-1-16, 1997.
  - CURTAIN SYSTEM SHALL BE EQUIPPED WITH LOAD TRANSFER TYPE PANEL CONNECTORS
  - INCLUDE MOORING SYSTEM IF REQUIRED.

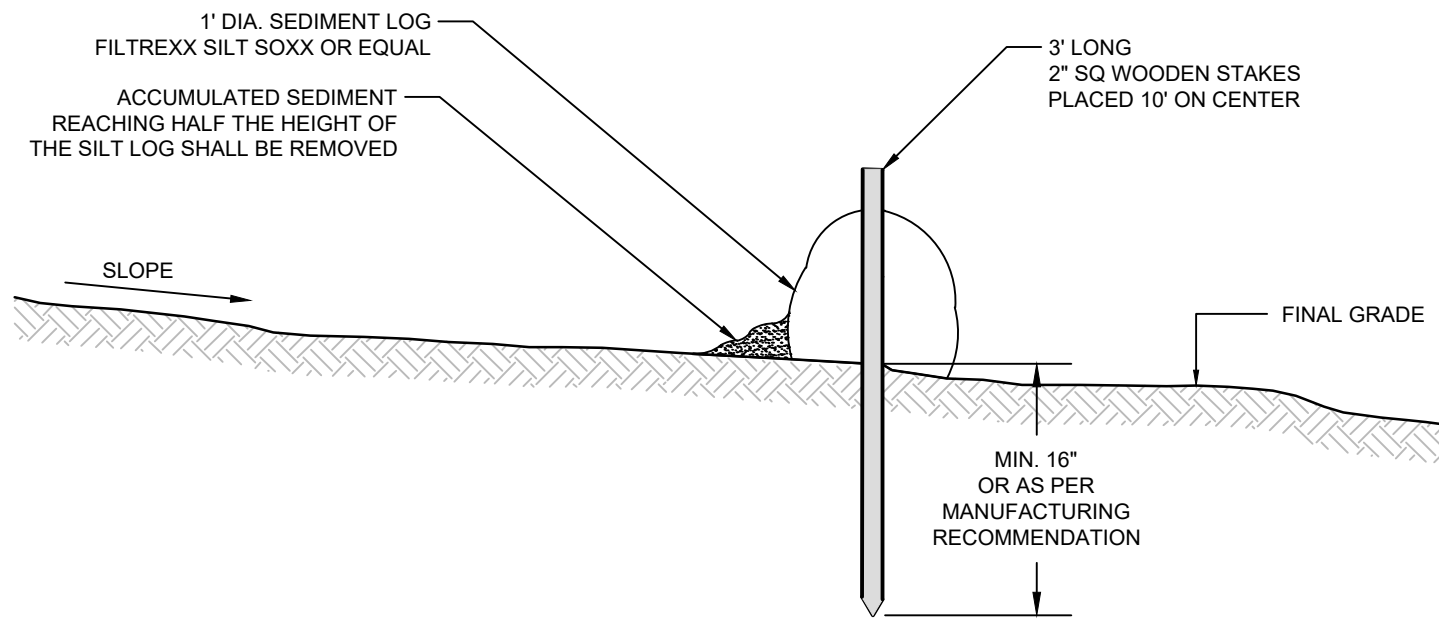
DETAIL 3 TURBIDITY CURTAINS  
N.T.S. C-04



DETAIL 4 TEMPORARY SEASONAL COVER  
N.T.S. C-28



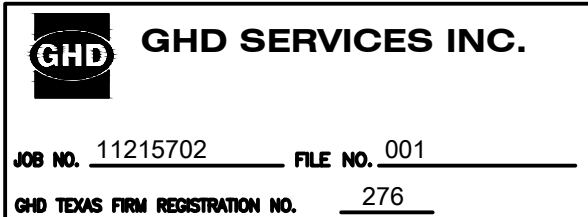
PLAN



SECTION

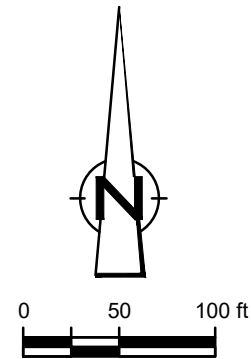
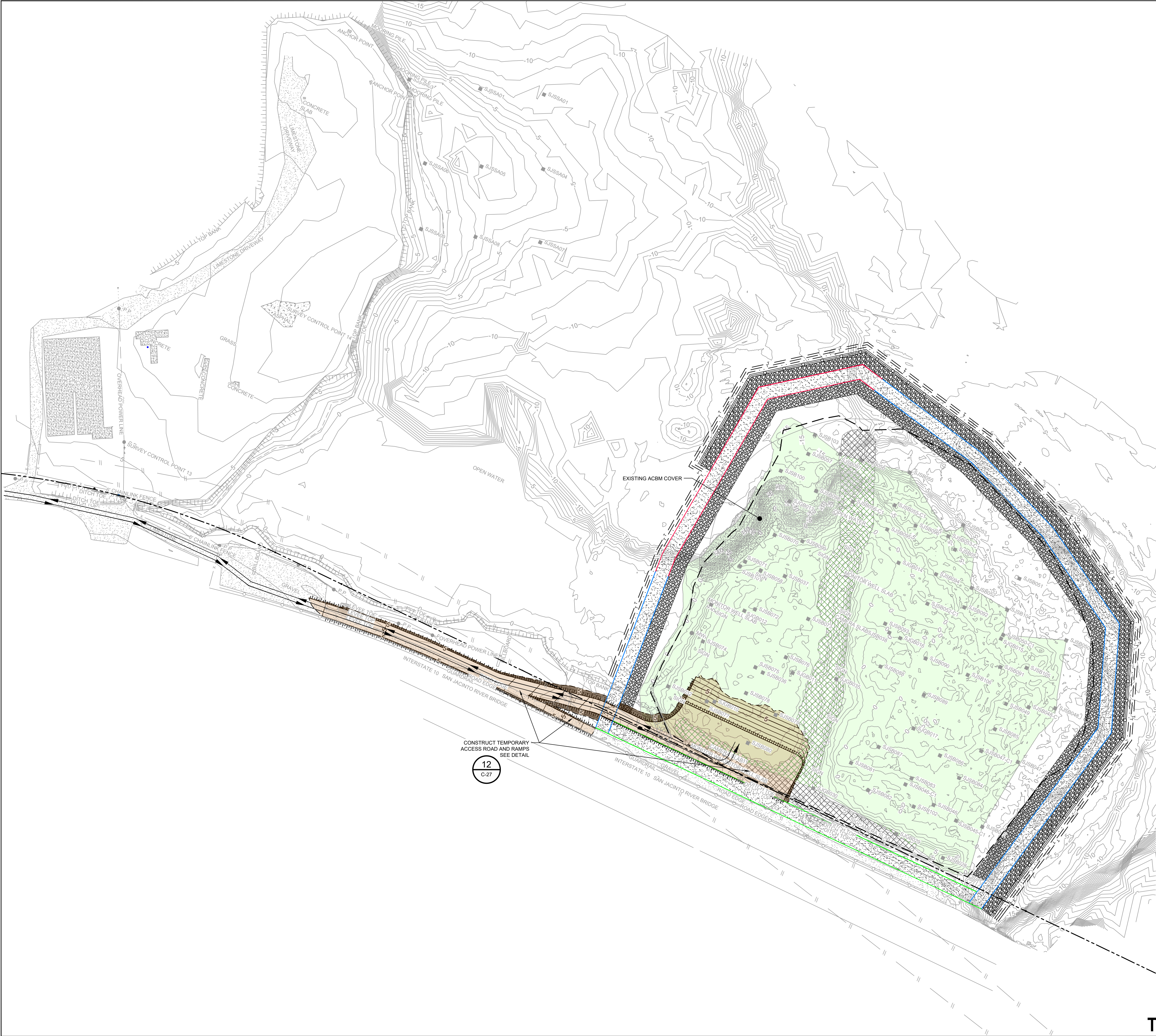
DETAIL 5 SEDIMENT LOG  
N.T.S. C-05

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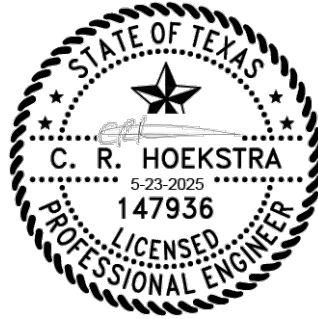


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LEGEND	
---	TxDOT RIGHT OF WAY
---	TORA CAP PERIMETER
---	EXISTING CONTOUR INTERVAL
---	FENCELINE
---	SHORELINE
---	TOP OF BANK
---	TOE OF SLOPE
---	OVERHEAD ELECTRICAL
---	GUARDRAIL
---	PIPELINE
---	BORING LOCATION
---	MONITORING WELL
---	POWER POLE
---	LIGHT POLE
---	WELL
---	MATERIAL TO BE EXCAVATED
---	EXISTING BERM TO BE EXCAVATED
---	FOR POTENTIAL TESTING AND REUSE
---	EXISTING BERM TO REMAIN
---	CONCRETE
---	GRAVEL
---	ASPHALT
---	A226-700 PILE
---	A236-700 PILE
---	A242-700 PILE
---	FRP BARRIER WALL
---	TURBIDITY CURTAIN
---	OIL BOOM
---	TRAFFIC FLOW
---	PLANNED IMPROVEMENTS FOR
---	NORTHERN IMPOUNDMENT ACCESS
---	EXTERIOR SCOUR PROTECTION
---	INTERIOR SCOUR PROTECTION

Client  
**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

9	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	JC	Designer	RH	
Drafting	BS	Design	LL	
Check		Check		
Project	CM	Date	May 22, 2025	
Coordinator		Scale	1" = 100'	
Original Size		Bar is one inch on original size drawing	0	1"
Arch D				

Project No. 11215702

Title

#### PROJECT TRAFFIC CONTROL PLAN

Sheet No.

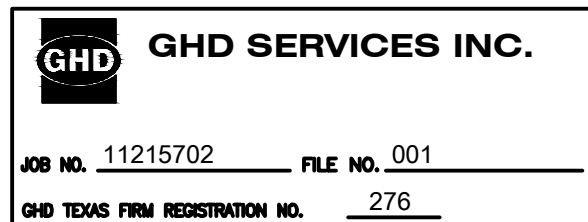
C-07

Sheet 8 of 83

SOURCE:  
TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608, JULY 8, 2019 TO AUGUST 2, 2019  
UPDATED BATHYMETRY DATA PROVIDED BY ANCHOR QEA OCTOBER 2021  
TxDOT RIGHT OF WAY FROM A BOUNDARY AND RIGHT-OF-WAY SURVEY OF PORT OF HOUSTON AUTHORITY PROPERTY & HOUSTON FLEETING SERVICES, LLC, PROPERTY ALONG INTERSTATE HIGHWAY 10 AT THE SAN JACINTO FLEET AREA, IN THE J. T. HARRELL SURVEY, A-330 HARRIS COUNTY, TEXAS, COBBFENDLEY, 2402-028-01, JUNE 28, 2024

NOTES:  
1. TRAFFIC ROUTES ARE PRELIMINARY. ASSUME USE OF TxDOT ACCESS ROAD.  
2. ACCESS ROAD IMPROVEMENTS MAY BE NECESSARY AND WILL BE DETERMINED AT A LATER STAGE IN THE REMEDIAL DESIGN.

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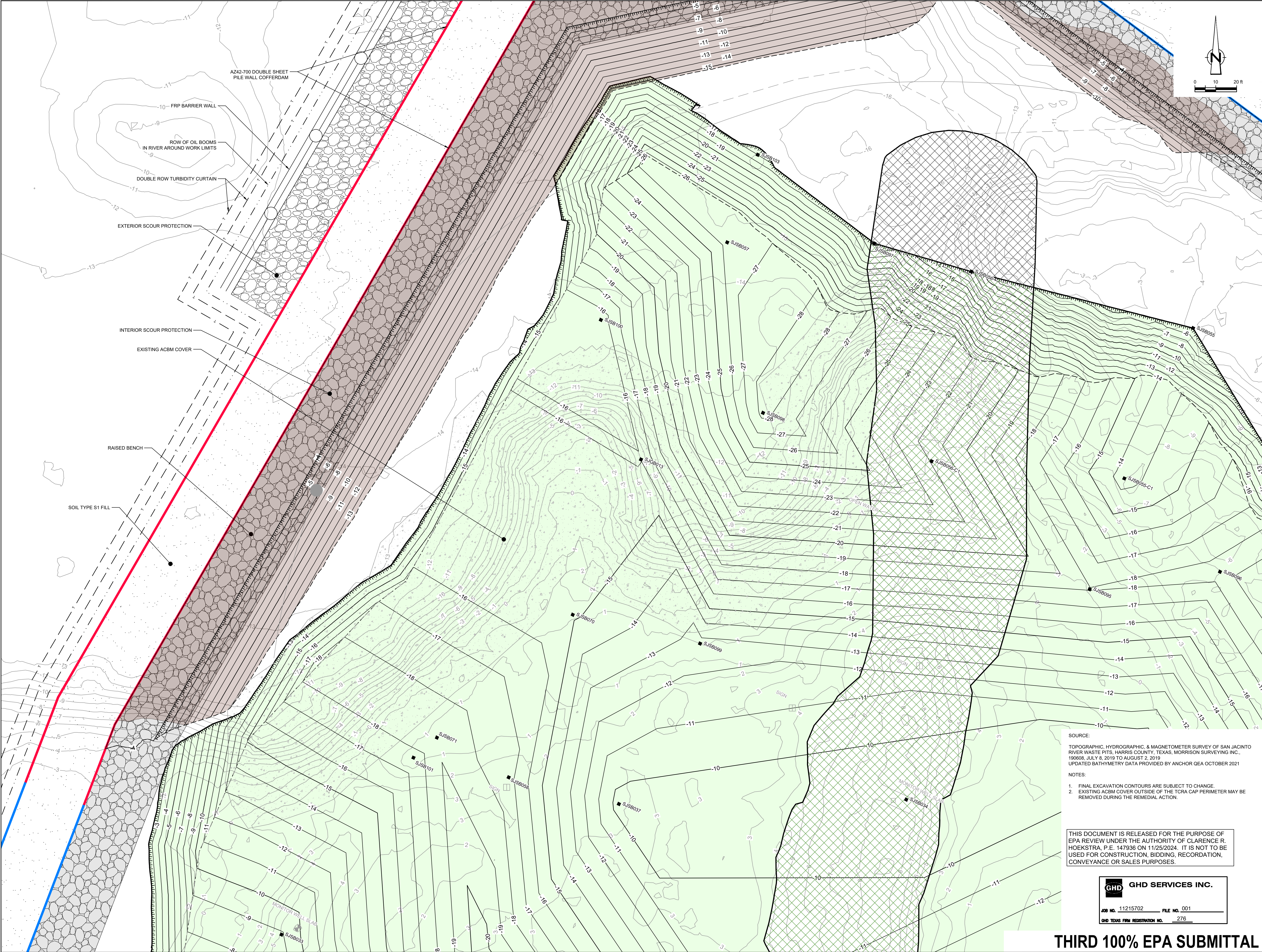


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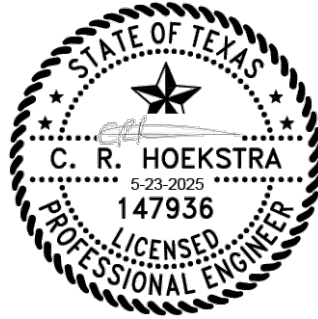








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LEGEND	
---	TXDOT RIGHT OF WAY
---	TCRA CAP PERIMETER
---	EXISTING CONTOUR INTERVAL
---	FENCELINE
---	SHORELINE
---	TOP OF BANK
---	TOE OF SLOPE
---	OVERHEAD ELECTRICAL
---	GUARDRAIL
---	PIPELINE
---	BORING LOCATION
---	MONITORING WELL
---	POWER POLE
---	LIGHT POLE
---	WELL
---	MATERIAL TO BE EXCAVATED
---	EXISTING BERM TO BE EXCAVATED
---	FOR POTENTIAL TESTING AND REUSE
---	EXISTING BERM TO REMAIN
---	CONCRETE
---	GRAVEL
---	AZ42-700 PILE
---	AZ42-700 PILE
---	FRP BARRIER WALL
---	TURBIDITY CURTAIN
---	OIL BOOM
---	RAISED BENCH
---	EXTERIOR SCOUR PROTECTION
---	INTERIOR SCOUR PROTECTION

Client  
**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

9	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
---	--------------------------	----	-----	------------

No.	Issue	Drawn	Approved	Date
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Drawn	JC	Designer	RH
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Drafting	BS	Design	LL
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Project	CM	Date	May 23, 2025
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Scale	1" = 20'
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Original Size

Arch D

Project No. 11215702

Title

**EXCAVATION PLAN  
NORTHWEST**

Sheet No.

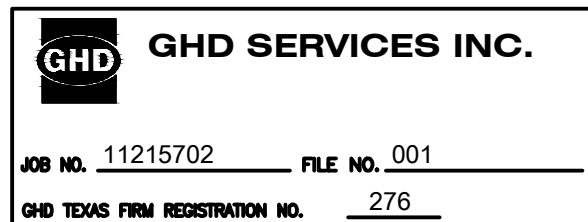
C-09

Sheet 10 of 83

SOURCE:  
TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608, JULY 8, 2019 TO AUGUST 2, 2019  
UPDATED BATHYMETRY DATA PROVIDED BY ANCHOR GEA OCTOBER 2021

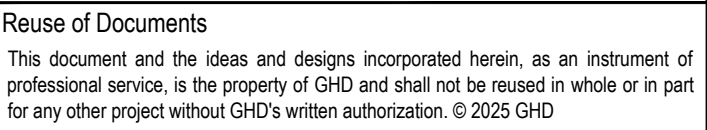
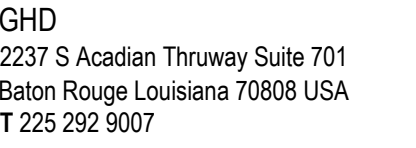
NOTES:  
1. FINAL EXCAVATION CONTOURS ARE SUBJECT TO CHANGE.  
2. EXISTING ACBM COVER OUTSIDE OF THE TCRA CAP PERIMETER MAY BE REMOVED DURING THE REMEDIAL ACTION.

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TID TO RIGHT OF WAY  
 TCRA CAP PERMETER  
 EXISTING CONTOUR INTERVAL  
 FENCE LINE  
 SHORELINE  
 TOP OF BANK  
 TOE OF SLOPE  
 OVERHEAD ELECTRICAL  
 GUARDRAIL  
 PIPELINE  
 BORING LOCATION  
 MONITORING WELL  
 POWER POLE  
 LIGHT POLE  
 WELL  
 MATERIAL TO BE EXCAVATED  
 EXISTING BERM TO BE EXCAVATED  
 FOR POTENTIAL TESTING AND REUSE  
 CONCRETE  
 GRAVEL  
 AS26-700 PILE  
 AS42-700 PILE  
 FRP BARRIER WALL  
 TURBIDITY CURTAIN  
 OIL BOOM  
 EXTERIOR SCOUR PROTECTION  
 INTERIOR SCOUR PROTECTION

Client

**SAN JACINTO RIVER  
WASTE PITS**

Project

**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**


9	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
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No.	Issue	Drawn	Approved	Date

Drawn	JC	Designer	RH
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Drafting Check	BS	Design Check	LL
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Project <b>CM</b>	Date <b>May 22, 2025</b>
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Coordinator	
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construction unless signed and sealed for construction.	Scale 1" = 20'
Original Class	

Original Size

**Arch D**

Bar is one inch on original size drawing

0  1"

Project No.	<b>11215702</b>
Title	

EXCAVATION PLAN  
NORTHEAST

Sheet No. 010

C-10

Sheet 11 of 83


SOURCE:

TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACIN  
RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC.,  
190608, JULY 8, 2019 TO AUGUST 2, 2019  
UPDATED BATHYMETRY DATA PROVIDED BY ANCHOR QEA OCTOBER 2021

NOTES:

1. FINAL EXCAVATION CONTOURS ARE SUBJECT TO CHANGE.
2. SCOUR PROTECTION ON INTERIOR AND EXTERIOR SIDE OF COFFERDAM NOT SHOWN. SEE DRAWINGS C-28 TO C-44 FOR LIMITS OF RIPRAP.

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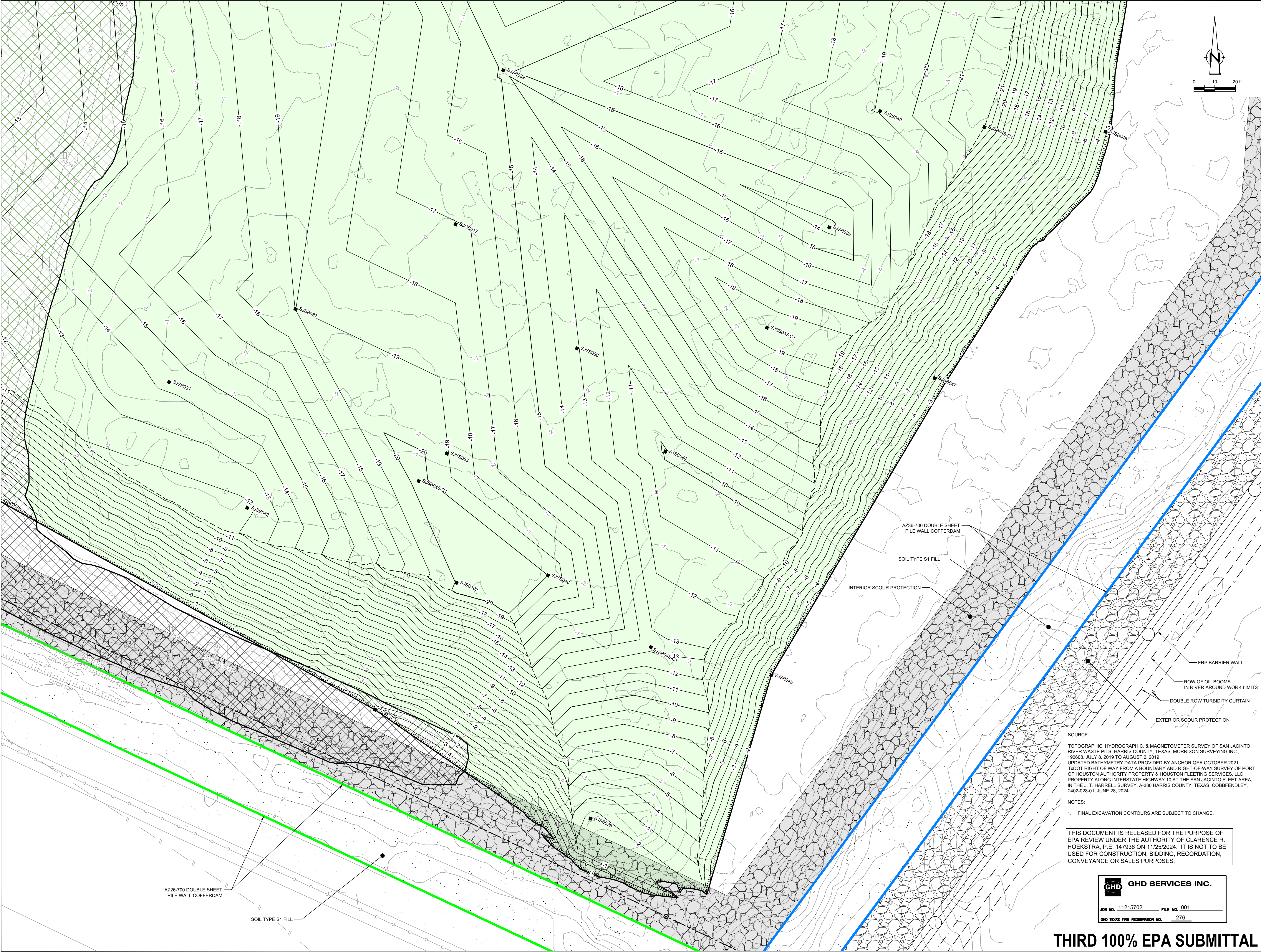
 **GHD SERVICES INC.**

JOB NO. 11215702 FILE NO. 001

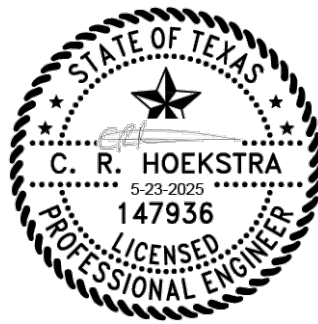
GHD TEXAS FIRM REGISTRATION NO. 276

### THIRD 100% EPA SUBMITTAL





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LEGEND	
	TXDOT RIGHT OF WAY
	TCRA CAP PERIMETER
	EXISTING CONTOUR INTERVAL
	FENCELINE
	SHORELINE
	TOP OF BANK
	TOE OF SLOPE
	OVERHEAD ELECTRICAL
	GUARDRAIL
	PIPELINE
	BORING LOCATION
	MONITORING WELL
	POWER POLE
	LIGHT POLE
	WELL
	MATERIAL TO BE EXCAVATED
	EXISTING BERM TO BE EXCAVATED
	FOR POTENTIAL TESTING AND REUSE
	EXISTING BERM TO REMAIN
	GRAVEL
	AZ26-700 PILE
	AZ36-700 PILE
	AZ42-700 PILE
	FRP BARRIER WALL
	TURBIDITY CURTAIN
	OIL BOOM
	EXTERIOR SCOUR PROTECTION
	INTERIOR SCOUR PROTECTION

Client  
**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

8	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
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No.	Issue	Drawn	Approved	Date
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Drawn	JC	Designer	RH
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Drafting	BS	Design	LL
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Project	CM	Date	May 22, 2025
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Original Size	Scale	1" = 20'
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Arch D

Project No. 11215702

Title

EXCAVATION PLAN

SOUTHEAST

Sheet No.

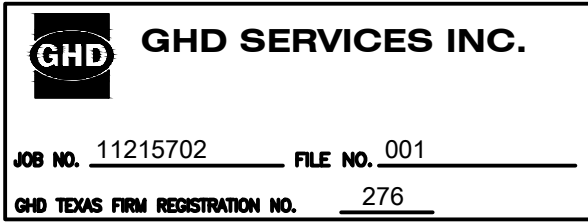
C-11

Sheet 12 of 83

SOURCE:  
TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608, JULY 8, 2019 TO AUGUST 2, 2019  
UPDATED BATHYMETRY DATA PROVIDED BY ANCHOR OEA OCTOBER 2021  
TXDOT RIGHT OF WAY FROM A BOUNDARY AND RIGHT-OF-WAY SURVEY OF PORT OF HOUSTON AUTHORITY PROPERTY & HOUSTON FLEETING SERVICES, LLC PROPERTY ALONG INTERSTATE HIGHWAY 10 AT THE SAN JACINTO FLEET AREA, IN THE J. T. HARRELL SURVEY, A-330 HARRIS COUNTY, TEXAS, COBBFENDLEY, 2402-028-01, JUNE 28, 2024

NOTES:  
1. FINAL EXCAVATION CONTOURS ARE SUBJECT TO CHANGE.

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LEGEND

TDDOT RIGHT OF WAY  
 TCRA CAP PERIMETER  
 EXISTING CONTOUR INTERVAL  
 FENCELINE  
 SHORELINE  
 TOE OF SLOPE  
 OVERHEAD ELECTRICAL GUARDRAIL  
 PIPELINE  
 BORING LOCATION  
 EXISTING WELLS  
 POWER POLE  
 LIGHT POLE  
 WELL  
 MATERIAL TO BE EXCAVATED  
 EXISTING BERM TO BE EXCAVATED  
 EXISTING BERM TO REMAIN  
 GRAVEL  
 A226-700 PILE  
 A226-700 PILE  
 A226-700 PILE  
 TURBIDITY CURTAIN  
 OIL BOOM  
 INTERIOR SCOUR PROTECTION

Client

## SAN JACINTO RIVER WASTE PITS

Project

**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**


9	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
---	--------------------------	----	-----	------------

No.	Issue	Drawn	Approved	Date

Drawn	JC	Designer	RH
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Drafting Check	BS	Design Check	LL
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Project Coordinator <b>CM</b>	Date <b>May 22, 2025</b>
-------------------------------	--------------------------

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Original Size	Bar is one inch on original size drawing
<b>Arch D</b>	0  1"

Project No. 11215702

EXCAVATION PLAN  
SOUTHWEST

Sheet No.

**C-12**

Sheet 13 of 83



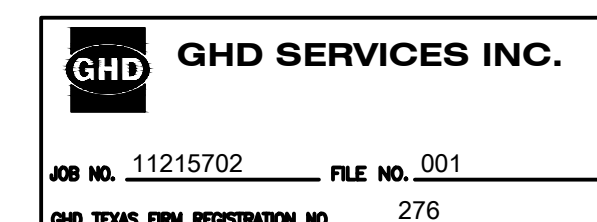
SOURCE:

TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608, JULY 8, 2019 TO AUGUST 2, 2019  
UPDATED BATHYMETRY DATA PROVIDED BY ANCHOR SEA OCTOBER 2021  
TxDOT RIGHT OF WAY FROM A BOUNDARY AND RIGHT-OF-WAY SURVEY OF PORT OF HOUSTON AUTHORITY PROPERTY & HOUSTON FLEETING SERVICES, LLC PROPERTY ALONG INTERSTATE HIGHWAY 10 AT THE SAN JACINTO FLEET AREA, IN THE J. T. HARRELL SURVEY, A-330 HARRIS COUNTY, TEXAS, COBBFENDLEY, 2402-028-011, JUNE 28, 2024

NOTES:

1. FINAL EXCAVATION CONTOURS ARE SUBJECT TO CHANGE.  
2. TEMPORARY CONSTRUCTION ACCESS ROAD AND RAMPS ARE NOT SHOWN SO THAT THE EXCAVATION DEPTHS CAN CLEARLY BE SEEN.

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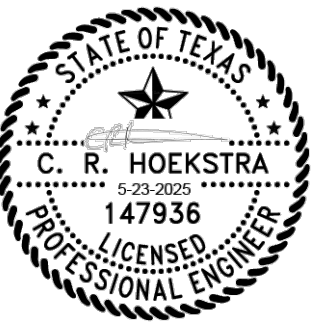


**THIRD 100% EPA SUBMITTAL**





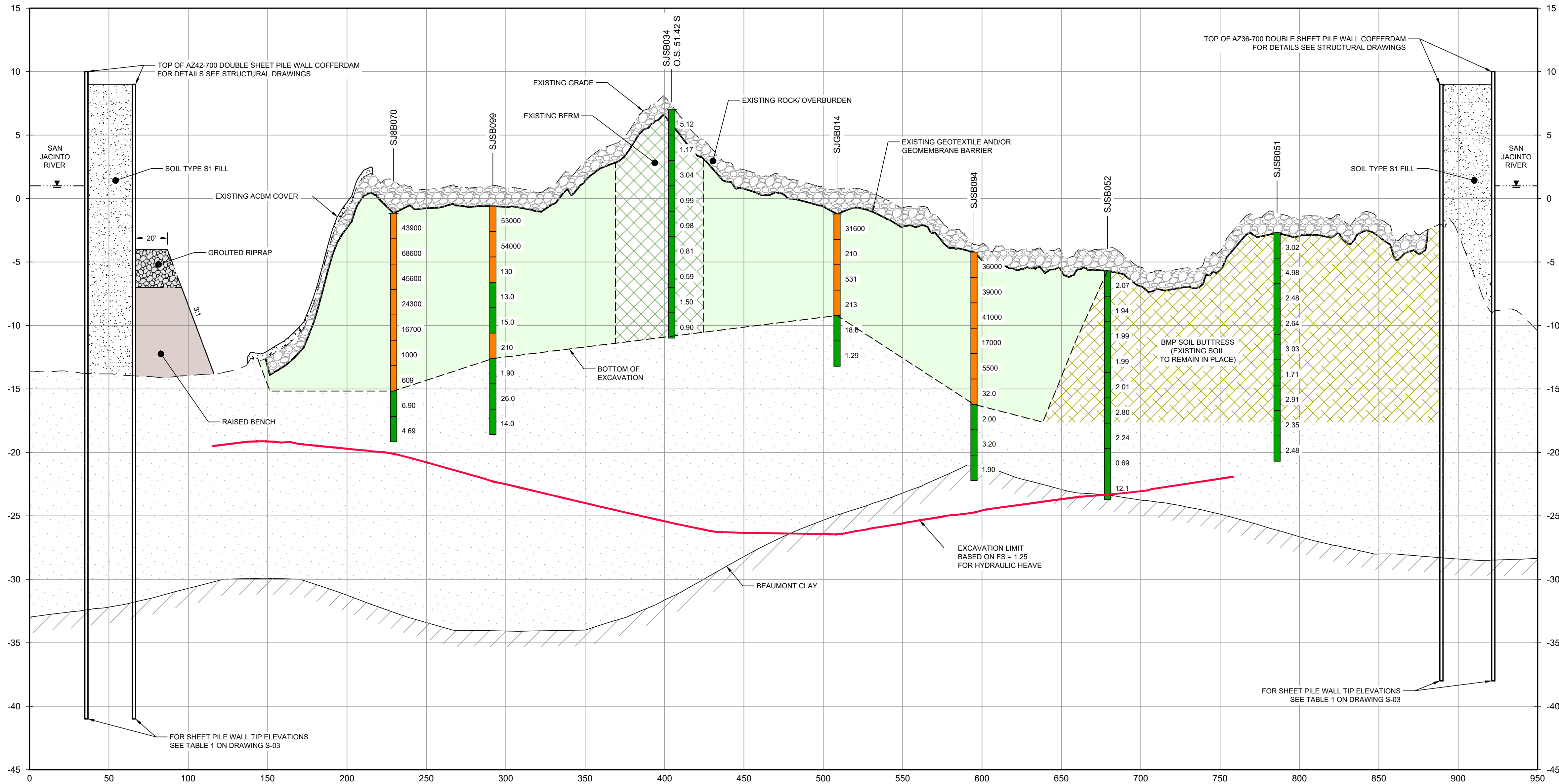
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**LEGEND**

- SOILS WITH CONCENTRATIONS <30 ng/kg TEQ<sub>2,3,4</sub> TCDD
- SOILS WITH CONCENTRATIONS >30 ng/kg TEQ<sub>2,3,4</sub> TCDD
- EXCAVATION LIMIT BASED ON FS = 1.25 FOR HYDRAULIC HEAVE
- MATERIAL TO BE EXCAVATED
- EXISTING BERM TO BE EXCAVATED FOR POTENTIAL TESTING AND REUSE
- BMP SOIL BUTTRESS (EXISTING SOIL TO REMAIN IN PLACE)
- INTERIOR SCOUR PROTECTION
- RAISED BENCH



SECTION **A** WEST/EAST  
HORIZ: 1"=40'  
VERT: 1"=5'

- NOTES:
- BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.
  - SCOUR PROTECTION ON INTERIOR AND EXTERIOR SIDE OF COFFERDAM NOT SHOWN. SEE DRAWINGS C-28 TO C-44 FOR LIMITS OF RIPRAP.

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**GHD SERVICES INC.**

JOB NO. 11215702 FILE NO. 001  
GHD TEXAS FIRM REGISTRATION NO. 276

**THIRD 100% EPA SUBMITTAL**

Client  
**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

9	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	JC	Designer	RH	
Drafting Check	BS	Design Check	LL	
Project Coordinator	CM	Date	May 22, 2025	
		Scale	AS SHOWN	
Original Size		Bar is one inch on original size drawing	0	1"

Project No. 11215702

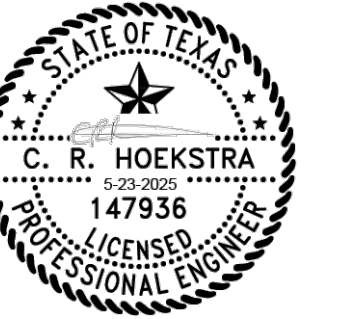
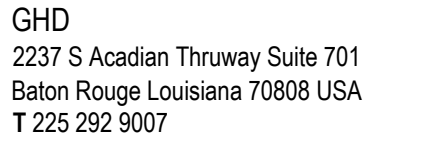
Title  
**EXCAVATION SECTION  
1 OF 6**

Sheet No.

**C-13**

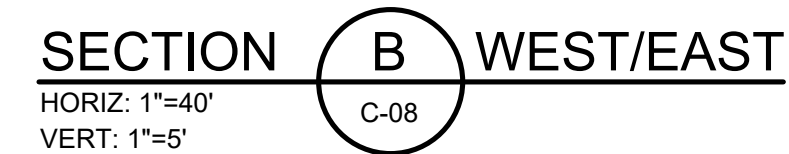
Sheet 14 of 83





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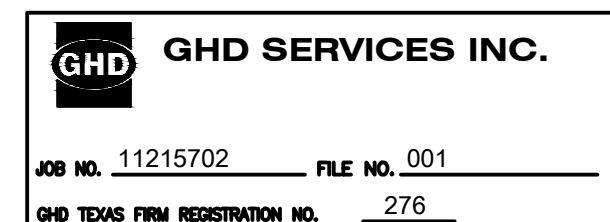
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NOTES:

1. BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.
2. SCOUR PROTECTION ON INTERIOR AND EXTERIOR SIDE OF COFFERDAM NOT SHOWN. SEE DRAWINGS C-28 TO C-44 FOR LIMITS OF RIPRAP.

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### THIRD 100% EPA SUBMITTAL

Client **SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**


8	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
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No.	Issue	Drawn	Approved	Date
-----	-------	-------	----------	------

Drawn	JC	Designer	RH
-------	----	----------	----

Drafting Check	BS	Design Check	LL
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Project Coordinator	CM	Date	May 22, 2025
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This document shall not be used for construction unless signed and sealed for	Scale <b>AS SHOWN</b>
---	-----------------------

construction.	
Original Size <b>Arch D</b>	<p>Bar is one inch on original size drawing</p> <p>0  1"</p>

Project No. 11215702

Title

**EXCAVATION SECTION  
2 OF 6**

Sheet No. \_\_\_\_\_

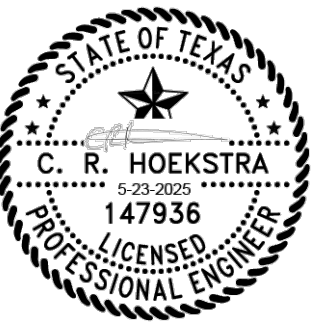
**C-14**

Sheet 15 of 83





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- LEGEND**
- SOILS WITH CONCENTRATIONS <30 ng/kg TEQ<sub>2,3,4</sub> TCDD
  - SOILS WITH CONCENTRATIONS >30 ng/kg TEQ<sub>2,3,4</sub> TCDD
  - EXCAVATION LIMIT BASED ON FS = 1.25 FOR HYDRAULIC HEAVE
  - MATERIAL TO BE EXCAVATED
  - EXISTING BERM TO BE EXCAVATED FOR POTENTIAL TESTING AND REUSE
  - BMP SOIL BUTTRESS (EXISTING SOIL TO REMAIN IN PLACE)

Client  
**SAN JACINTO RIVER WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

8	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	JC	Designer	RH	
Drafting Check	BS	Design Check	LL	
Project Coordinator	CM	Date	May 22, 2025	
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Original Size		Bar is one inch on original size drawing 0 1"		
Arch D				

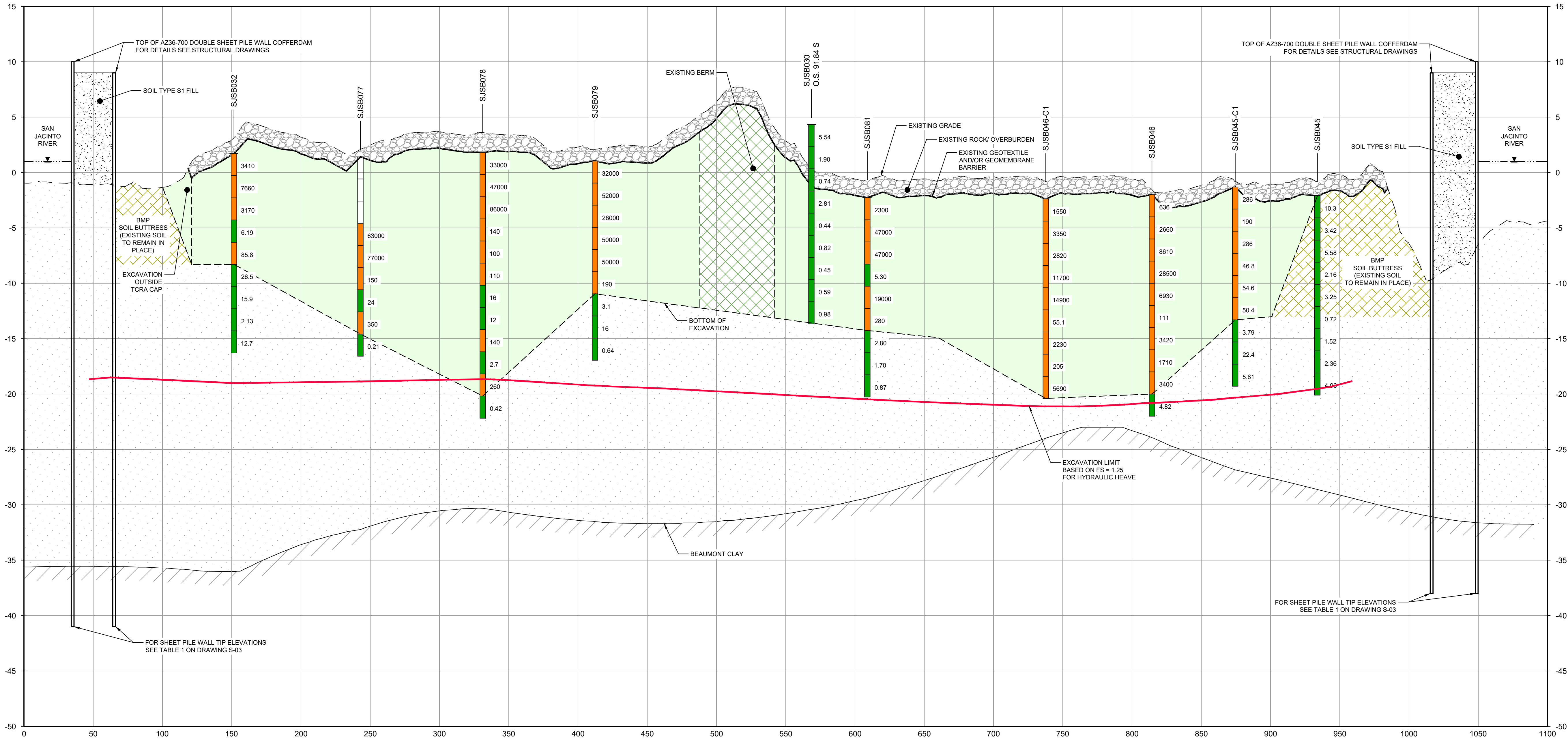
Project No. 11215702

Title  
**EXCAVATION SECTION  
3 OF 6**

Sheet No.

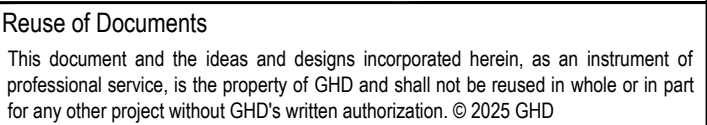
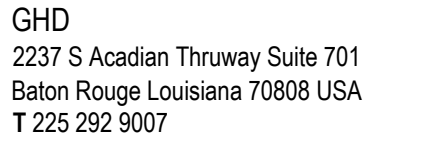
C-15

Sheet 16 of 83









THIRD 100% EPA SUBMITTAL





**LEGEND**

	SOILS WITH CONCENTRATIONS <30 ng/kg TEQ <sub>2-8</sub> TCDD
	SOILS WITH CONCENTRATIONS >30 ng/kg TEQ <sub>2-8</sub> TCDD
	EXCAVATION LIMIT BASED ON FS = 1.25 FOR HYDRAULIC HEAVE MATERIAL TO BE EXCAVATED
	EXISTING BERM TO BE EXCAVATED FOR POTENTIAL TESTING AND REUSE
	BMP SOIL BUTTRESS (EXISTING SOIL TO REMAIN IN PLACE)
	PLANNED IMPROVEMENTS FOR NORTHERN IMPOUNDMENT ACCESS

Client

**SAN JACINTO RIVER  
WASTE PITS**

Project

**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

9	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
No.	Issue	Drawn	Approved	Date

Drafting Check	BS	Design Check	LL
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Original Size	Bar is one inch on original size drawing
<b>Arch D</b>	0

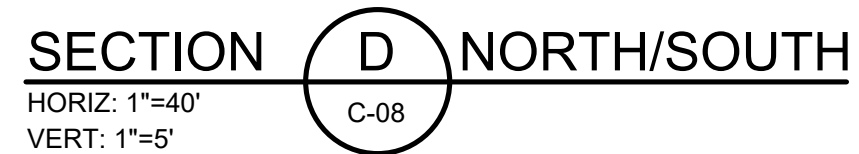
Title

**EXCAVATION SECTION  
4 OF 6**

Sheet No. \_\_\_\_\_

**C-16**

Sheet 17 of 83

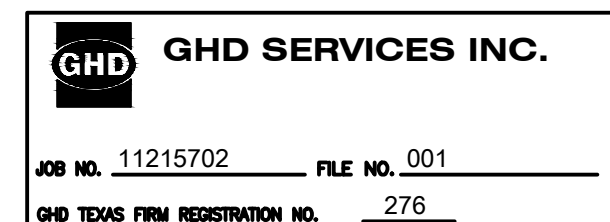


SOURCE:

TxDOT RIGHT OF WAY FROM A BOUNDARY AND RIGHT-OF-WAY SURVEY OF PORT OF HOUSTON AUTHORITY PROPERTY & HOUSTON FLEETING SERVICES, LLC PROPERTY ALONG INTERSTATE HIGHWAY 10 AT THE SAN JACINTO FLEET AREA, IN THE J. T. HARRELL SURVEY, A-330 HARRIS COUNTY, TEXAS, COBBFENDLEY, 2402-028-01, JUNE 28, 2024

- NOTES:
1. BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.
  2. SCOUR PROTECTION ON INTERIOR AND EXTERIOR SIDE OF COFFERDAM NOT SHOWN. SEE DRAWINGS C-28 TO C-44 FOR LIMITS OF RIPRAP.

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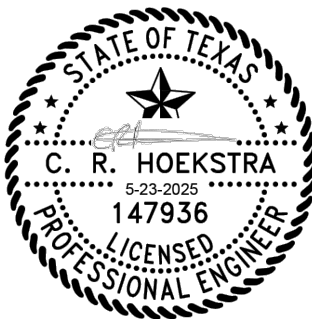


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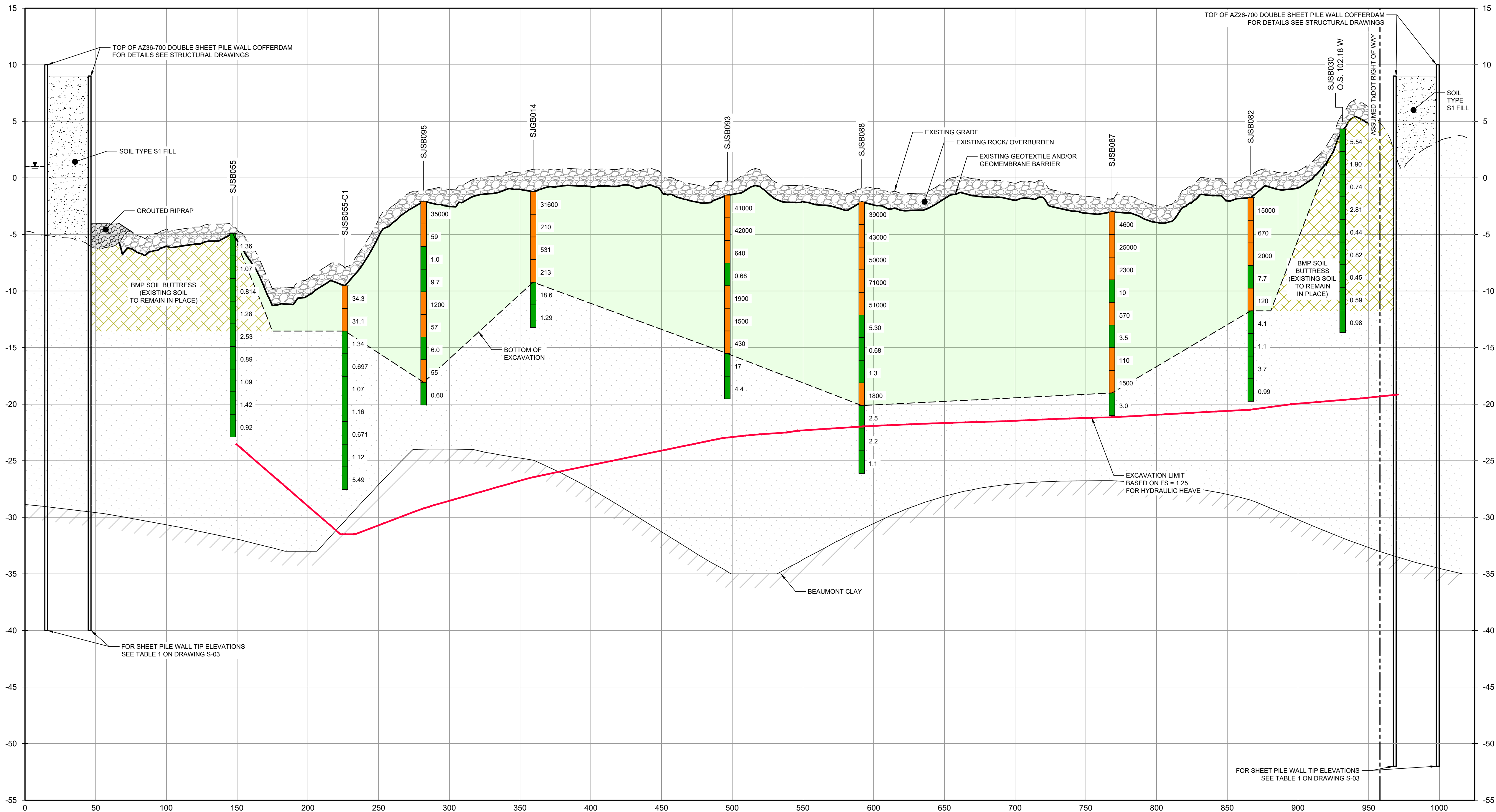
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- SOILS WITH CONCENTRATIONS <30 ng/kg TEQ<sub>2,3,4</sub> TCDD
- SOILS WITH CONCENTRATIONS >30 ng/kg TEQ<sub>2,3,4</sub> TCDD
- EXCAVATION LIMIT BASED ON FS = 1.25 FOR HYDRAULIC HEAVE
- MATERIAL TO BE EXCAVATED
- EXISTING BERM TO BE EXCAVATED FOR POTENTIAL TESTING AND REUSE
- BMP SOIL BUTTRESS (EXISTING SOIL TO REMAIN IN PLACE)



SECTION **E** NORTH/SOUTH  
C-08  
HORIZ: 1"=40'  
VERT: 1"=5'

SOURCE:  
TXDOT RIGHT OF WAY FROM A BOUNDARY AND RIGHT-OF-WAY SURVEY OF PORT OF HOUSTON AUTHORITY PROPERTY & HOUSTON FLEETING SERVICES, LLC. PROPERTY ALONG INTERSTATE HIGHWAY 10 AT THE SAN JACINTO FLEET AREA, IN THE J. T. HARRELL SURVEY, A-330 HARRIS COUNTY, TEXAS, COBBFENDLEY, 2402-028-01, JUNE 28, 2024

- NOTES:
- BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.
  - SCOUR PROTECTION ON INTERIOR AND EXTERIOR SIDE OF COFFERDAM NOT SHOWN. SEE DRAWINGS C-28 TO C-44 FOR LIMITS OF RIPRAP.

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**GHD SERVICES INC.**

JOB NO. 11215702 FILE NO. 001  
GHD TEXAS FIRM REGISTRATION NO. 276

Client  
**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

9 THIRD 100% EPA SUBMITTAL JC CRH 09/23/2025

No. Issue Drawn Approved Date

Drawn JC Designer RH

Drafting BS Design Check LL

Project Coordinator CM Date May 22, 2025

Scale AS SHOWN

Original Size  
**Arch D**  
Bar is one inch on original size drawing  
0 1"

Project No. 11215702

Title  
**EXCAVATION SECTION  
5 OF 6**

Sheet No.

**C-17**

Sheet 18 of 83

**THIRD 100% EPA SUBMITTAL**





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**LEGEND**

- SOILS WITH CONCENTRATIONS <30 ng/kg TEQ<sub>2,3,4</sub> TCDD (Green bar)
- SOILS WITH CONCENTRATIONS >30 ng/kg TEQ<sub>2,3,4</sub> TCDD (Orange bar)
- EXCAVATION LIMIT BASED ON FS = 1.25 FOR HYDRAULIC HEAVE (Red line)
- MATERIAL TO BE EXCAVATED (Hatched area)
- EXISTING BERM TO BE EXCAVATED FOR POTENTIAL TESTING AND REUSE (Dotted area)
- BMP SOIL BUTTRESS (EXISTING SOIL TO REMAIN IN PLACE) (Cross-hatched area)

Client  
**SAN JACINTO RIVER WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

8	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	JC	Designer	RH	
Drafting Check	BS	Design Check	LL	
Project Coordinator	CM	Date	May 22, 2025	
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Original Size		Bar is one inch on original size drawing 0 1"		
<b>Arch D</b>				

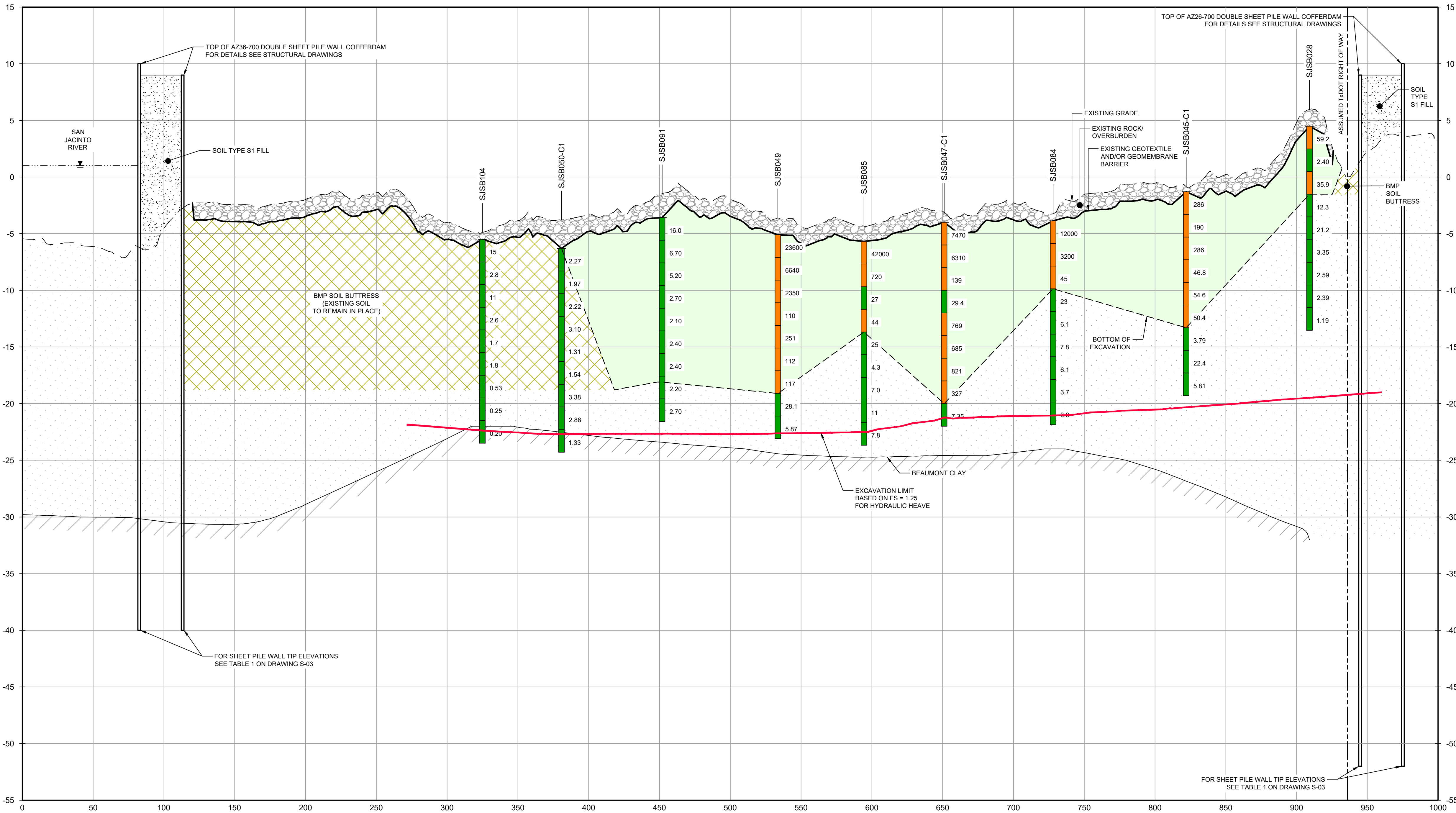
Project No. 11215702

Title

**EXCAVATION SECTION  
6 OF 6**

Sheet No.

**C-18**



**SECTION F NORTH/SOUTH**  
C-08  
HORIZ: 1"=40'  
VERT: 1"=5'

SOURCE:  
TxDOT RIGHT OF WAY FROM A BOUNDARY AND RIGHT-OF-WAY SURVEY OF PORT OF HOUSTON AUTHORITY PROPERTY & HOUSTON FLEETING SERVICES, LLC. PROPERTY ALONG INTERSTATE HIGHWAY 10 AT THE SAN JACINTO FLEET AREA, IN THE J. T. HARRELL SURVEY, A-330 HARRIS COUNTY, TEXAS, COBBFENDLEY, 2402-028-01, JUNE 28, 2024

NOTES:  
1. BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.  
2. SCOUR PROTECTION ON INTERIOR AND EXTERIOR SIDE OF COFFERDAM NOT SHOWN. SEE DRAWINGS C-28 TO C-44 FOR LIMITS OF RIPRAP.

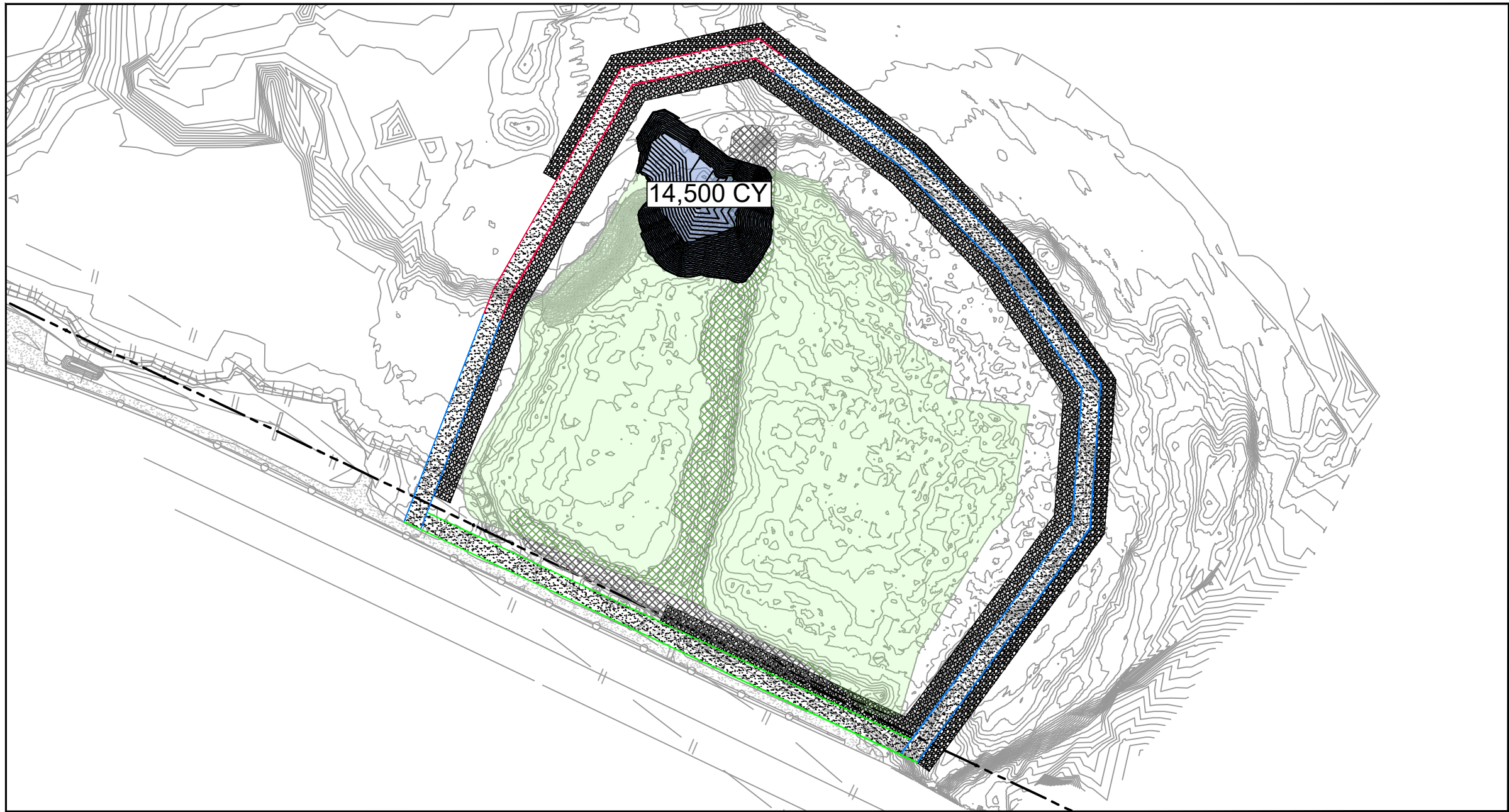
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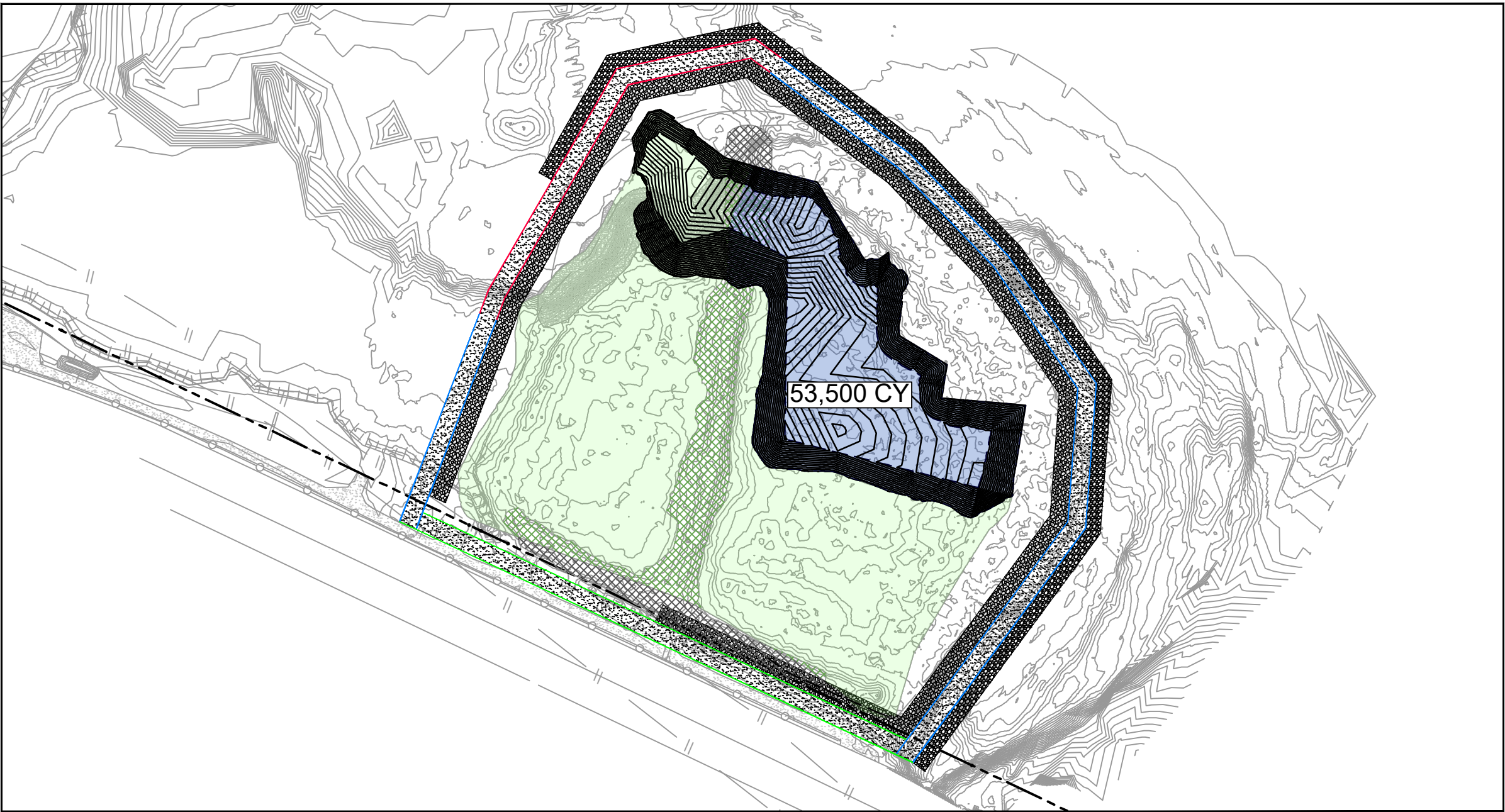
JOB NO. 11215702 FILE NO. 001  
GHD TEXAS FIRM REGISTRATION NO. 276

**THIRD 100% EPA SUBMITTAL**

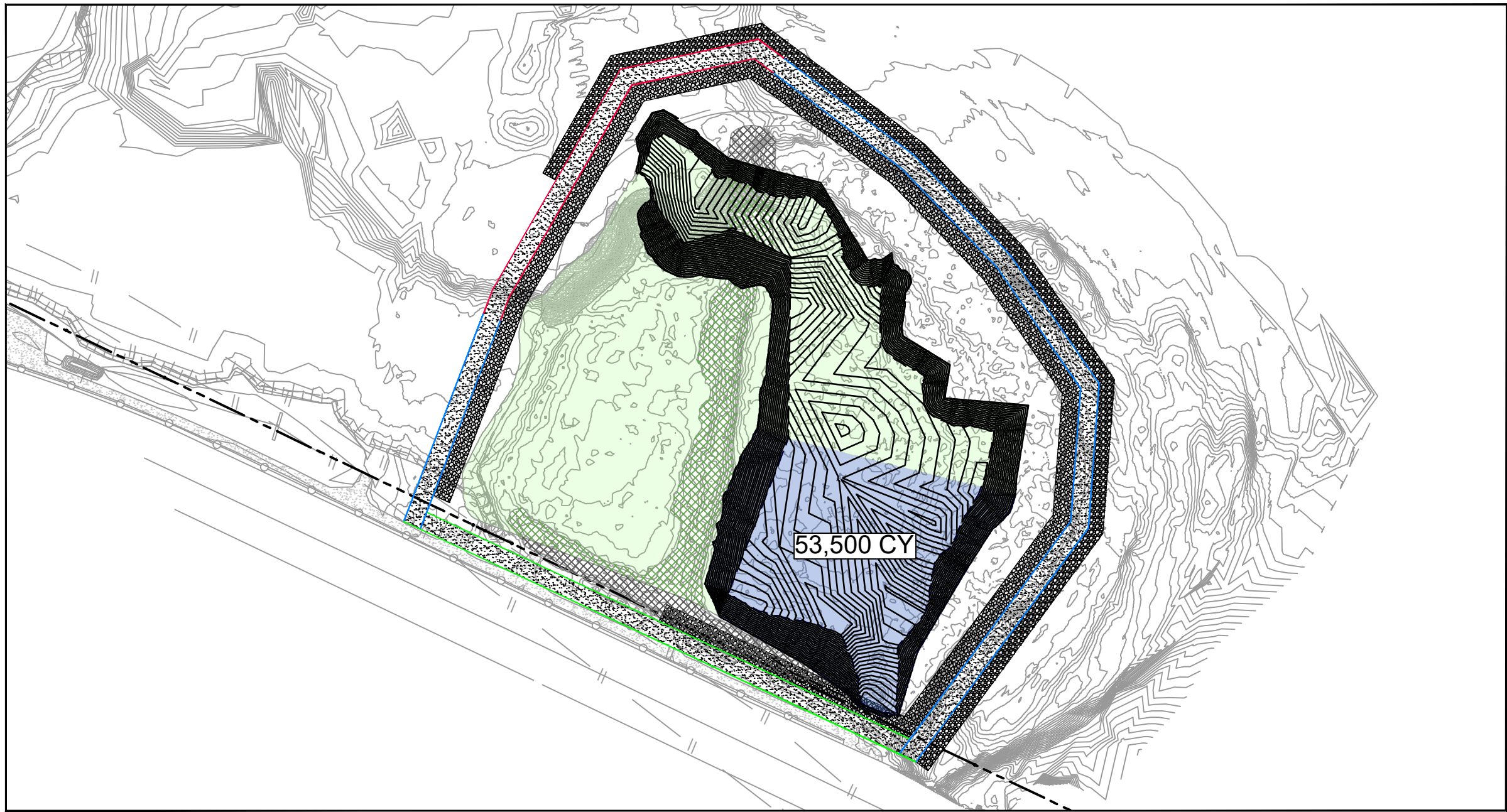




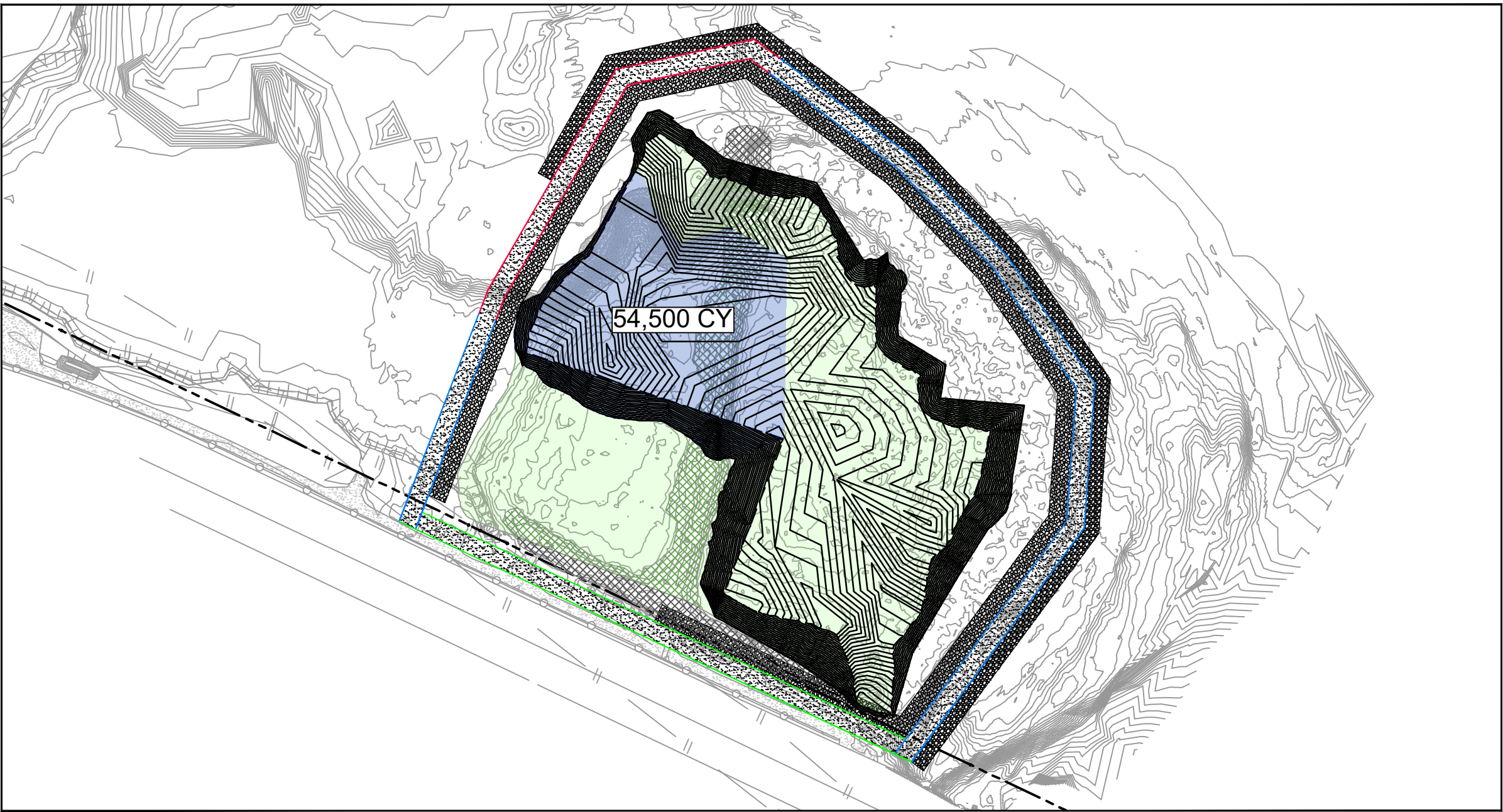
YEAR 2



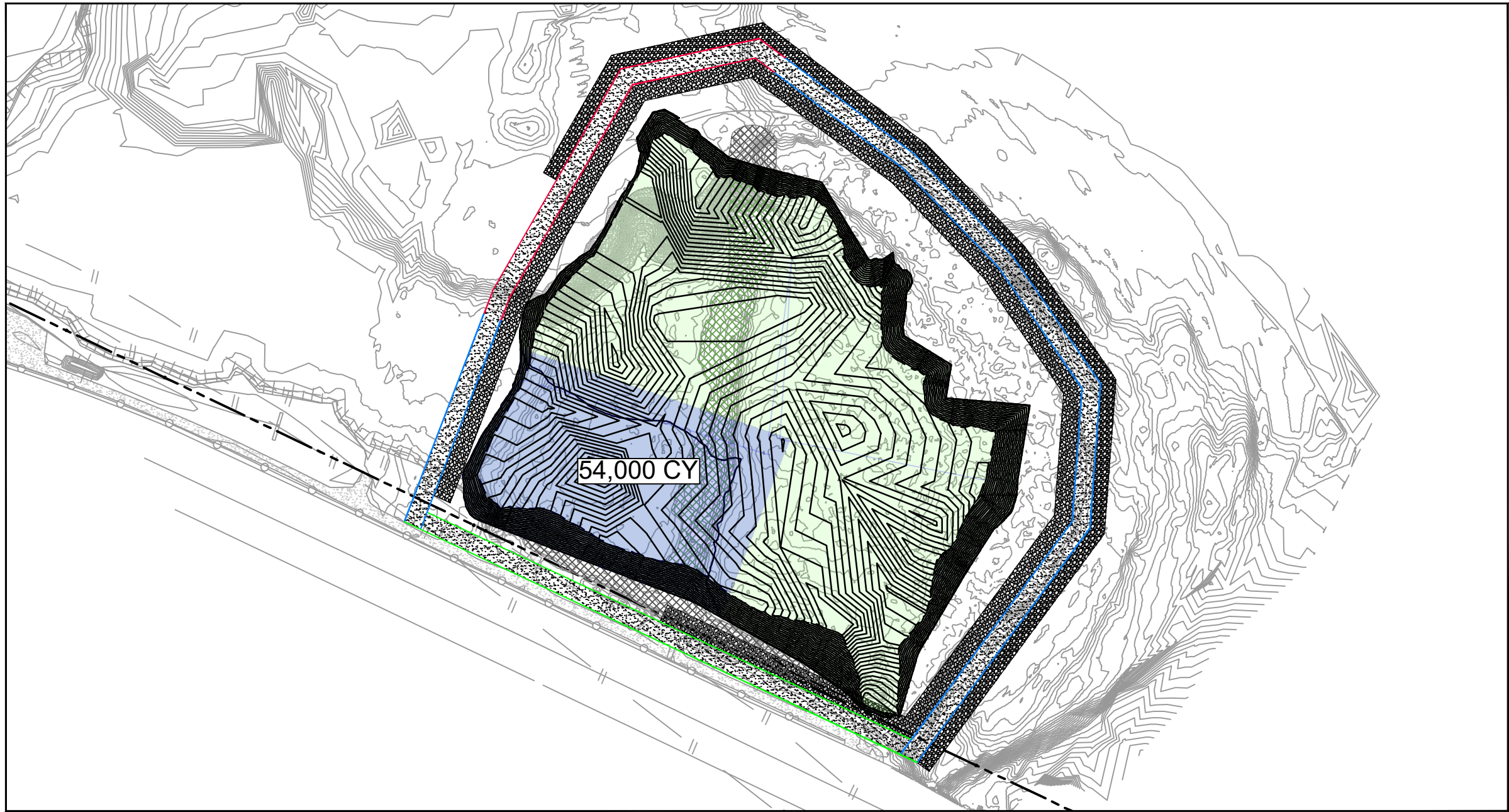
YEAR 3



YEAR 4



YEAR 5



YEAR 6

PHASE	TCRA CAP (CY)	CENTER BERM MATERIAL			CONTAMINATED MATERIAL		
		CUT (CY)	FILL (CY)	NET (CUT; CY)	CUT (CY)	FILL (CY)	NET (CUT; CY)
YEAR 2	2,440	4,300	0	4,300	10,200	0	10,200
YEAR 3	7,800	2,350	0	2,350	51,150	0	51,150
YEAR 4	7,000	20	0	20	53,480	0	53,480
YEAR 5	5,560	11,230	0	11,230	43,270	0	43,270
YEAR 6	5,520	12,760	0	12,760	41,240	0	41,240
TOTAL	28,320	30,660	0	30,660	199,340	0	199,340

- NOTES:
- CENTER BERM MATERIAL MAY NOT BE IMPACTED MATERIAL. CHEMICAL SAMPLING SHALL BE CONDUCTED ON CENTER BERM MATERIAL. IF DIOXIN CONTAMINATION IS FOUND TO BE PRESENT THEN THE CENTER BERM MATERIAL SHALL BE DISPOSED OFF-SITE AND WILL NOT BE AVAILABLE FOR RE-USE.
  - VOLUME CALCULATIONS CONDUCTED USING TOOLS AND MEASUREMENTS IN AUTODESK AUTOCAD CIVIL 3D 2024.

SOURCE:  
TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608, JULY 8, 2019 TO AUGUST 2, 2019  
UPDATED BATHYMETRY DATA PROVIDED BY ANCHOR GEA OCTOBER 2021  
TXDOT RIGHT OF WAY FROM A BOUNDARY AND RIGHT-OF-WAY SURVEY OF PORT OF HOUSTON AUTHORITY PROPERTY & HOUSTON FLEETING SERVICES, LLC PROPERTY ALONG INTERSTATE HIGHWAY 10 AT THE SAN JACINTO FLEET AREA, IN THE J. T. HARRELL SURVEY, A-330 HARRIS COUNTY, TEXAS, COBBFENDLEY, 2402-028-01, JUNE 28, 2024

NOTES:

- TYPICAL EXCAVATION SEQUENCING ASSUMES BMP INSTALLATION AND SITE PREPARATION WILL BE COMPLETED IN YEAR 1. REMEDIATION OF THE NORTHWEST CORNER IN YEAR 2, AND BMP REMOVAL AND SITE RESTORATION WILL BE COMPLETED IN YEAR 7.
- SEASONAL EXCAVATION AREAS, VOLUMES, AND SEQUENCING ARE APPROXIMATE AND SUBJECT TO CHANGE.

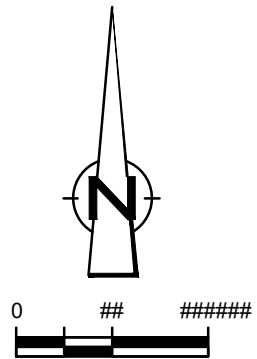
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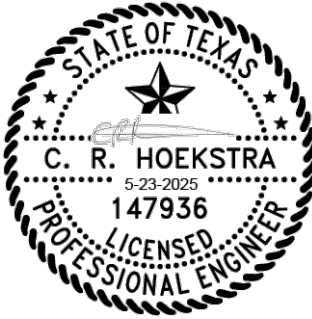
JOB NO. 11215702

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**LEGEND**

--- TXDOT RIGHT OF WAY  
--- TCRA CAP PERIMETER  
--- EXISTING CONTOUR INTERVAL  
--- FENCELINE  
--- SHORELINE  
--- TOP OF BANK  
--- TOE OF SLOPE  
--- OVERHEAD ELECTRICAL  
--- GUARDRAIL  
--- PIPELINE  
--- BORING LOCATION  
--- MONITORING WELL  
--- POWER POLE  
--- LIGHT POLE  
--- WELL

■ SJSB002  
● MW  
● P.P.  
● L.P.  
○ WELL

--- MATERIAL TO BE EXCAVATED  
--- EXISTING BERM TO BE EXCAVATED  
--- FOR POTENTIAL TESTING AND REUSE  
--- EXISTING BERM TO REMAIN

--- CONCRETE  
--- GRAVEL  
--- A226-700 PILE  
--- A236-700 PILE  
--- A242-700 PILE  
--- PHASE OF EXCAVATION  
--- EXTERIOR SCOUR PROTECTION  
--- INTERIOR SCOUR PROTECTION

Client  
**SAN JACINTO RIVER WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**


6	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
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No.	Issue	Drawn	Approved	Date
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Drawn	JC	Designer	RH	
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Drafting Check	BS	Design Check	LL	
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Project Coordinator	CM	Date	May 22, 2025	
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Original Size	Arch D	Bar is one inch on original size drawing 0 1"
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Project No. 11215702

Title  
**SEASONAL EXCAVATION SEQUENCING TYPICAL**

Sheet No.

C-19





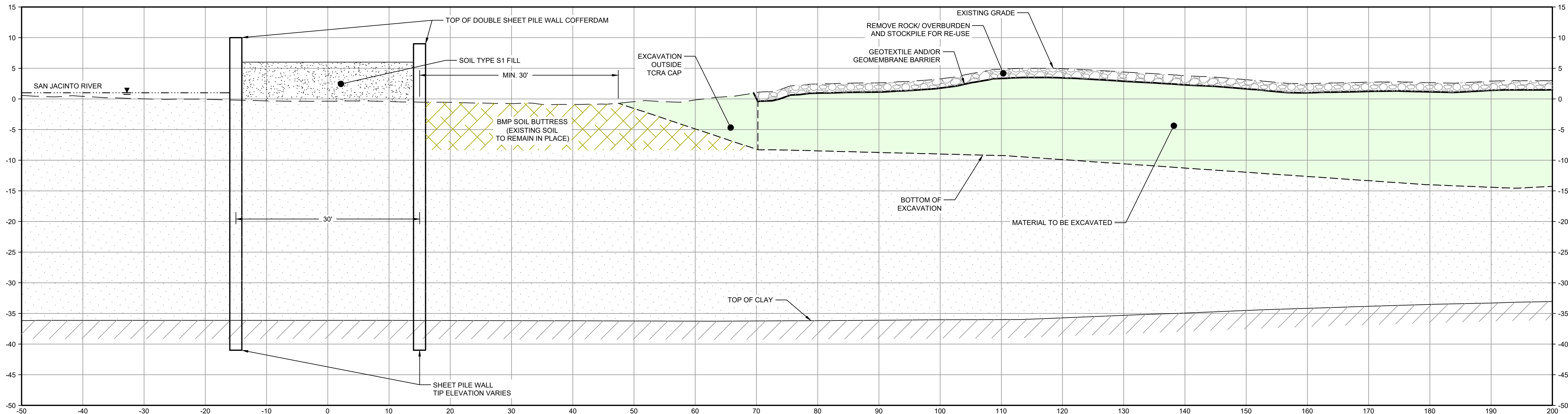
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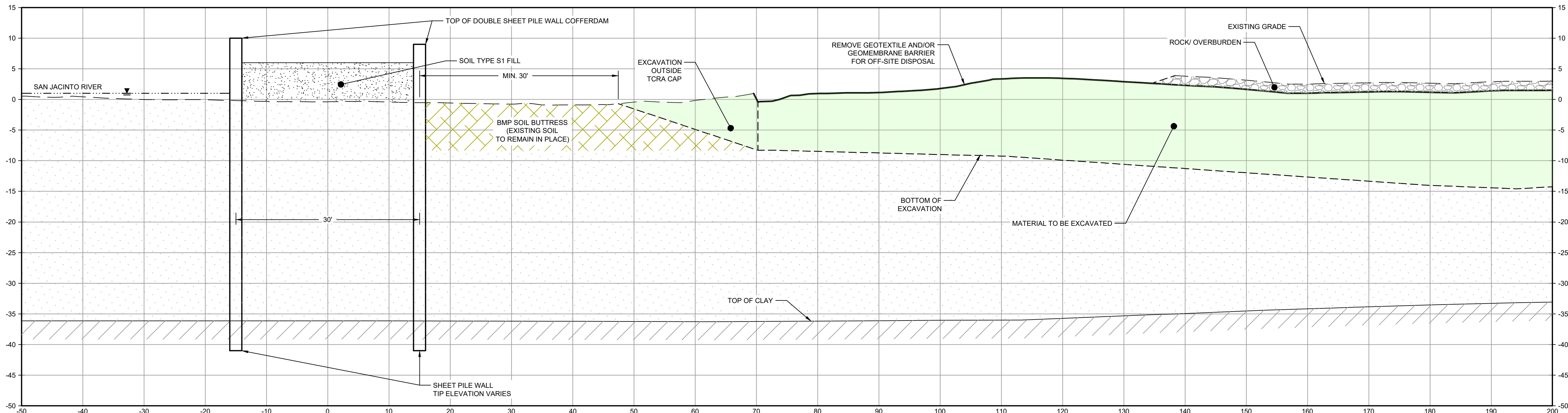
LEGEND

- MATERIAL TO BE EXCAVATED  
BMP SOIL BUTTRESS (EXISTING SOIL TO REMAIN IN PLACE)



- NOTES:
1. INSTALL PILE WALL COFFERDAM AROUND PERIMETER OF EXCAVATION AND DEWATER.

PHASE 1  
1" = 10'

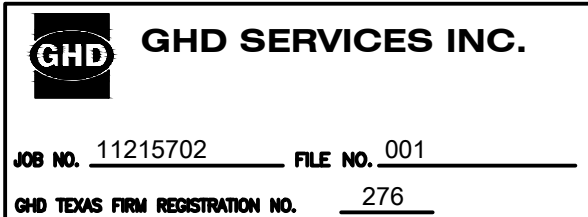


- NOTES:
1. REMOVE ROCK LAYER TO BE STOCKPILED ON SITE. REUSED AS TEMPORARY COVER AT END OF SEASONAL EXCAVATION.

PHASE 2  
1" = 10'

- NOTES:
1. BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.
  2. SCOUR PROTECTION ON INTERIOR AND EXTERIOR SIDE OF COFFERDAM NOT SHOWN. SEE DRAWINGS C-28 TO C-44 FOR LIMITS OF RIPRAP.
  3. FRP BARRIER WALL NOT SHOWN FOR CLARITY.

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THIRD 100% EPA SUBMITTAL

Client  
**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

6	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	JC	Designer	RH	
Drafting Check	BS	Design Check	LL	
Project Coordinator	CM	Date	May 22, 2025	
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Original Size		Bar is one inch on original size drawing 0 1"		
Arch D				

Project No. 11215702

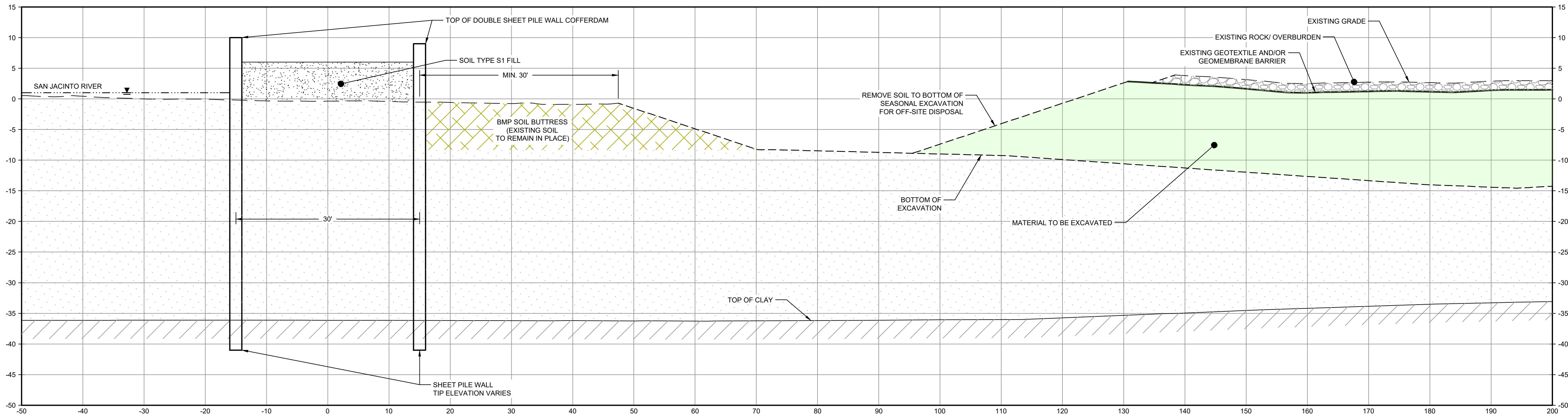
Title  
**TYPICAL EXCAVATION  
SEQUENCING  
1 OF 2**

Sheet No.

C-20

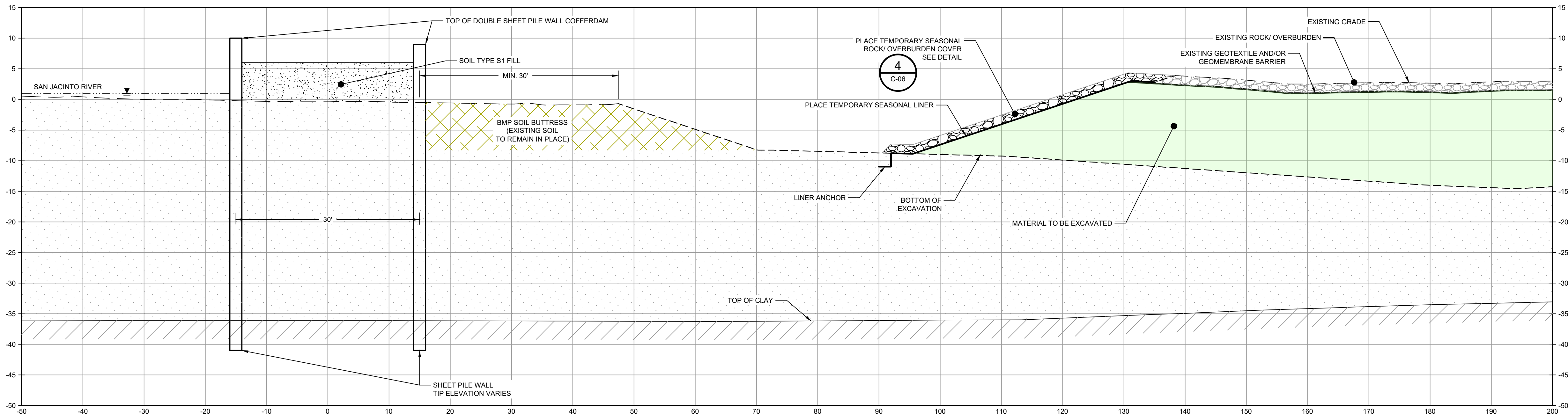
Sheet 21 of 83





- NOTES:
1. REMOVE GEOMEMBRANE, EXCAVATE MATERIAL AND DISPOSE OF OFFSITE.

**PHASE 3**  
1' = 10'



- NOTES:
1. BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.
  2. SCOUR PROTECTION ON INTERIOR AND EXTERIOR SIDE OF COFFERDAM NOT SHOWN. SEE DRAWINGS C-28 TO C-44 FOR LIMITS OF RIPRAP.
  3. FRP BARRIER WALL NOT SHOWN FOR CLARITY.

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**GHD SERVICES INC.**

JOB NO. 11215702

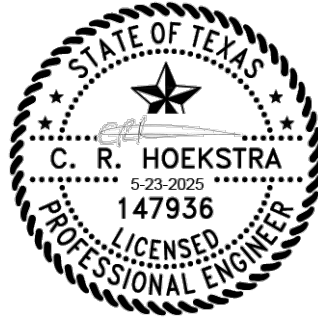
FILE NO. 001

GHD TEXAS FIRM REGISTRATION NO. 276

**THIRD 100% EPA SUBMITTAL**



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LEGEND	
	MATERIAL TO BE EXCAVATED
	BMP SOIL BUTTRESS (EXISTING SOIL TO REMAIN IN PLACE)

Client  
**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

6	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	JC	Designer	RH	
Drafting Check	BS	Design Check	LL	
Project Coordinator	CM	Date	May 22, 2025	
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Original Size		Bar is one inch on original size drawing 0 1"		
Arch D				

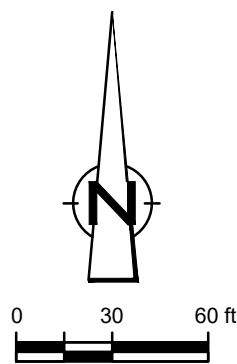
Project No. 11215702

Title  
**TYPICAL EXCAVATION  
SEQUENCING  
2 OF 2**

Sheet No.

**C-21**





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LEGEND	
---	TXDOT RIGHT OF WAY
---	TCRA CAP PERIMETER
---	EXISTING CONTOUR INTERVAL
---	FENCELINE
---	SHORELINE
---	TOP OF BANK
---	TOE OF SLOPE
---	OVERHEAD ELECTRICAL
---	GUARDRAIL
---	PIPELINE
---	BORING LOCATION
---	MONITORING WELL
---	POWER POLE
---	LIGHT POLE
---	WELL
---	CONCRETE
---	GRAVEL
---	AZ26-700 PILE
---	AZ36-700 PILE
---	AZ42-700 PILE
---	EXTERIOR SCOUR PROTECTION/RIPRAP
---	INTERIOR SCOUR PROTECTION

Client  
**SAN JACINTO RIVER WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

7	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	JC	Designer	RH	
Drafting Check	BS	Design Check	LL	
Project Coordinator	CM	Date	May 22, 2025	
Original Size	Arch D	Scale	1" = 60'	
		Bar is one inch on original size drawing 0 1"		

Project No. 11215702

Title

**RESTORATION PLAN**

Sheet No.

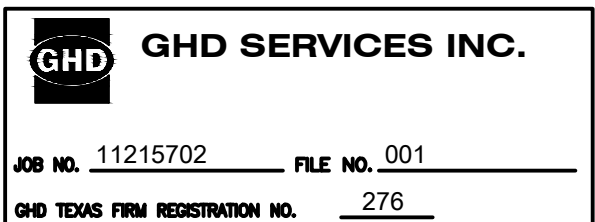
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Sheet 23 of 83

SOURCE:  
TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608, JULY 8, 2019 TO AUGUST 2, 2019  
UPDATED BATHYMETRY DATA PROVIDED BY ANCHOR GEA OCTOBER 2021  
TXDOT RIGHT OF WAY FROM A BOUNDARY AND RIGHT-OF-WAY SURVEY OF PORT OF HOUSTON AUTHORITY PROPERTY & HOUSTON FLEETING SERVICES, LLC, PROPERTY ALONG INTERSTATE HIGHWAY 10 AT THE SAN JACINTO FLEET AREA, IN THE J. T. HARRELL SURVEY, A-330 HARRIS COUNTY, TEXAS, COBBFENDLEY, 2402-028-01, JUNE 28, 2024

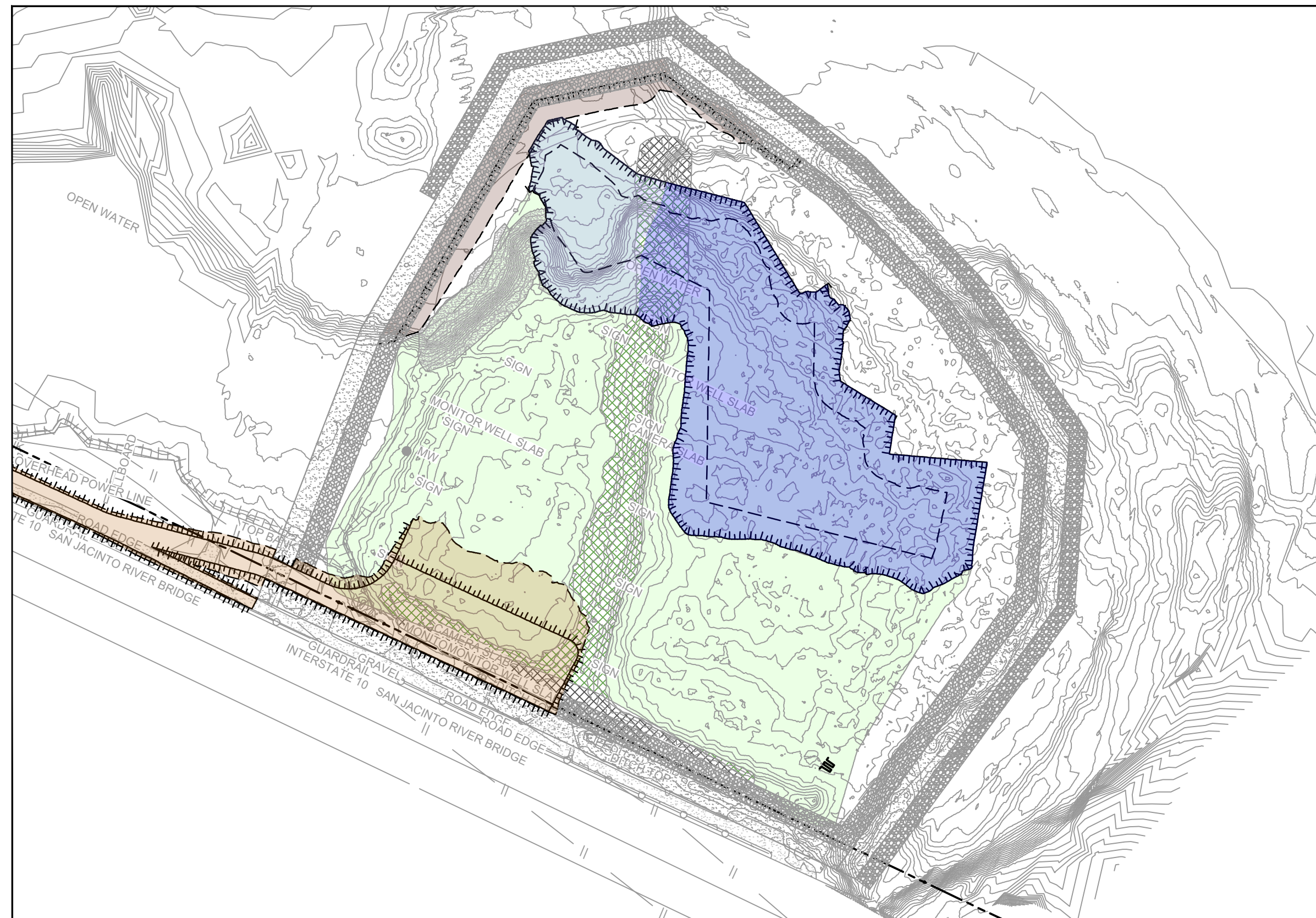
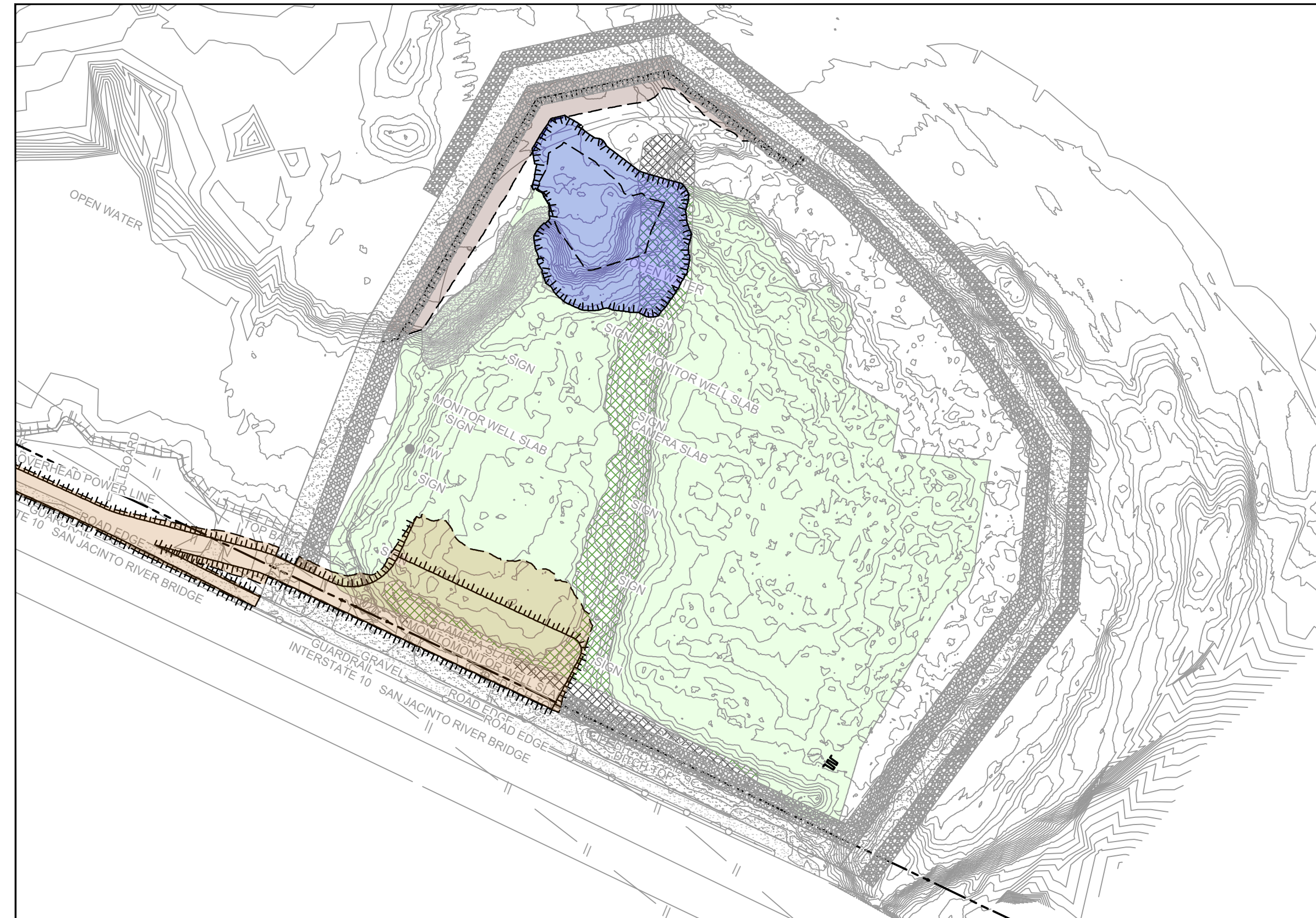
NOTES:  
1. FINAL EXCAVATION CONTOURS ARE SUBJECT TO CHANGE.

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**THIRD 100% EPA SUBMITTAL**





**SOURCE:**

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NOTES:

1. SEASONAL EXCAVATION AREAS, VOLUMES, AND SEQUENCING ARE APPROXIMATE AND SUBJECT TO CHANGE.

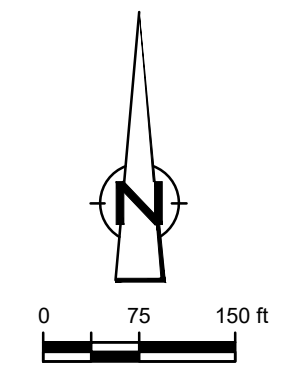
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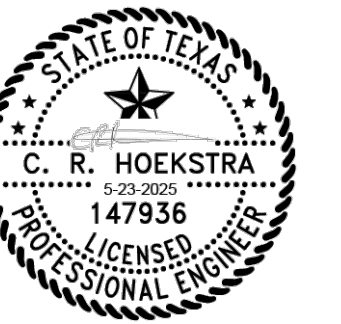
### THIRD 100% EPA SUBMITTAL

**C-23**

Sheet 24 of 83



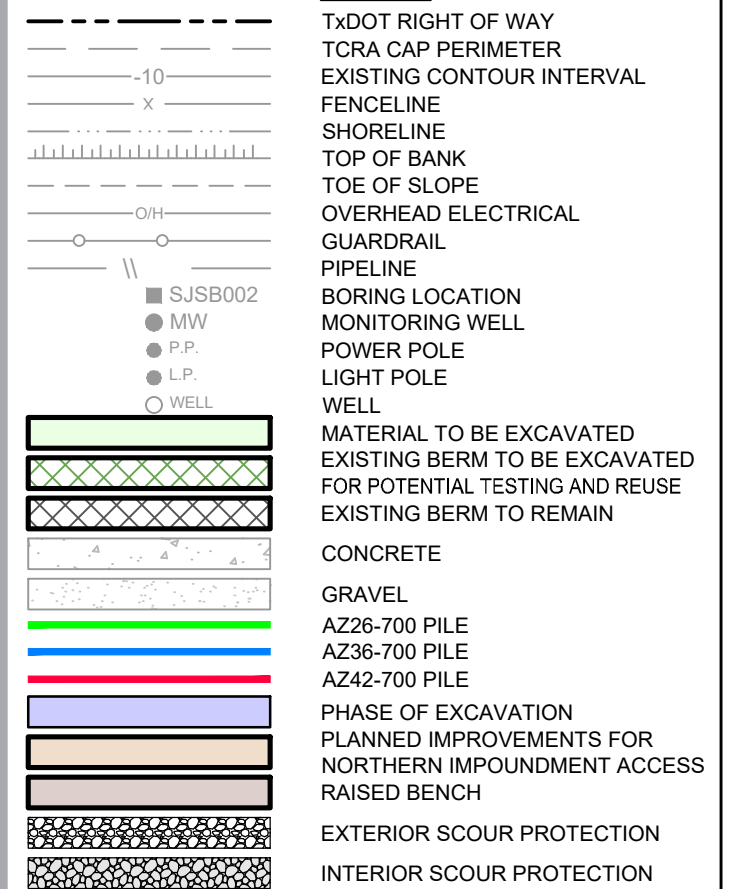
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### LEGEND



Client

## SAN JACINTO RIVER WASTE PITS

Project

**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**


7	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
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No.	Issue	Drawn	Approved	Date

Drawn <b>JC</b>	Designer <b>RH</b>

Drafting Check	BS	Design Check	LL
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Project Coordinator <b>CM</b>	Date <b>May 23, 2025</b>
-------------------------------	--------------------------

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Original Size	Bar is one inch on original size drawing
<b>Arch D</b>	0

Project No. **11215702**

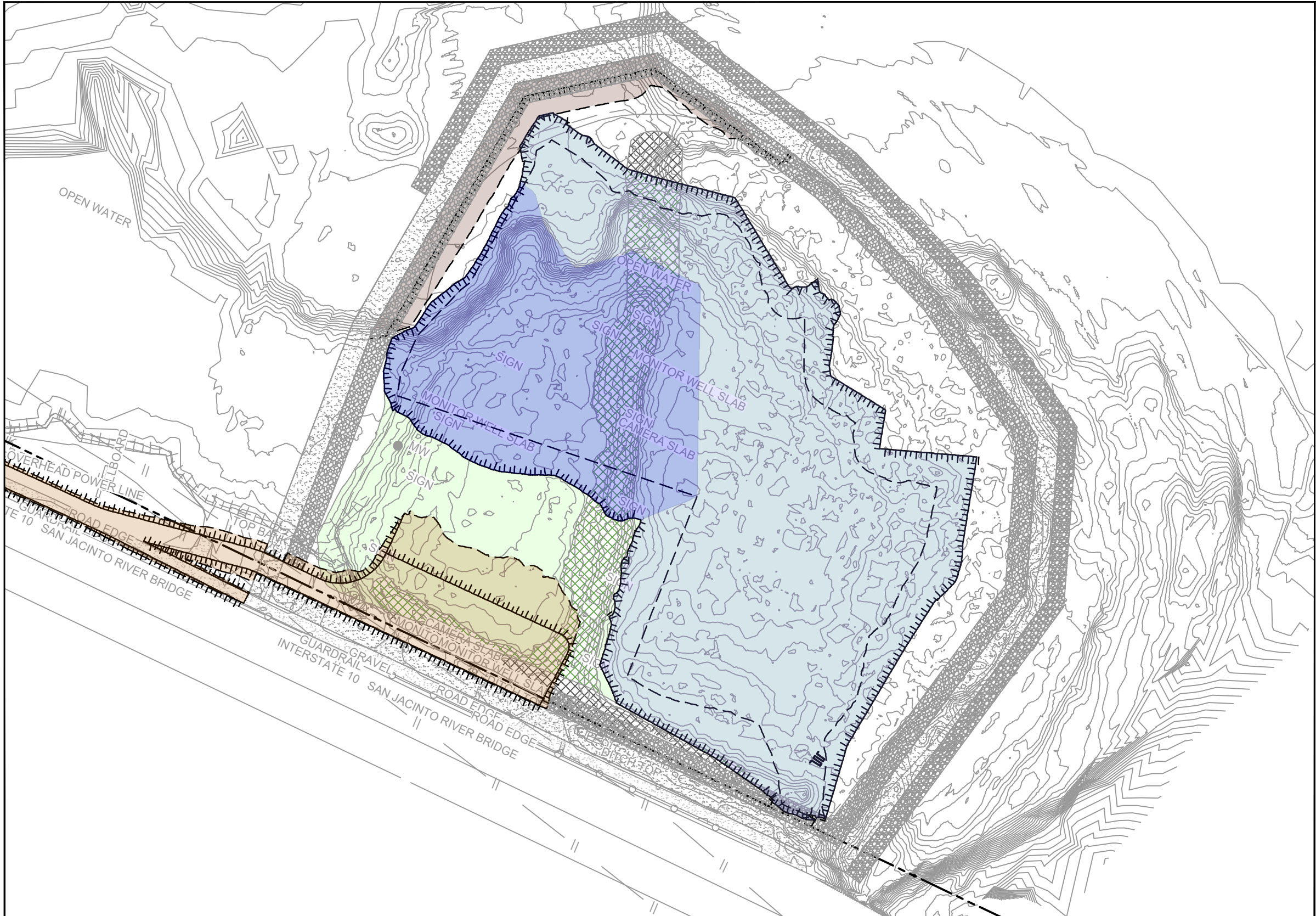
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# CONSTRUCTION SEQUENCING 1 OF 2

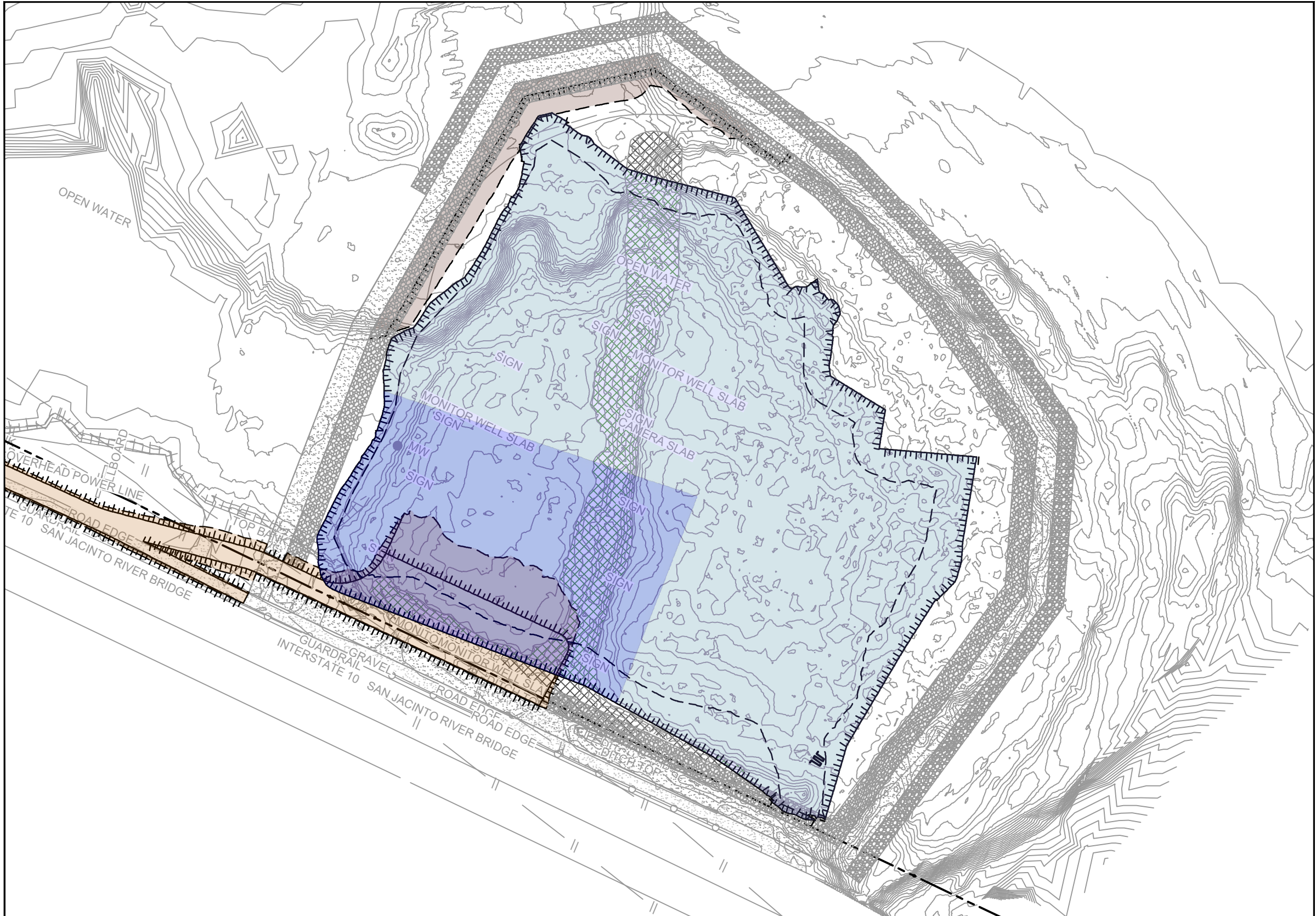
Sheet No.

C-23

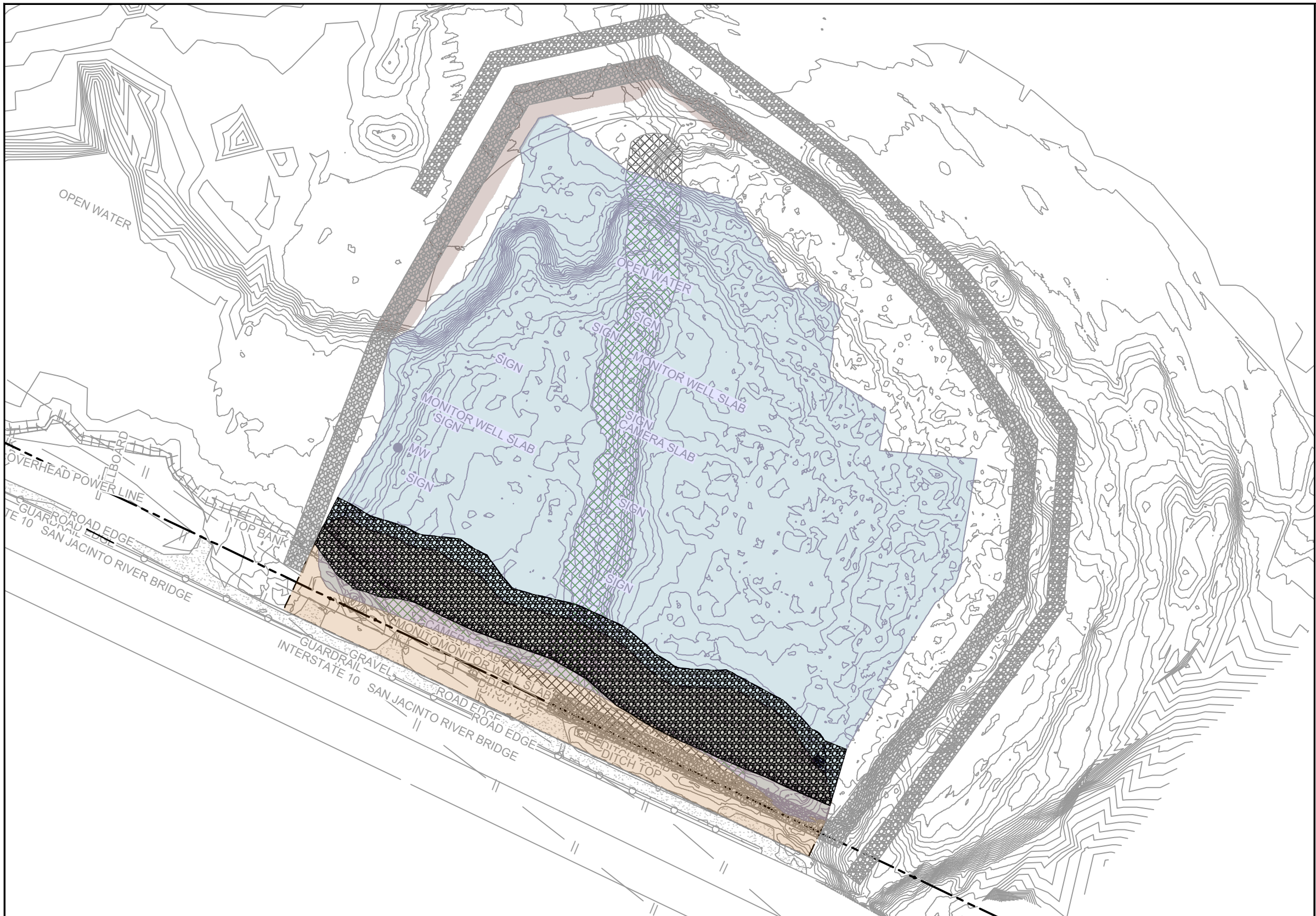




YEAR 5 - EXCAVATION SEASON 4



YEAR 6 - EXCAVATION SEASON 5



YEAR 7 - BMP REMOVAL AND SITE RESTORATION

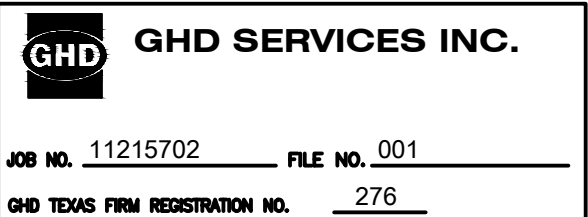
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UPDATED BATHYMETRY DATA PROVIDED BY ANCHOR QEA OCTOBER 2021  
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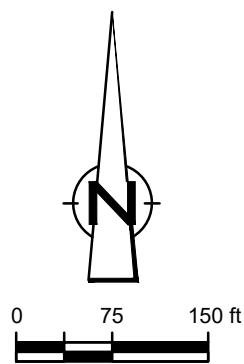
NOTES:

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LEGEND	
---	TXDOT RIGHT OF WAY
---	TCRA CAP PERIMETER
---	EXISTING CONTOUR INTERVAL
---	FENCELINE
---	SHORELINE
---	TOP OF BANK
---	TOE OF SLOPE
---	OVERHEAD ELECTRICAL
---	GUARDRAIL
---	PIPELINE
---	BORING LOCATION
---	MONITORING WELL
---	POWER POLE
---	LIGHT POLE
---	WELL
---	MATERIAL TO BE EXCAVATED
---	EXISTING BERM TO BE EXCAVATED
---	FOR POTENTIAL TESTING AND REUSE
---	EXISTING BERM TO REMAIN
---	CONCRETE
---	GRAVEL
---	AZ26-700 PILE
---	AZ36-700 PILE
---	AZ42-700 PILE
---	PHASE OF EXCAVATION
---	PLANNED IMPROVEMENTS FOR
---	NORTHERN IMPOUNDMENT ACCESS
---	RESTORED AREA
---	INCLUDING TOPSOIL PLACEMENT
---	AND SEEDING TO RIVER LEVEL
---	RAISED BENCH
---	EXTERIOR SCOUR PROTECTION
---	INTERIOR SCOUR PROTECTION

Client

SAN JACINTO RIVER  
WASTE PITS

Project

NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS

7	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	JC	Designer RH		
Drafting Check	BS	Design Check	LL	
Project Coordinator	CM	Date	May 23, 2025	
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Original Size	Bar is one inch on original size drawing 0  1"			
Arch D				

Project No. 11215702

Title

CONSTRUCTION  
SEQUENCING  
2 OF 2

Sheet No.

C-24

Sheet 25 of 83





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**SAN JACINTO RIVER  
WASTE PITS**  
Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

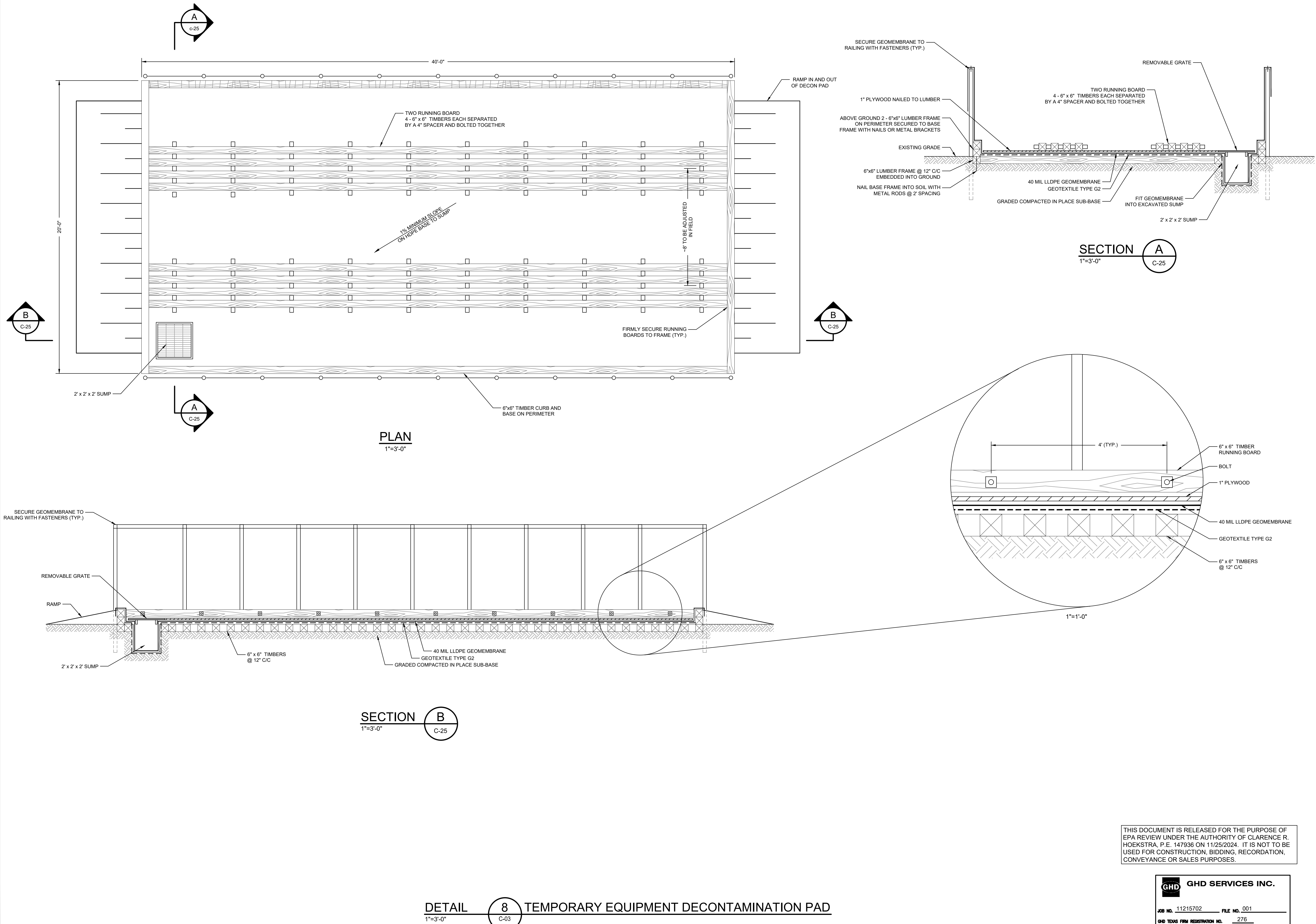
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No.	Issue	Drawn	Approved	Date
Drawn	JC	Designer	RH	
Drafting Check	BS	Design Check	LL	
Project Coordinator	CM	Date	May 22, 2025	
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Original Size		Bar is one inch on original size drawing 0 1"		
Arch D				

Project No. 11215702  
Title

**TYPICAL DETAILS  
1 OF 3**

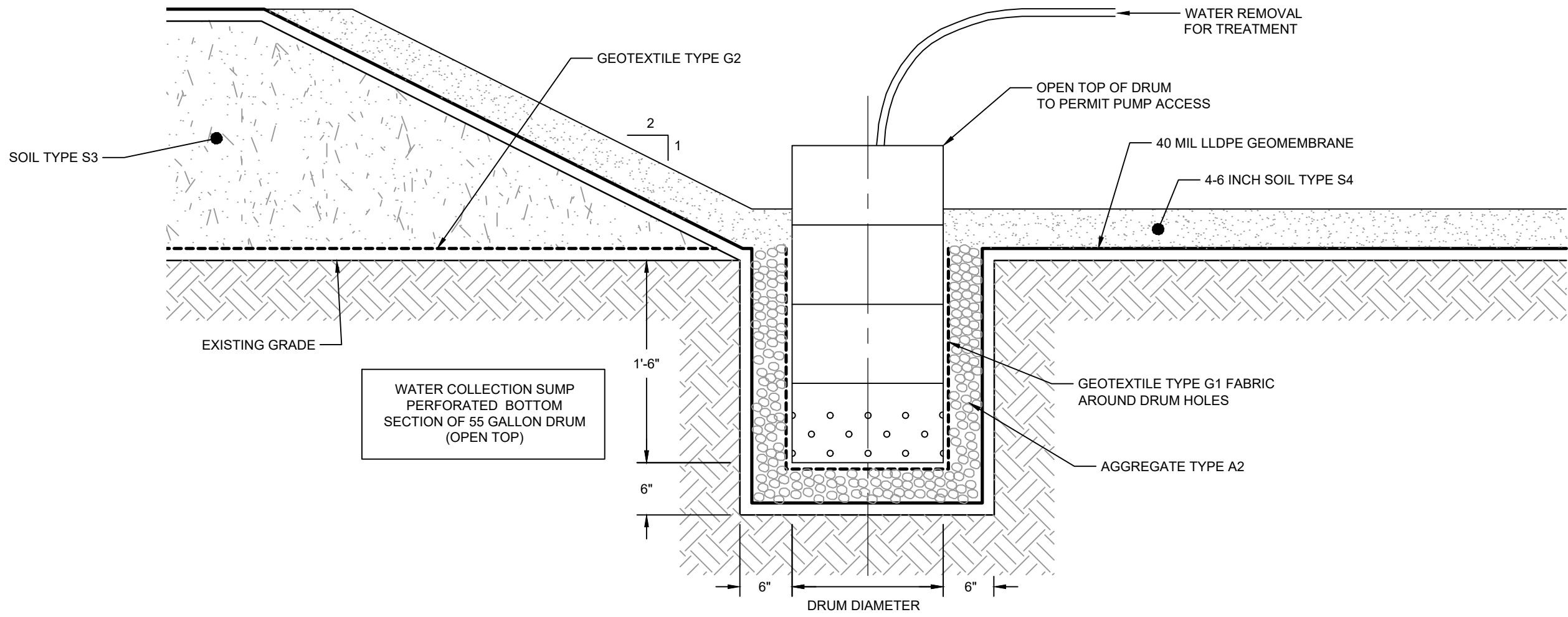
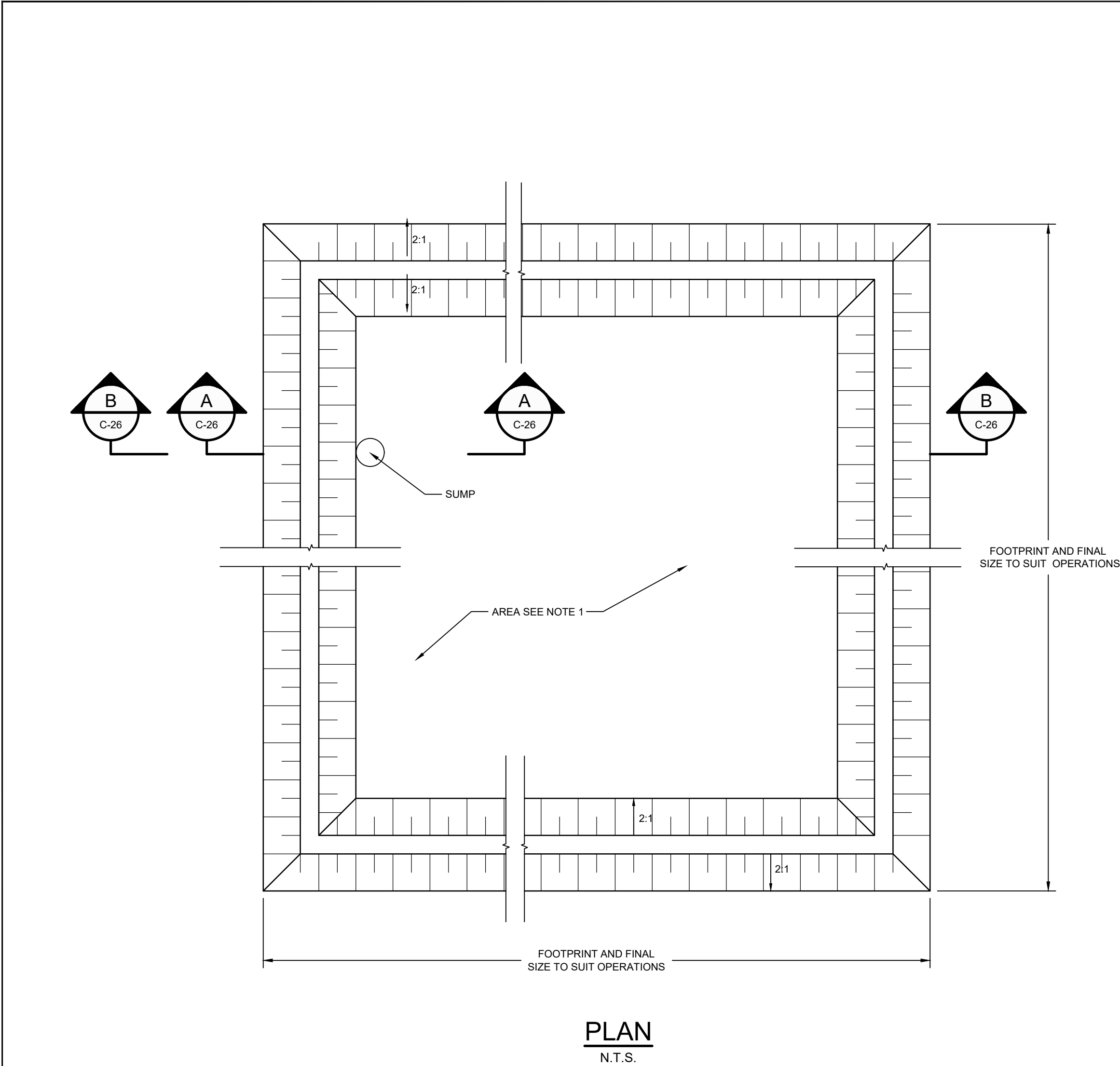
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**C-25**



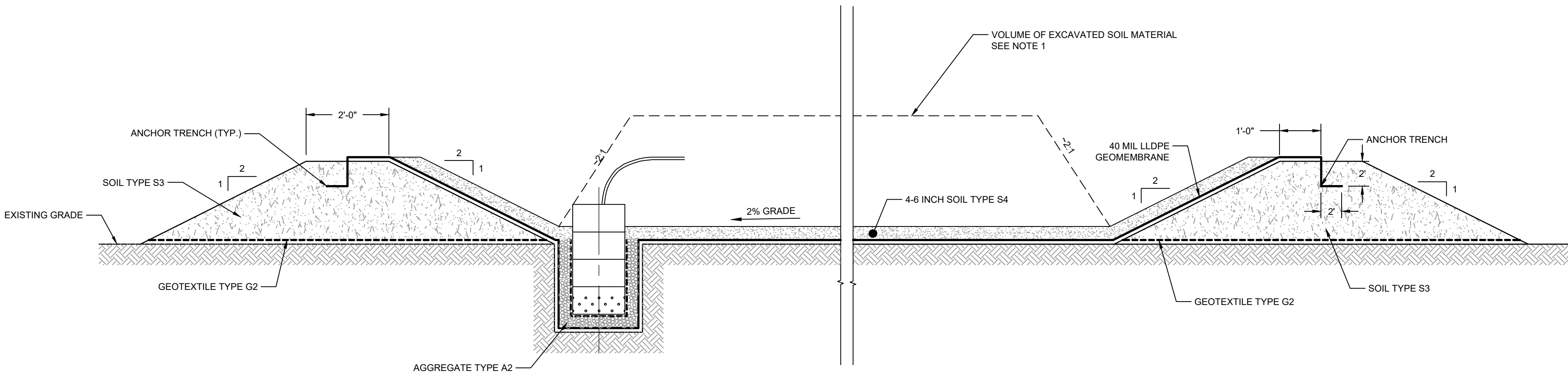
**THIRD 100% EPA SUBMITTAL**





SECTION A A SUMP  
N.T.S.

NOTES:  
1. TYPICAL DETAILS SHOWN AT DEWATERING AND SOLIDIFICATION AREA MAY BE REVISED BY THE CONTRACTOR. CONTRACTOR'S REVISED DETAILS SHALL BE SUBMITTED FOR REVIEW PRIOR TO CONSTRUCTION.



SECTION B B SUMP  
N.T.S.

DETAIL 9 TEMPORARY DEWATERING FACILITY  
N.T.S.

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**GHD SERVICES INC.**  
JOB NO. 11215702 FILE NO. 001  
GHD TEXAS FIRM REGISTRATION NO. 276

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Client **SAN JACINTO RIVER WASTE PITS**  
Project **NORTHERN IMPOUNDMENT THIRD FINAL 100% REMEDIAL DESIGN HARRIS COUNTY, TEXAS**

8	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	JC	Designer	RH	
Drafting Check	BS	Design Check	LL	
Project Coordinator	CM	Date	May 22, 2025	
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Original Size		Bar is one inch on original size drawing 0 1"		
Arch D				

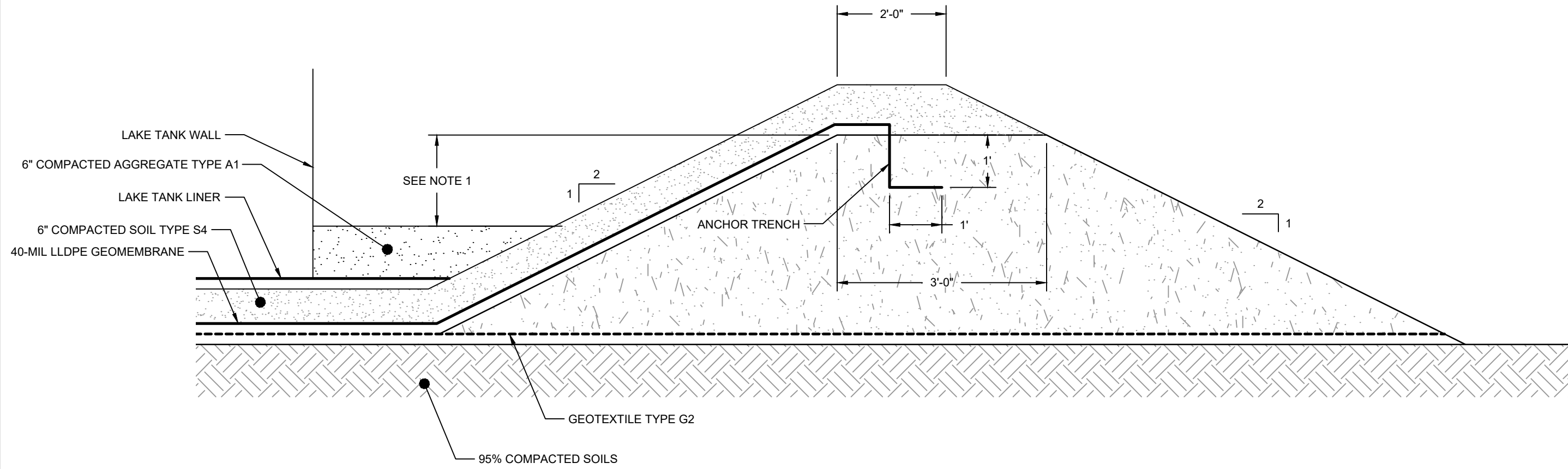
Project No. 11215702

Title  
**TYPICAL DETAILS 2 OF 3**

Sheet No.

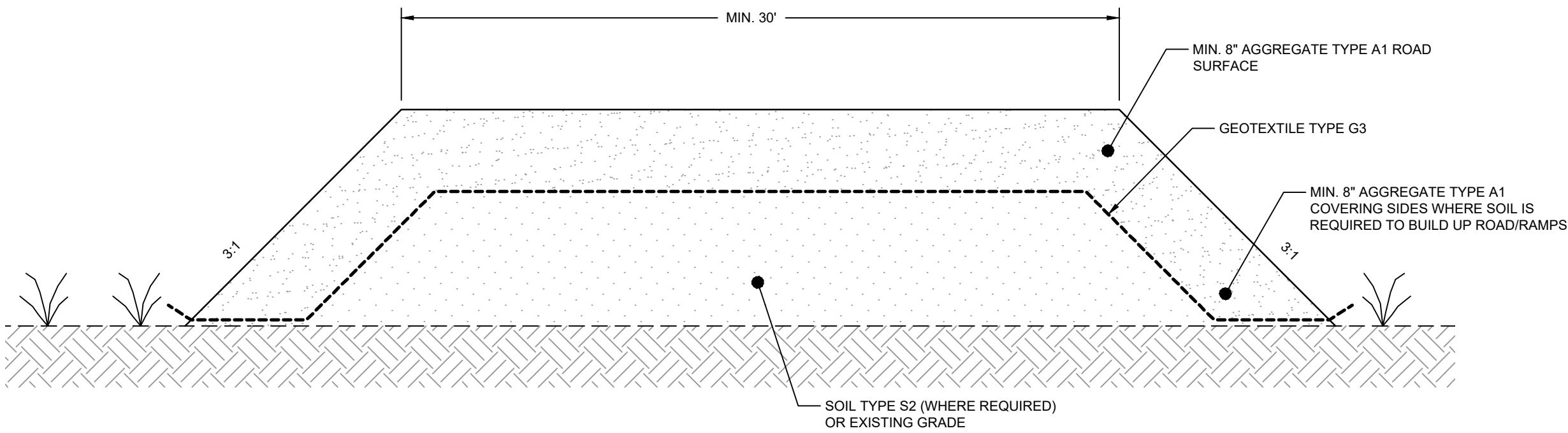
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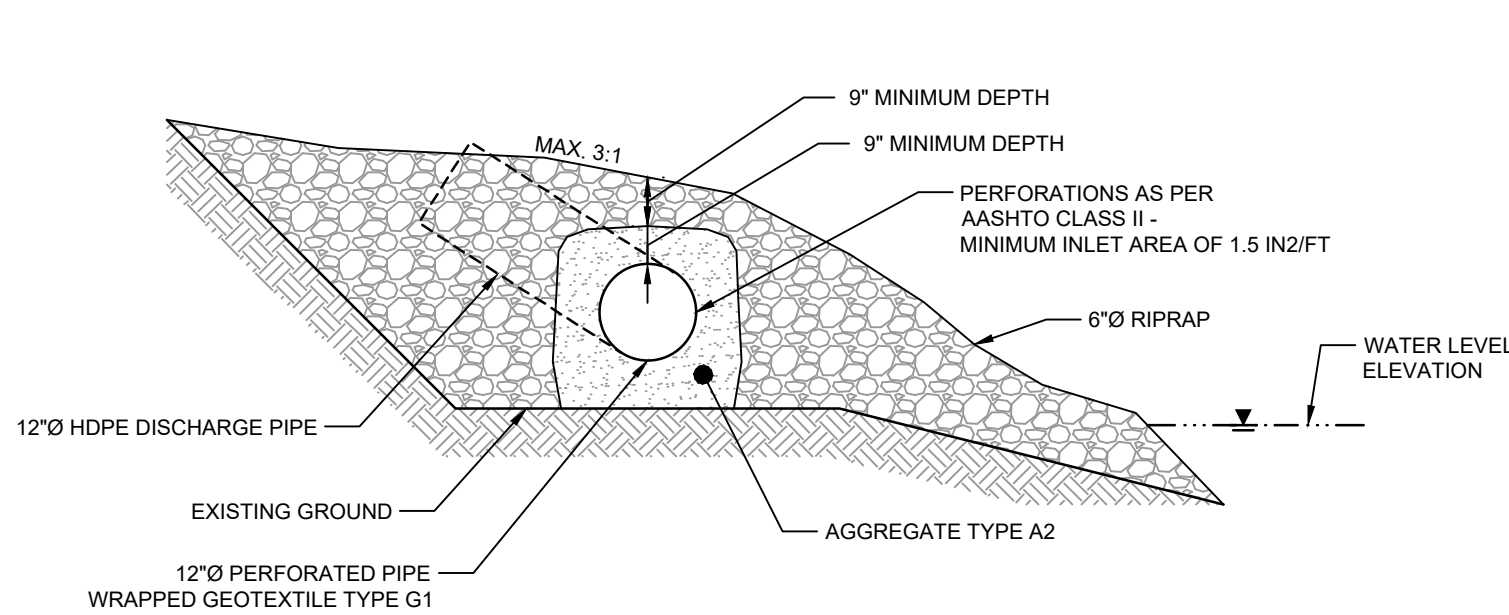


NOTE:  
1. CONTRACTOR SHALL DESIGN THE HEIGHT AND LENGTHS OF THE BERM SUCH THAT THE AVAILABLE VOLUME OF CONTAINMENT AREA (I.E., NOT OCCUPIED BY ONE INFLUENT TANK AND WTS EQUIPMENT) IS GREATER THAN THE 110% OF THE VOLUME OF THE LARGEST TANK (I.E., 1.33 MILLION GALLONS)

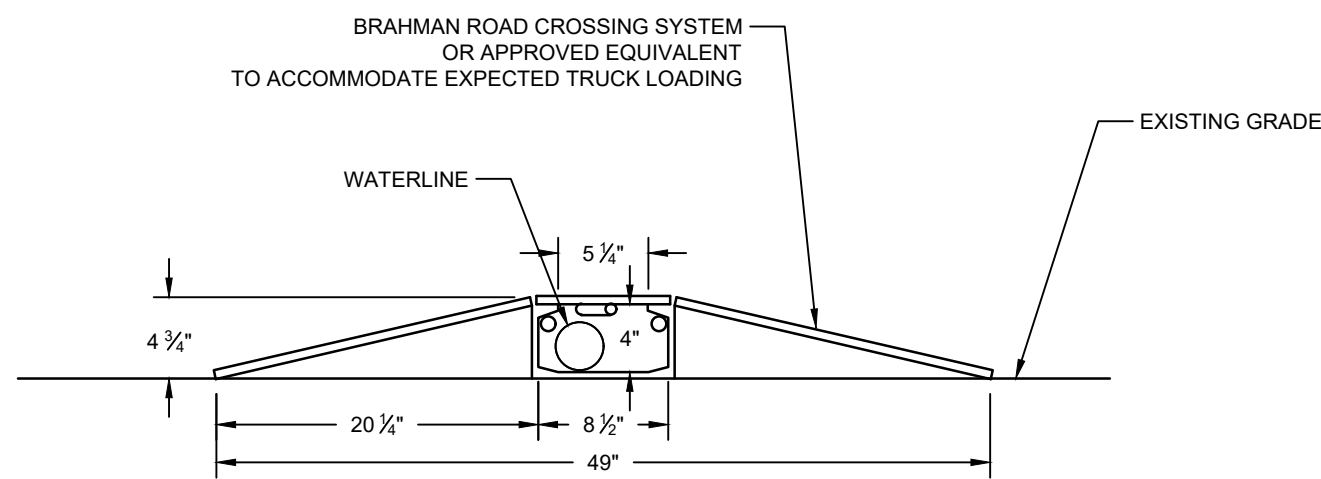
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N.T.S. C-55, P-011, P-013, P-014



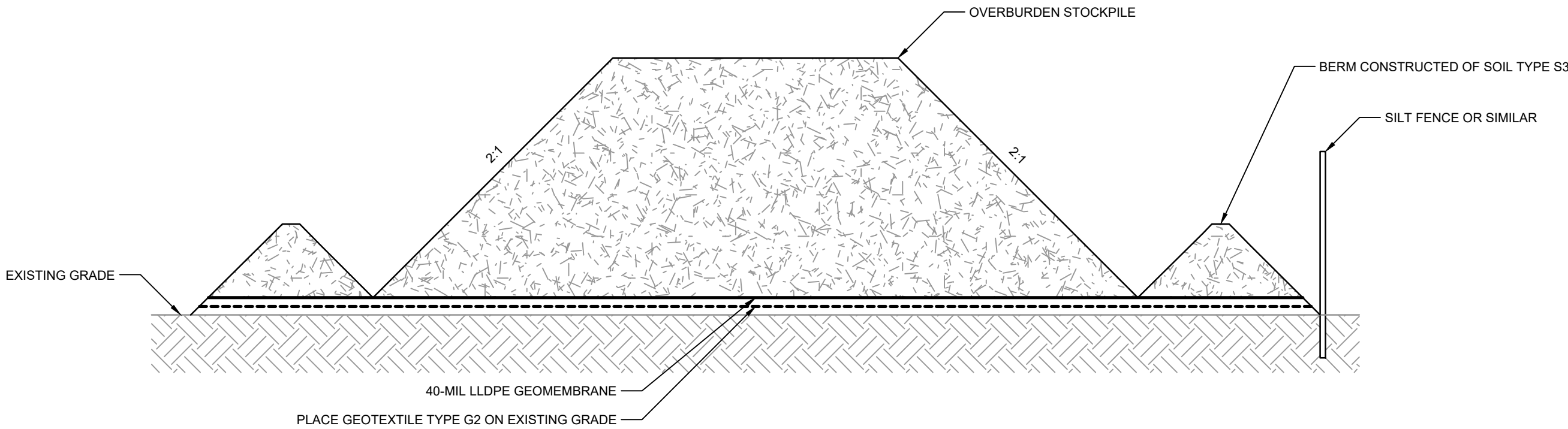
DETAIL 12 TEMPORARY ACCESS ROAD/ RAMPS  
N.T.S. C-03



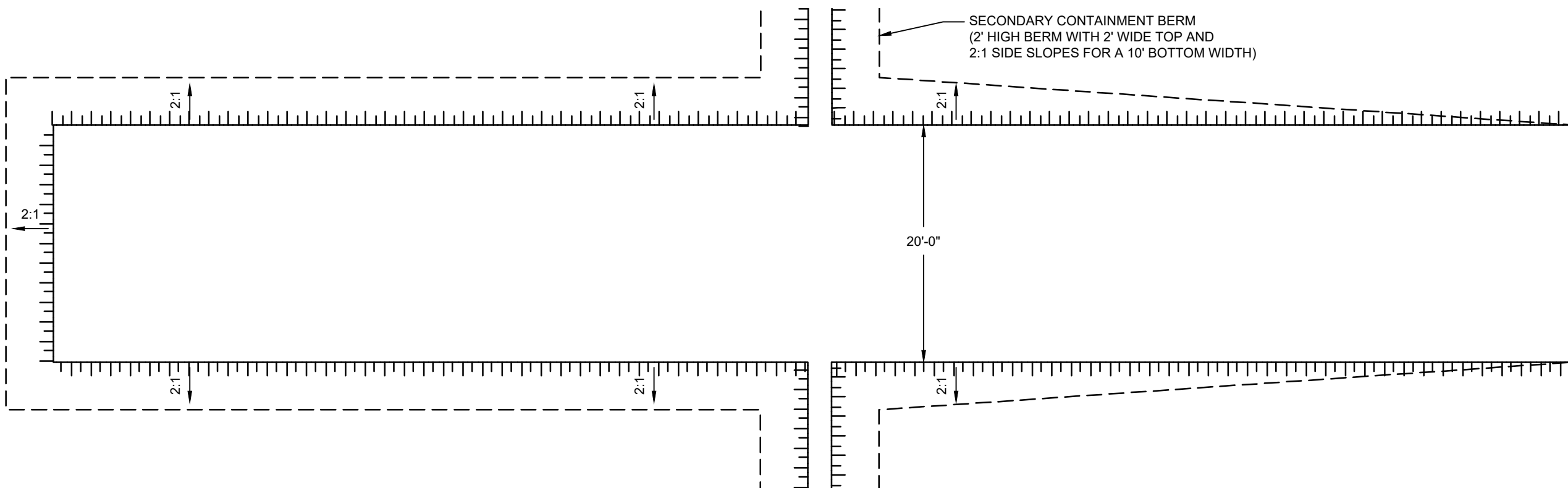
DETAIL 14 RIVER DISCHARGE DIFFUSER  
N.T.S.



DETAIL 11 TEMPORARY PIPE CROSSING PROTECTION  
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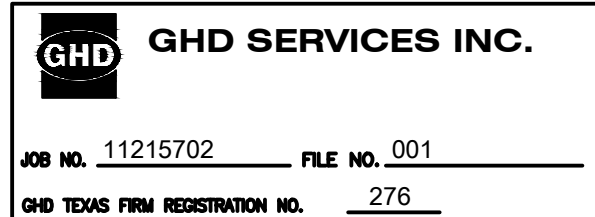


DETAIL 13 TEMPORARY EXCAVATED MATERIAL STOCKPILE  
N.T.S. C-03



DETAIL 15 ACCESS PLATFORM  
N.T.S.

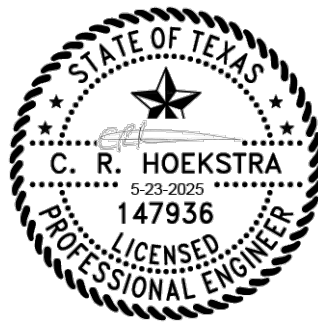
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**SAN JACINTO RIVER WASTE PITS**  
Project  
**NORTHERN IMPOUNDMENT THIRD FINAL 100% REMEDIAL DESIGN HARRIS COUNTY, TEXAS**

7 THIRD 100% EPA SUBMITTAL JC CRH 05/23/2025

No. Issue Drawn Approved Date

Drawn JC Designer RH

Drafting Check BS Design Check LL

Project Coordinator CM Date May 22, 2025

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**Arch D**  
Bar is one inch on original size drawing  
0 1"

Project No. 11215702

Title

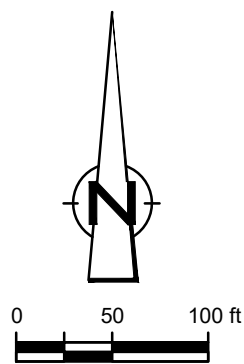
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Sheet No.

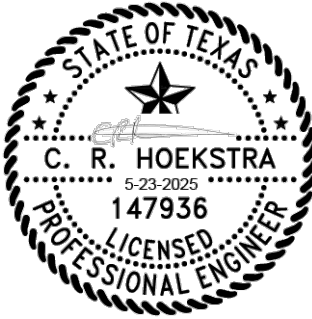
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	TORA CAP PERIMETER
	EXISTING CONTOUR INTERVAL
	FENCELINE
	SHORELINE
	TOP OF BANK
	TOE OF SLOPE
	OVERHEAD ELECTRICAL
	GUARDRAIL
	PIPELINE
	BORING LOCATION
	MONITORING WELL
	POWER POLE
	LIGHT POLE
	WELL
	MATERIAL TO BE EXCAVATED
	EXISTING BERM TO BE EXCAVATED
	FOR POTENTIAL TESTING AND REUSE
	EXISTING BERM TO REMAIN
	CONCRETE
	GRAVEL
	ASPHALT
	AZ26-700 PILE
	AZ36-700 PILE
	AZ42-700 PILE
	RAISED BENCH
	EXTERIOR SCOUR PROTECTION
	INTERIOR SCOUR PROTECTION

Client

SAN JACINTO RIVER  
WASTE PITS

Project

NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS


9	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
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No.	Issue	Drawn	Approved	Date
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Drawn	JC	Designer	RH
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Drafting	BS	Design	LL
Check		Check	

Project	CM	Date	May 23, 2025
Coordinator			

		Scale	1" = 100'
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Original Size	
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	Bar is one inch on original size drawing
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Arch D	
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Project No.	11215702
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Title	
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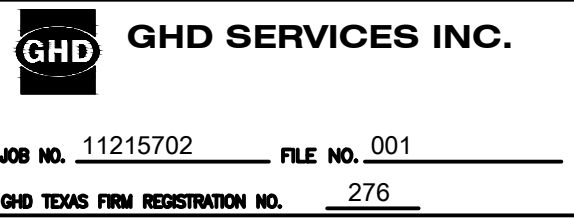
PILE WALL LAYOUT  
PLAN

Sheet No.	
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C-28

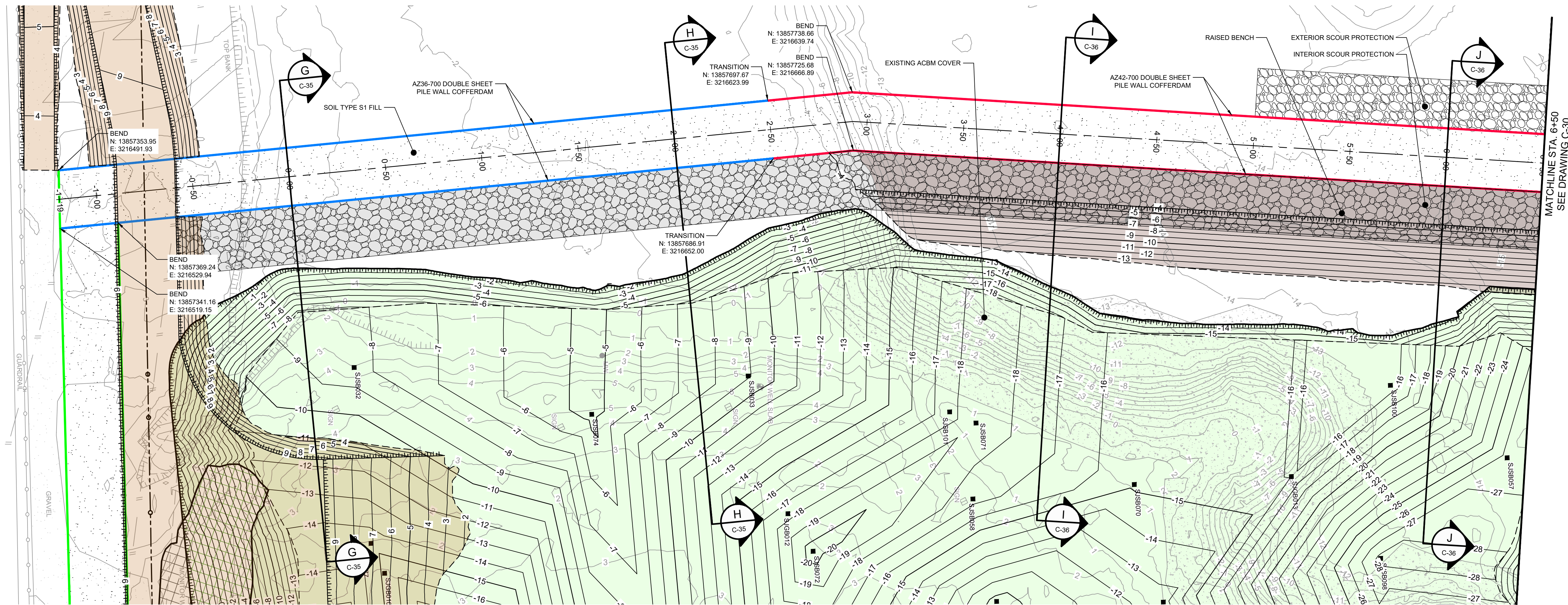
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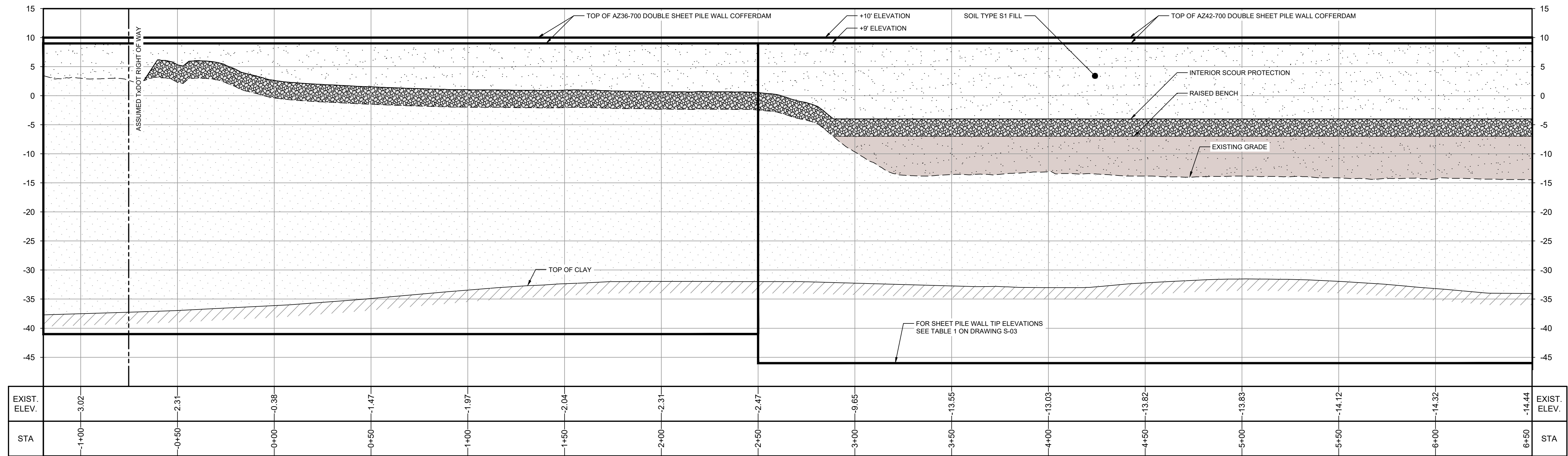
THIRD 100% EPA SUBMITTAL





PLAN

1" = 30'



PROFILE

HORIZ: 1" = 30'  
VERT: 1" = 10'

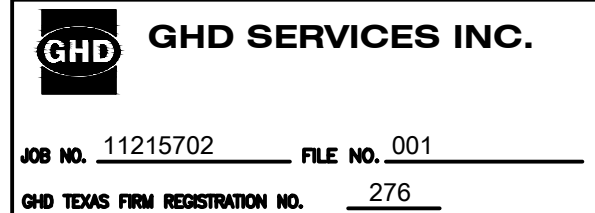
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NOTES:

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- FRP BARRIER WALL NOT SHOWN FOR CLARITY.

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	EXISTING CONTOUR INTERVAL
	FENCELINE
	SHORELINE
	TOP OF BANK
	TOE OF SLOPE
	OVERHEAD ELECTRICAL
	GUARDRAIL
	PIPELINE
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	MONITORING WELL
	POWER POLE
	LIGHT POLE
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	MATERIAL TO BE EXCAVATED
	EXISTING BERM TO BE EXCAVATED
	POTENTIAL TESTING AND REUSE
	EXISTING BERM TO REMAIN
	CONCRETE
	GRAVEL
	AZ26-700 PILE
	AZ36-700 PILE
	AZ42-700 PILE
	PLANNED IMPROVEMENTS FOR NORTHERN IMPOUNDMENT ACCESS
	RAISED BENCH
	EXTERIOR SCOUR PROTECTION
	INTERIOR SCOUR PROTECTION

Client  
**SAN JACINTO RIVER WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT THIRD FINAL 100% REMEDIAL DESIGN HARRIS COUNTY, TEXAS**

9	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	JC	Designer	RH	
Drafting Check	BS	Design Check	LL	
Project Coordinator	CM	Date	May 23, 2025	
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Original Size		Bar is one inch on original size drawing 0 1"		
Arch D				

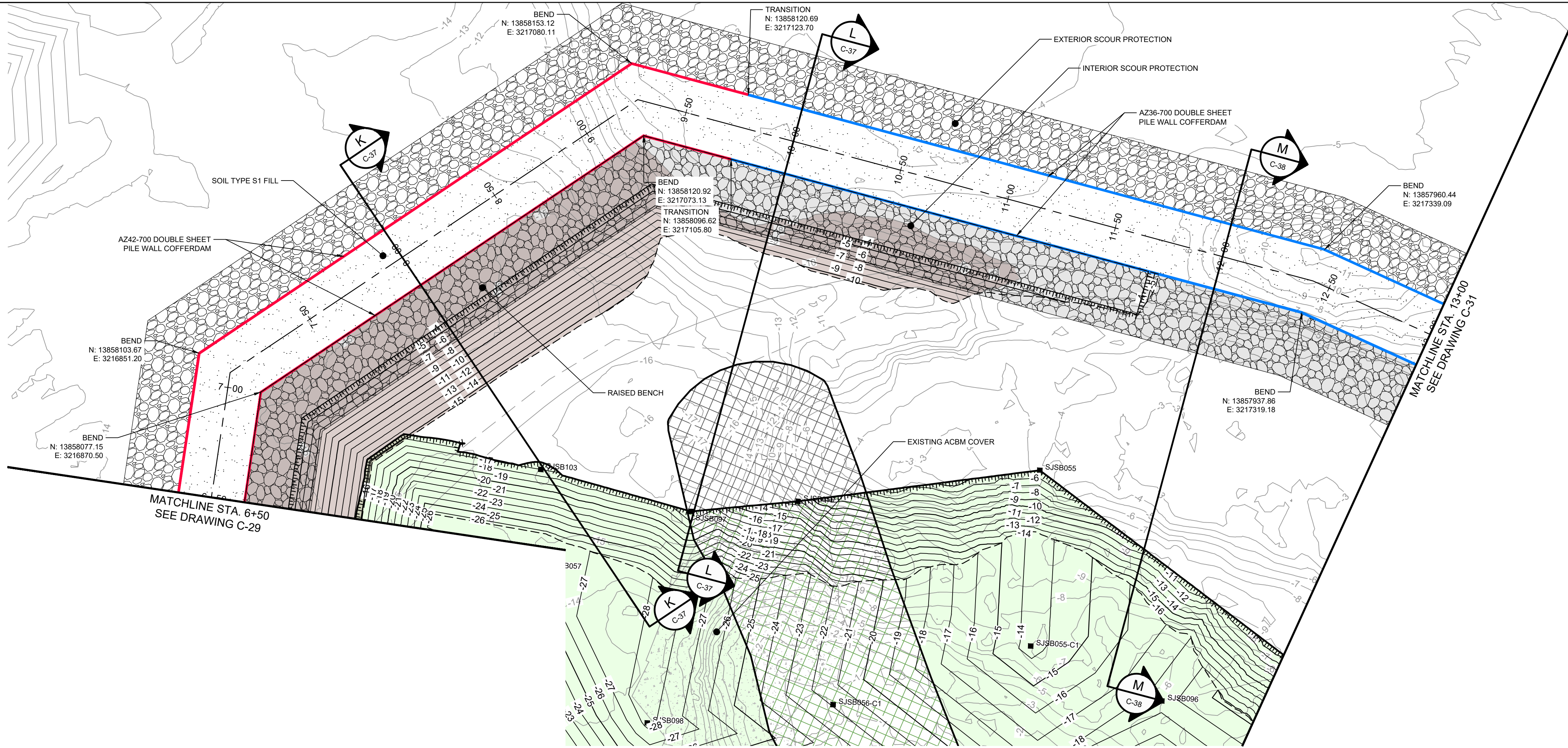
Project No. 11215702

Title  
**DOUBLE PILE WALL PLAN AND PROFILE 1 OF 4**

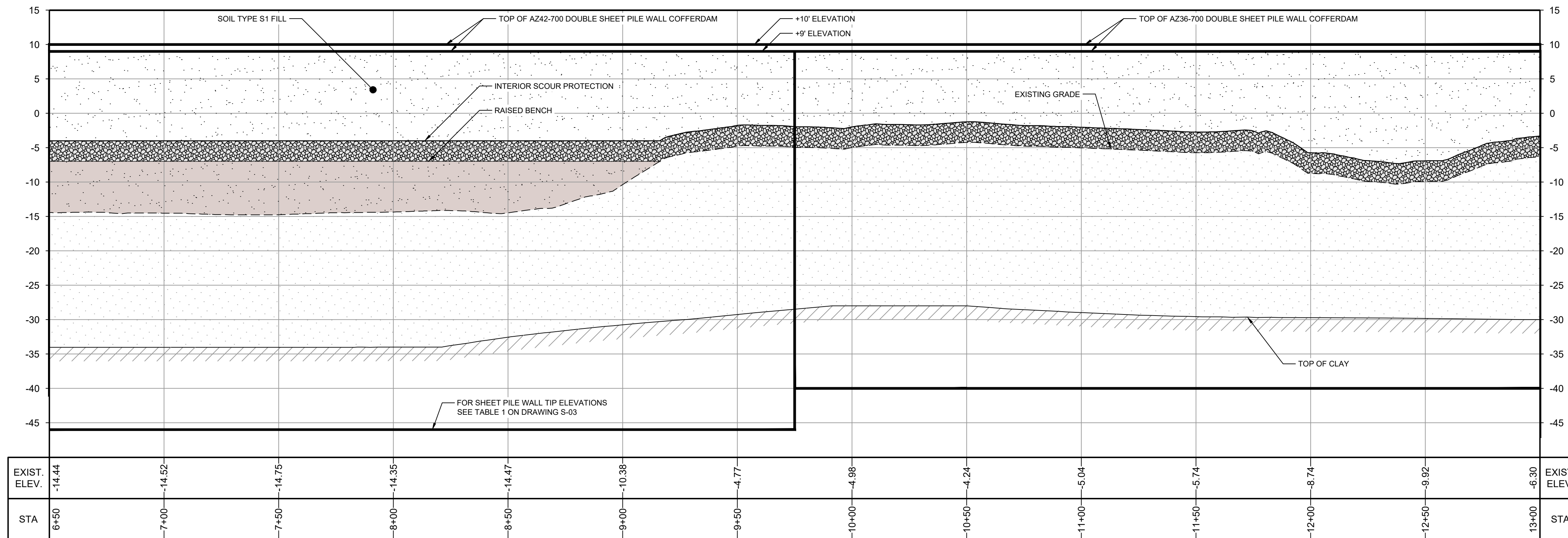
Sheet No.

C-29





PLAN  
1" = 30'



PROFILE  
HORIZ: 1" = 30'  
VERT: 1" = 10'

SOURCE:  
TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608, JULY 8, 2019 TO AUGUST 2, 2019  
UPDATED BATHYMETRY DATA PROVIDED BY ANCHOR QEA OCTOBER 2021

NOTES:  
1. FINAL EXCAVATION CONTOURS ARE SUBJECT TO CHANGE.  
3. FRP BARRIER WALL NOT SHOWN FOR CLARITY.

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**GHD SERVICES INC.**  
JOB NO. 11215702 FILE NO. 001  
GHD TEXAS FIRM REGISTRATION NO. 276



GHD  
2237 S Acadian Thruway Suite 701  
Baton Rouge Louisiana 70808 USA  
T 225 292 9007



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LEGEND	
---	TXDOT RIGHT OF WAY
---	TORA CAP PERIMETER
---	EXISTING CONTOUR INTERVAL
---	FENCELINE
---	SHORELINE
---	TOP OF BANK
---	TOE OF SLOPE
---	OVERHEAD ELECTRICAL
---	GUARDRAIL
---	PIPELINE
---	BORING LOCATION
---	MONITORING WELL
---	POWER POLE
---	LIGHT POLE
---	WELL
---	MATERIAL TO BE EXCAVATED
---	EXISTING BERM TO BE EXCAVATED
---	FOR POTENTIAL TESTING AND REUSE
---	EXISTING BERM TO REMAIN
---	CONCRETE
---	GRAVEL
---	AZ36-700 PILE
---	AZ36-700 PILE
---	AZ42-700 PILE
---	RAISED BENCH
---	EXTERIOR SCOUR PROTECTION
---	INTERIOR SCOUR PROTECTION

Client  
**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

9	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	JC	Designer	RH	
Drafting Check	BS	Design Check	LL	
Project Coordinator	CM	Date	May 23, 2025	
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Original Size		Bar is one inch on original size drawing 0 1"		
Arch D				

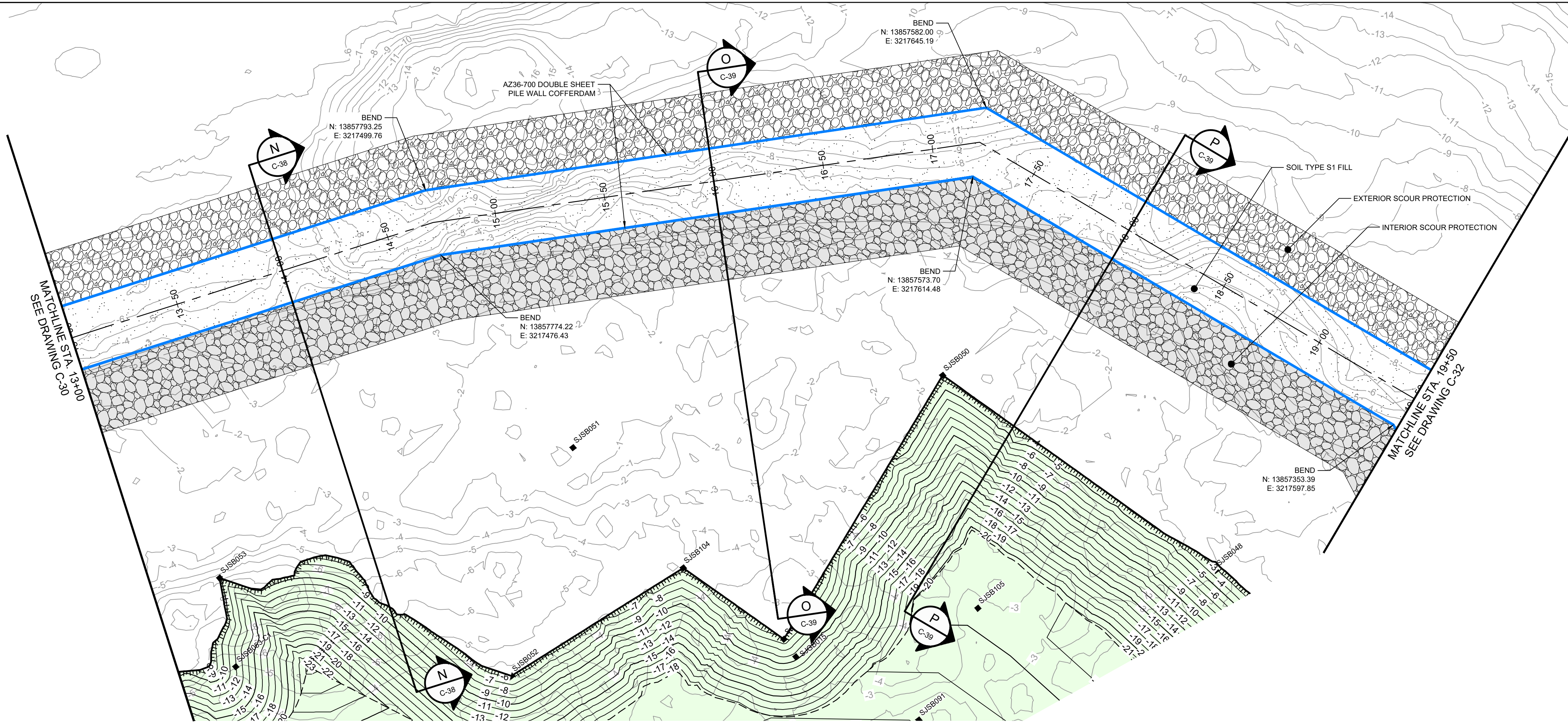
Project No. 11215702

Title  
**DOUBLE PILE WALL  
PLAN AND PROFILE  
2 OF 4**

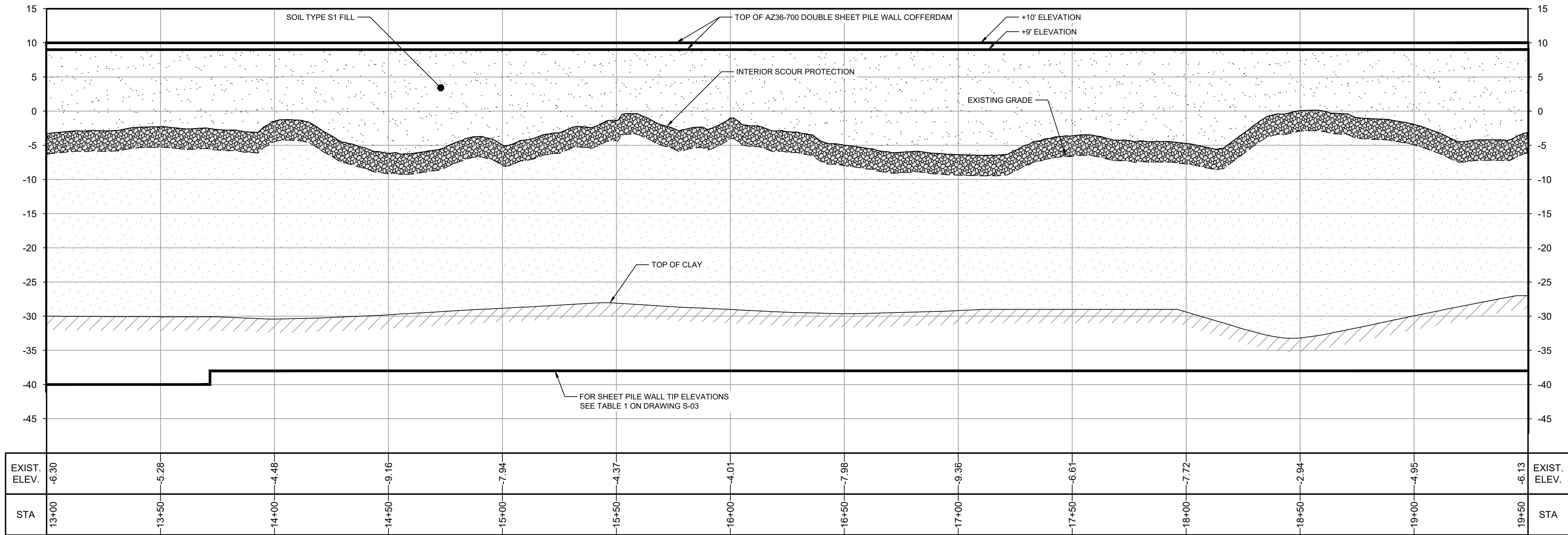
Sheet No.

**C-30**





PLAN  
1" = 30'



PROFILE  
HORIZ: 1" = 30'  
VERT: 1" = 10'

SOURCE:  
TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608, JULY 8, 2019 TO AUGUST 2, 2019  
UPDATED BATHYMETRY DATA PROVIDED BY ANCHOR QEA OCTOBER 2021

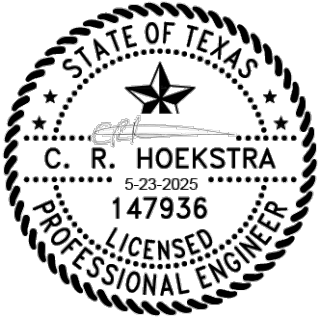
NOTES:  
1. FINAL EXCAVATION CONTOURS ARE SUBJECT TO CHANGE.  
3. FRP BARRIER WALL NOT SHOWN FOR CLARITY.

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JOB NO. 11215702 FILE NO. 001  
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LEGEND	
---	TXDOT RIGHT OF WAY
---	TCRA CAP PERIMETER
---	EXISTING CONTOUR INTERVAL
---	FENCELINE
---	SHORELINE
---	TOP OF BANK
---	TOE OF SLOPE
---	OVERHEAD ELECTRICAL
---	GUARDRAIL
---	PIPELINE
---	BORING LOCATION
---	MONITORING WELL
---	POWER POLE
---	LIGHT POLE
---	WELL
---	MATERIAL TO BE EXCAVATED
---	EXISTING BERM TO BE EXCAVATED
---	FOR POTENTIAL TESTING AND REUSE
---	EXISTING BERM TO REMAIN
---	CONCRETE
---	GRAVEL
---	AZ26-700 PILE
---	AZ36-700 PILE
---	AZ42-700 PILE
---	EXTERIOR SCOUR PROTECTION
---	INTERIOR SCOUR PROTECTION

Client  
**SAN JACINTO RIVER WASTE PITS**  
Project  
**NORTHERN IMPOUNDMENT THIRD FINAL 100% REMEDIAL DESIGN HARRIS COUNTY, TEXAS**

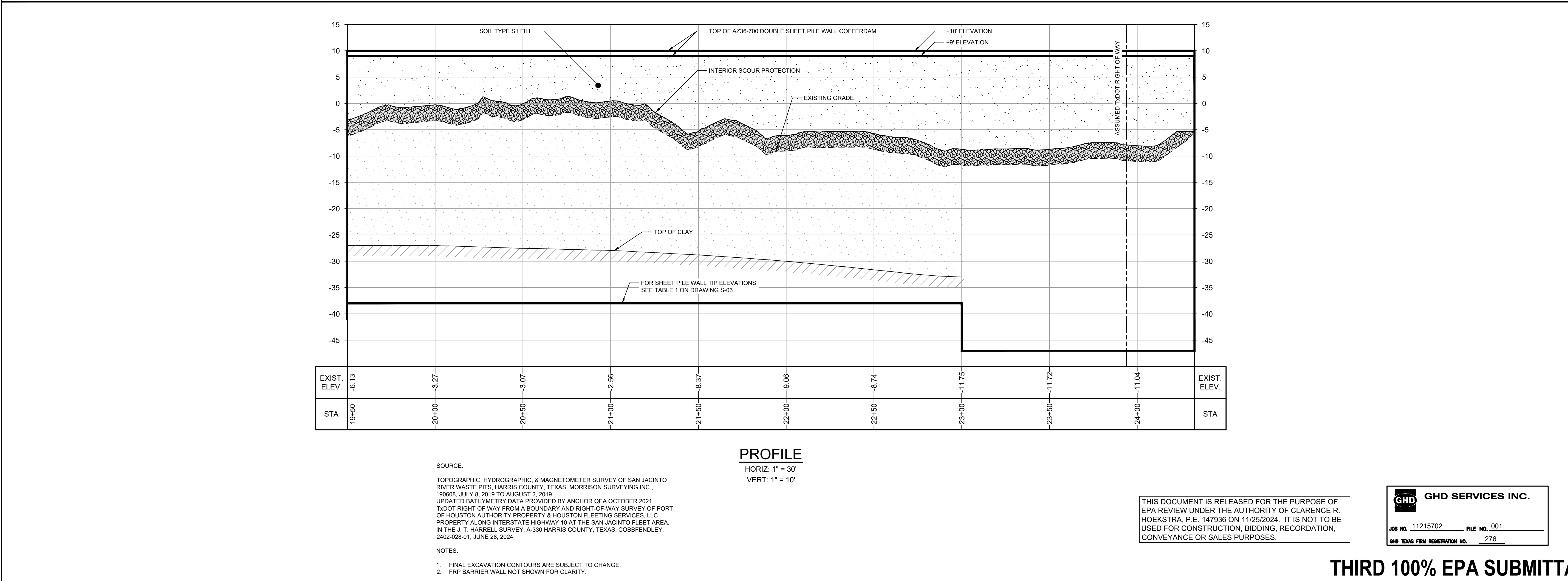
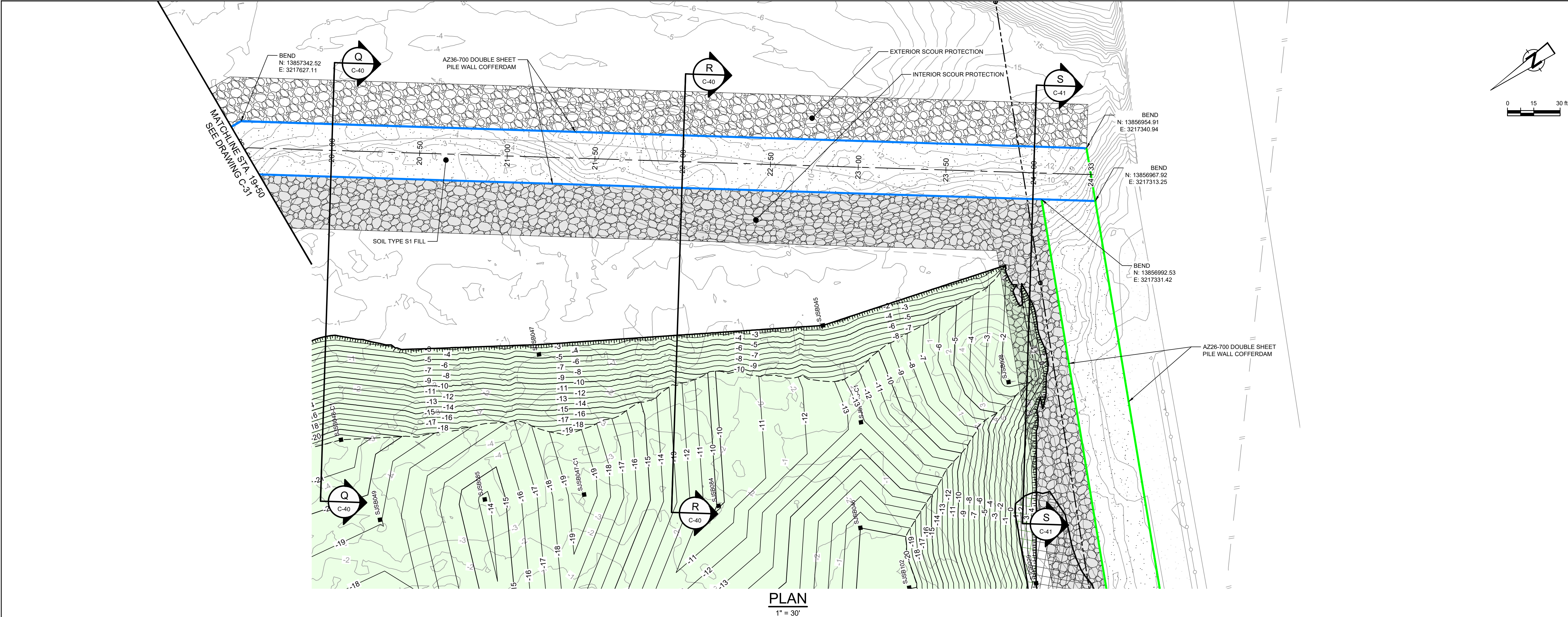
8	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	JC	Designer	RH	
Drafting Check	BS	Design Check	LL	
Project Coordinator	CM	Date	May 22, 2025	
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Original Size		Bar is one inch on original size drawing 0 1"		
Arch D				

Project No. 11215702  
Title  
**DOUBLE PILE WALL PLAN AND PROFILE 3 OF 4**

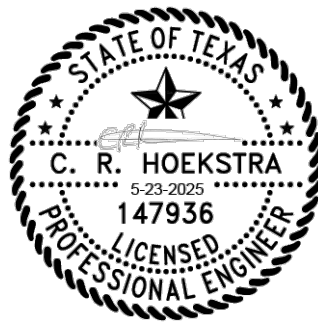
Sheet No.

C-31





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LEGEND	
---	TxDOT RIGHT OF WAY
---	TORA CAP PERIMETER
---	EXISTING CONTOUR INTERVAL
---	FENCELINE
---	SHORELINE
---	TOP OF BANK
---	TOE OF SLOPE
---	OVERHEAD ELECTRICAL
---	GUARDRAIL
---	PIPELINE
---	BORING LOCATION
---	MONITORING WELL
---	POWER POLE
---	LIGHT POLE
---	WELL
---	MATERIAL TO BE EXCAVATED
---	EXISTING BERM TO BE EXCAVATED
---	FOR POTENTIAL TESTING AND REUSE
---	EXISTING BERM TO REMAIN
---	CONCRETE
---	GRAVEL
---	AZ26-700 PILE
---	AZ36-700 PILE
---	AZ42-700 PILE
---	EXTERIOR SCOUR PROTECTION
---	INTERIOR SCOUR PROTECTION

Client  
**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

8 THIRD 100% EPA SUBMITTAL JC CRH 05/23/2025

No.	Issue	Drawn	Approved	Date
-----	-------	-------	----------	------

Drawn	JC	Designer	RH
-------	----	----------	----

Drafting	BS	Design	LL
----------	----	--------	----

Project	CM	Date	May 22, 2025
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Original Size	Bar is one inch on original size drawing 0 1"
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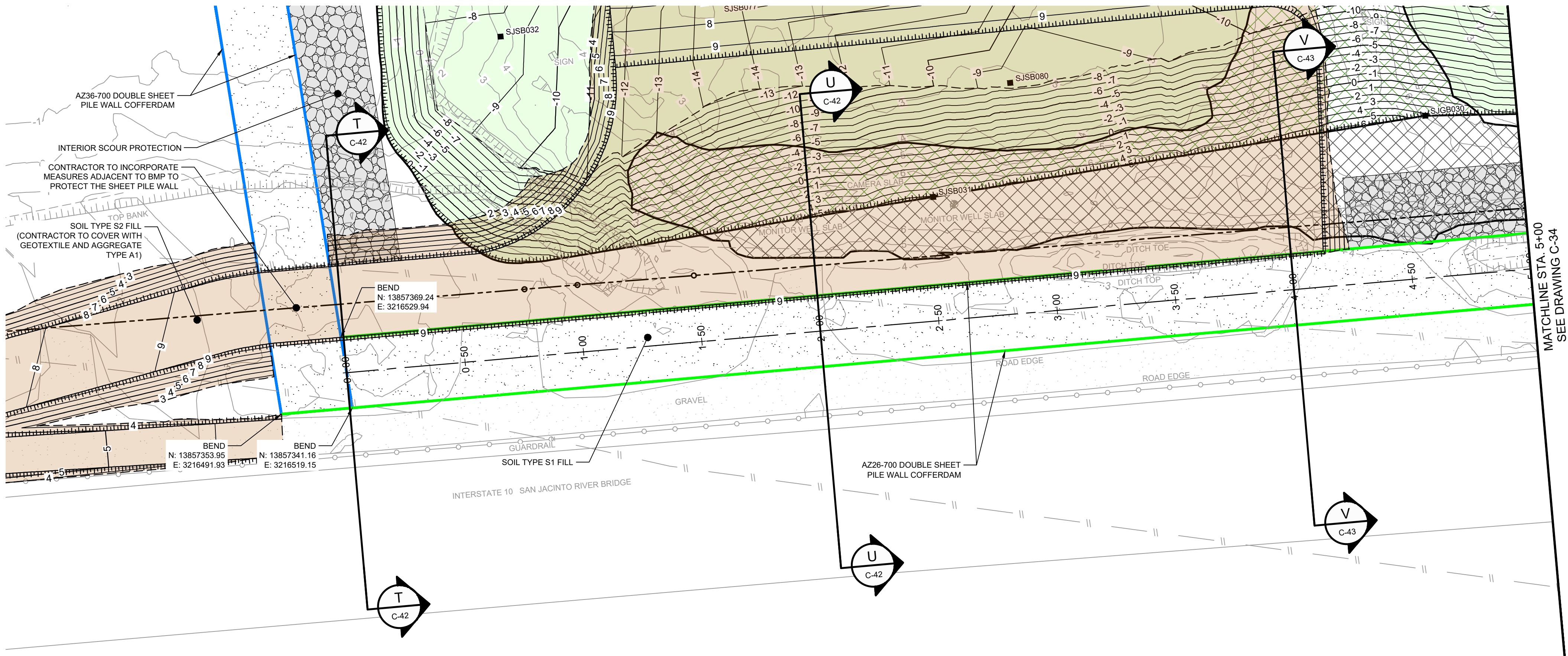
Project No. 11215702

Title  
**DOUBLE PILE WALL  
PLAN AND PROFILE  
4 OF 4**

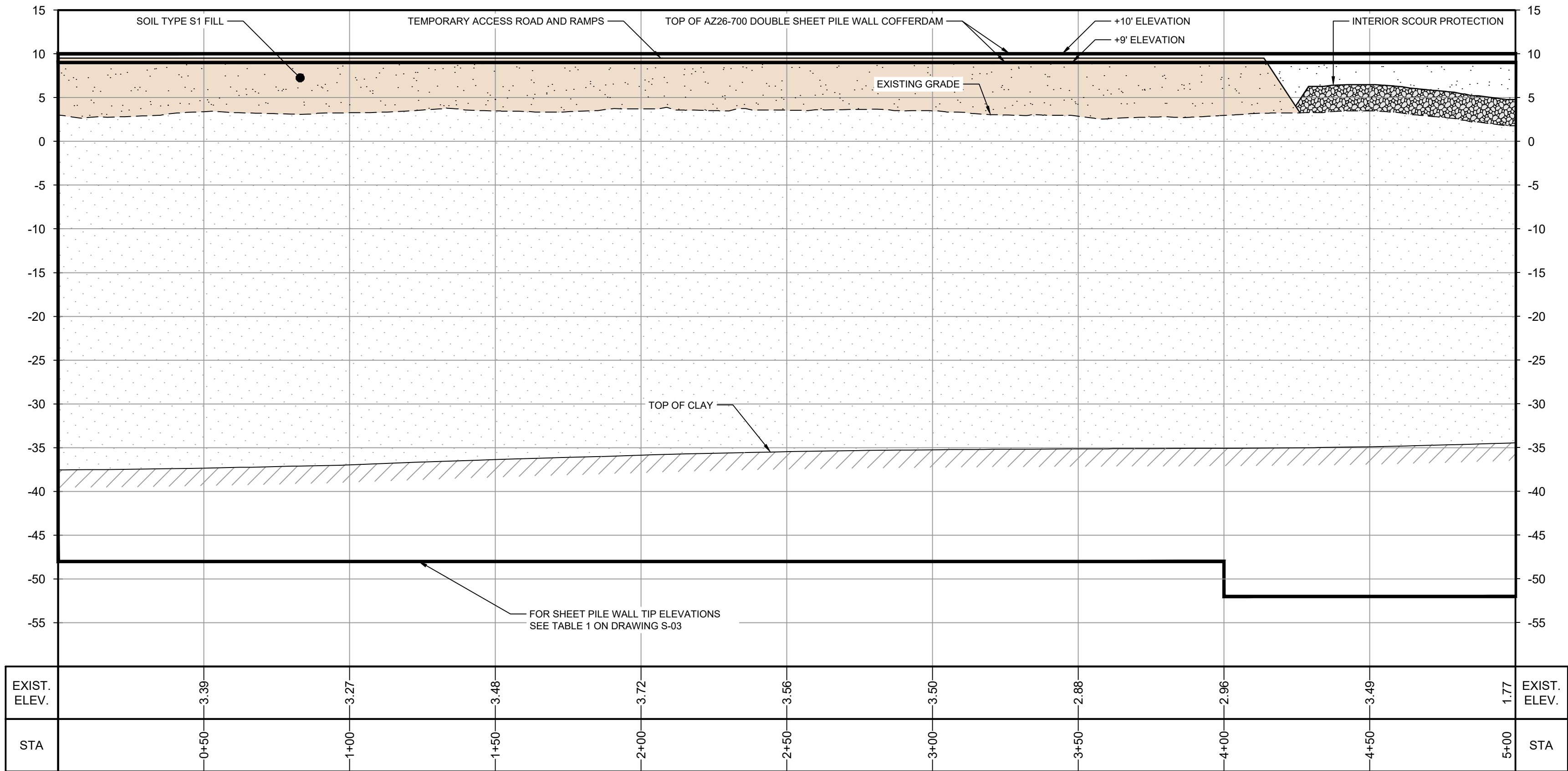
Sheet No.

C-32





PLAN  
1" = 30'

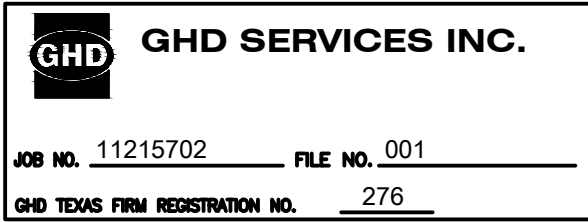


PROFILE  
HORIZ: 1" = 30'  
VERT: 1" = 10'

SOURCE:  
TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190808, JULY 8, 2019 TO AUGUST 2, 2019  
UPDATED BATHYMETRY DATA PROVIDED BY ANCHOR QEA OCTOBER 2021  
TXDOT RIGHT OF WAY FROM A BOUNDARY AND RIGHT-OF-WAY SURVEY OF PORT OF HOUSTON AUTHORITY PROPERTY & HOUSTON FLEETING SERVICES, LLC, PROPERTY ALONG INTERSTATE HIGHWAY 10 AT THE SAN JACINTO FLEET AREA, IN THE J. T. HARRELL SURVEY, A-330 HARRIS COUNTY, TEXAS, COBBFENDLEY, 2402-028-01, JUNE 28, 2024

NOTES:  
1. FINAL EXCAVATION CONTOURS ARE SUBJECT TO CHANGE.

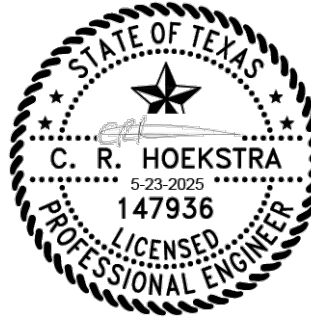
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## THIRD 100% EPA SUBMITTAL



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LEGEND	
---	TXDOT RIGHT OF WAY
---	TOCA CAP PERIMETER
---	EXISTING CONTOUR INTERVAL
---	FENCELINE
---	SHORELINE
---	TOP OF BANK
---	TOE OF SLOPE
---	OVERHEAD ELECTRICAL
---	GUARDRAIL
---	PIPELINE
---	BORING LOCATION
---	MONITORING WELL
---	POWER POLE
---	LIGHT POLE
---	WELL
---	MATERIAL TO BE EXCAVATED
---	EXISTING BERM TO BE EXCAVATED
---	FOR POTENTIAL TESTING AND REUSE
---	EXISTING BERM TO REMAIN
---	GRAVEL
---	AZ26-700 PILE
---	AZ36-700 PILE
---	AZ42-700 PILE
---	PLANNED IMPROVEMENTS FOR
---	NORTHERN IMPOUNDMENT ACCESS
---	INTERIOR SCOUR PROTECTION

Client

### SAN JACINTO RIVER WASTE PITS

Project

### NORTHERN IMPOUNDMENT THIRD FINAL 100% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

8	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	JC	Designer	RH	
Drafting Check	BS	Design Check	LL	
Project Coordinator	CM	Date	May 22, 2025	
		Scale	AS SHOWN	
Original Size	Arch D	Bar is one inch on original size drawing	0	1"

Project No. 11215702

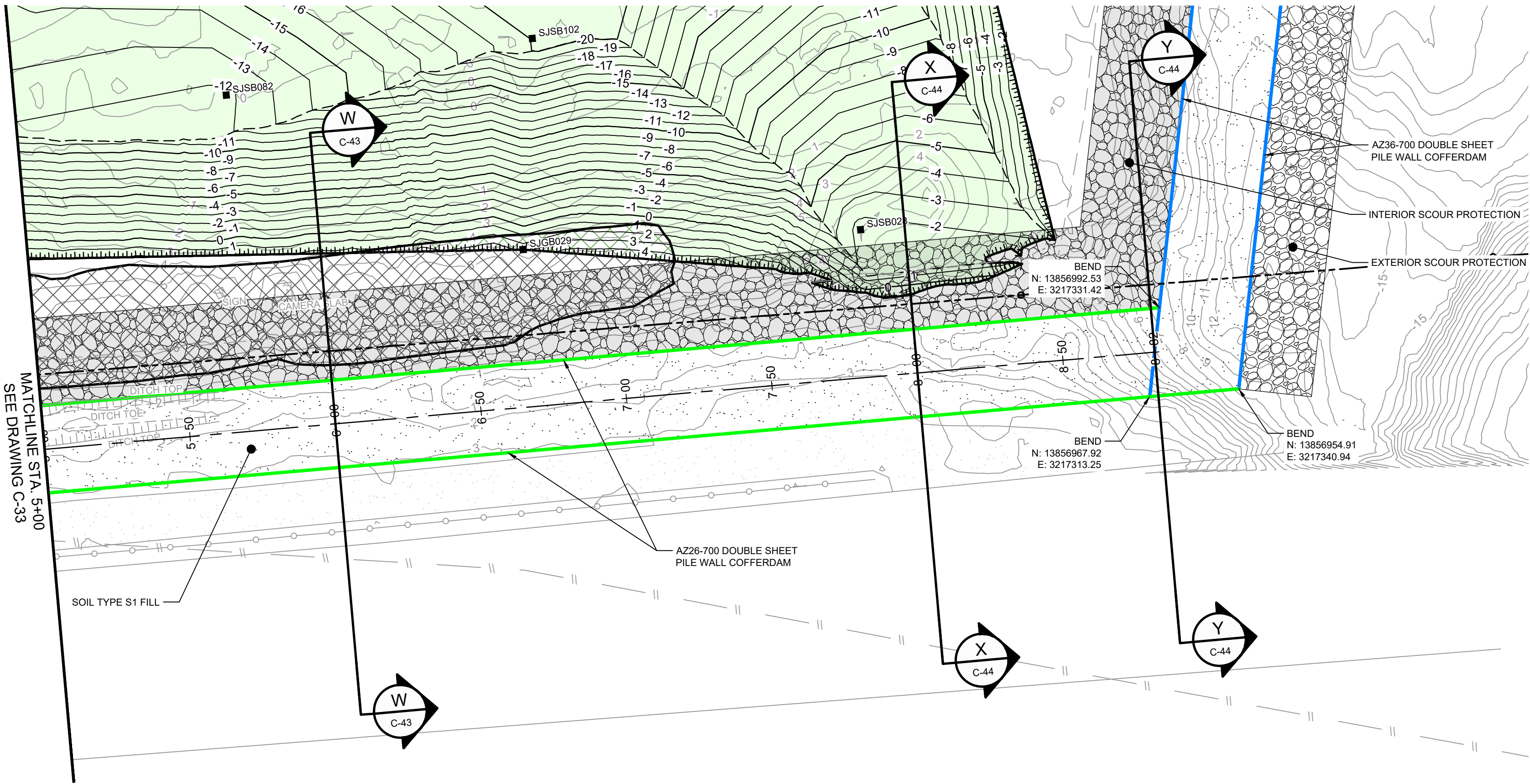
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### PILE WALL PLAN AND PROFILE 1 OF 2

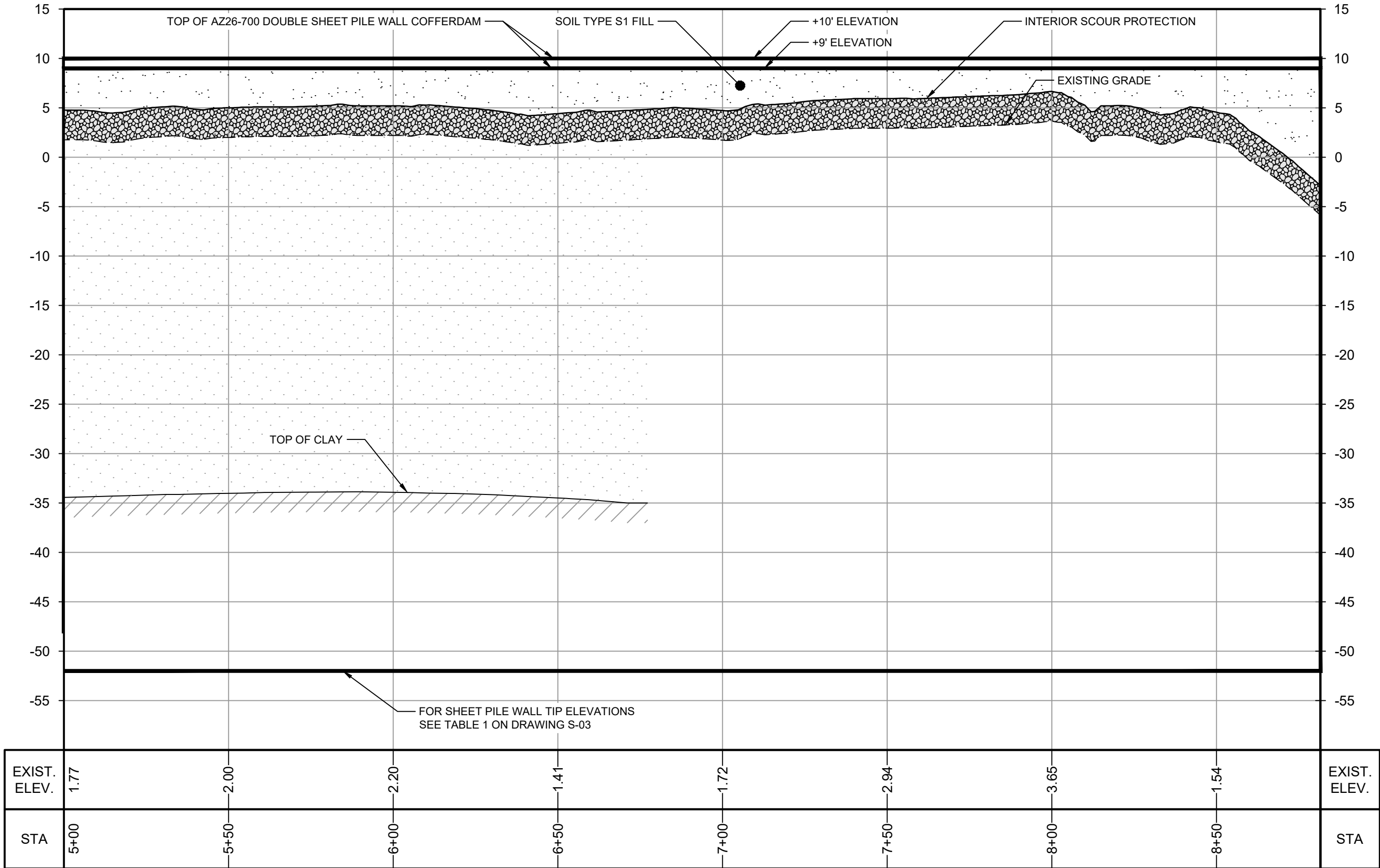
Sheet No.

C-33





PLAN  
1" = 30'

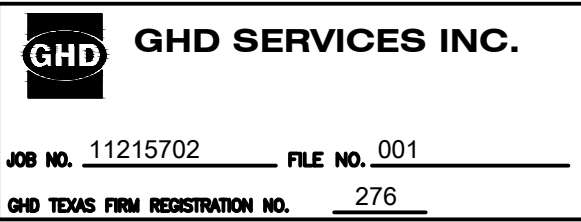


PROFILE  
HORIZ: 1" = 30'  
VERT: 1" = 10'

SOURCE:  
TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608, JULY 8, 2019 TO AUGUST 2, 2019  
UPDATED BATHYMETRY DATA PROVIDED BY ANCHOR OEA OCTOBER 2021  
TXDOT RIGHT OF WAY FROM A BOUNDARY AND RIGHT-OF-WAY SURVEY OF PORT OF HOUSTON AUTHORITY PROPERTY & HOUSTON FLEETING SERVICES, LLC PROPERTY ALONG INTERSTATE HIGHWAY 10 AT THE SAN JACINTO FLEET AREA, IN THE J. T. HARRELL SURVEY, A-330 HARRIS COUNTY, TEXAS, COBBFENDLEY, 2402-028-01, JUNE 28, 2024

- NOTES:
1. FINAL EXCAVATION CONTOURS ARE SUBJECT TO CHANGE.
  2. FRP BARRIER WALL NOT SHOWN FOR CLARITY.

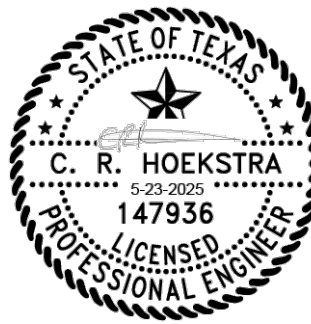
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LEGEND	
	TXDOT RIGHT OF WAY
	TORA CAP PERIMETER
	EXISTING CONTOUR INTERVAL
	FENCELINE
	SHORELINE
	TOP OF BANK
	TOE OF SLOPE
	OVERHEAD ELECTRICAL
	GUARDRAIL
	PIPELINE
	BORING LOCATION
	MONITORING WELL
	POWER POLE
	LIGHT POLE
	WELL
	MATERIAL TO BE EXCAVATED
	EXISTING BERM TO BE EXCAVATED
	EXISTING BERM TO REMAIN
	GRAVEL
	AZ26-700 PILE
	AZ36-700 PILE
	AZ42-700 PILE
	PLANNED IMPROVEMENTS FOR NORTHERN IMPOUNDMENT ACCESS
	EXTERIOR SCOUR PROTECTION
	INTERIOR SCOUR PROTECTION

### Client

## SAN JACINTO RIVER WASTE PITS

### Project

## NORTHERN IMPOUNDMENT THIRD FINAL 100% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

8	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	JC	Designer	RH	
Drafting Check	BS	Design Check	LL	
Project Coordinator	CM	Date	May 22, 2025	
		Scale	AS SHOWN	
Original Size	Arch D	Bar is one inch on original size drawing	0	1"

Project No. 11215702

Title

## PILE WALL PLAN AND PROFILE 2 OF 2

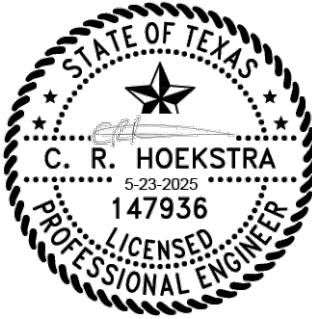
Sheet No.

C-34





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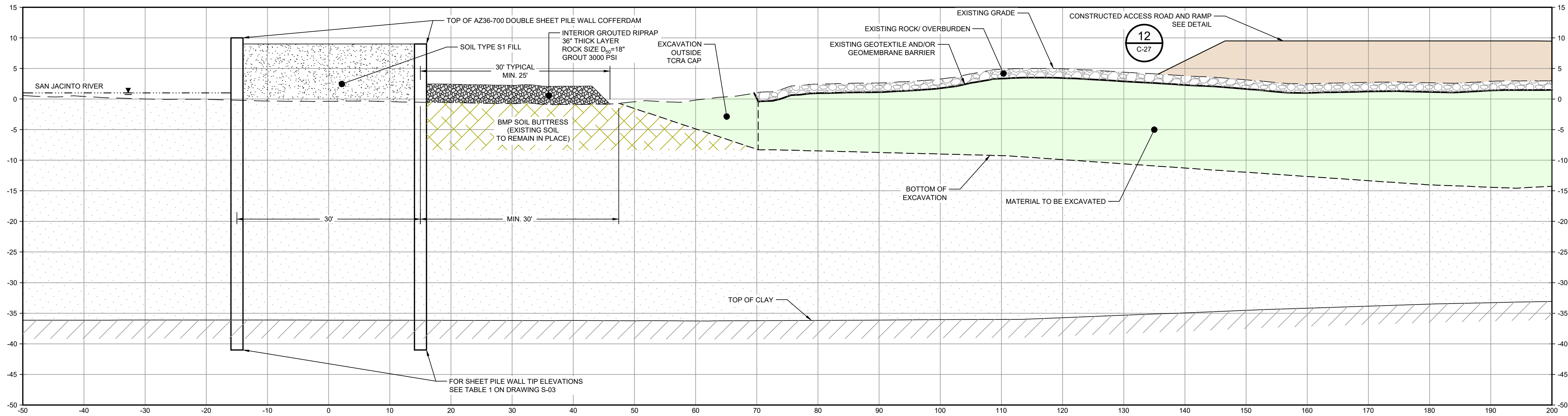


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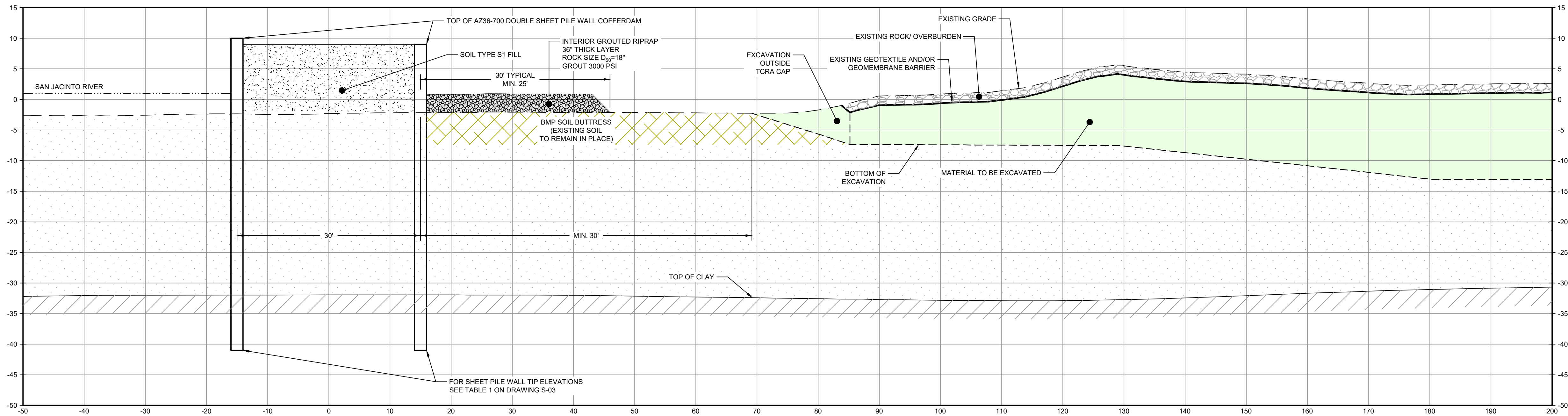
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LEGEND

	MATERIAL TO BE EXCAVATED
	BMP SOIL BUTTRESS (EXISTING SOIL TO REMAIN IN PLACE)
	PLANNED IMPROVEMENTS FOR NORTHERN IMPOUNDMENT ACCESS
	INTERIOR SCOUR PROTECTION



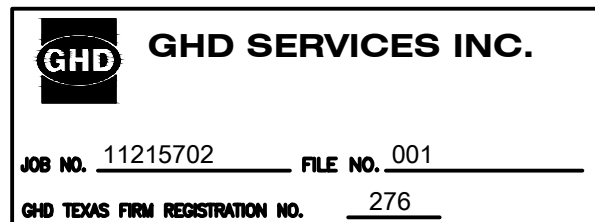
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SCALE: 1"=10'  
C-29



SECTION **H** STA. 2+00.00  
SCALE: 1"=10'  
C-29

- NOTES:
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Client  
**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

6 THIRD 100% EPA SUBMITTAL JC CRH 05/23/2025

No.	Issue	Drawn	Approved	Date
-----	-------	-------	----------	------

Drawn	JC	Designer	RH
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Drafting Check	BS	Design Check	LL
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Project Coordinator	CM	Date	May 22, 2025
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Original Size	Arch D	Bar is one inch on original size drawing 0 1"
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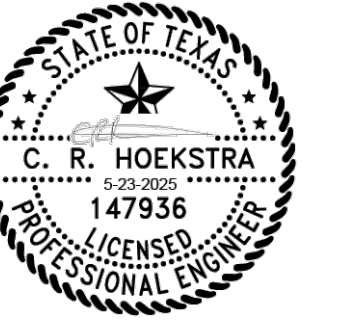
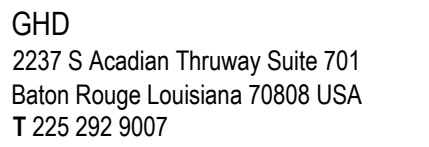
Project No. 11215702

Title  
**DOUBLE PILE WALL SECTIONS  
1 OF 7**

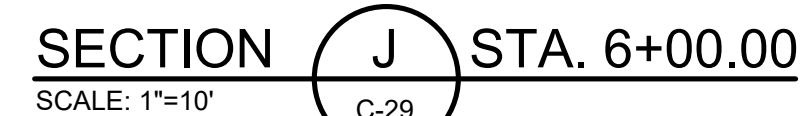
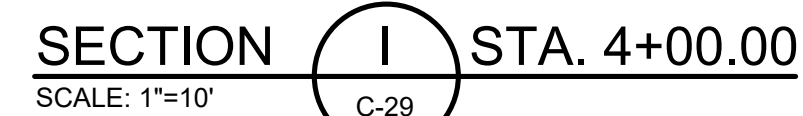
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**C-35**



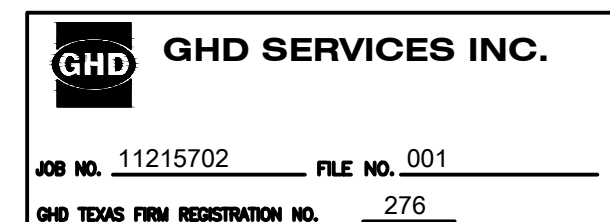


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### THIRD 100% EPA SUBMITTAL

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

7	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
---	--------------------------	----	-----	------------

Drawn	JC	Designer	RH
-------	----	----------	----

Check <b>BB</b>	Check <b>LL</b>
Resident	

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Scale 1" = 10'

Project No.	11215702
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**DOUBLE PILE WALL SECTIONS**  
**2 OF 7**

**C-36**



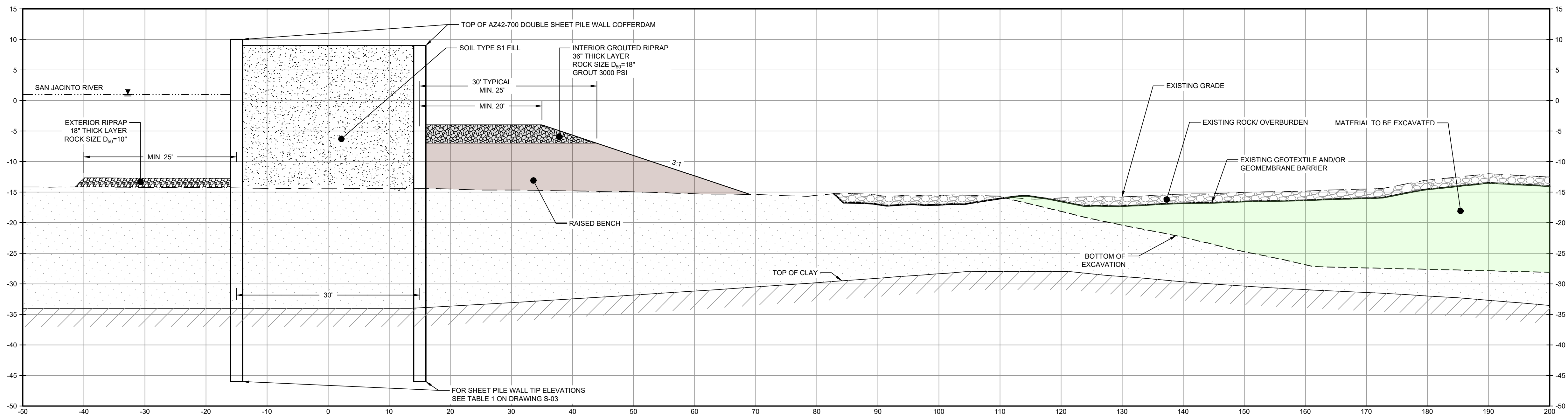


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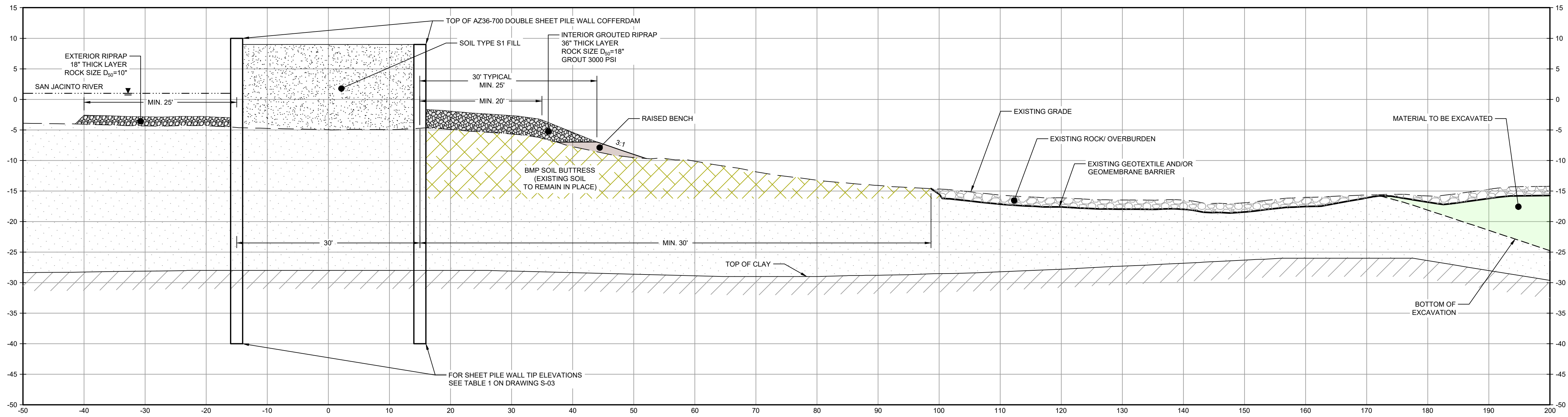


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LEGEND	
	MATERIAL TO BE EXCAVATED
	BMP SOIL BUTTRESS (EXISTING SOIL TO REMAIN IN PLACE)
	RAISED BENCH
	EXTERIOR SCOUR PROTECTION
	INTERIOR SCOUR PROTECTION



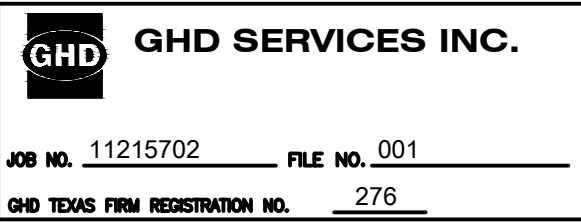
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SCALE: 1"=10'  
C-30



SECTION **L** STA. 10+00.00  
SCALE: 1"=10'  
C-30

- NOTES:
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  - FRP BARRIER WALL NOT SHOWN FOR CLARITY.

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THIRD 100% EPA SUBMITTAL

Client  
**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

7	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	JC	Designer	RH	
Drafting Check	BS	Design Check	LL	
Project Coordinator	CM	Date	May 22, 2025	
This document shall not be used for construction unless signed and sealed for construction.		Scale	1" = 10'	
Original Size		Bar is one inch on original size drawing 0 1"		
<b>Arch D</b>				

Project No. 11215702

Title  
**DOUBLE PILE WALL SECTIONS  
3 OF 7**

Sheet No.

C-37



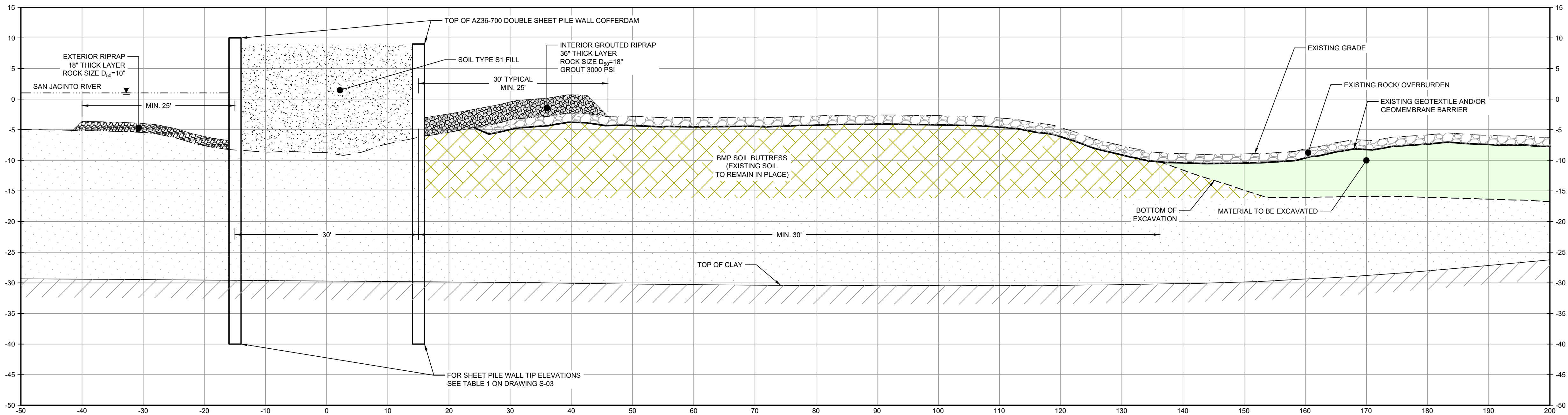


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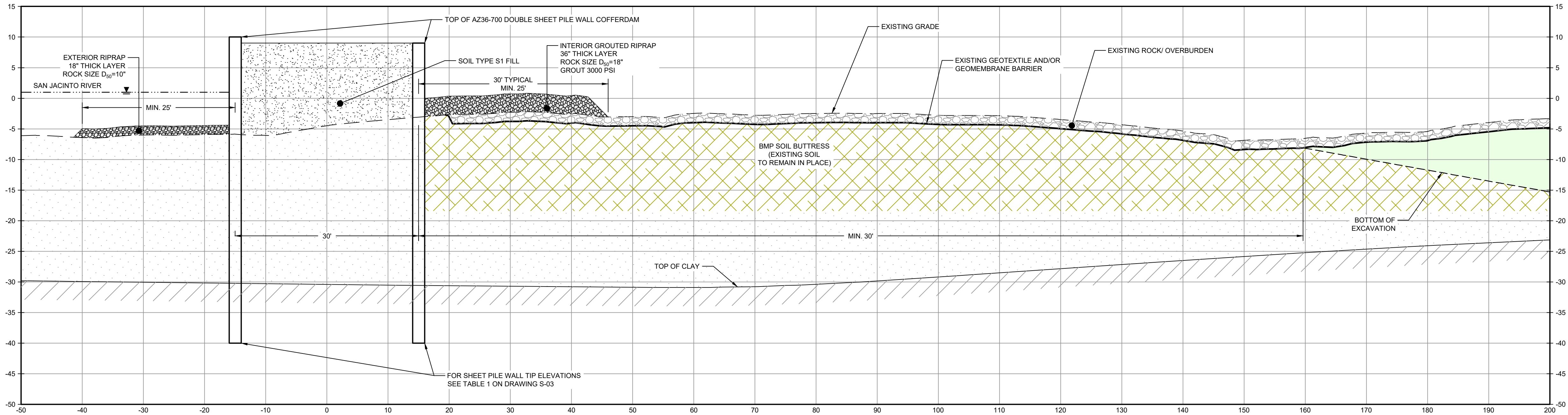


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LEGEND	
	MATERIAL TO BE EXCAVATED
	BMP SOIL BUTTRESS (EXISTING SOIL TO REMAIN IN PLACE)
	EXTERIOR SCOUR PROTECTION
	INTERIOR SCOUR PROTECTION



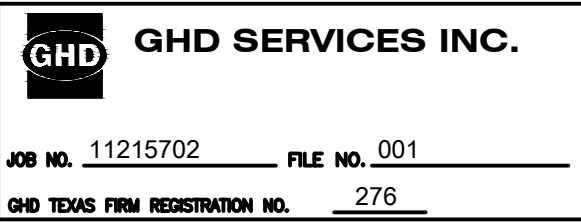
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SCALE: 1"=10'



SECTION **N** STA. 14+00.00  
SCALE: 1"=10'

- NOTES:
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  - FRP BARRIER WALL NOT SHOWN FOR CLARITY.

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## THIRD 100% EPA SUBMITTAL

Client  
**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

6	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	JC	Designer	RH	
Drafting Check	BS	Design Check	LL	
Project Coordinator	CM	Date	May 22, 2025	
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Original Size		Bar is one inch on original size drawing 0 1"		

Arch D

Project No. 11215702

Title

**DOUBLE PILE WALL SECTIONS  
4 OF 7**

Sheet No.

**C-38**





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T 225 292 9007

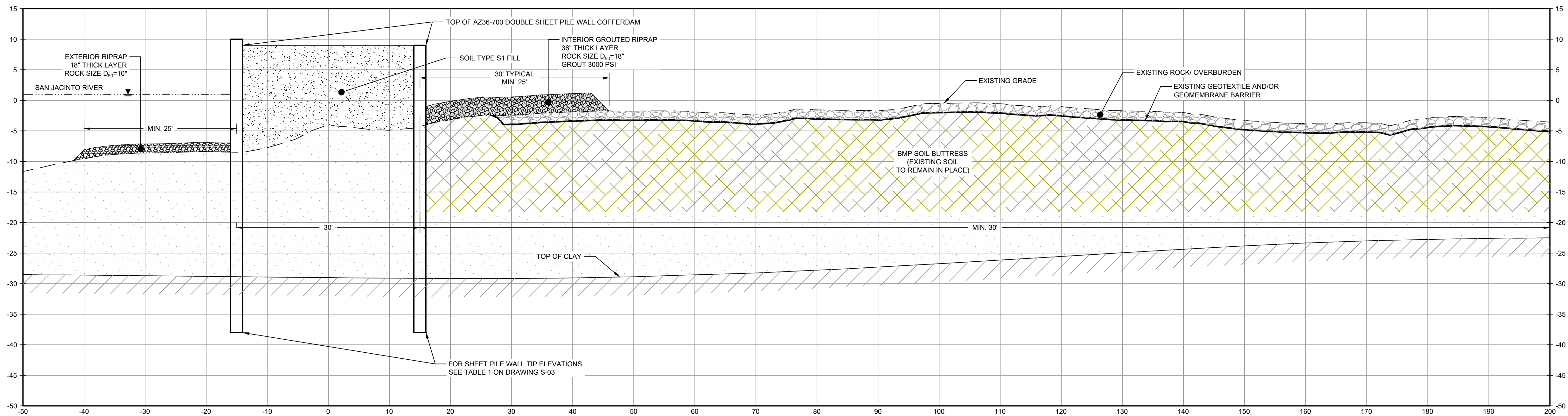


Reuse of Documents

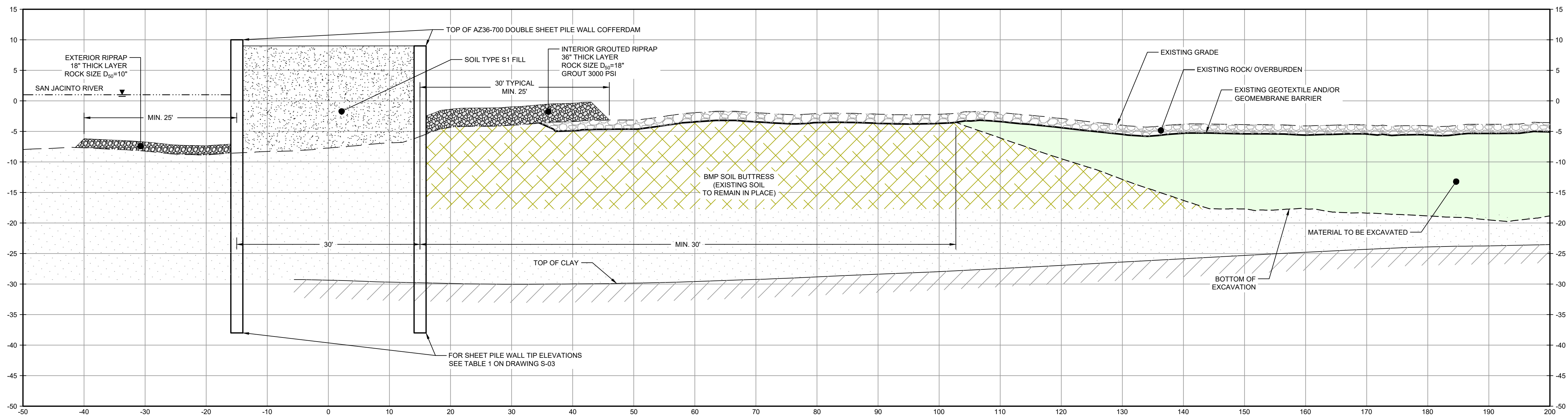
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LEGEND

	MATERIAL TO BE EXCAVATED
	BMP SOIL BUTTRESS (EXISTING SOIL TO REMAIN IN PLACE)
	EXTERIOR SCOUR PROTECTION
	INTERIOR SCOUR PROTECTION



SECTION **O** STA. 16+00.00  
SCALE: 1"=10'  
C-31

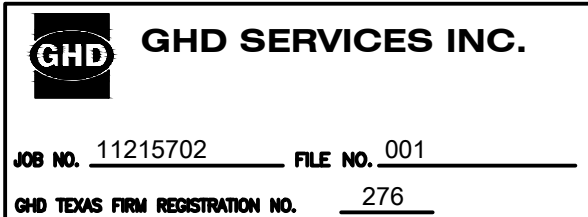


SECTION **P** STA. 18+00.00  
SCALE: 1"=10'  
C-31

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THIRD 100% EPA SUBMITTAL

Client  
**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

6	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
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No.	Issue	Drawn	Approved	Date
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Drawn	JC	Designer	RH
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Drafting Check	BS	Design Check	LL
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Project Coordinator	CM	Date	May 22, 2025
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---	-------	----------

Original Size	Arch D	Bar is one inch on original size drawing 0 1"
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Project No. 11215702

Title  
**DOUBLE PILE WALL SECTIONS  
5 OF 7**

Sheet No.

**C-39**



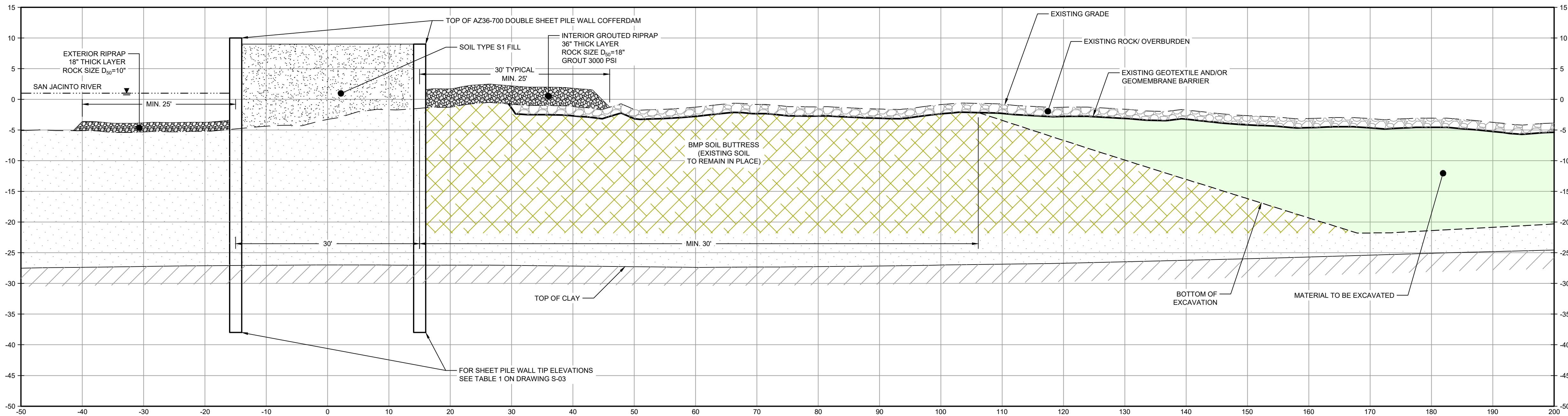


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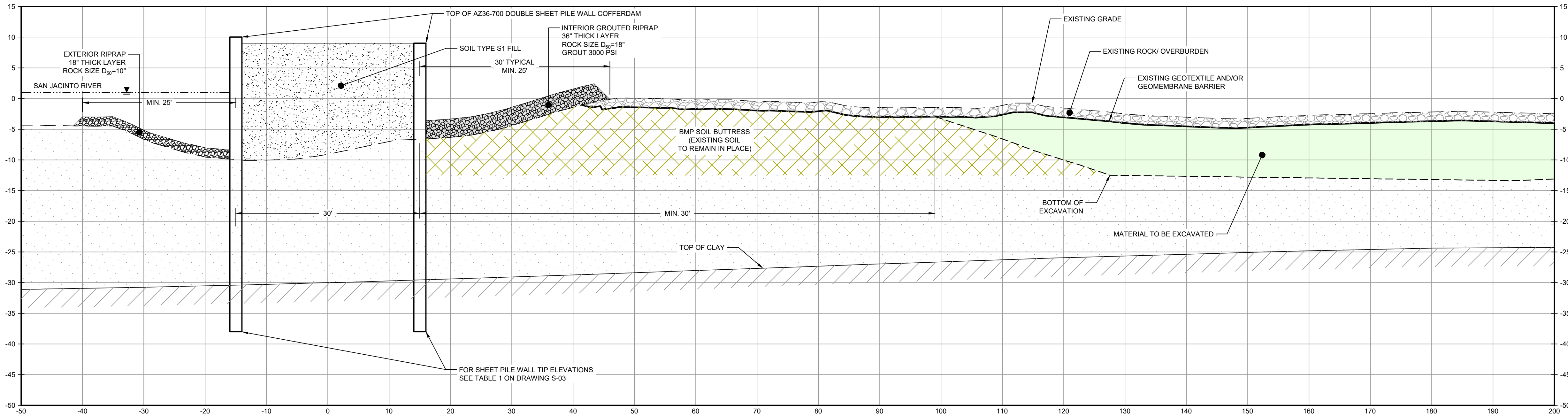


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LEGEND	
	MATERIAL TO BE EXCAVATED
	BMP SOIL BUTTRESS (EXISTING SOIL TO REMAIN IN PLACE)
	EXTERIOR SCOUR PROTECTION
	INTERIOR SCOUR PROTECTION



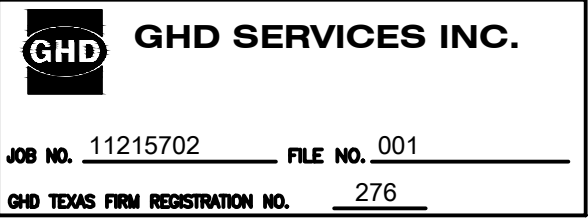
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SCALE: 1"=10'  
C-32



SECTION **R** STA. 22+00.00  
SCALE: 1"=10'  
C-32

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## THIRD 100% EPA SUBMITTAL

Client  
**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

6	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	JC	Designer	RH	
Drafting Check	BS	Design Check	LL	
Project Coordinator	CM	Date	May 22, 2025	
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Original Size		Bar is one inch on original size drawing 0 1"		
<b>Arch D</b>				

Project No. 11215702

Title  
**DOUBLE PILE WALL SECTIONS  
6 OF 7**

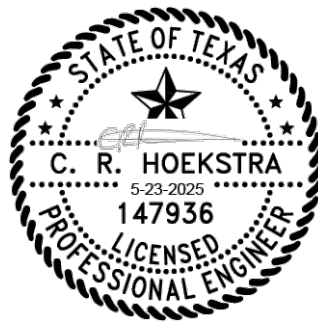
Sheet No.

**C-40**



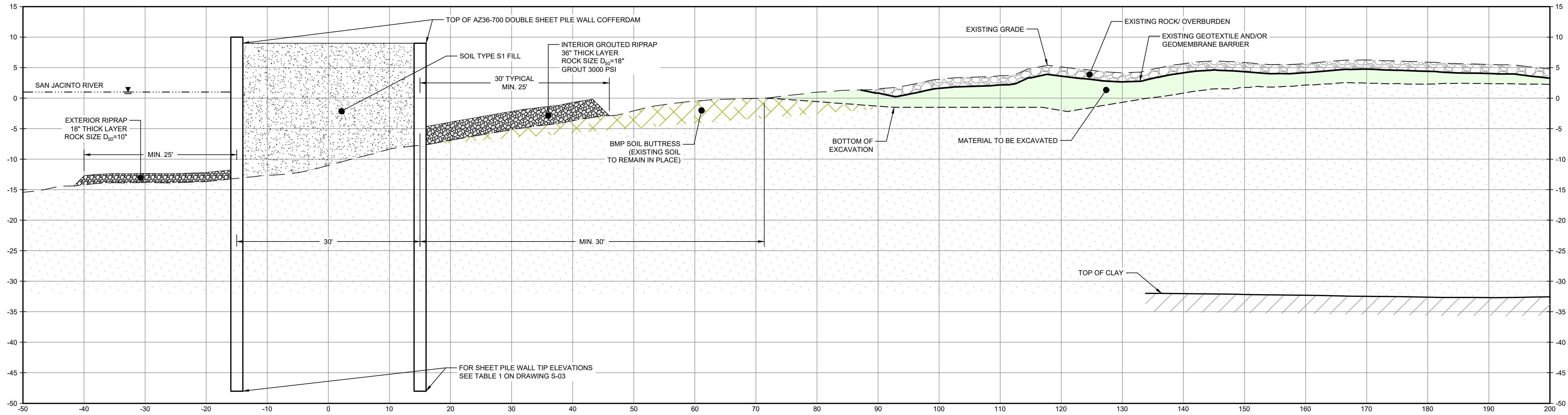


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	MATERIAL TO BE EXCAVATED
	BMP SOIL BUTTRESS (EXISTING SOIL TO REMAIN IN PLACE)
	EXTERIOR SCOUR PROTECTION
	INTERIOR SCOUR PROTECTION



SECTION **S** STA. 24+00  
SCALE: 1"=10'  
C-32

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	<b>GHD SERVICES INC.</b>
JOB NO. 11215702	FILE NO. 001
GHD TEXAS FIRM REGISTRATION NO. 276	

Client  
**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

6	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	JC	Designer	RH	
Drafting Check	BS	Design Check	LL	
Project Coordinator	CM	Date	May 22, 2025	
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Original Size		Bar is one inch on original size drawing 0 1"		
<b>Arch D</b>				

Project No. 11215702

Title  
**DOUBLE PILE WALL SECTIONS  
7 OF 7**

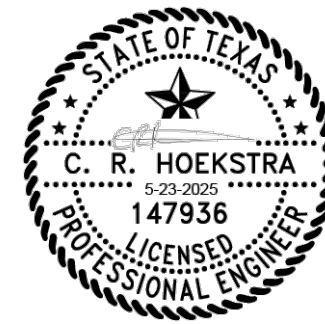
Sheet No.

**C-41**



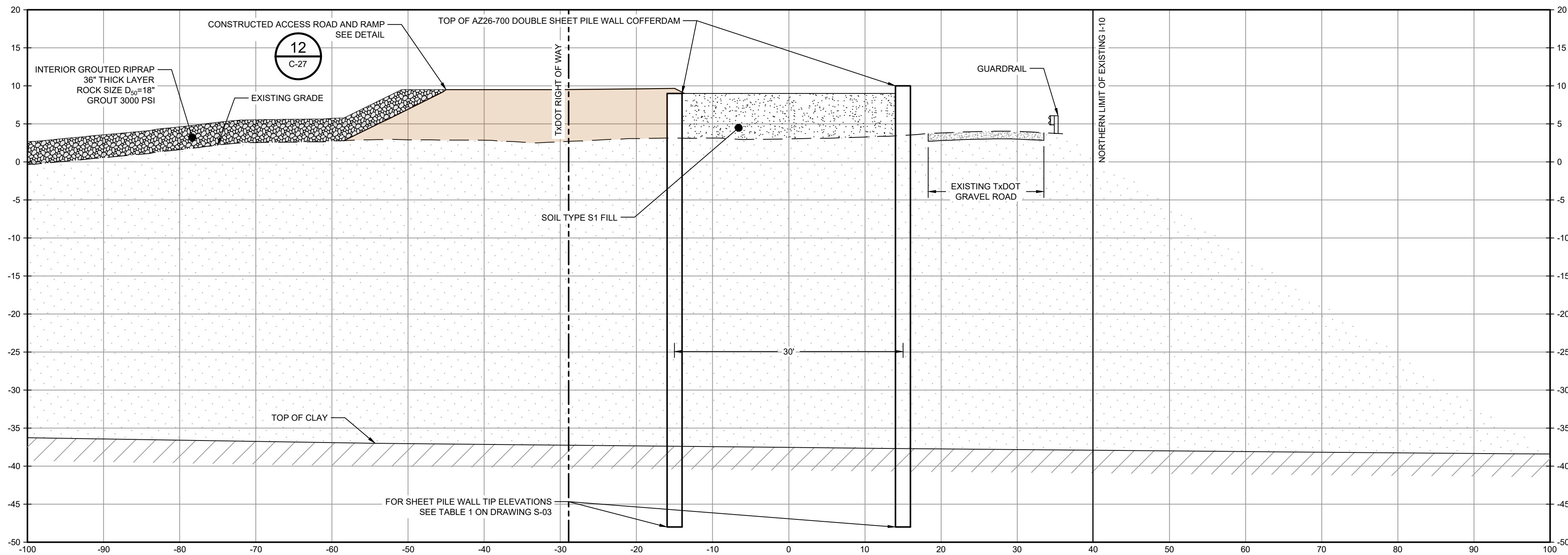


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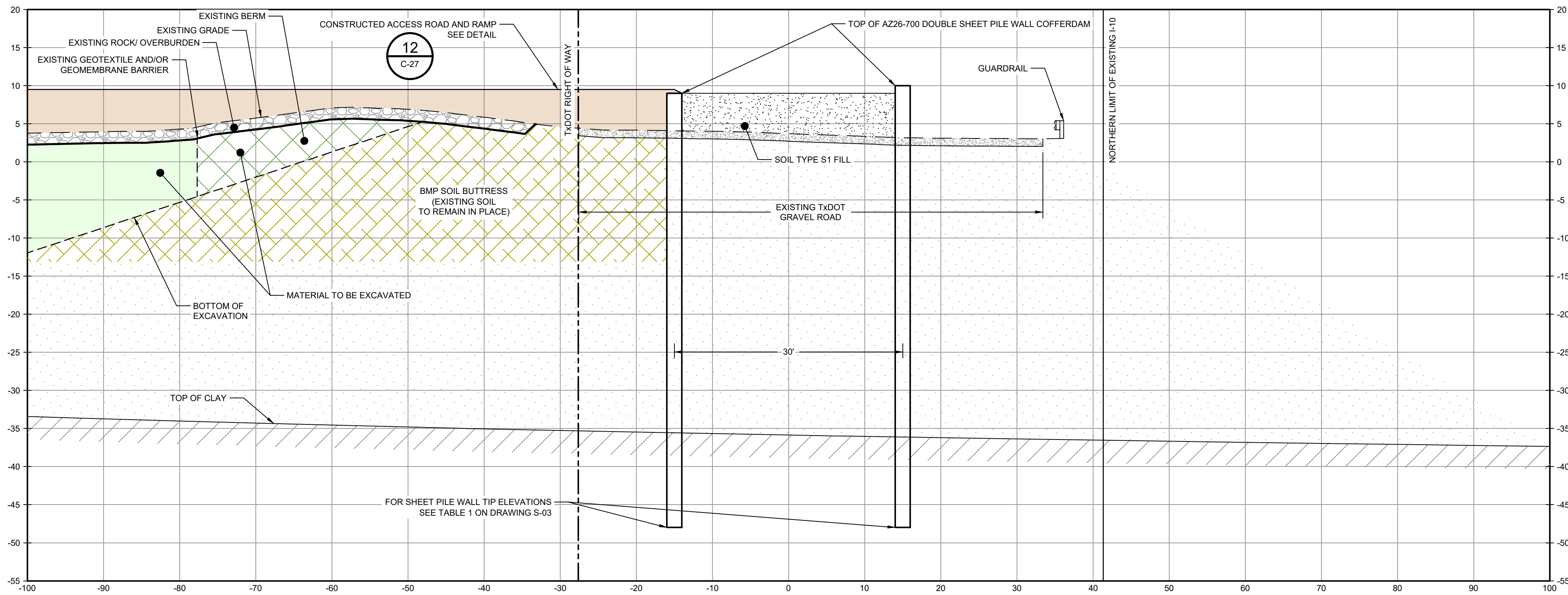


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LEGEND	
	MATERIAL TO BE EXCAVATED
	BMP SOIL BUTTRESS (EXISTING SOIL TO REMAIN IN PLACE)
	PLANNED IMPROVEMENTS FOR NORTHERN IMPOUNDMENT ACCESS
	EXISTING BERM TO BE EXCAVATED FOR POTENTIAL TESTING AND REUSE
	INTERIOR SCOUR PROTECTION



SECTION **T** STA. 0+00.00  
SCALE: 1"=10'



SECTION **U** STA. 2+00.00  
SCALE: 1"=10'

SOURCE:

TxDOT RIGHT OF WAY FROM A BOUNDARY AND RIGHT-OF-WAY SURVEY OF PORT OF HOUSTON AUTHORITY PROPERTY & HOUSTON FLEETING SERVICES, LLC PROPERTY ALONG INTERSTATE HIGHWAY 10 AT THE SAN JACINTO FLEET AREA, IN THE J. T. HARRELL SURVEY, A-330 HARRIS COUNTY, TEXAS, COBBFENDLEY, 2402-028-01, JUNE 28, 2024

NOTES:

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	<b>GHD SERVICES INC.</b>
JOB NO. 11215702	FILE NO. 001
GHD TEXAS FIRM REGISTRATION NO. 276	

Client  
**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

6	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	JC	Designer	RH	
Drafting Check	BS	Design Check	LL	
Project Coordinator	CM	Date	May 22, 2025	
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Original Size  
**Arch D**  
Bar is one inch on original size drawing  
0 1"

Project No. 11215702

Title

**SOUTH WALL SECTIONS  
1 OF 3**

Sheet No.

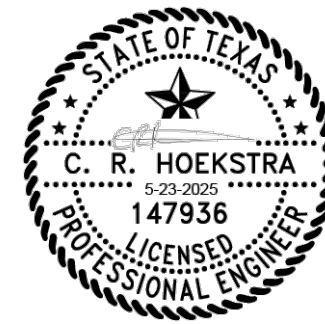
**C-42**

**THIRD 100% EPA SUBMITTAL**



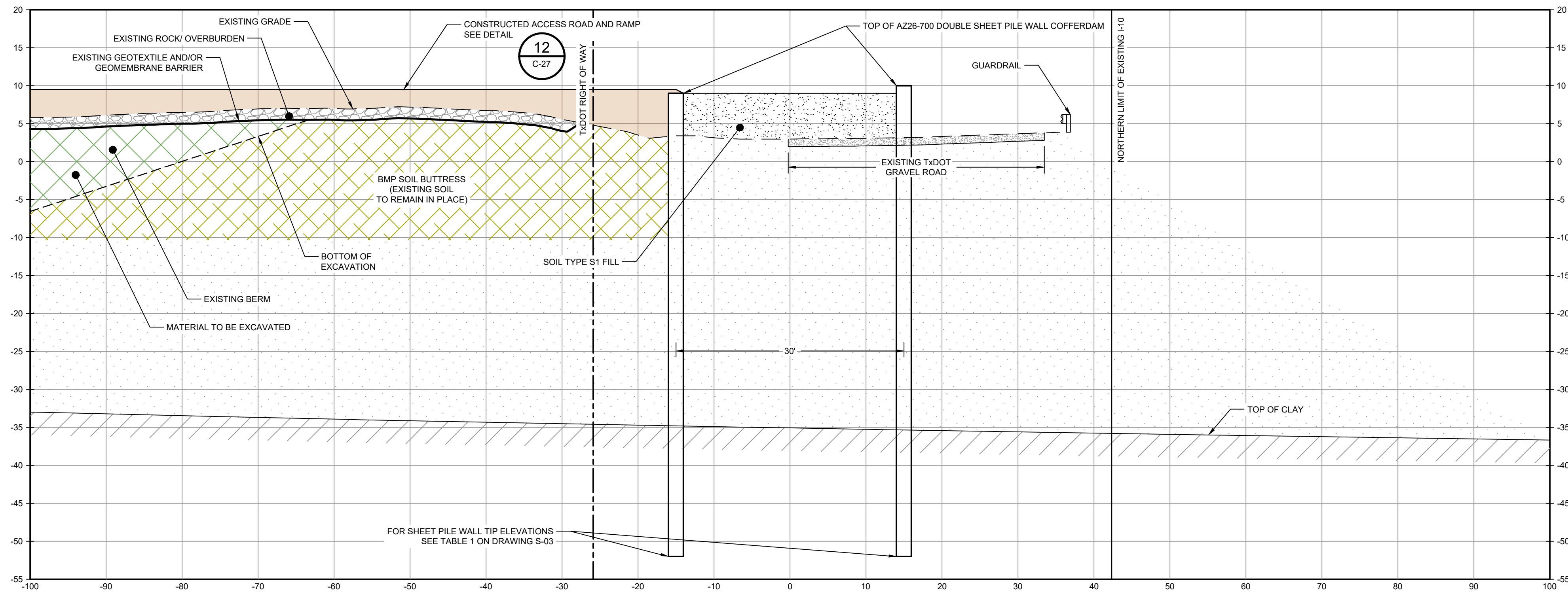


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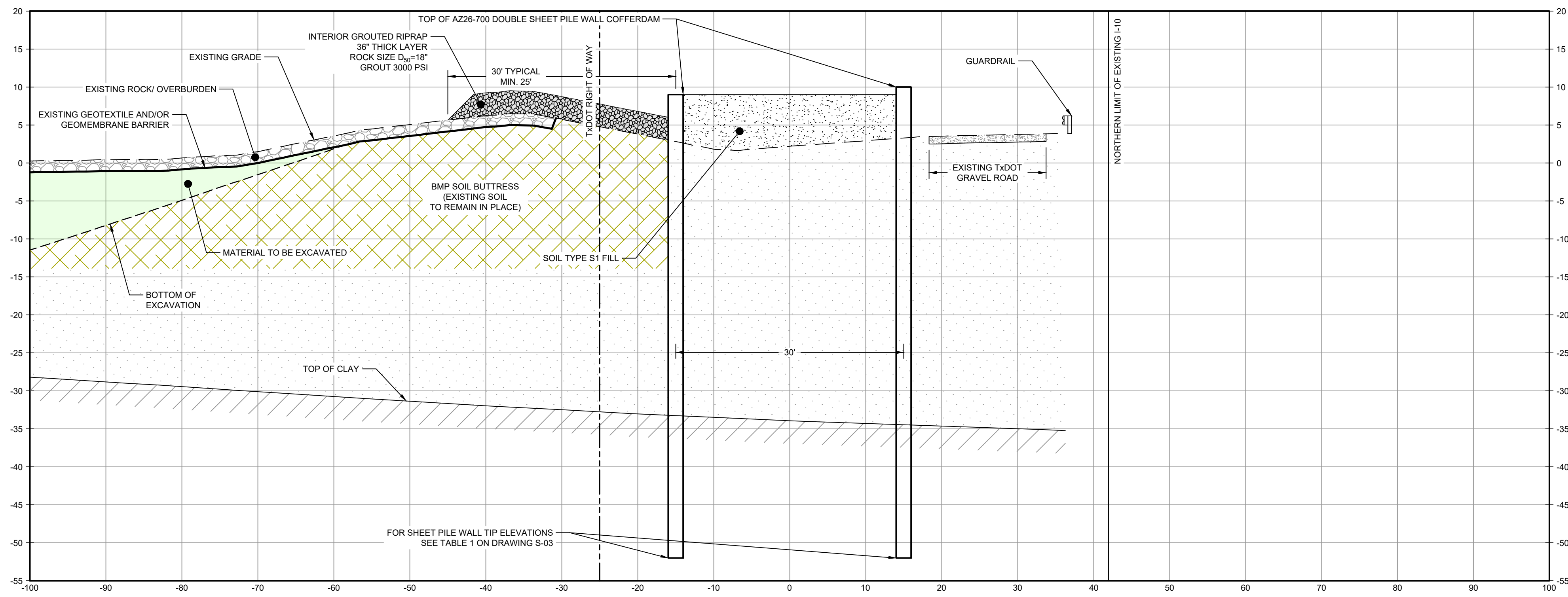


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LEGEND	
	MATERIAL TO BE EXCAVATED
	BMP SOIL BUTTRESS (EXISTING SOIL TO REMAIN IN PLACE)
	PLANNED IMPROVEMENTS FOR NORTHERN IMPOUNDMENT ACCESS
	EXISTING BERM TO BE EXCAVATED FOR POTENTIAL TESTING AND REUSE
	INTERIOR SCOUR PROTECTION



SECTION **V** STA. 4+00.00  
SCALE: 1"=10'  
C-33



SECTION **W** STA. 6+00.00  
SCALE: 1"=10'  
C-34

SOURCE:

TxDOT RIGHT OF WAY FROM A BOUNDARY AND RIGHT-OF-WAY SURVEY OF PORT OF HOUSTON AUTHORITY PROPERTY & HOUSTON FLEETING SERVICES, LLC PROPERTY ALONG INTERSTATE HIGHWAY 10 AT THE SAN JACINTO FLEET AREA, IN THE J. T. HARRELL SURVEY, A-330 HARRIS COUNTY, TEXAS, COBBFENDLEY, 2402-028-01, JUNE 28, 2024

NOTES:

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	<b>GHD SERVICES INC.</b>
JOB NO. 11215702	FILE NO. 001
GHD TEXAS FIRM REGISTRATION NO. 276	

Client  
**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

6	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	JC	Designer	RH	
Drafting Check	BS	Design Check	LL	
Project Coordinator	CM	Date	May 22, 2025	
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Original Size  
**Arch D**  
Bar is one inch on original size drawing  
0 1"

Project No. 11215702

Title  
**SOUTH WALL SECTIONS  
2 OF 3**

Sheet No.

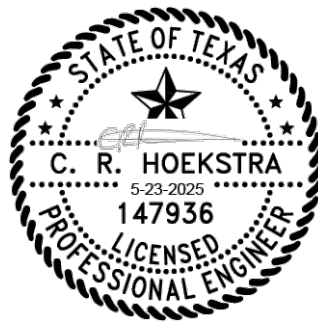
**C-43**

**THIRD 100% EPA SUBMITTAL**



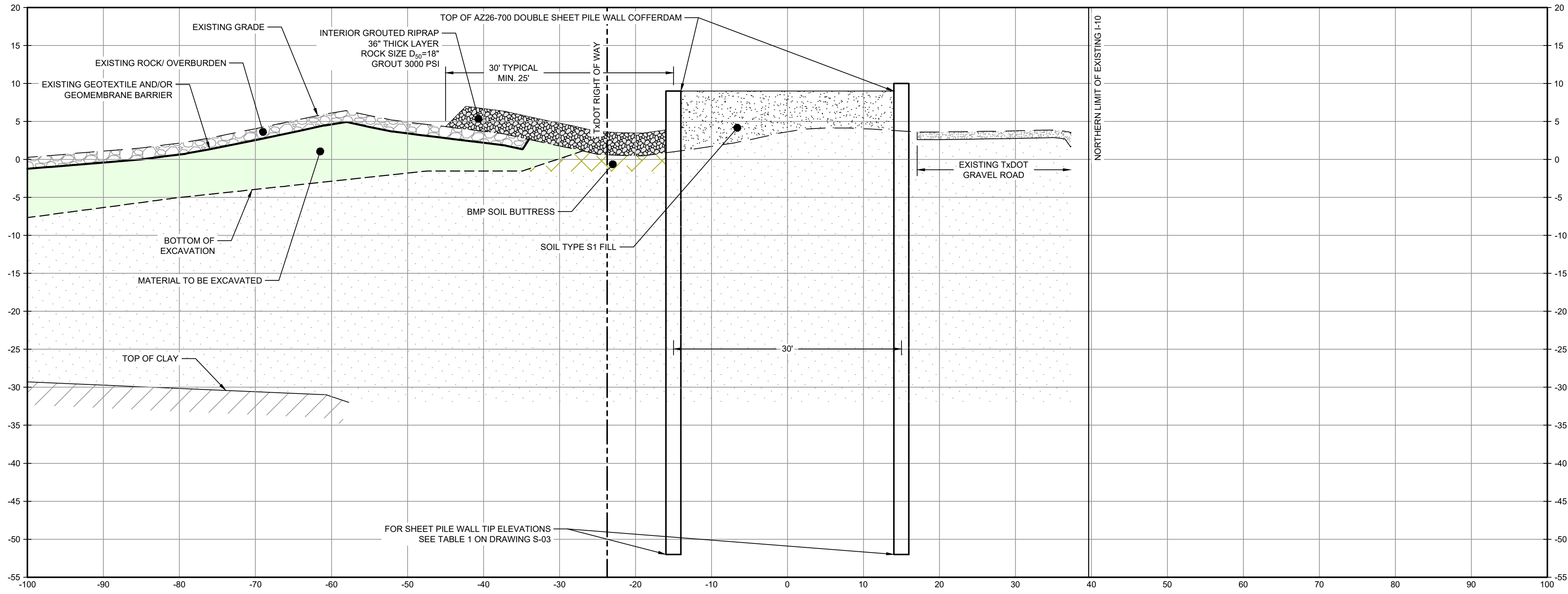


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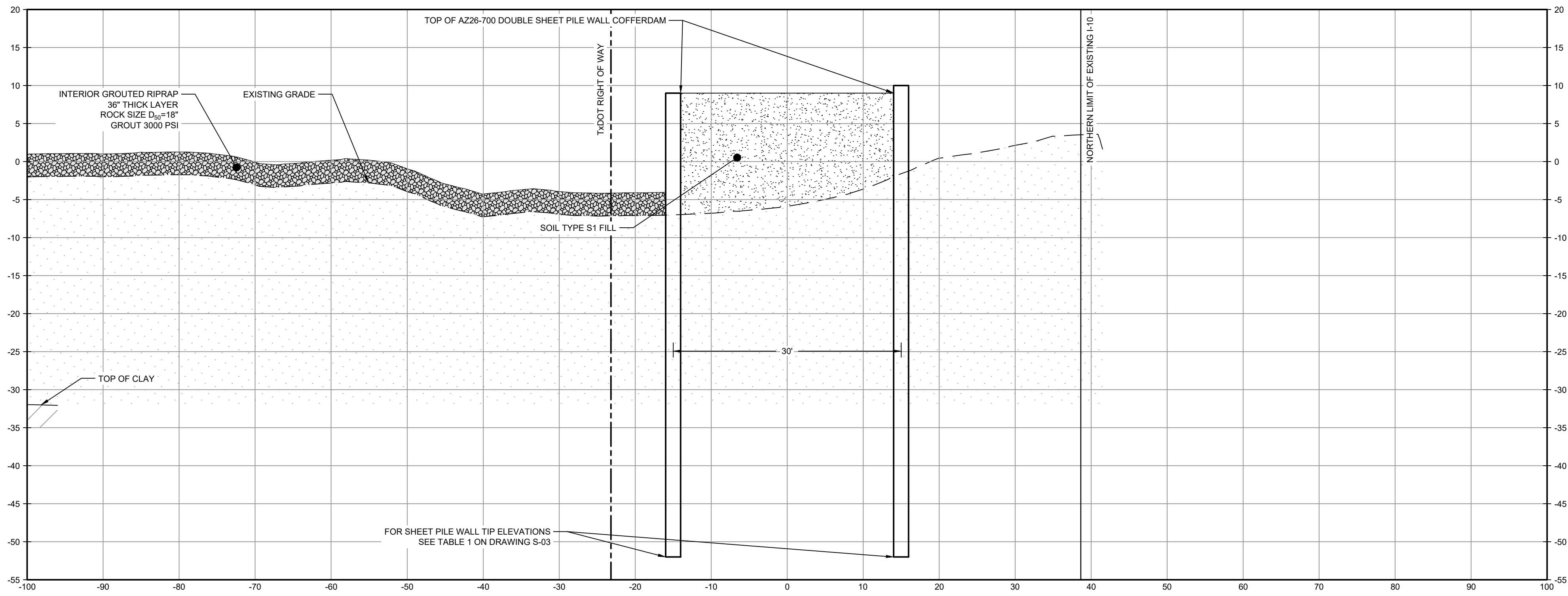


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LEGEND	
	MATERIAL TO BE EXCAVATED
	BMP SOIL BUTTRESS (EXISTING SOIL TO REMAIN IN PLACE)
	INTERIOR SCOUR PROTECTION



SECTION **X** STA. 8+00.00  
SCALE: 1"=10'




SECTION **Y** STA. 8+81.52  
SCALE: 1"=10'

SOURCE:  
TXDOT RIGHT OF WAY FROM A BOUNDARY AND RIGHT-OF-WAY SURVEY OF PORT OF HOUSTON AUTHORITY PROPERTY & HOUSTON FLEETING SERVICES, LLC PROPERTY ALONG INTERSTATE HIGHWAY 10 AT THE SAN JACINTO FLEET AREA, IN THE J. T. HARRELL SURVEY, A-330 HARRIS COUNTY, TEXAS, COBBFENDLEY, 2402-028-01, JUNE 28, 2024

- NOTES:  
1. BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.

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**GHD SERVICES INC.**

JOB NO. 11215702

FILE NO. 001

GHD TEXAS FIRM REGISTRATION NO.

276

Client  
**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

6	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	JC	Designer	RH	
Drafting Check	BS	Design Check	LL	
Project Coordinator	CM	Date	May 22, 2025	
This document shall not be used for construction unless signed and sealed for construction.				Scale 1" = 10'
Original Size		Arch D Bar is one inch on original size drawing 0 1"		

Project No. 11215702

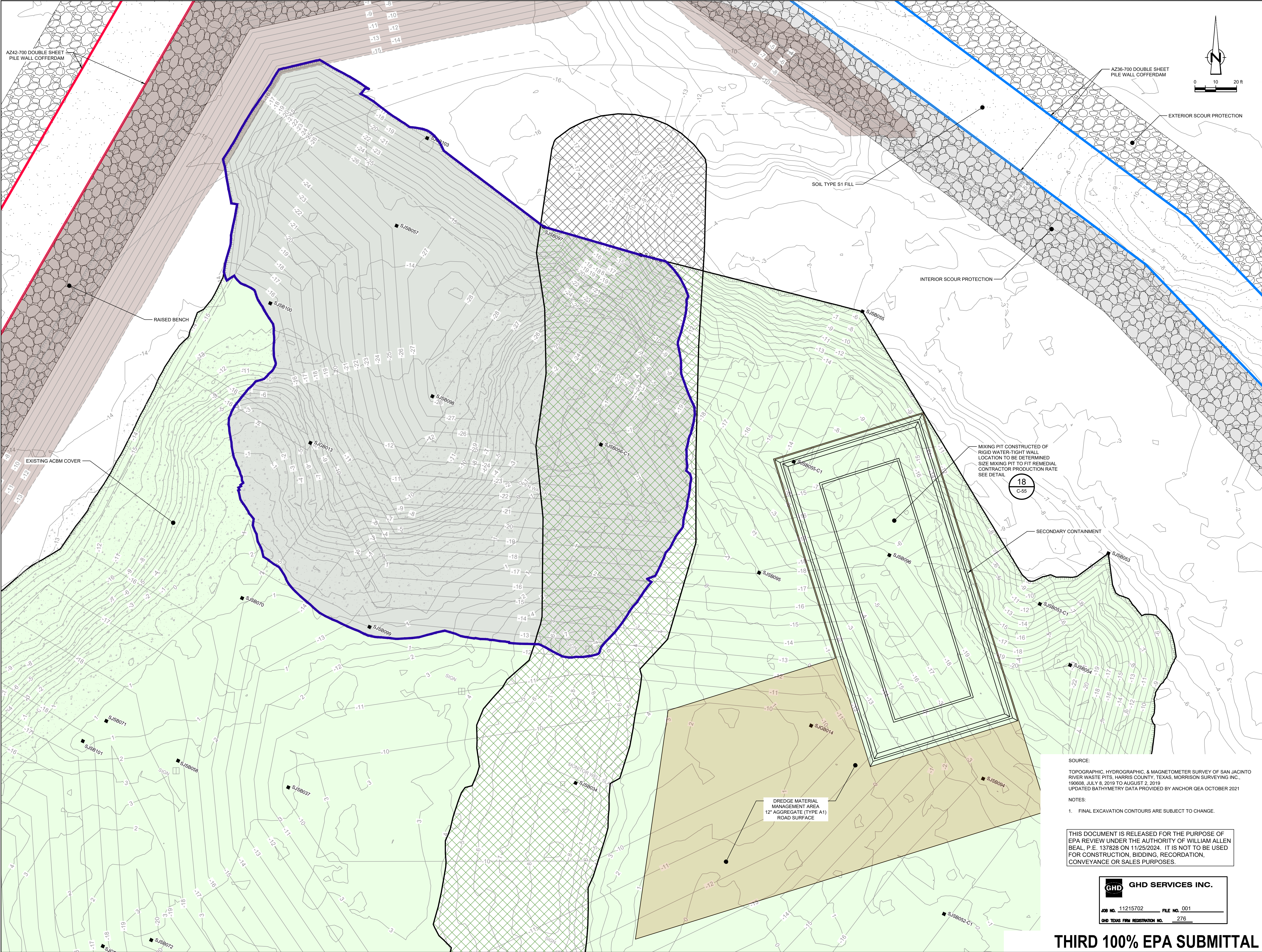
Title  
**SOUTH WALL SECTIONS  
3 OF 3**

Sheet No.

**C-44**

**THIRD 100% EPA SUBMITTAL**





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**LEGEND**

- TXDOT RIGHT OF WAY
- TCRA CAP PERIMETER
- EXISTING CONTOUR INTERVAL
- FENCELINE
- SHORELINE
- TOP OF BANK
- TOE OF SLOPE
- OVERHEAD ELECTRICAL
- GUARDRAIL
- PIPELINE
- BORING LOCATION
- MONITORING WELL
- POWER POLE
- LIGHT POLE
- WELL
- MATERIAL TO BE EXCAVATED
- EXISTING BERM TO BE EXCAVATED FOR POTENTIAL TESTING AND REUSE
- EXISTING BERM TO REMAIN
- NORTHWEST CORNER
- CONCRETE
- GRAVEL
- AZ42-700 PILE
- RAISED BENCH
- EXTERIOR SCOUR PROTECTION
- INTERIOR SCOUR PROTECTION

Client  
**SAN JACINTO RIVER WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

No.	Issue	Drawn	Approved	Date
5	THIRD 100% EPA SUBMITTAL	JC	WB	05/23/2025

Drawn JC Designer RH

Drafting BS Design Check WB

Project Coordinator CM Date May 23, 2025

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Original Size  
**Arch D**  
Bar is one inch on original size drawing  
0 1"

Project No. 11215702

Title  
**DREDGING  
NORTHWEST CORNER  
WORKS PLAN**

Sheet No.

**C-45**

SOURCE:  
TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608, JULY 8, 2019 TO AUGUST 2, 2019  
UPDATED BATHYMETRY DATA PROVIDED BY ANCHOR OEA OCTOBER 2021

NOTES:  
1. FINAL EXCAVATION CONTOURS ARE SUBJECT TO CHANGE.

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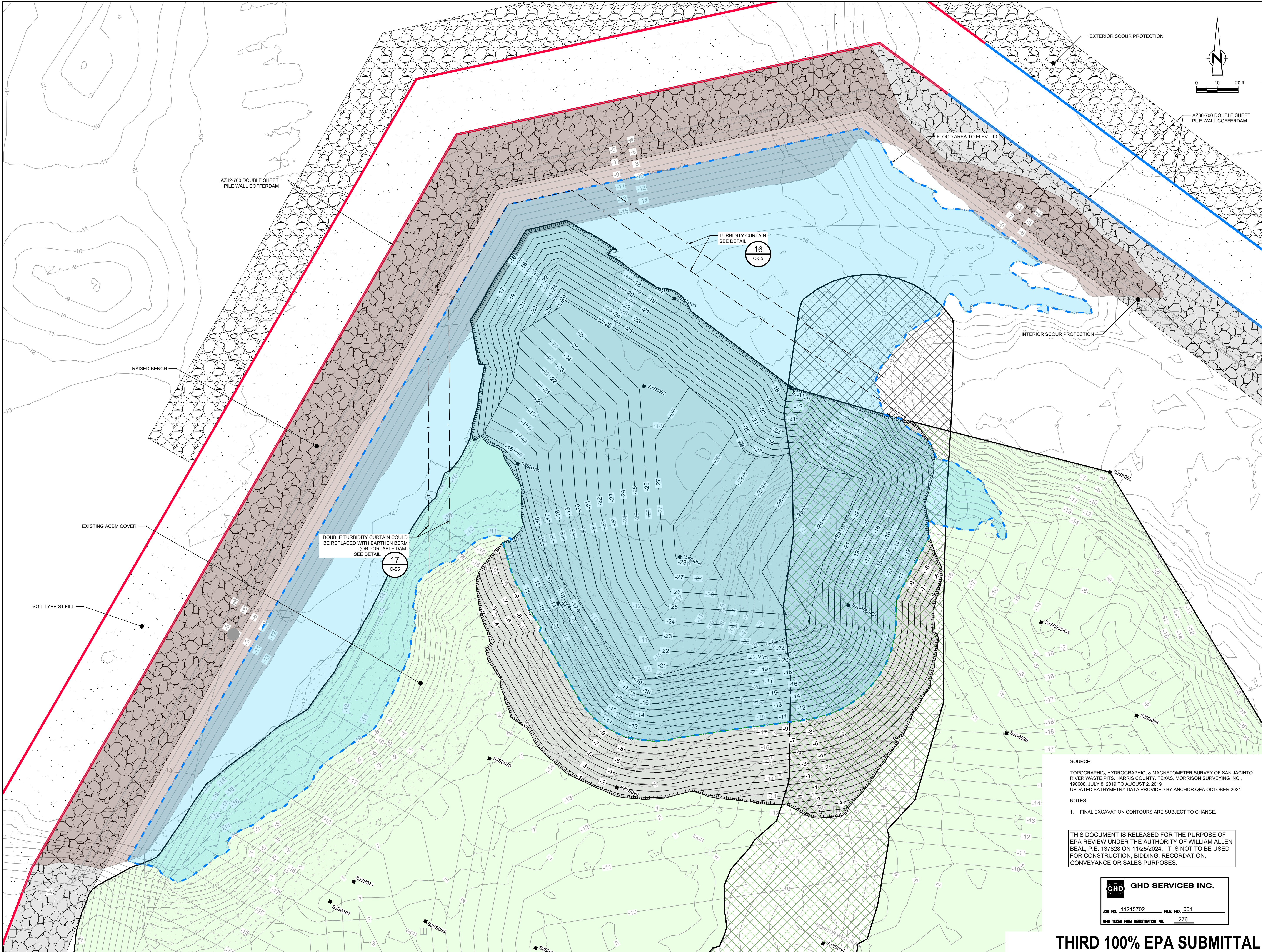
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JOB NO. 11215702 FILE NO. 001

GHD TEXAS FIRM REGISTRATION NO. 276

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**LEGEND**

- TXDOT RIGHT OF WAY
- TCRA CAP PERIMETER
- EXISTING CONTOUR INTERVAL
- FENCELINE
- SHORELINE
- TOP OF BANK
- TOE OF SLOPE
- OVERHEAD ELECTRICAL
- GUARDRAIL
- PIPELINE
- BORING LOCATION
- MONITORING WELL
- POWER POLE
- LIGHT POLE
- WELL
- MATERIAL TO BE EXCAVATED
- EXISTING BERM TO BE EXCAVATED
- FOR POTENTIAL TESTING AND REUSE
- EXISTING BERM TO REMAIN
- NORTHWEST CORNER
- CONCRETE
- GRAVEL
- AZ42-700 PILE
- AZ42-700 PILE
- RAISED BENCH
- FLOOD AREA TO ELEV. -10
- TURBIDITY CURTAIN
- EXTERIOR SCOUR PROTECTION
- INTERIOR SCOUR PROTECTION

Client

**SAN JACINTO RIVER  
WASTE PITS**

Project

**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

No.	Issue	Drawn	Approved	Date
5	THIRD 100% EPA SUBMITTAL	JC	WB	05/23/2025

Drawn JC Designer RH

Drafting BS Design Check WB

Project Coordinator CM Date May 23, 2025

This document shall not be used for construction unless signed and sealed for construction.

Original Size

Arch D

Bar is one inch on original size drawing  
0 1"

Project No. 11215702

Title

**DREDGING  
NORTHWEST CORNER  
DREDGING CONTROLS**

Sheet No.

**C-46**

Sheet 47 of 83

SOURCE:

TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608, JULY 8, 2019 TO AUGUST 2, 2019  
UPDATED BATHYMETRY DATA PROVIDED BY ANCHOR OEA OCTOBER 2021

NOTES:

1. FINAL EXCAVATION CONTOURS ARE SUBJECT TO CHANGE.

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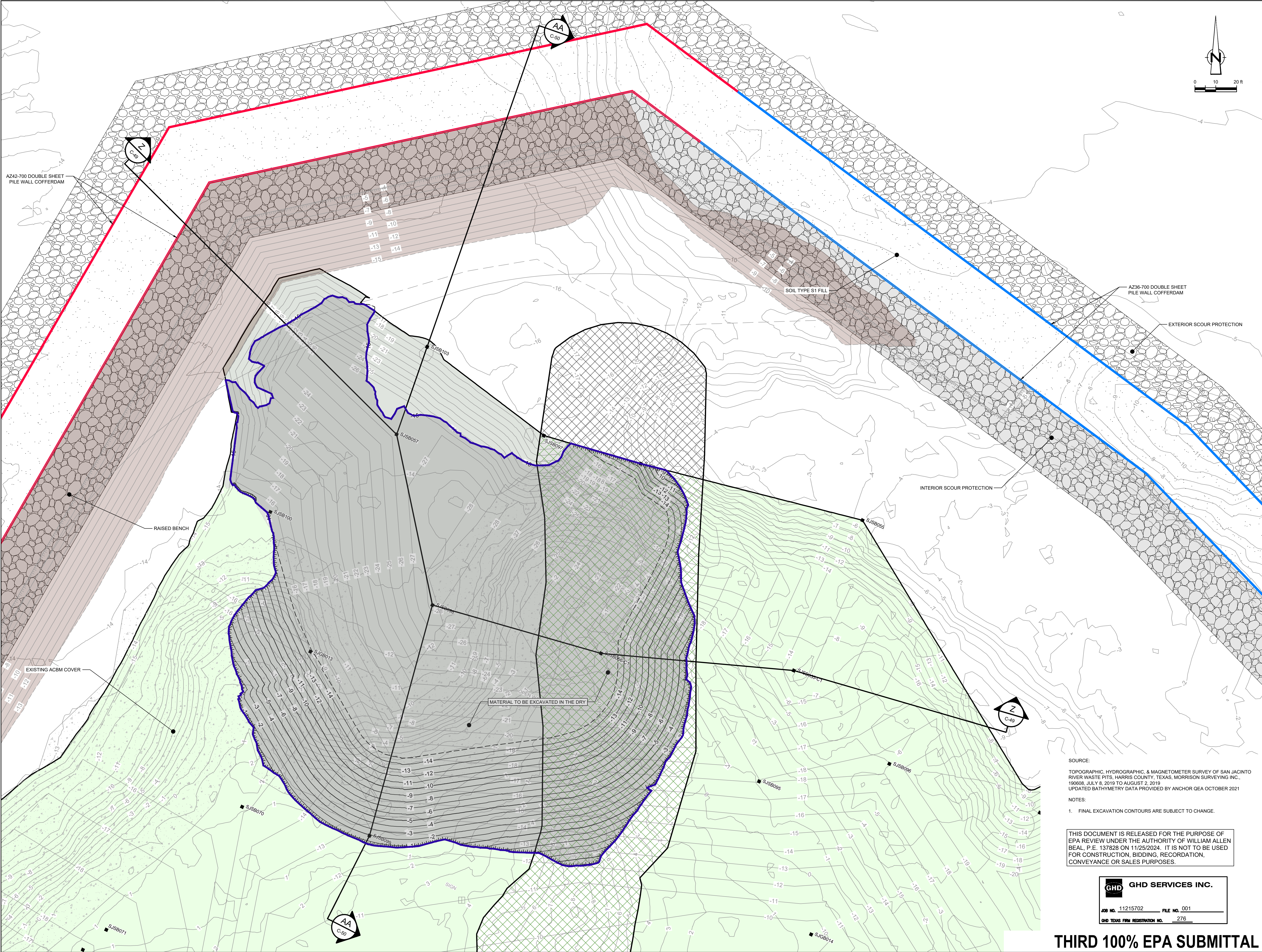
GHD SERVICES INC.

JOB NO. 11215702 FILE NO. 001

GHD TEXAS FIRM REGISTRATION NO. 276

**THIRD 100% EPA SUBMITTAL**





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LEGEND	
---	TXDOT RIGHT OF WAY
---	TCRA CAP PERIMETER
---	EXISTING CONTOUR INTERVAL
---	FENCELINE
---	SHORELINE
---	TOP OF BANK
---	TOE OF SLOPE
---	OVERHEAD ELECTRICAL
---	GUARDRAIL
---	PIPELINE
---	BORING LOCATION
---	MONITORING WELL
---	POWER POLE
---	LIGHT POLE
---	WELL
---	MATERIAL TO BE EXCAVATED
---	EXISTING BERM TO BE EXCAVATED
---	FOR POTENTIAL TESTING AND REUSE
---	EXISTING BERM TO REMAIN
---	NORTHWEST CORNER
---	CONCRETE
---	GRAVEL
---	AZ36-700 PILE
---	AZ42-700 PILE
---	RAISED BENCH
---	MATERIAL TO BE EXCAVATED - DRY
---	EXTERIOR SCOUR PROTECTION
---	INTERIOR SCOUR PROTECTION

Client  
**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**


5	THIRD 100% EPA SUBMITTAL	JC	WB	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	JC	Designer	RH	
Drafting Check	BS	Design Check	WB	
Project Coordinator	CM	Date	May 23, 2025	
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Original Size	Arch D
Bar is one inch on original size drawing 0 1"	

Project No. 11215702

Title  
**DREDGING  
NORTHWEST CORNER  
DRY EXCAVATION**

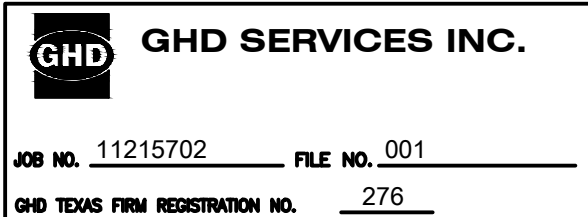
Sheet No.

**C-47**

SOURCE:  
TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608, JULY 8, 2019 TO AUGUST 2, 2019  
UPDATED BATHYMETRY DATA PROVIDED BY ANCHOR OEA OCTOBER 2021

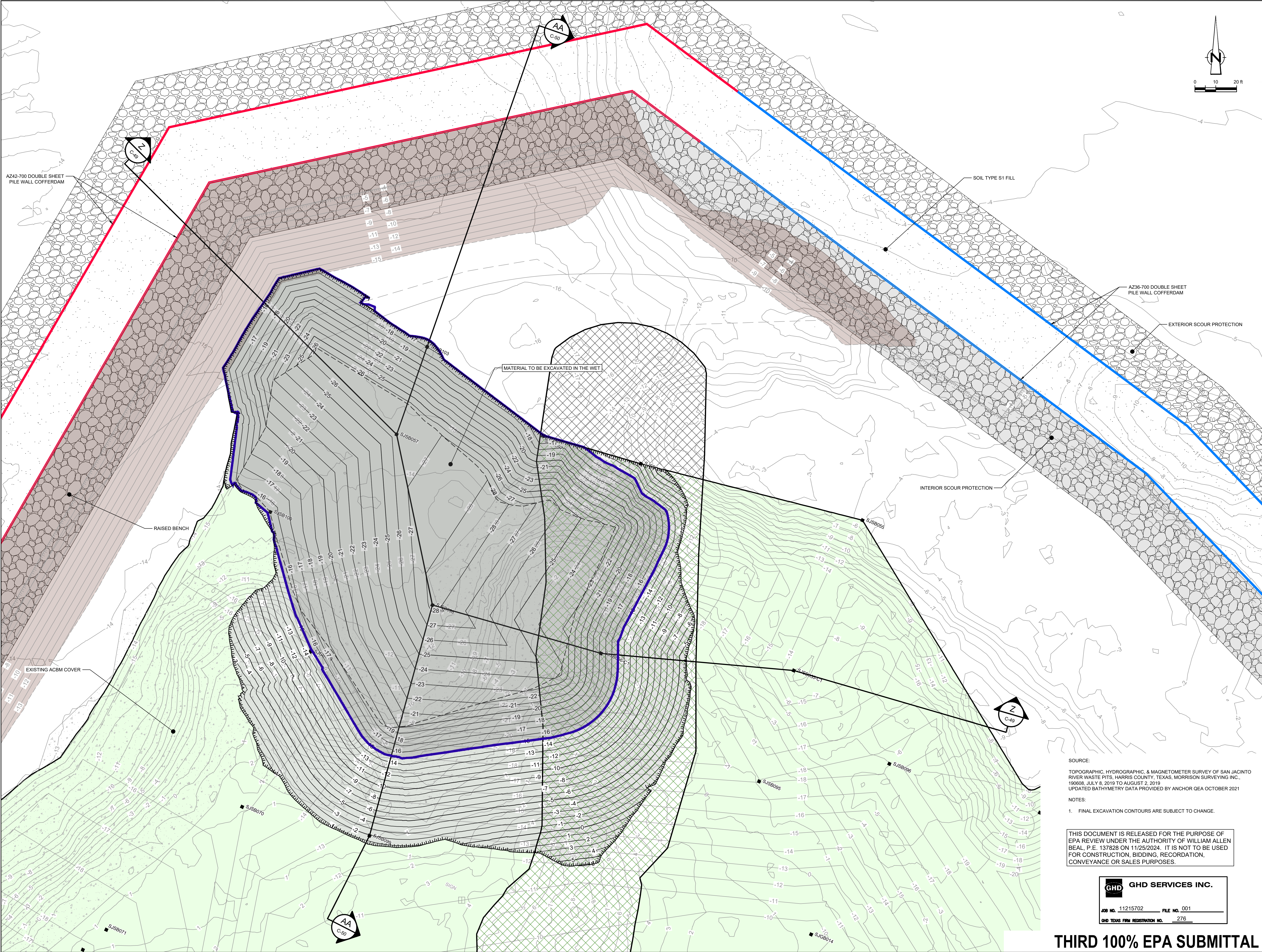
NOTES:  
1. FINAL EXCAVATION CONTOURS ARE SUBJECT TO CHANGE.

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LEGEND	
---	TXDOT RIGHT OF WAY
---	TORA CAP PERIMETER
---	EXISTING CONTOUR INTERVAL
---	FENCELINE
---	SHORELINE
---	TOP OF BANK
---	TOE OF SLOPE
---	OVERHEAD ELECTRICAL
---	GUARDRAIL
---	PIPELINE
---	BORING LOCATION
---	MONITORING WELL
---	POWER POLE
---	LIGHT POLE
---	WELL
---	MATERIAL TO BE EXCAVATED
---	EXISTING BERM TO BE EXCAVATED
---	FOR POTENTIAL TESTING AND REUSE
---	EXISTING BERM TO REMAIN
---	NORTHWEST CORNER
---	CONCRETE
---	GRAVEL
---	AZ36-700 PILE
---	AZ42-700 PILE
---	RAISED BENCH
---	MATERIAL TO BE EXCAVATED - WET
---	EXTERIOR SCOUR PROTECTION
---	INTERIOR SCOUR PROTECTION

Client  
**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

5	THIRD 100% EPA SUBMITTAL	JC	WB	05/23/2025
---	--------------------------	----	----	------------

No.	Issue	Drawn	Approved	Date
-----	-------	-------	----------	------

Drawn	JC	Designer	RH
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Drafting	BS	Design	WB
Check		Check	

Project	CM	Date	May 23, 2025
Coordinator			

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Scale 1" = 20'

Original Size  
**Arch D**  
Bar is one inch on original size drawing  
0 1"

Project No. 11215702

Title  
**DREDGING  
NORTHWEST CORNER  
WET EXCAVATION**

Sheet No.

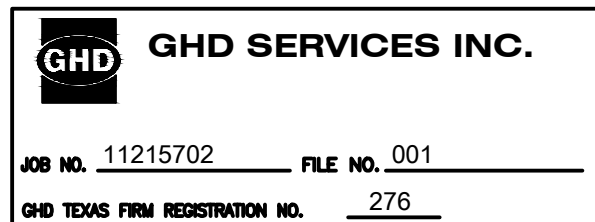
**C-48**

Sheet 49 of 83

SOURCE:  
TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608, JULY 8, 2019 TO AUGUST 2, 2019  
UPDATED BATHYMETRY DATA PROVIDED BY ANCHOR OEA OCTOBER 2021

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**LEGEND**  
SOILS WITH CONCENTRATIONS  
<30 ng/kg TEQ<sub>TCDD</sub> TCDD  
SOILS WITH CONCENTRATIONS  
>30 ng/kg TEQ<sub>TCDD</sub> TCDD  
EXCAVATION LIMIT BASED ON  
FS = 1.25 FOR HYDRAULIC HEAVE  
MATERIAL TO BE EXCAVATED  
EXISTING BERM TO BE EXCAVATED  
FOR POTENTIAL TESTING AND REUSE

Client  
**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

5 THIRD 100% EPA SUBMITTAL JC WB 05/23/2025

No. Issue Drawn Approved Date

Drawn JC Designer RH

Drafting BS Design Check WB

Project Coordinator CM Date May 22, 2025

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Original Size Scale AS SHOWN

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Project No. 11215702

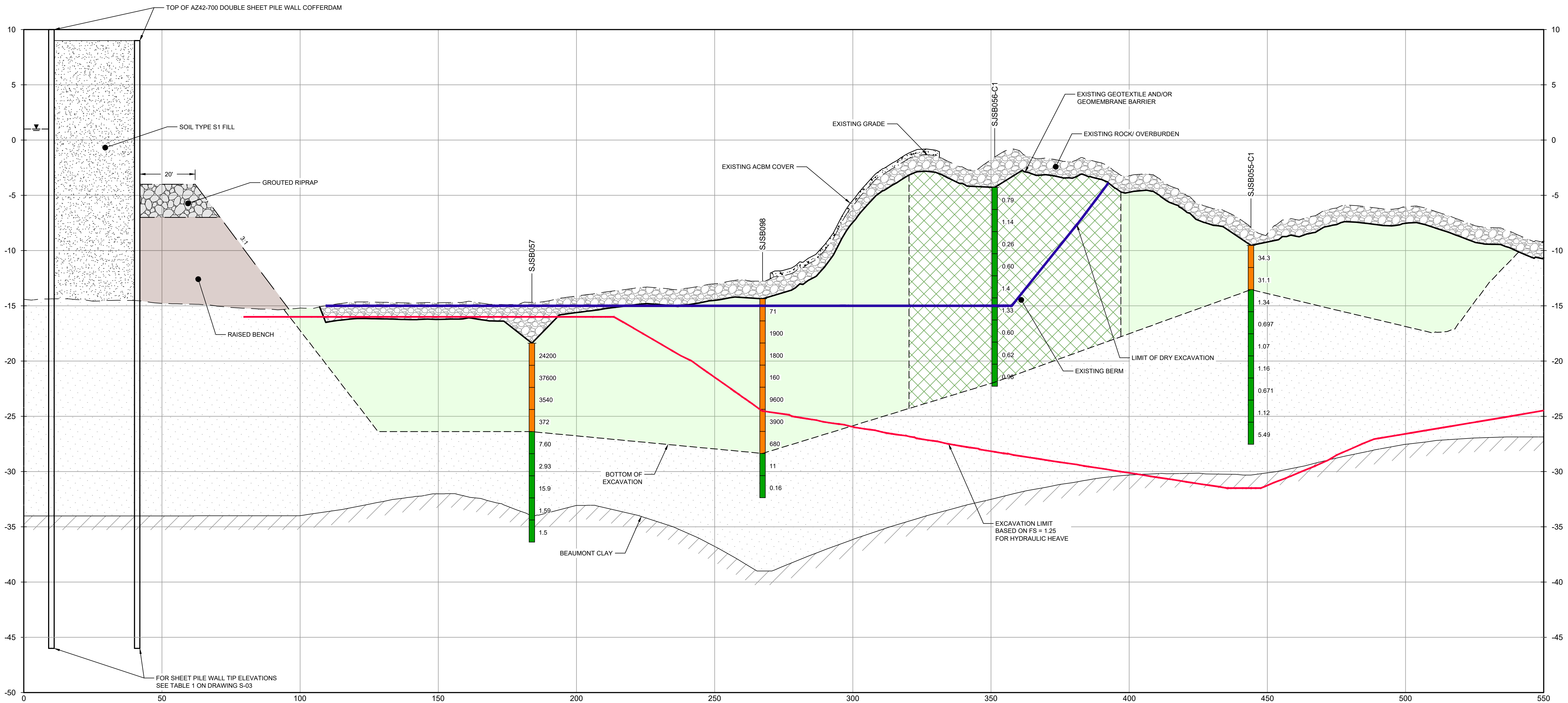
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**DREDGING  
NORTHWEST CORNER  
SECTIONS 1 OF 2**

Sheet No.

**C-49**

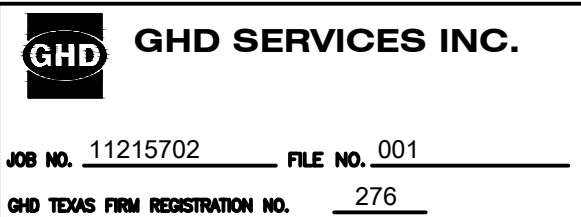
Sheet 50 of 83



SECTION **Z** WEST/EAST  
HORIZ: 1"=20'  
VERT: 1"=5'

- NOTES:
1. BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.
  2. SCOUR PROTECTION ON INTERIOR AND EXTERIOR SIDE OF COFFERDAM NOT SHOWN. SEE DRAWINGS C-28 TO C-44 FOR LIMITS OF RIPRAP.

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**LEGEND**

- SOILS WITH CONCENTRATIONS <30 ng/kg TEQ<sub>2,3,4</sub> TCDD
- SOILS WITH CONCENTRATIONS >30 ng/kg TEQ<sub>2,3,4</sub> TCDD
- EXCAVATION LIMIT BASED ON FS = 1.25 FOR HYDRAULIC HEAVE
- MATERIAL TO BE EXCAVATED
- EXISTING BERM TO BE EXCAVATED FOR POTENTIAL TESTING AND REUSE

Client  
**SAN JACINTO RIVER WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

5	THIRD 100% EPA SUBMITTAL	JC	WB	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	JC	Designer	RH	
Drafting Check	BS	Design Check	WB	
Project Coordinator	CM	Date	May 22, 2025	
This document shall not be used for construction unless signed and sealed for construction.		Scale	AS SHOWN	
Original Size		Bar is one inch on original size drawing 0 1"		
Arch D				

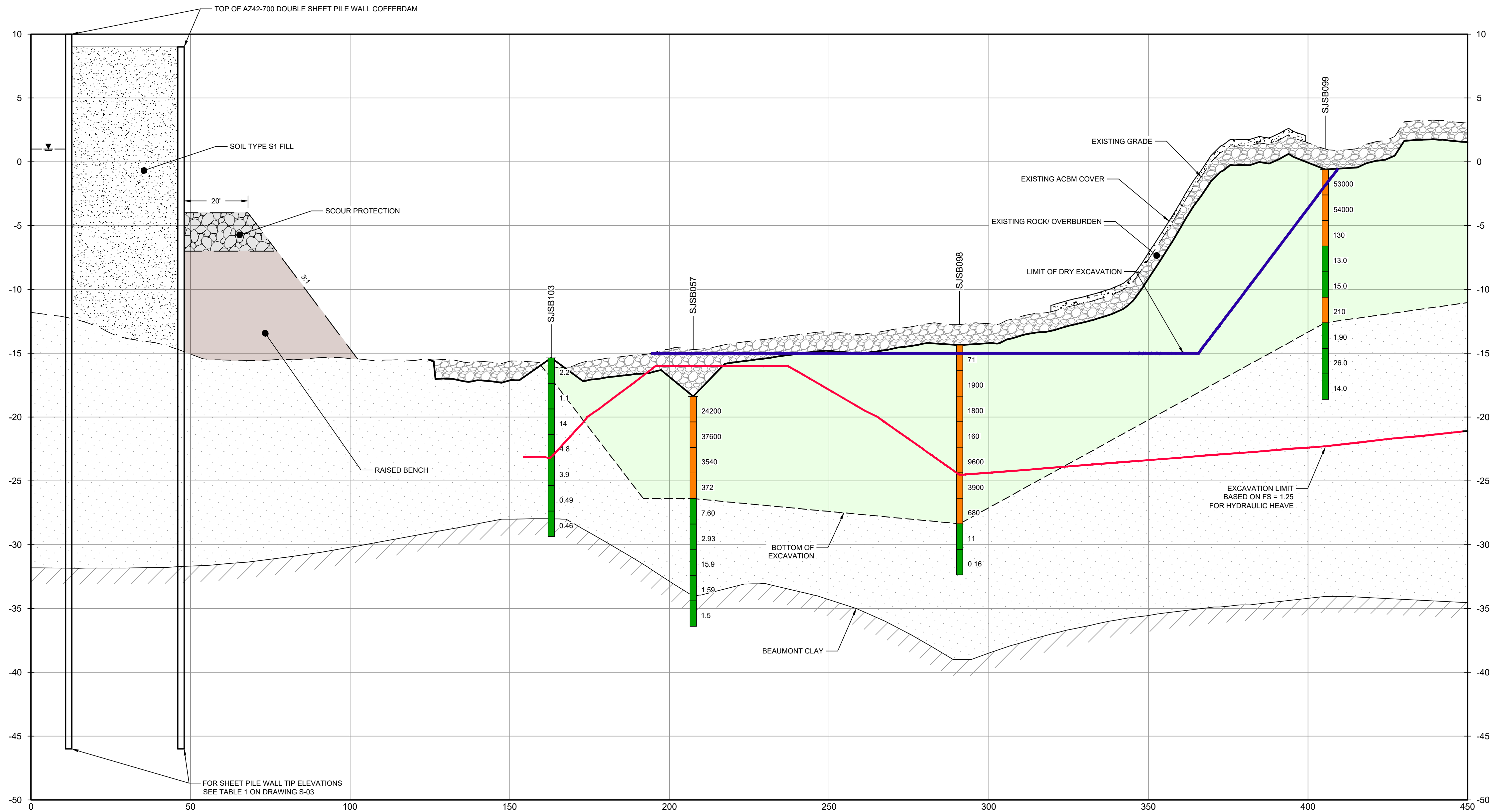
Project No. 11215702

Title  
**DREDGING  
NORTHWEST CORNER  
SECTIONS 2 OF 2**

Sheet No.

C-50

Sheet 51 of 83



SECTION AA NORTH/ SOUTH  
HORIZ: 1"=20'  
VERT: 1"=5'

- NOTES:
- BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.
  - SCOUR PROTECTION ON INTERIOR AND EXTERIOR SIDE OF COFFERDAM NOT SHOWN. SEE DRAWINGS C-28 TO C-44 FOR LIMITS OF RIPRAP.

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**GHD SERVICES INC.**

JOB NO. 11215702 FILE NO. 001

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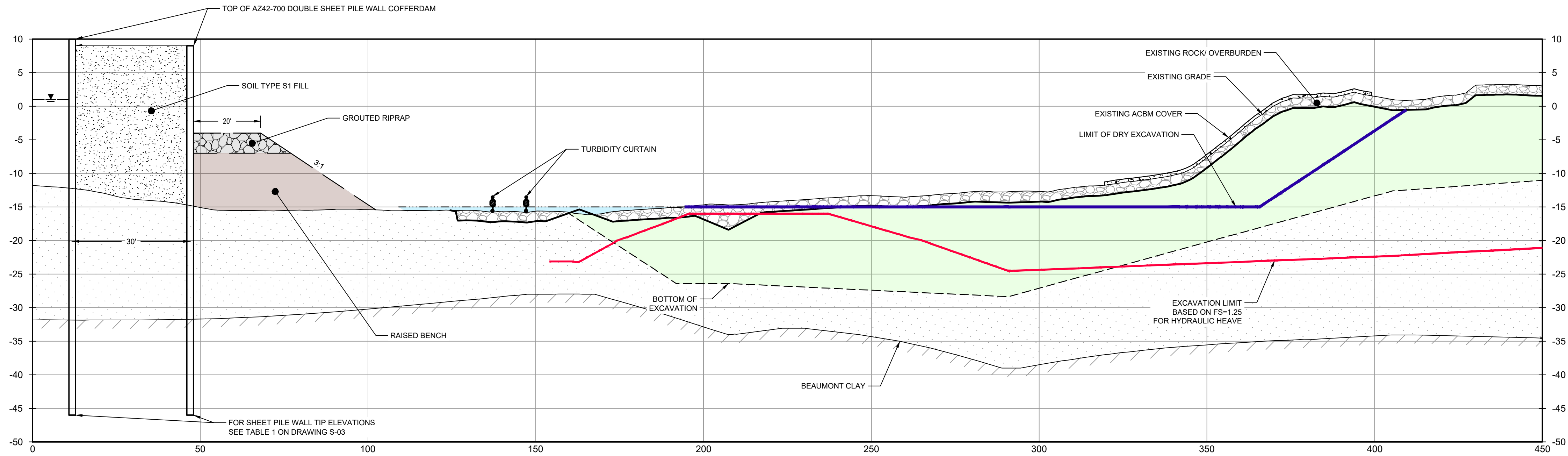
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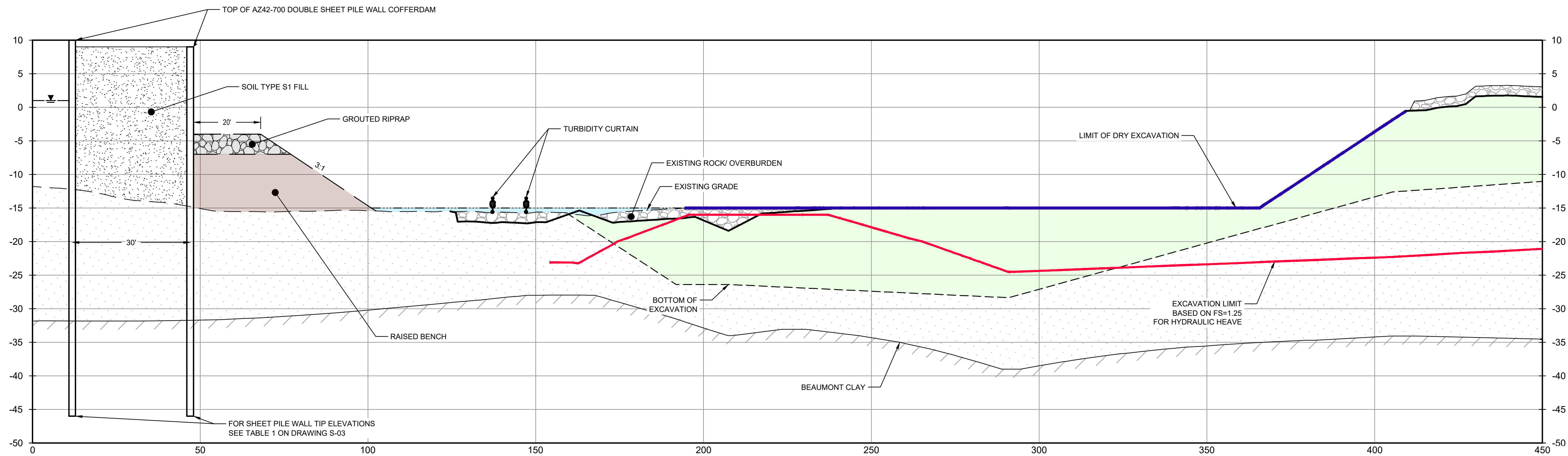
LEGEND

EXCAVATION LIMIT BASED ON  
FS = 1.25 FOR HYDRAULIC HEAVE  
MATERIAL TO BE EXCAVATED



PHASE 1

HORIZ: 1" = 20'  
VERT: 1" = 10'



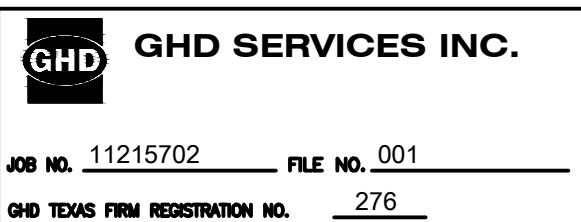
PHASE 2

HORIZ: 1" = 20'  
VERT: 1" = 10'

NOTES:

- BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.
- SCOUR PROTECTION ON INTERIOR AND EXTERIOR SIDE OF COFFERDAM NOT SHOWN. SEE DRAWINGS C-28 TO C-44 FOR LIMITS OF RIPRAP.

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THIRD 100% EPA SUBMITTAL

Client  
**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

5 THIRD 100% EPA SUBMITTAL JC WB 05/23/2025

No. Issue Drawn Approved Date

Drawn JC Designer RH

Drafting BS Design Check WB

Project Coordinator CM Date May 22, 2025

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Original Size Scale AS SHOWN

Arch D Bar is one inch on original size drawing 0 1"

Project No. 11215702

Title  
**DREDGING  
NORTHWEST CORNER  
SEQUENCING 1 OF 3**

Sheet No.

C-51

Sheet 52 of 83





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**LEGEND**  
EXCAVATION LIMIT BASED ON  
FS = 1.25 FOR HYDRAULIC HEAVE  
MATERIAL TO BE EXCAVATED

Client  
**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

5 THIRD 100% EPA SUBMITTAL JC WB 05/23/2025

No.	Issue	Drawn	Approved	Date
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Drawn	JC	Designer	RH
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Drafting Check	BS	Design Check	WB
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Project Coordinator	CM	Date	May 22, 2025
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Original Size	Bar is one inch on original size drawing
Arch D	0 1"

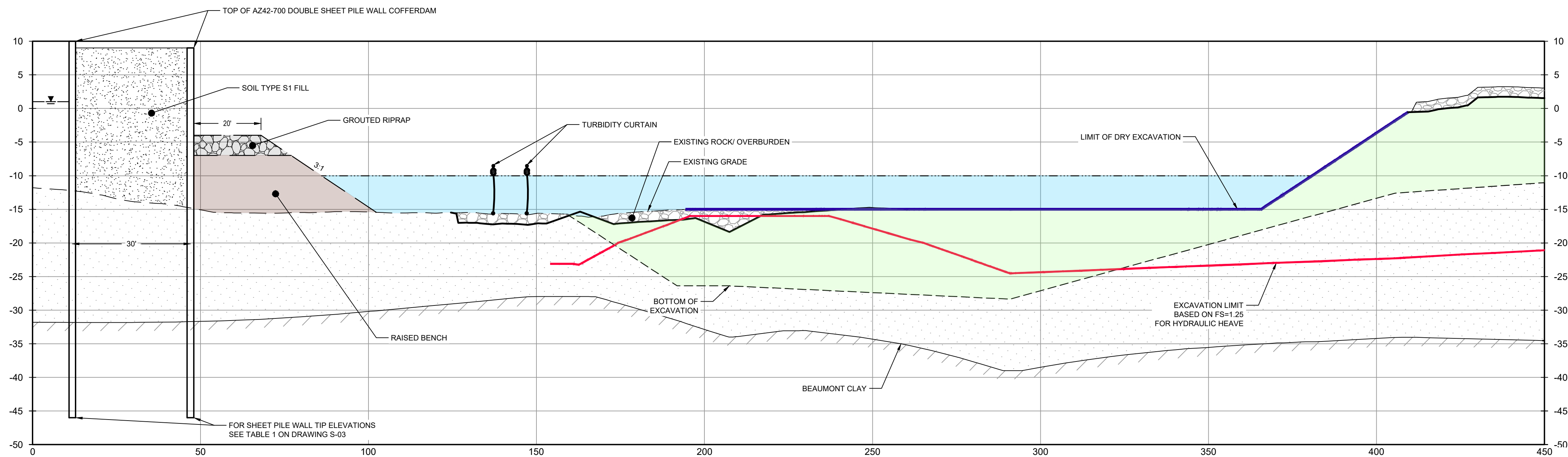
Project No. 11215702

Title  
**DREDGING  
NORTHWEST CORNER  
SEQUENCING 2 OF 3**

Sheet No.

**C-52**

Sheet 53 of 83

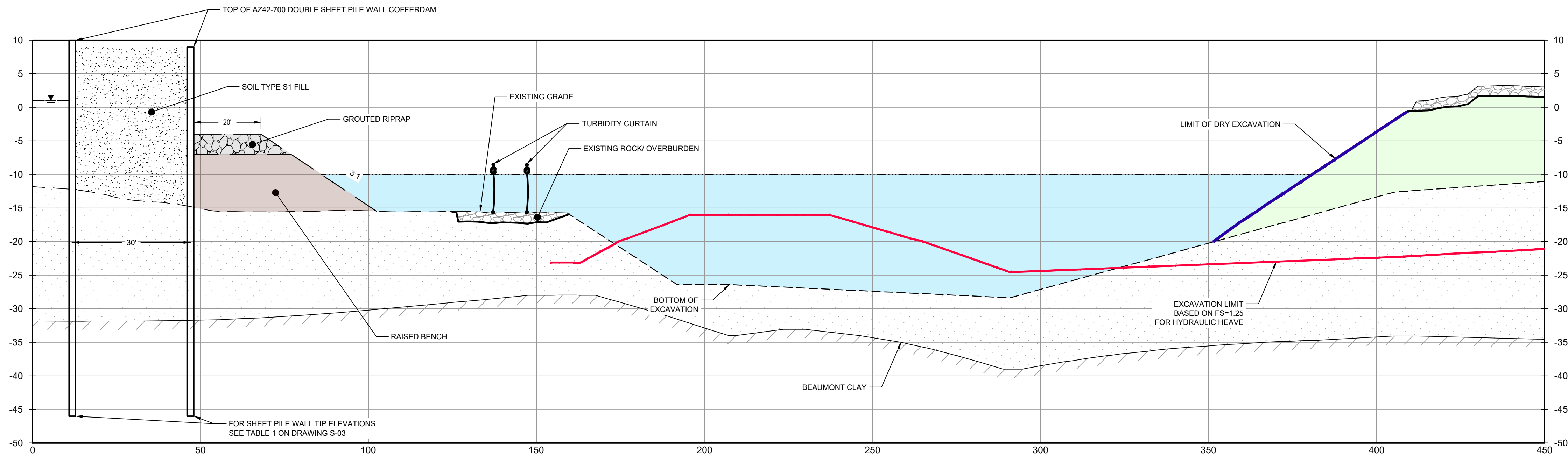


NOTES:

1. WATER ADDED TO MITIGATE HYDRAULIC HEAVE AND ALLOW DRAFT OF DREDGE VESSEL.

### PHASE 3

HORIZ: 1" = 20'  
VERT: 1" = 10'



NOTES:

1. REMOVE ROCK LAYER TO BE STOCKPILED ON SITE. REUSED AS TEMPORARY COVER AT END OF SEASONAL EXCAVATION.
2. REMOVE GEOTEXTILE (IF PRESENT), EXCAVATE MATERIAL THROUGH A COLUMN OF WATER, AND DISPOSE OF OFFSITE.
3. WATER LEVEL TO BE MAINTAINED ABOVE EXCAVATION LIMIT BASED ON FS=1.25 FOR HYDRAULIC HEAVE.

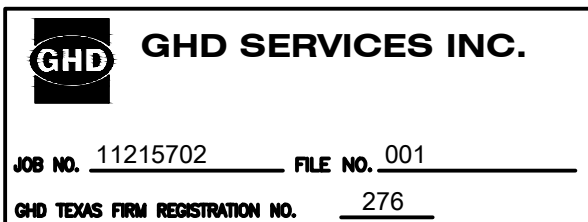
### PHASE 4

HORIZ: 1" = 20'  
VERT: 1" = 10'

NOTES:

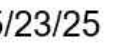
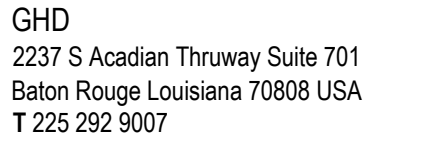
1. BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.
2. SCOUR PROTECTION ON INTERIOR AND EXTERIOR SIDE OF COFFERDAM NOT SHOWN. SEE DRAWINGS C-28 TO C-44 FOR LIMITS OF RIPRAP.

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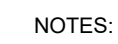
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### LEGEND

EXCAVATION LIMIT BASED ON  
FS = 1.25 FOR HYDRAULIC HEAVE  
MATERIAL TO BE EXCAVATED

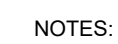
GRANULAR MATERIAL



1. PLACE GRANULAR MATERIAL AS RESIDUAL MANAGEMENT LAYER UPON COMPLETION OF DREDGING

PHASE 5

HORIZ: 1" = 20'  
VERT: 1" = 10'



1. OPTIONAL REUSE OF ONSITE RIP RAP AND AGGREGATE.
2. FILL PLACEMENT TO OVERCOME HYDRAULIC HEAVE.
3. WATER TO BE PUMPED OFF AND TREATED. WATER LEVEL TO BE MAINTAINED ABOVE HYDRAULIC HEAVE LIMIT BASED ON FS=1.25.

## PHASE 6

HORIZ: 1" = 20'  
VERT: 1" = 10'

- NOTES:
1. BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.
  2. SCOUR PROTECTION ON INTERIOR AND EXTERIOR SIDE OF COFFERDAM NOT SHOWN. SEE DRAWINGS C-28 TO C-44 FOR LIMITS OF RIPRAP.

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### THIRD 100% EPA SUBMITTAL

Client **SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

5	THIRD 100% EPA SUBMITTAL	JC	WB	05/23/2025
---	--------------------------	----	----	------------

Drawn	JC	Designer	RH
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Project Coordinator	CM	Date	May 22, 2025
------------------------	----	------	--------------

Original Size	Bar is one inch on original size drawing
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**Arch D** original size drawing

0  1"

Project No. 11215702

Title

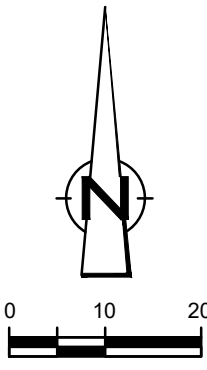
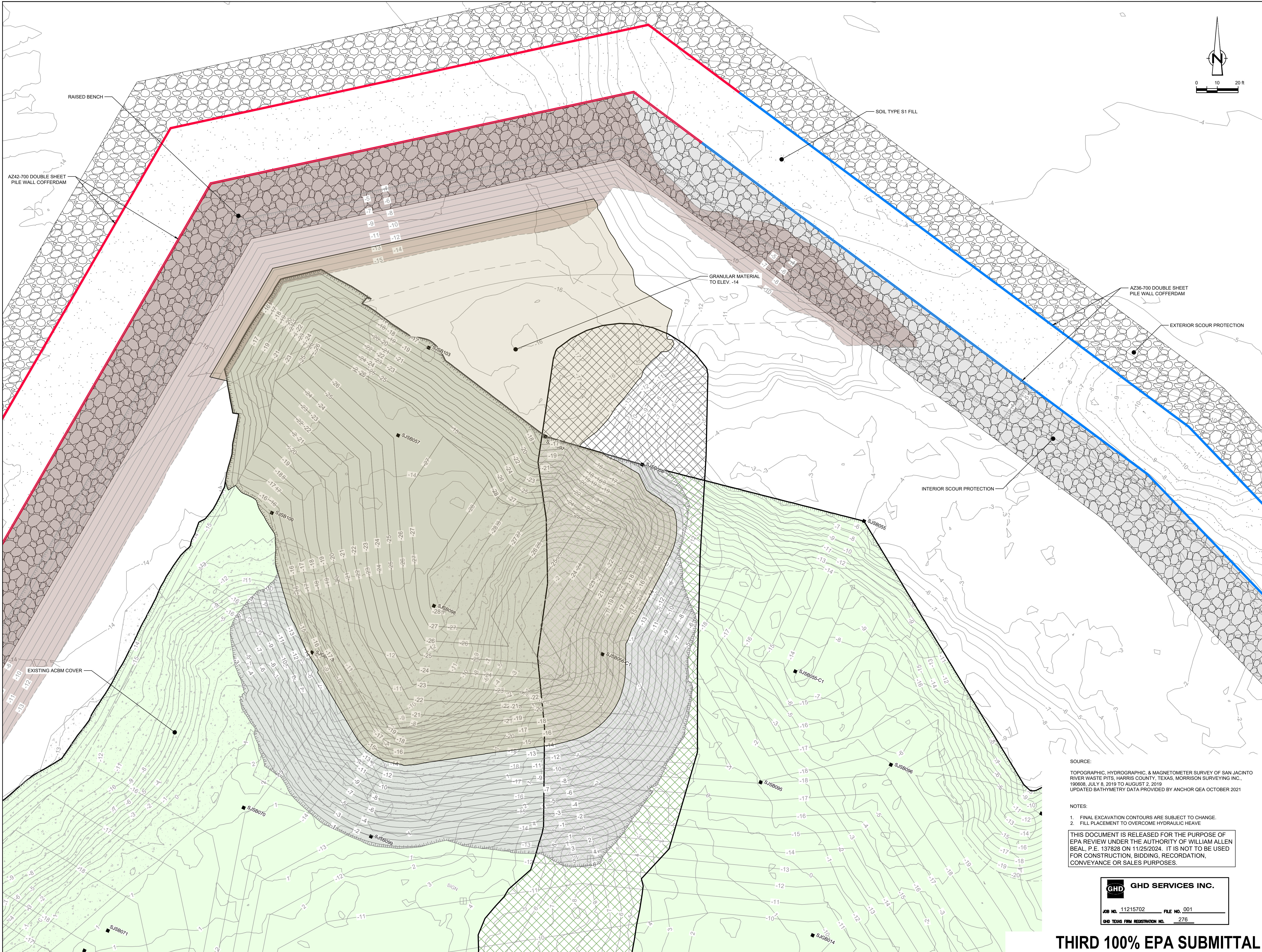
**DREDGING  
NORTHWEST CORNER  
SEQUENCING 3 OF 3**

Sheet No. \_\_\_\_\_

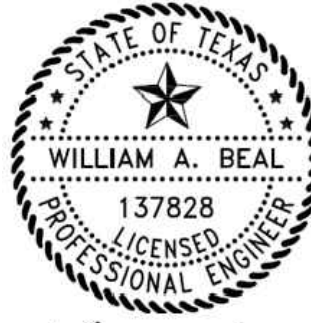
**C-53**

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LEGEND	
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---	TCRA CAP PERIMETER
---	EXISTING CONTOUR INTERVAL
---	FENCELINE
---	SHORELINE
---	TOP OF BANK
---	TOE OF SLOPE
---	OVERHEAD ELECTRICAL
---	GUARDRAIL
---	PIPELINE
---	BORING LOCATION
---	MONITORING WELL
---	POWER POLE
---	LIGHT POLE
---	WELL
---	MATERIAL TO BE EXCAVATED
---	EXISTING BERM TO BE EXCAVATED
---	FOR POTENTIAL TESTING AND REUSE
---	EXISTING BERM TO REMAIN
---	NORTHWEST CORNER
---	CONCRETE
---	GRAVEL
---	AZ42-700 PILE
---	AZ42-700 PILE
---	RAISED BENCH
---	GRANULAR MATERIAL
---	EXTERIOR SCOUR PROTECTION
---	INTERIOR SCOUR PROTECTION

Client  
**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

5	THIRD 100% EPA SUBMITTAL	JC	WB	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	JC	Designer	RH	
Drafting	BS	Design	WB	
Check		Check		
Project	CM	Date	May 23, 2025	
Coordinator		Scale	1" = 20'	
Original Size		Bar is one inch on original size drawing 0 1"		
Arch D				

Project No. 11215702

Title  
**DREDGING  
NORTHWEST CORNER  
FINAL GRADE**

Sheet No.


**C-54**

Sheet 55 of 83

SOURCE:  
TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608, JULY 8, 2019 TO AUGUST 2, 2019  
UPDATED BATHYMETRY DATA PROVIDED BY ANCHOR OEA OCTOBER 2021

- NOTES:
1. FINAL EXCAVATION CONTOURS ARE SUBJECT TO CHANGE.
  2. FILL PLACEMENT TO OVERCOME HYDRAULIC HEAVE

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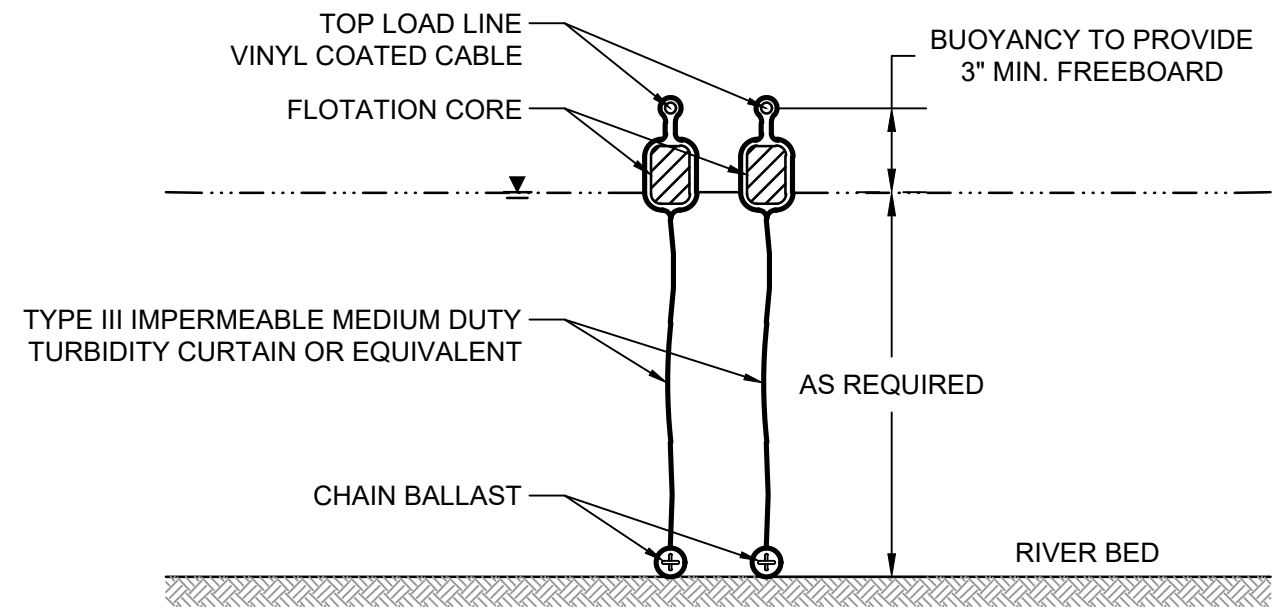
**GHD SERVICES INC.**

JOB NO. 11215702 FILE NO. 001

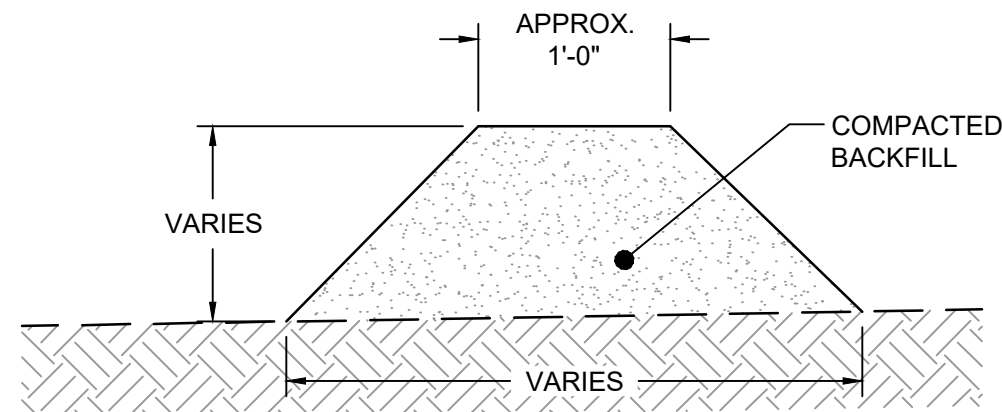
GHD TEXAS FIRM REGISTRATION NO. 276

**THIRD 100% EPA SUBMITTAL**



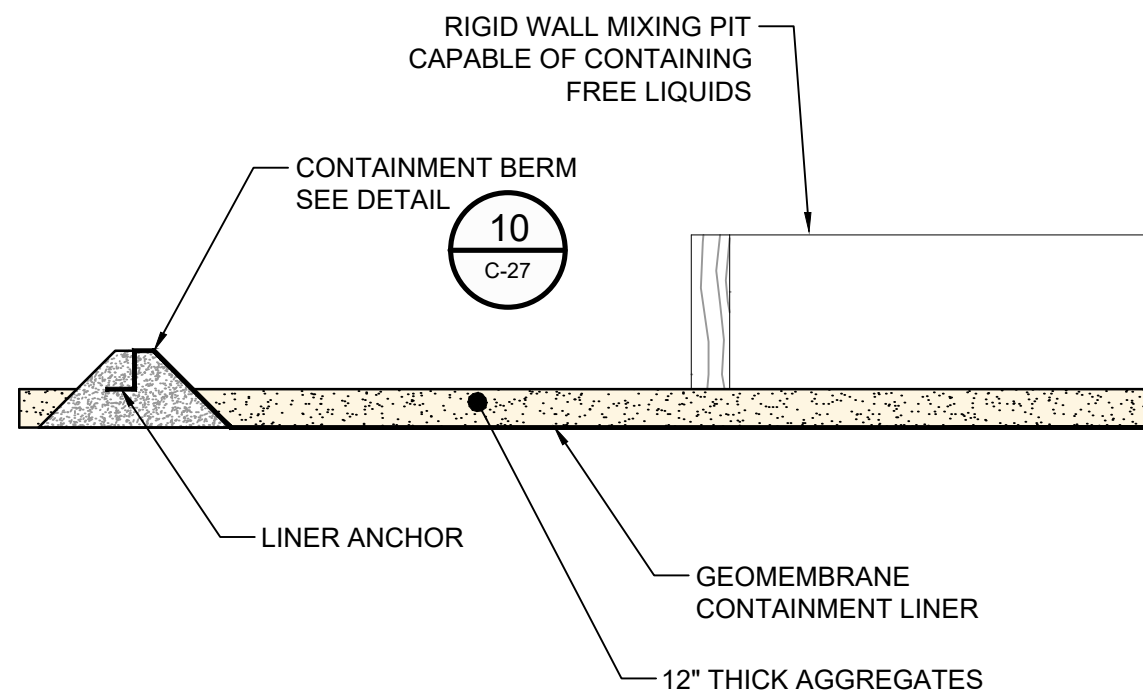
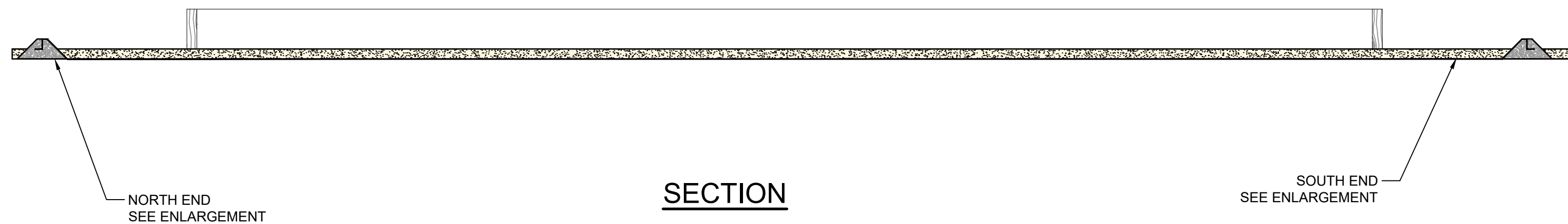


DETAIL 16 DREDGING TURBIDITY CURTAINS  
N.T.S. C-46

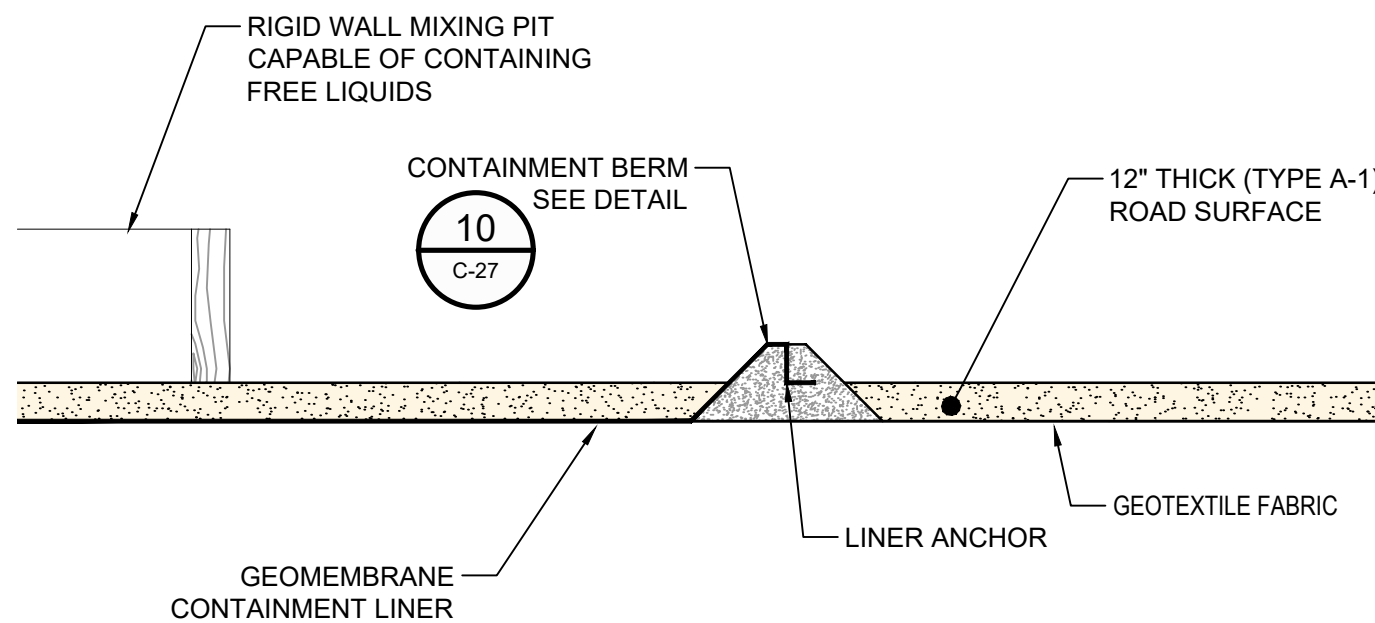


NOTES:  
1. TOP WIDTH MAY BE WIDER AND SIDE SLOPES MAY BE FLATTER IF REQUIRED TO FACILITATE CROSSING CONSTRUCTION TRAFFIC.

DETAIL 17 DREDGING EARTHEN BERM  
N.T.S. C-46



NORTH END



SOUTH END

DETAIL 18 MIXING PIT  
N.T.S. C-45

NOTES:  
1. DIMENSION TO BE DETERMINED BY CONTRACTOR

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**GHD SERVICES INC.**

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Client  
**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

5	THIRD 100% EPA SUBMITTAL	JC	WB	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	JC	Designer	RH	
Drafting Check	BS	Design Check	WB	
Project Coordinator	CM	Date	May 22, 2025	
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Arch D				

Project No. 11215702

Title

**DREDGING  
NORTHWEST CORNER  
DREDGING DETAILS**

Sheet No.

**C-55**

Sheet 56 of 83





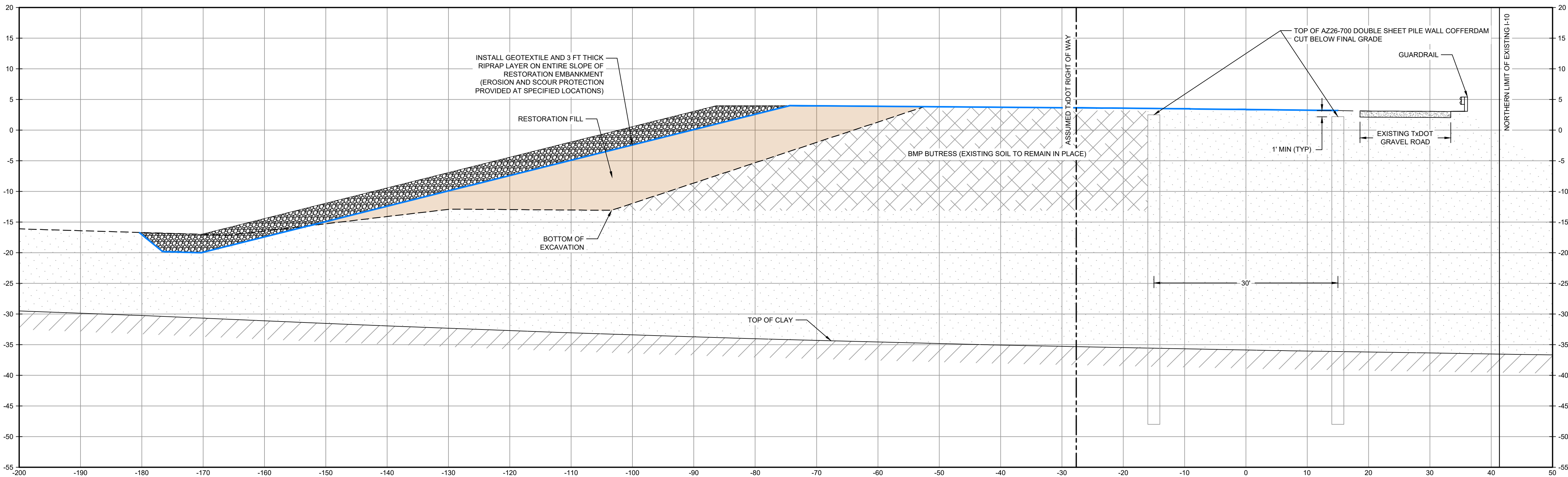
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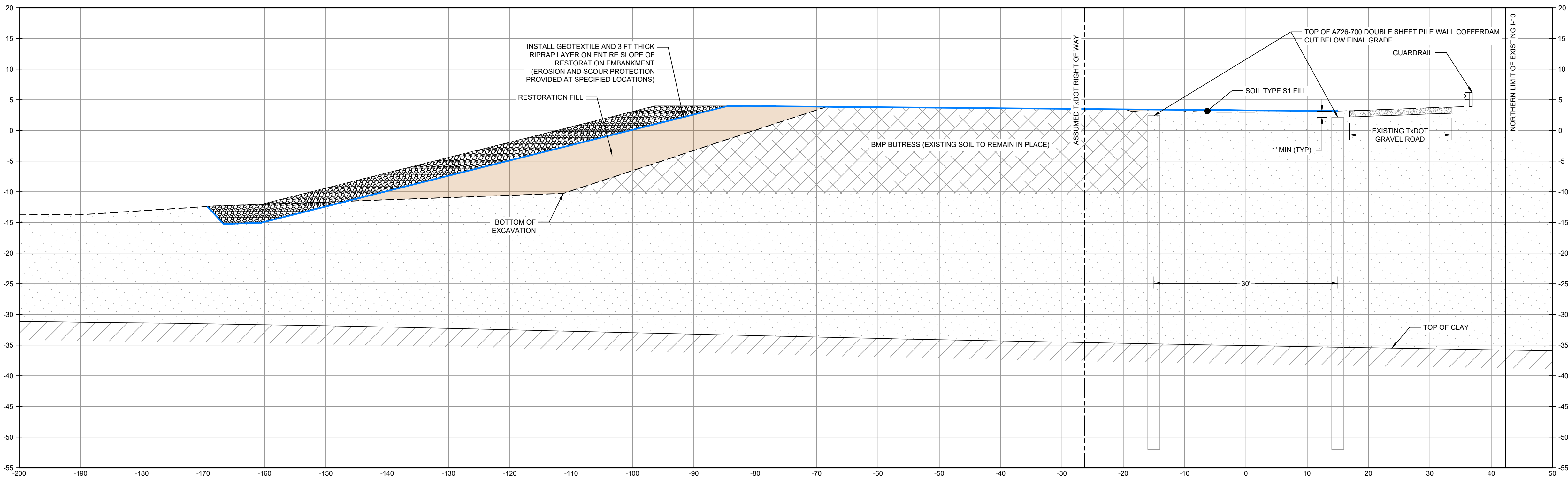
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LEGEND

- RESTORED AREA INCLUDING SOIL BACKFILL AND EROSION CONTROL (NOT SHOWN)
- RESTORATION EMBANKMENT
- RIPRAP



SECTION **U** STA. 2+00.00  
SCALE: 1"=10'  
C-22



SECTION **V** STA. 4+00.00  
SCALE: 1"=10'  
C-22

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SOURCE:  
TxDOT RIGHT OF WAY FROM A BOUNDARY AND RIGHT-OF-WAY SURVEY OF PORT OF HOUSTON AUTHORITY PROPERTY & HOUSTON FLEETING SERVICES, LLC PROPERTY ALONG INTERSTATE HIGHWAY 10 AT THE SAN JACINTO FLEET AREA, IN THE J. T. HARRELL SURVEY, A-330 HARRIS COUNTY, TEXAS, COBBFENDLEY, 2402-028-01, JUNE 28, 2024

- NOTES:
- BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.

**GHD SERVICES INC.**

JOB NO. 11215702 FILE NO. 001

GHD TEXAS FIRM REGISTRATION NO. 276

THIRD 100% EPA SUBMITTAL

Client  
**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

4 THIRD 100% EPA SUBMITTAL JC CRH 05/23/2025

No.	Issue	Drawn	Approved	Date
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Drawn	JC	Designer	RH
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Drafting Check	BS	Design Check	WB
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Project Coordinator	CM	Date	May 22, 2025
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<b>Arch D</b>	0 1"

Project No. 11215702

Title  
**RESTORATION SECTIONS  
1 OF 2**

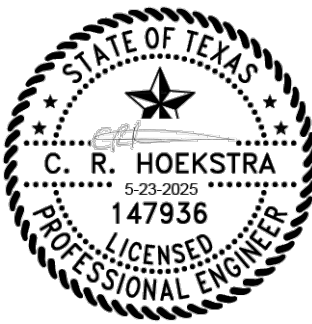
Sheet No.

**C-56**





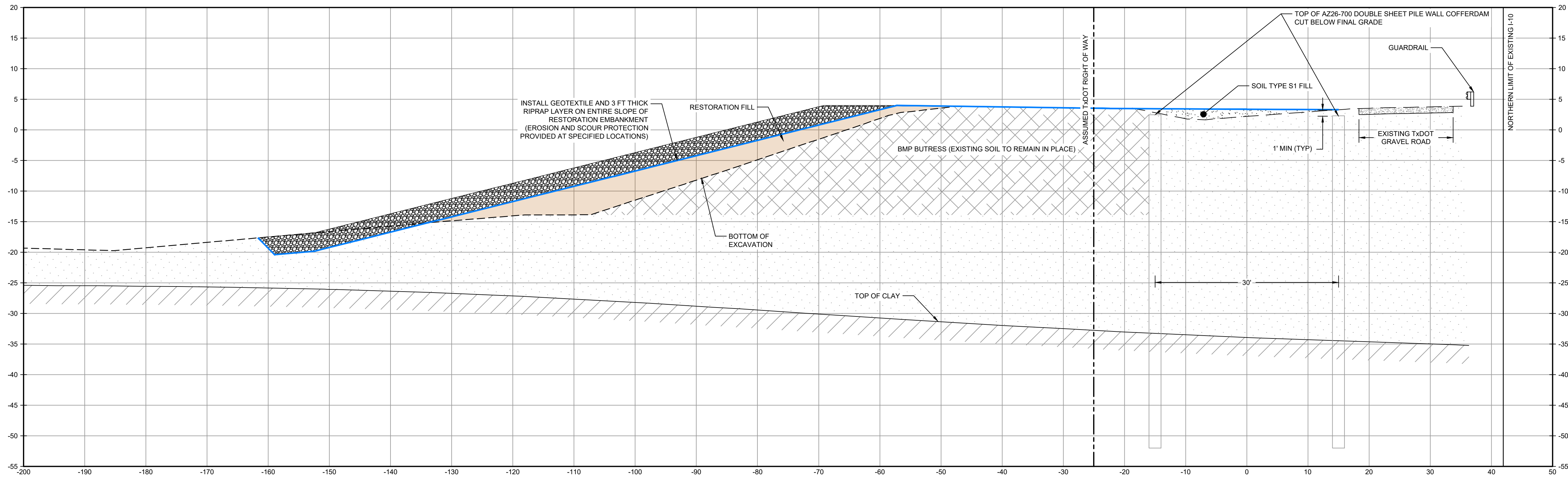
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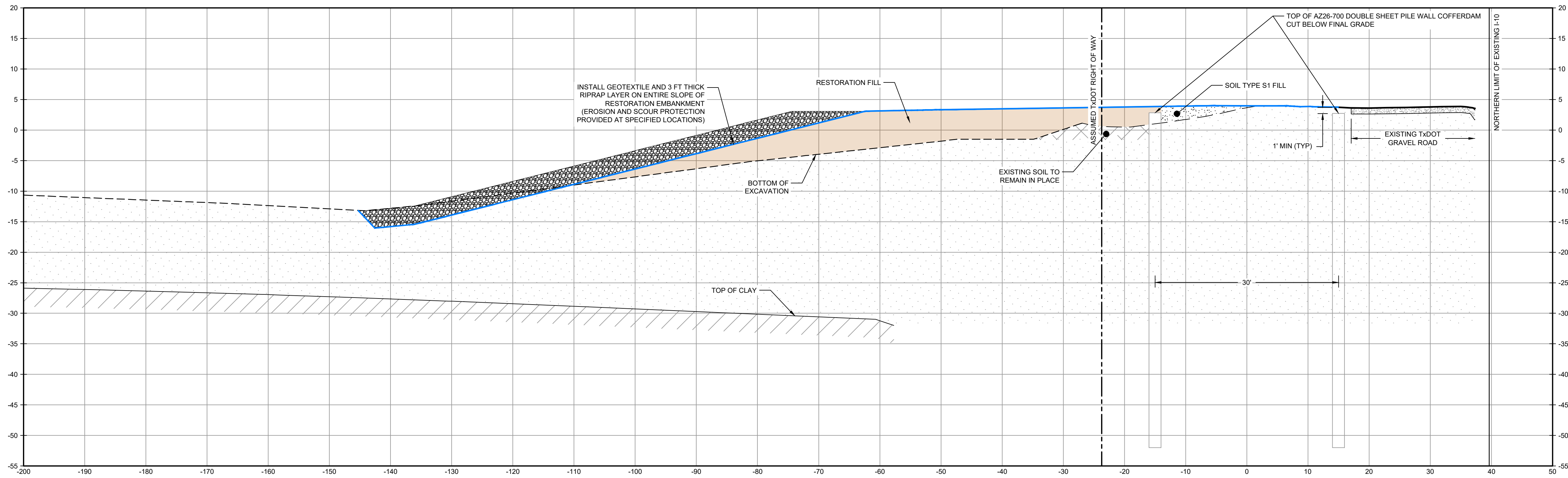
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- RESTORATION EMBANKMENT
- RIPRAP



SECTION **W** STA. 6+00.00  
SCALE: 1"=10'  
C-22



SECTION **X** STA. 8+00.00  
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C-22

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- NOTES:
- BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.

**GHD SERVICES INC.**

JOB NO. 11215702      FILE NO. 001

GHD TEXAS FIRM REGISTRATION NO. 276

Client  
**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

4	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025
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No.	Issue	Drawn	Approved	Date
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Drawn	JC	Designer	RH
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Drafting Check	BS	Design Check	WB
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Project Coordinator	CM	Date	May 22, 2025
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<b>Arch D</b>	0 1"

Project No. 11215702

Title

**RESTORATION SECTIONS  
2 OF 2**

Sheet No.

**C-57**

Sheet 58 of 83

**THIRD 100% EPA SUBMITTAL**



GENERAL

1. VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS BEFORE COMMENCING WORK. REPORT ANY DISCREPANCIES AND/OR INCONSISTENCIES TO THE OWNER FOR CLARIFICATION.
2. TEMPORARILY BRACE PILES AFTER DRIVING UNTIL TIE RODS ARE INSTALLED.

CODES AND GUIDELINES

- ASCE MINIMUM DESIGN LOADS AND ASSOCIATED CRITERIA FOR BUILDING AND OTHER STRUCTURES, ASCE 7, 2016
- USACE ENGINEERING MANUAL, DESIGN OF SHEET PILE WALLS BY UNITED STATES ARMY CORPS OF ENGINEERS, EM 1110 2 2504
- AMERICAN INSTITUTE OF STEEL CONTRACTORS, STEEL CONSTRUCTION MANUAL 15TH EDITION, AISC 360-16.
- USACE HURRICANE AND STORM DAMAGE RISK REDUCTION SYSTEM DESIGN GUIDELINES, UPDATED JUNE 2012.
- AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, LRFD BRIDGE DESIGN SPECIFICATIONS, 2012.

MATERIALS

STEEL:

- BARS AND C, MC, AND L SHAPESASTM A36, GALV, UNO
- SHEET PILEASTM A572, GRADE 60
- PIPE PILESASTM A252, GRADE 3 MODIFIED TO MEET ASTM A572 GRADE 55
- TIE ROD ASSEMBLYGRADE 80 KSI
- THREADED BARSASTM A572/A588 GRADE 50
- BEARING PLATEASTM F436
- HARDENED WASHERASTM 108/S576
- HEX NUT WITH JAM NUTASTM 108/S576
- GALVANIZED BOLTS FOR SPLICE CONNECTIONSASTM A325 WITH A563 NUTS AND HARDENED WASHER

STRUCTURAL STEEL AND MISCELLANEOUS METAL

1. WELDING SHALL CONFORM TO "STRUCTURAL WELDING CODE - STEEL" (AWS D1.1).
2. PROVIDE 1" DIAMETER BLEED HOLES IN WALERS AT 10'-0" ON CENTER MAX, AVOID CONTACT WITH SPLICE PLATE CONNECTION.

FRP BARRIER WALL

- PIPE PILESPECIFICATION 31 62 23
- FENDER WALERSSPECIFICATION 06 71 13
- BOLTSASTM A193 316L STAINLESS STEEL GRADE B8M
- NUTSASTM F594 TYPE 316L STAINLESS STEEL
- WASHERS316L STAINLESS STEEL

CONSTRUCTION SEQUENCE

SECTION C1

- INSTALL LEFT AND RIGHT SHEET PILE WALL
- INSTALL FILL UP TO EL. +3 FT UNIFORMLY OVER MIN 10 DAYS
- INSTALL TIE ROD AT ELEVATION NOTED ON SHEET S-03
- INSTALL FILL UP TO EL. +9 FT UNIFORMLY OVER MIN 6 DAYS
- MINIMUM TIME FOR DEWATERING TO EXISTING MUDLINE: 4 DAYS
- MINIMUM TIME FOR EXCAVATING TO 50% DEPTH: 17 DAYS
- MINIMUM TIME FOR DEWATERING TO FINAL LEVEL: 3 DAYS
- MINIMUM TIME FOR EXCAVATING TO 100% DEPTH: 14 DAYS

SECTION C2

- INSTALL LEFT AND RIGHT SHEET PILE WALL
- INSTALL FILL UP TO EL. -7 FT UNIFORMLY OVER MIN 7 DAYS
- INSTALL TIE ROD AT ELEVATION NOTED ON SHEET S-03
- INSTALL FILL UP TO EL. -1 FT UNIFORMLY OVER MIN 7 DAYS
- INSTALL FILL UP TO EL. +5 FT UNIFORMLY OVER MIN 7 DAYS
- INSTALL FILL UP TO EL. +9 FT UNIFORMLY OVER MIN 7 DAYS
- INSTALL RAISED BENCH TO EL. -9 FT, SLOPED AT 4H:1V AND WAIT 7 DAYS.
- INSTALL RAISED BENCH FROM EL.-9 FT TO EL. -4 FT, SLOPED AT 4H:1V, TOP WIDTH OF MIN 20-FT AND WAIT 7 DAYS BEFORE DEWATERING.
- MINIMUM TIME FOR DEWATERING TO EXISTING MUDLINE: 4 DAYS
- MINIMUM TIME FOR EXCAVATING TO 50% DEPTH: 17 DAYS
- MINIMUM TIME FOR DEWATERING TO FINAL LEVEL: 3 DAYS
- MINIMUM TIME FOR EXCAVATING TO 100% DEPTH: 14 DAYS

SECTION C3

- INSTALL LEFT AND RIGHT SHEET PILE WALL
- INSTALL FILL UP TO EL. +0 FT UNIFORMLY OVER MIN 10 DAYS
- INSTALL TIE ROD AT ELEVATION NOTED ON SHEET S-03
- INSTALL FILL UP TO EL. +3 FT UNIFORMLY OVER MIN 3 DAYS
- INSTALL FILL UP TO EL. +9 FT UNIFORMLY OVER MIN 10 DAYS
- MINIMUM TIME FOR DEWATERING TO EXISTING MUDLINE: 4 DAYS
- MINIMUM TIME FOR EXCAVATING TO 50% DEPTH: 17 DAYS
- MINIMUM TIME FOR DEWATERING TO FINAL LEVEL: 3 DAYS
- MINIMUM TIME FOR EXCAVATING TO 100% DEPTH: 14 DAYS

SECTION C4A

- INSTALL LEFT AND RIGHT SHEET PILE WALL
- INSTALL FILL UP TO EL. +0 FT UNIFORMLY OVER MIN 10 DAYS
- INSTALL TIE ROD AT ELEVATION NOTED ON SHEET S-03
- INSTALL FILL UP TO EL. +9 FT UNIFORMLY OVER MIN 6 DAYS
- MINIMUM TIME FOR DEWATERING TO EXISTING MUDLINE: 4 DAYS
- MINIMUM TIME FOR EXCAVATING TO 50% DEPTH: 17 DAYS
- MINIMUM TIME FOR DEWATERING TO FINAL LEVEL: 3 DAYS
- MINIMUM TIME FOR EXCAVATING TO 100% DEPTH: 14 DAYS

SECTION C4

- INSTALL LEFT AND RIGHT SHEET PILE WALL
- INSTALL FILL UP TO EL. -3 FT UNIFORMLY OVER MIN 10 DAYS
- INSTALL TIE ROD AT ELEVATION NOTED ON SHEET S-03
- INSTALL FILL UP TO EL. +9 FT UNIFORMLY OVER MIN 6 DAYS
- MINIMUM TIME FOR DEWATERING TO EXISTING MUDLINE: 4 DAYS
- MINIMUM TIME FOR EXCAVATING TO 50% DEPTH: 17 DAYS
- MINIMUM TIME FOR DEWATERING TO FINAL LEVEL: 3 DAYS
- MINIMUM TIME FOR EXCAVATING TO 100% DEPTH: 14 DAYS

SECTION C5

- INSTALL LEFT AND RIGHT SHEET PILE WALL
- INSTALL FILL UP TO EL. -1 FT UNIFORMLY OVER MIN 10 DAYS
- INSTALL TIE ROD AT ELEVATION NOTED ON SHEET S-03
- INSTALL FILL UP TO EL. +9 FT UNIFORMLY OVER MIN 6 DAYS
- MINIMUM TIME FOR DEWATERING TO EXISTING MUDLINE: 4 DAYS
- MINIMUM TIME FOR EXCAVATING TO 50% DEPTH: 17 DAYS
- MINIMUM TIME FOR DEWATERING TO FINAL LEVEL: 3 DAYS
- MINIMUM TIME FOR EXCAVATING TO 100% DEPTH: 14 DAYS

SECTION C6, C7

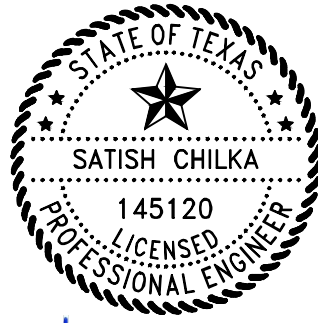
- INSTALL LEFT AND RIGHT SHEET PILE WALL
- CUT BETWEEN THE SHEET PILES TO ELEVATION 0 FT
- INSTALL TIE RODS AT ELEVATION NOTED ON SHEET S-03
- INSTALL FILL UP TO EL. +9 FT UNIFORMLY OVER MIN 6 DAYS
- MINIMUM TIME FOR DEWATERING TO EXISTING MUDLINE: 4 DAYS
- MINIMUM TIME FOR EXCAVATING TO 50% DEPTH: 17 DAYS
- MINIMUM TIME FOR DEWATERING TO FINAL LEVEL: 3 DAYS
- MINIMUM TIME FOR EXCAVATING TO 100% DEPTH: 14 DAYS

ABBREVIATIONS

- |        |                                       |
|--------|---------------------------------------|
| ANG    | ANGLE                                 |
| ASCE   | AMERICAN SOCIETY OF CIVIL ENGINEERS   |
| AWS    | AMERICAN WELDING SOCIETY              |
| BEG    | BEGINNING                             |
| BOW    | BOTTOM OF WALL                        |
| CONST  | CONSTRUCTION                          |
| CONT   | CONTINUOUS OR CONTINUED               |
| DIA    | DIAMETER                              |
| DWG    | DRAWING                               |
| EA     | EACH                                  |
| EL     | ELEVATION                             |
| E      | EASTING                               |
| EXIST. | EXISTING                              |
| FG     | FINISH GRADE                          |
| FOW    | FACE OF WALL                          |
| FS     | FINISH SURFACE                        |
| FT     | FEET                                  |
| HORIZ  | HORIZONTAL                            |
| INV    | INVERT                                |
| JT     | JOINT                                 |
| LF     | LINEAR FEET                           |
| LT     | LEFT                                  |
| MAX    | MAXIMUM                               |
| MHW    | MEAN HIGH WATER                       |
| MIN    | MINIMUM                               |
| MISC.  | MISCELLANEOUS                         |
| N      | NORTHING                              |
| NTS    | NOT TO SCALE                          |
| NAVD   | NORTH AMERICAN VERTICAL DATUM         |
| OC     | ON CENTER                             |
| PROF   | PROFILE                               |
| PT     | POINT                                 |
| QTY    | QUANTITY                              |
| RET    | RETAINING                             |
| ROW    | RIGHT OF WAY                          |
| RT     | RIGHT                                 |
| SHT    | SHEET                                 |
| STA    | STATION                               |
| STD    | STANDARD                              |
| T&B    | TOP AND BOTTOM                        |
| TOW    | TOP OF WALL                           |
| TYP    | TYPICAL                               |
| UNK    | UNKNOWN                               |
| UNO    | UNLESS NOTED OTHERWISE                |
| USACE  | UNITED STATES ARMY CORPS OF ENGINEERS |
| VERT   | VERTICAL                              |
| W      | WIDTH                                 |
| WI     | WITH                                  |



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*Satish Chilka*  
05/23/2025

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Client

**SAN JACINTO RIVER  
WASTE PITS**

Project

**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

6	THIRD 100% EPA SUBMITTAL	DS	SC	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	DS	Designer	KM	
Drafting Check		Design Check	SC	
Project Coordinator	CM	Date	May 22, 2025	
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Arch D				

Project No. 11215702

Title

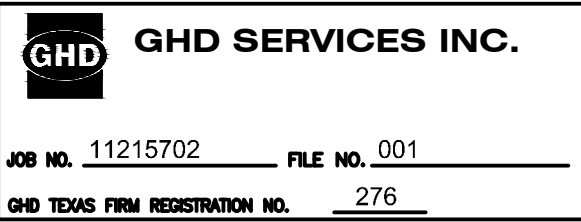
**STRUCTURAL  
NOTES**

Sheet No.

**S-01**

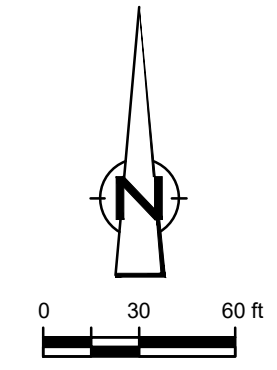
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LEGEND	
	TxDOT RIGHT OF WAY
	TORA CAP PERIMETER
	EXISTING CONTOUR INTERVAL
	FENCELINE
	SHORELINE
	TOP OF BANK
	TOE OF SLOPE
	OVERHEAD ELECTRICAL
	GUARDRAIL
	PIPELINE
	BORING LOCATION
	MONITORING WELL
	POWER POLE
	LIGHT POLE
	WELL
	MATERIAL TO BE EXCAVATED
	EXISTING BERM TO BE EXCAVATED
	POTENTIAL TESTING AND REUSE
	EXISTING BERM TO REMAIN
	CONCRETE
	GRAVEL
	ASPHALT
	A226-700 PILE
	A236-700 PILE
	A242-700 PILE
	PLANNED IMPROVEMENTS FOR NORTHERN IMPOUNDMENT ACCESS
	SOIL TYPE S1
	RAISED BENCH
	EXTERIOR SCOUR PROTECTION
	INTERIOR SCOUR PROTECTION
	FRP BARRIER WALL

Client  
**SAN JACINTO RIVER WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT THIRD FINAL 100% REMEDIAL DESIGN HARRIS COUNTY, TEXAS**

6	THIRD 100% EPA SUBMITTAL	DS	SC	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	DS	Designer	KM	
Drafting Check		Design Check	SC	
Project Coordinator	CM	Date	May 22, 2025	
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Project No. 11215702


Title  
**STRUCTURAL LAYOUT PLAN**

Sheet No.  
**S-02**

Sheet 60 of 83

SOURCE: TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS. MORRISON SURVEYING INC., 190608, JULY 8, 2019 TO AUGUST 2, 2019. UPDATED BATHYMETRY DATA PROVIDED BY ANCHOR QEA OCTOBER 2021

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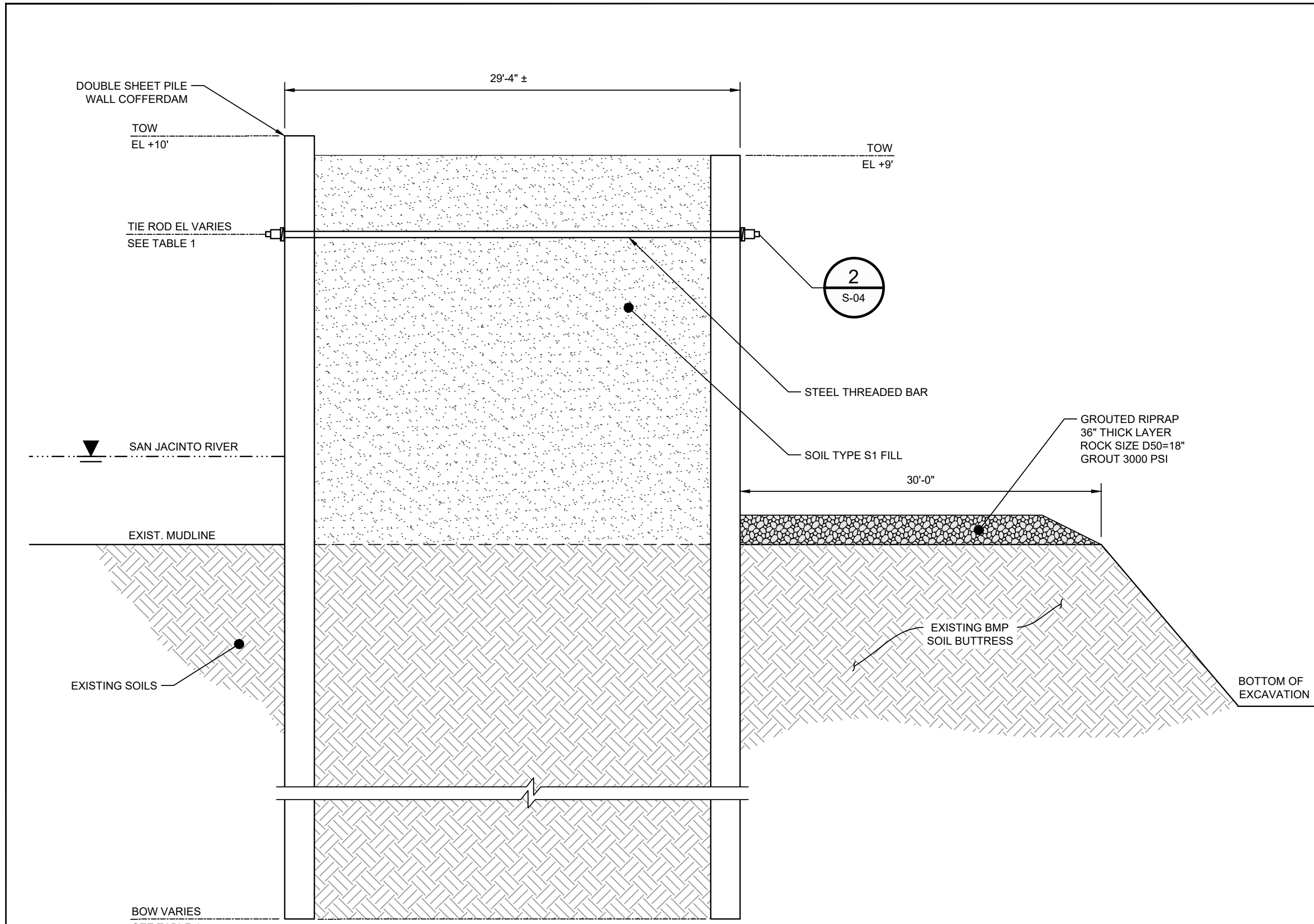
**GHD SERVICES INC.**

JOB NO. 11215702 FILE NO. 001

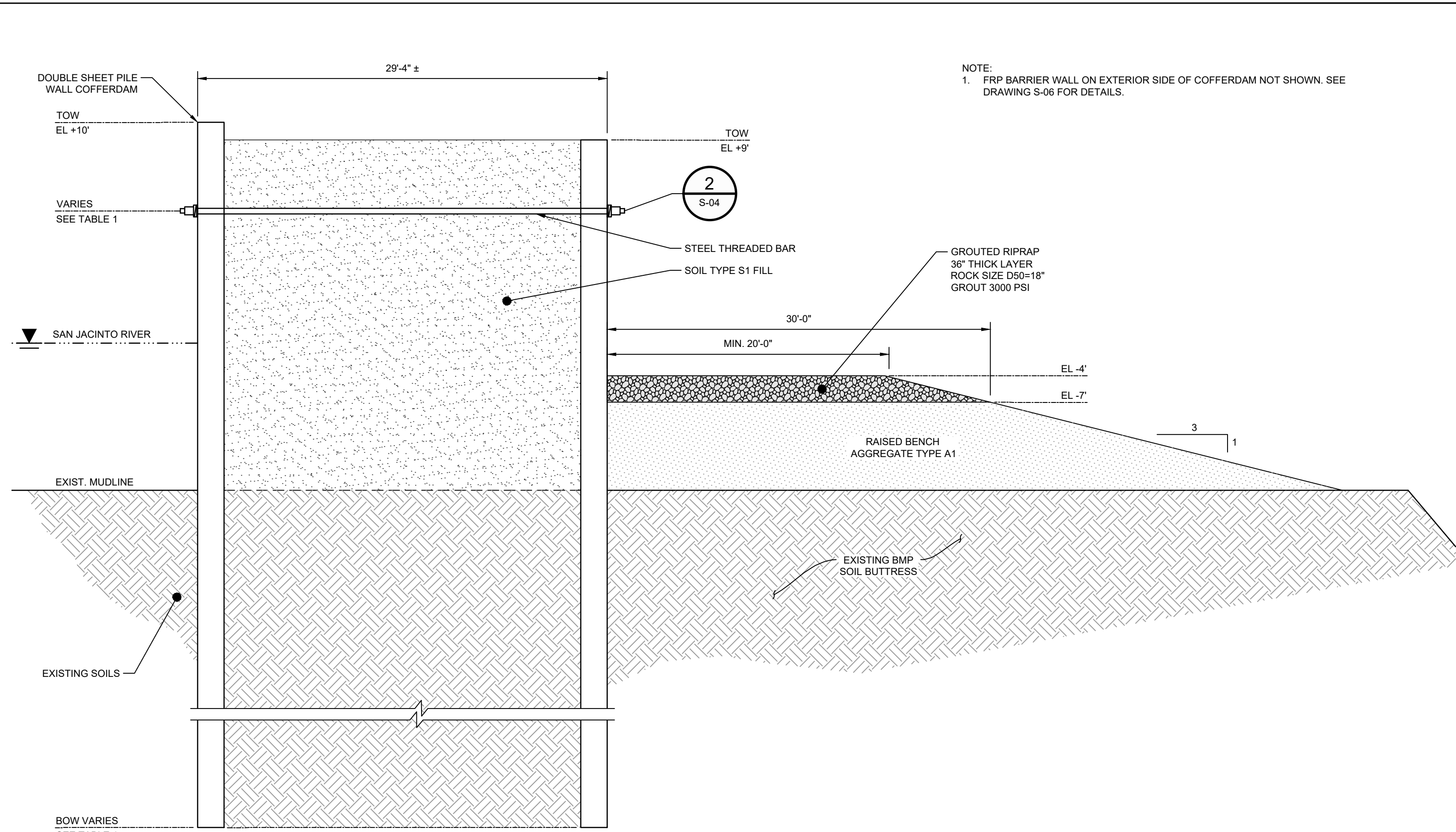
GHD TEXAS FIRM REGISTRATION NO. 276

**THIRD 100% EPA SUBMITTAL**

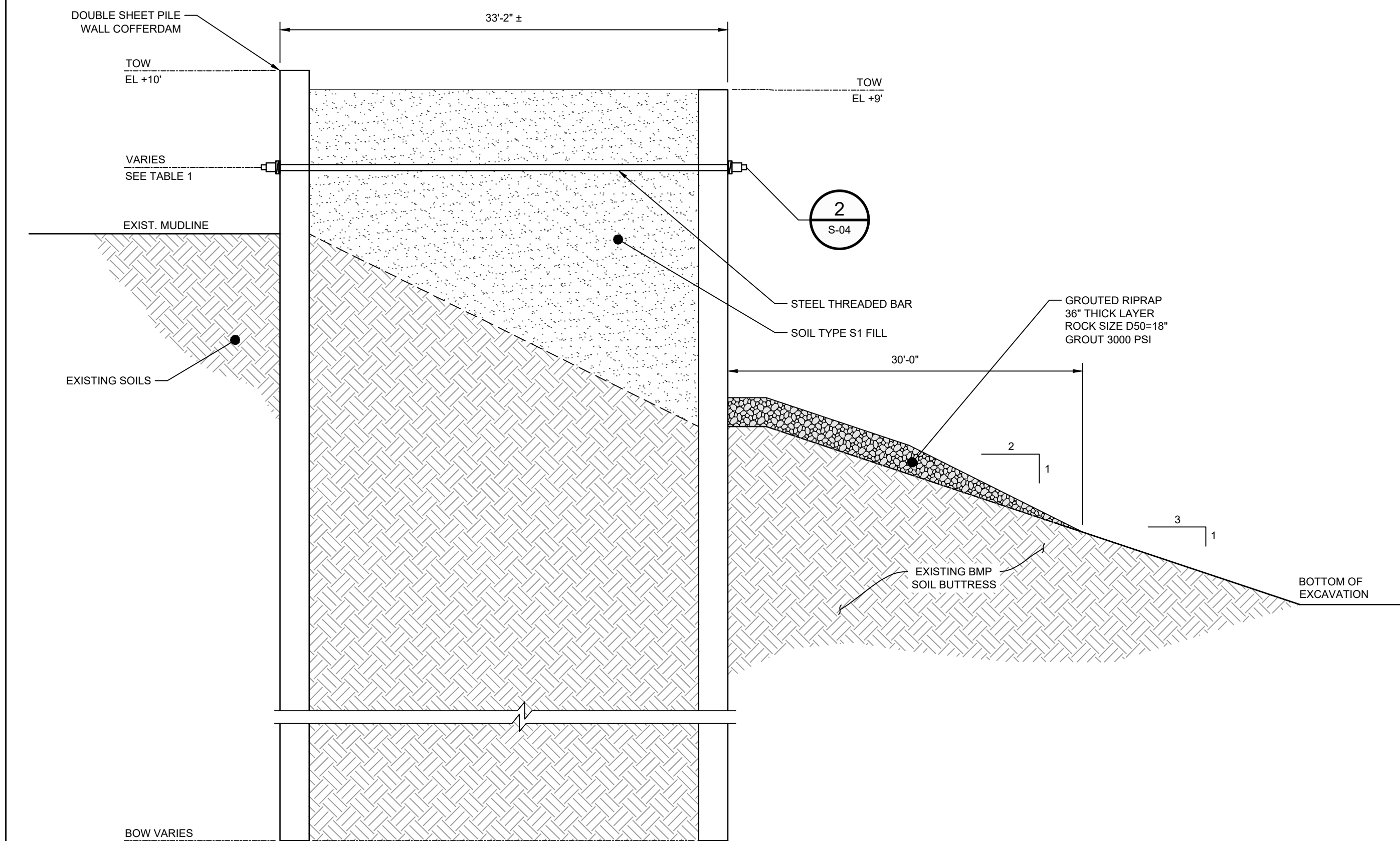




DETAIL A TYPICAL WALL SECTION  
N.T.S.



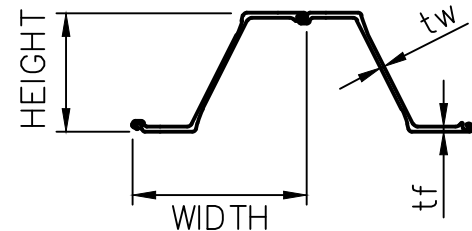
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N.T.S.



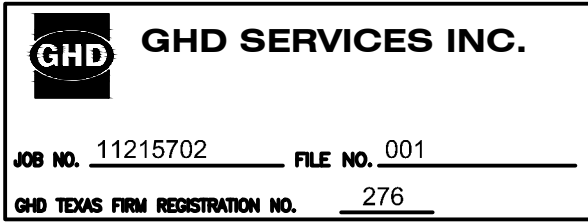
DETAIL C TYPICAL WALL SECTION  
N.T.S.

TABLE 1								
WALL SEGMENT	START STA	END STA	DETAIL	SHEET PILE SECTION	SHEET PILE LENGTH (FT)	TIE ROD NOMINAL DIAMETER (IN)	TIE ROD SPACING (FT)	TIE ROD EL (FT)
C1	-1+10	2+50	A	AZ36-700N	50	SEE TABLE 2 ON S-04	5	3
C2	2+50	9+75	B	AZ42-700N	55		5	3
C3	9+75	14+00	A	AZ36-700N	50		5	3
C4	14+00	17+00	A	AZ36-700N	50		5	3
C4A	17+00	23+00	A	AZ36-700N	50		5	3
C5	23+00	24+33	A	AZ36-700N	60		5	3
C6	0+00	4+00	C	AZ26-700	60		5	3
C7	4+00	8+82	C	AZ26-700	60		5	3

MINIMUM STEEL SHEET PILE									
SSP SECTION	ASTM	YIELD STRENGTH (KSI)	WIDTH w (IN)	HEIGHT h (IN)	THICKNESS (IN)		WEIGHT		ELASTIC MODULUS (IN <sup>3</sup> /FT)
					FLANGE tf	WEB tw	SINGLE PILE (LB/FT)	WALL AREA (LB/FT <sup>2</sup> )	
AZ26-700	A572	60	27.56	18.11	0.480	0.480	69.12	30.10	48.4
AZ36-700N	A572	60	27.56	19.65	0.591	0.441	79.72	34.71	66.8
AZ42-700N	A572	60	27.56	19.65	0.709	0.551	95.51	41.59	78.2



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### SAN JACINTO RIVER WASTE PITS

#### Project NORTHERN IMPOUNDMENT THIRD FINAL 100% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

6 THIRD 100% EPA SUBMITTAL DS SC 05/23/2025

No. Issue Drawn Approved Date

Drawn DS Designer KM

Drafting Check Design Check SC

Project Coordinator CM Date May 22, 2025

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Original Size  
Arch D  
Bar is one inch on original size drawing  
0 1"

Project No. 11215702

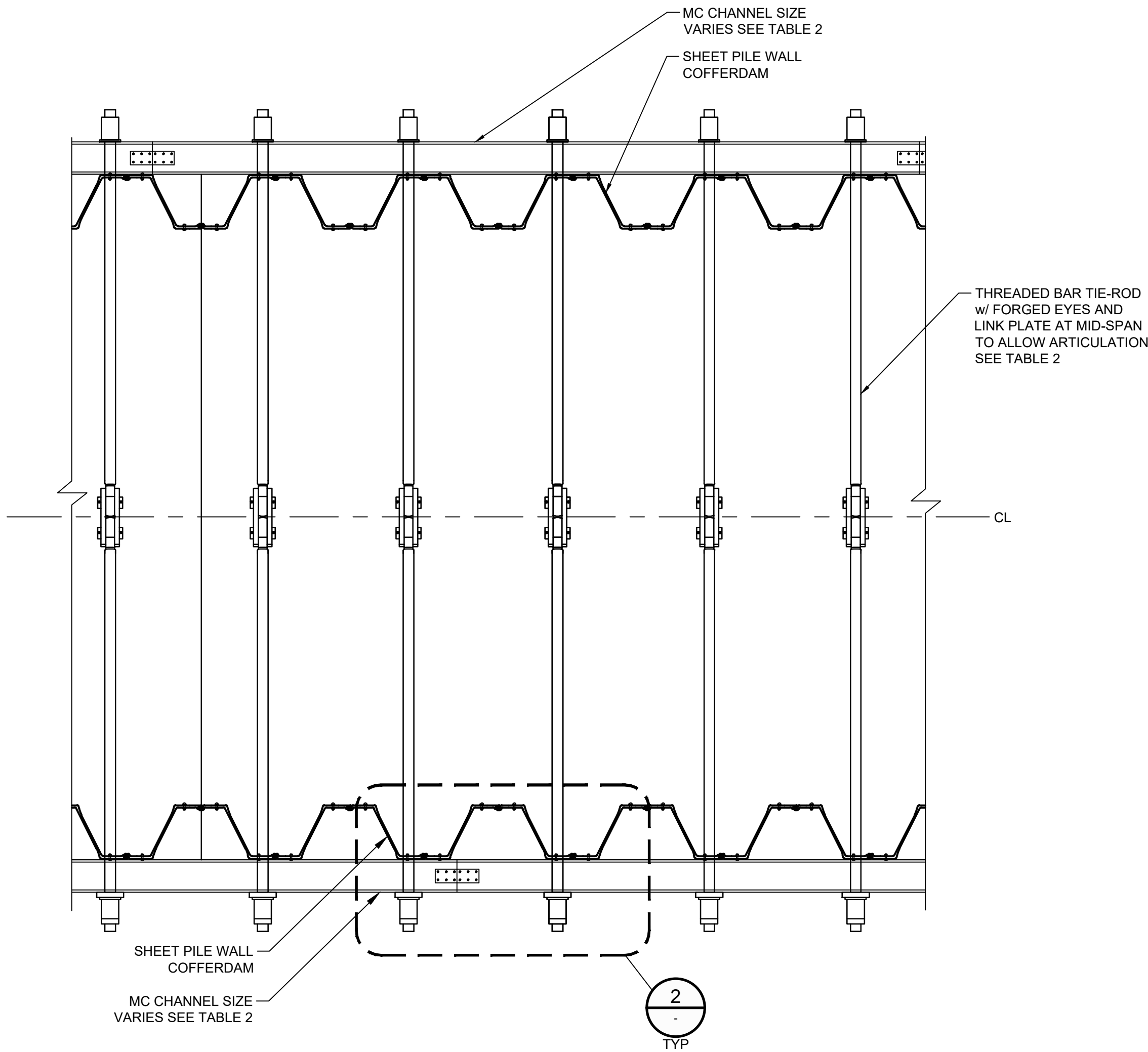
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### STRUCTURAL SECTIONS

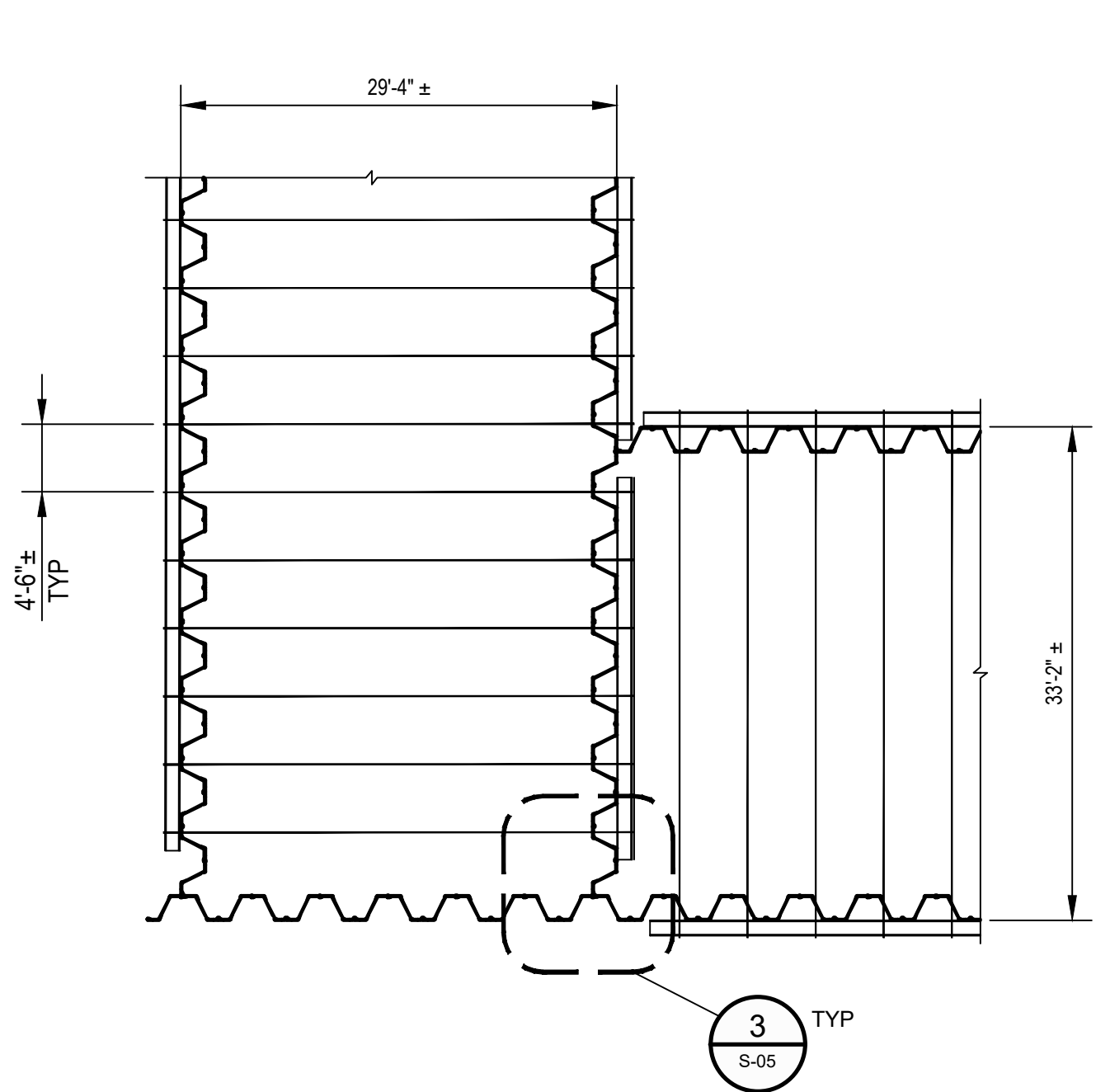
Sheet No.

S-03

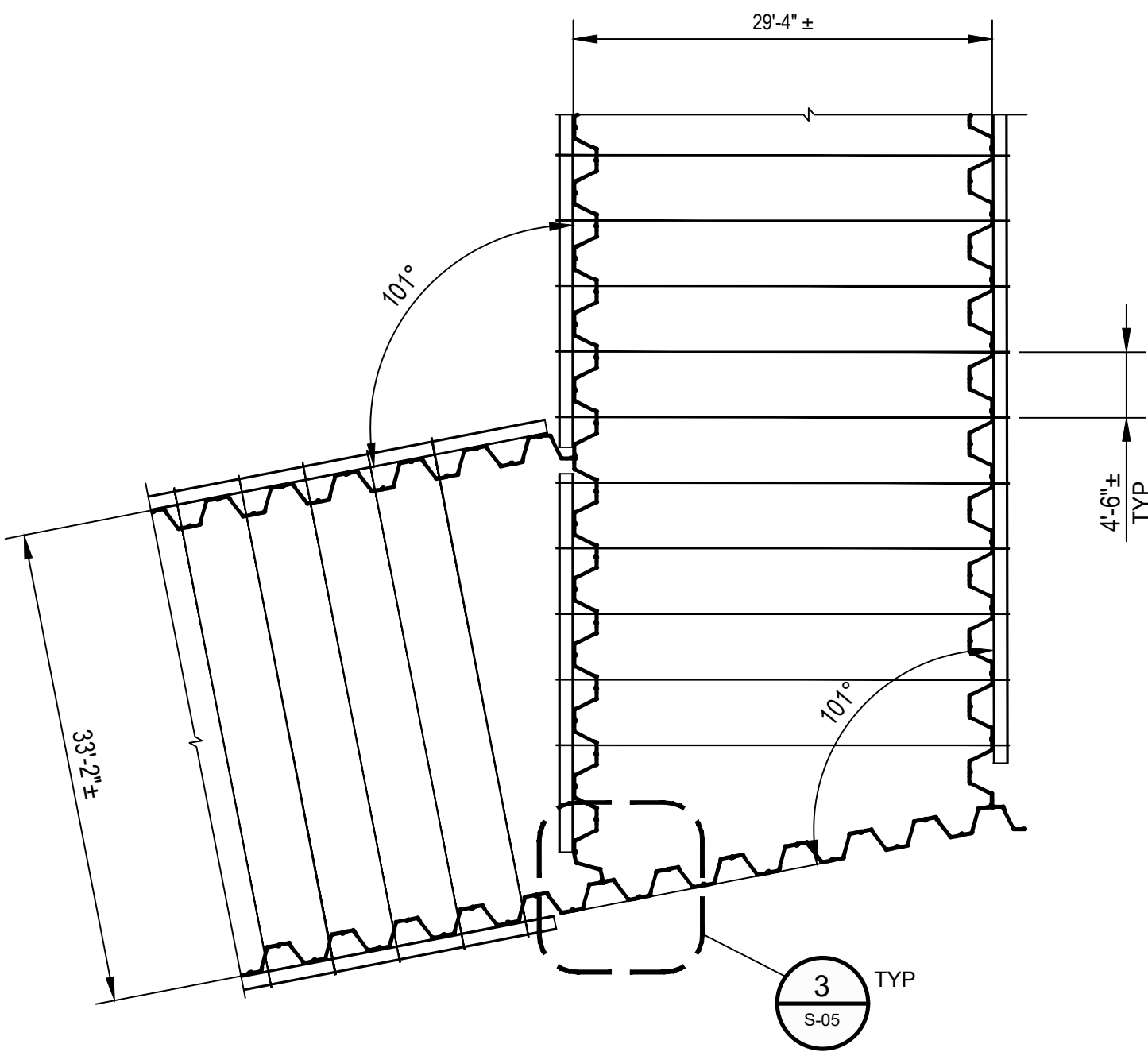




DETAIL 1 PLAN VIEW  
SCALE: 1"=3'-0"



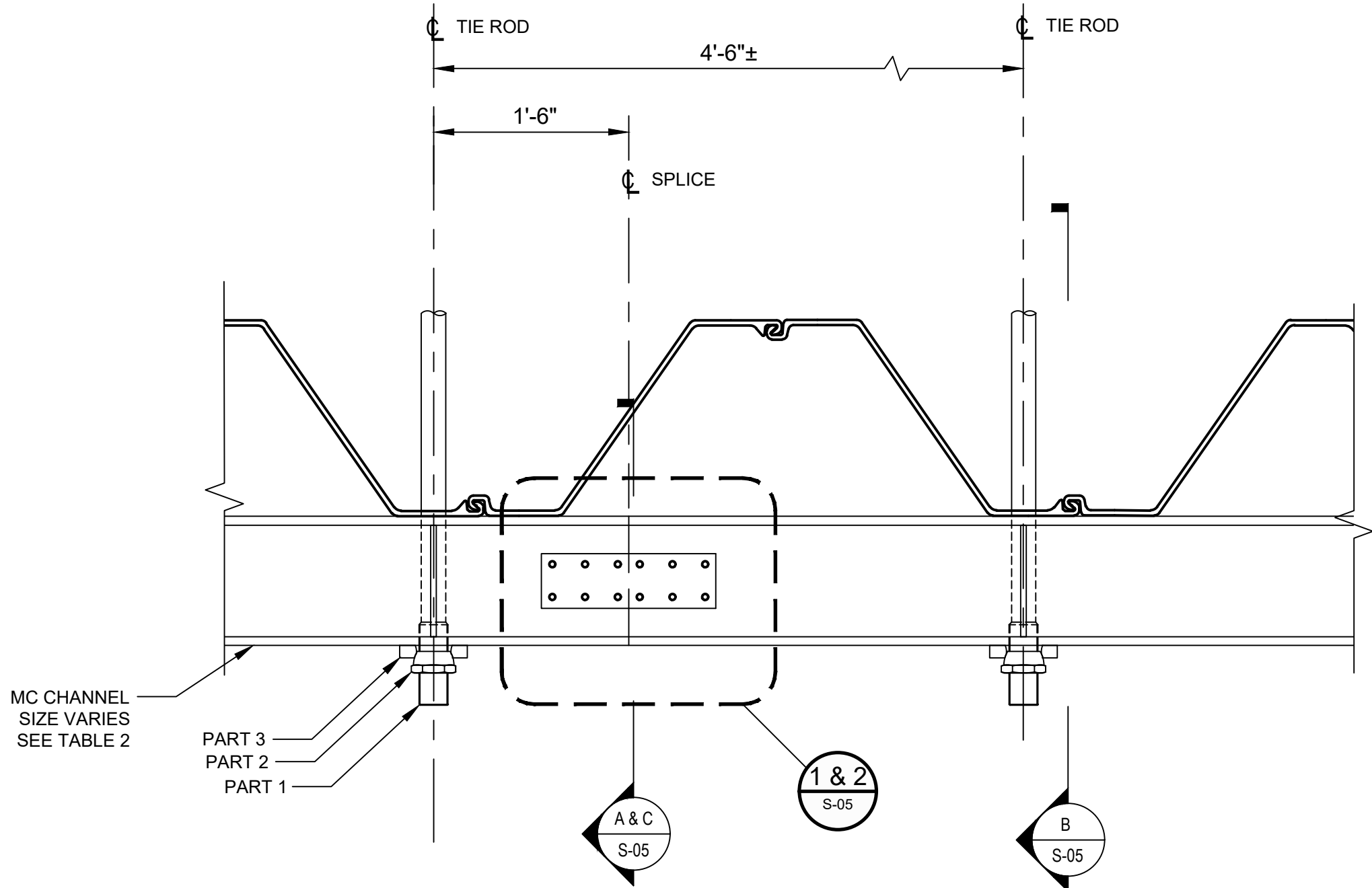
DETAIL 3 PLAN VIEW  
SCALE: 3/32"=1'-0"



DETAIL 4 PLAN VIEW  
SCALE: 3/32"=1'-0"

TABLE 2				
WALL SEGMENT	TIE ROD NOMINAL DIAMETER PART 1 (IN)	TIE ROD SPHERICAL NUT O.D. PART 2 (IN)	SPHERICAL BEARING PLATE PART 3 (IN)	WALER SECTION
C1	2.25	4 1/8"	6 1/4" X 7 3/4" X 1 1/8"	MC12 x 35
C2	3.00	4 3/4"	7" X 9" X 1 1/2"	MC18 x 45.8
C3	2.25	4 1/8"	6 1/4" X 7 3/4" X 1 1/8"	MC12 x 35
C4	2.25	4 1/8"	6 1/4" X 7 3/4" X 1 1/8"	MC12 x 35
C4A	2.25	4 1/8"	6 1/4" X 7 3/4" X 1 1/8"	MC12 x 35
C5	2.25	4 1/8"	6 1/4" X 7 3/4" X 1 1/8"	MC12 x 35
C6	2.25	4 1/8"	6 1/4" X 7 3/4" X 1 1/8"	MC12 x 35
C7	2.25	4 1/8"	6 1/4" X 7 3/4" X 1 1/8"	MC12 x 35

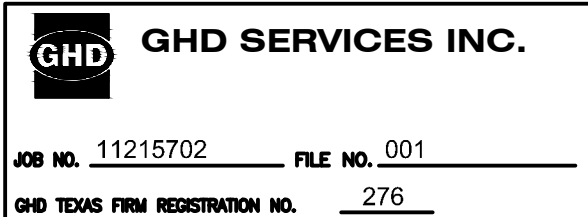
NOTE: TIE ROD SUPPLIER SHALL REVIEW AND VERIFY THE DIMENSIONS OF THE SPHERICAL NUT AND BEARING PLATE TO MATCH THE REQUIRED TIE ROD NOMINAL DIAMETER



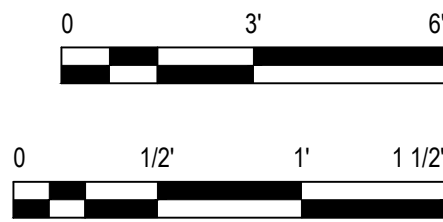
NOTE:  
1. STAGGER WALER SPLICE ON INTERIOR AND EXTERIOR WALL BY 10'-0" +/-  
2. WELD 1/2" THICK STEEL PLATES BETWEEN T&B WALERS TO MAINTAIN SPACING

DETAIL 2 PLAN VIEW  
SCALE: 1"=1'-0"

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Client  
**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

6	THIRD 100% EPA SUBMITTAL	DS	SC	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	DS	Designer	KM	
Drafting Check		Design Check	SC	
Project Coordinator	CM	Date	May 22, 2025	
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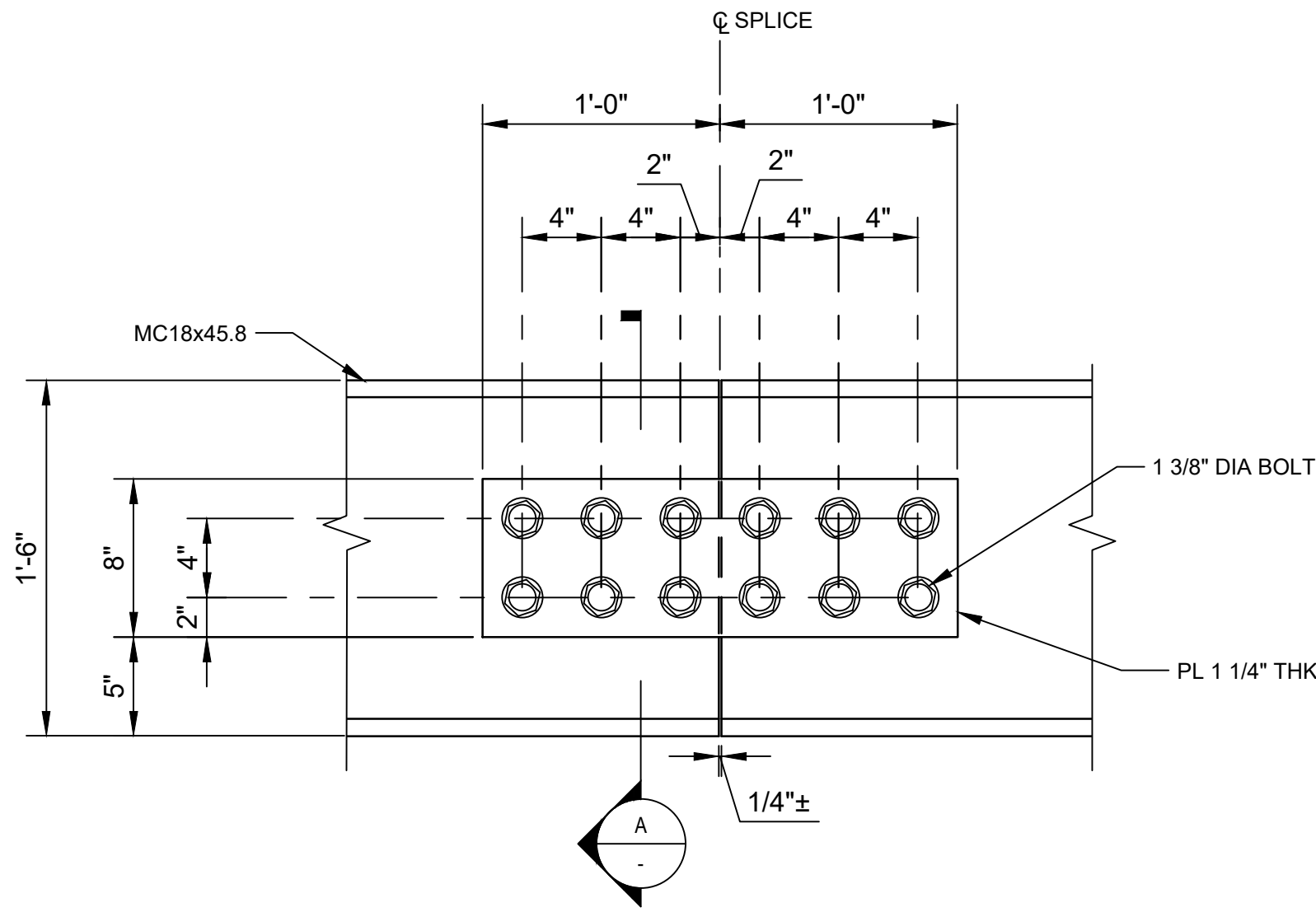
Project No. 11215702

Title  
**STRUCTURAL  
DETAILS 1 of 2**

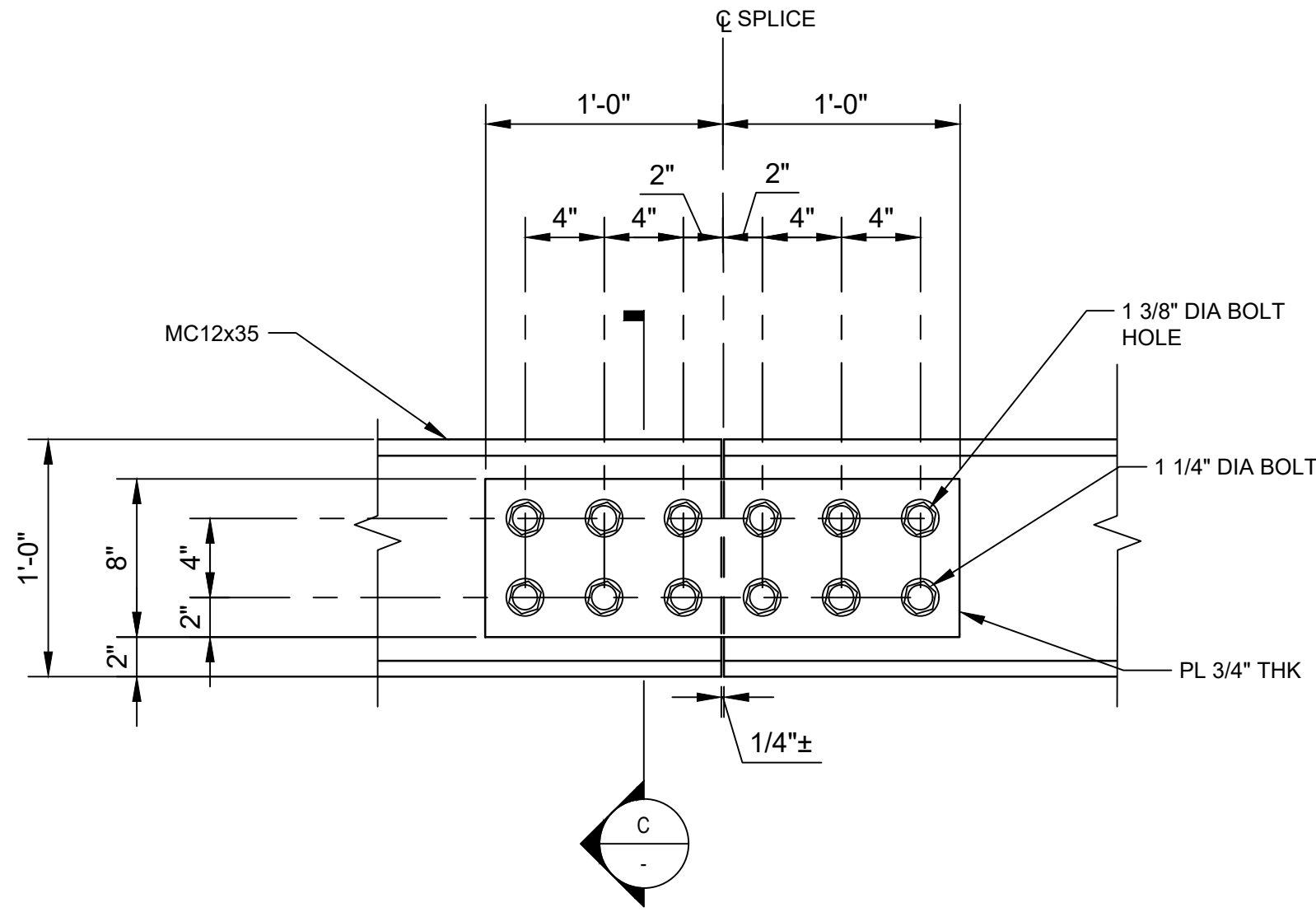
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**S-04**

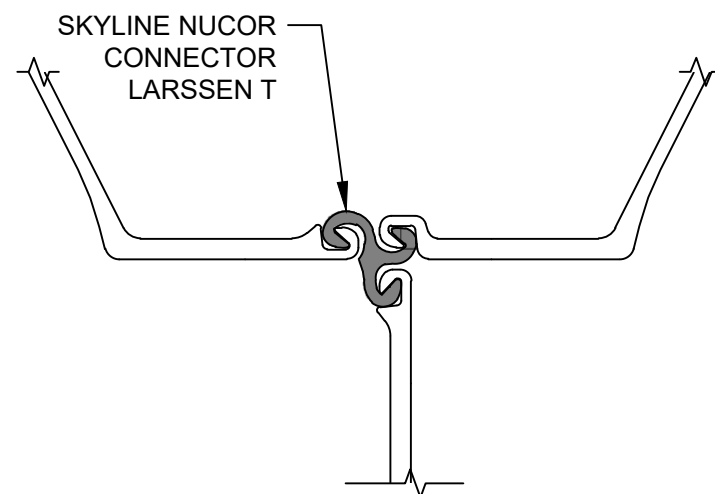




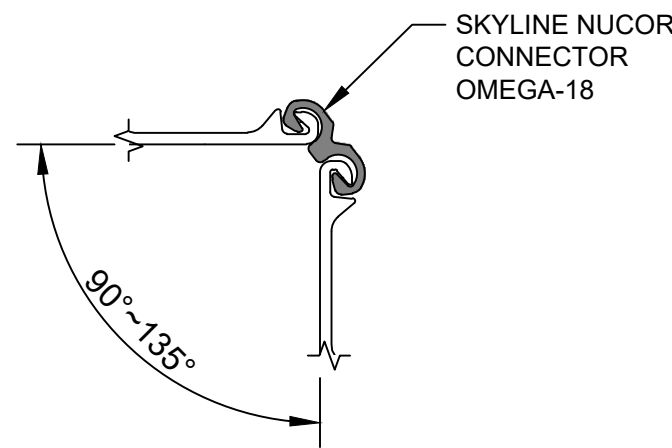
DETAIL 1 PLAN - SPLICE CONNECTION - WALER MC 18X45.8  
SCALE: 1 1/2"=1'-0"



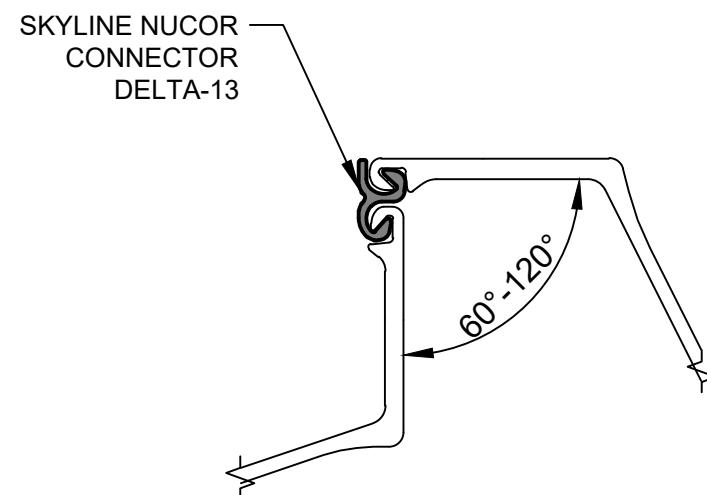
DETAIL 2 PLAN - SPLICE CONNECTION - WALER MC 12X35  
SCALE: 1 1/2"=1'-0"



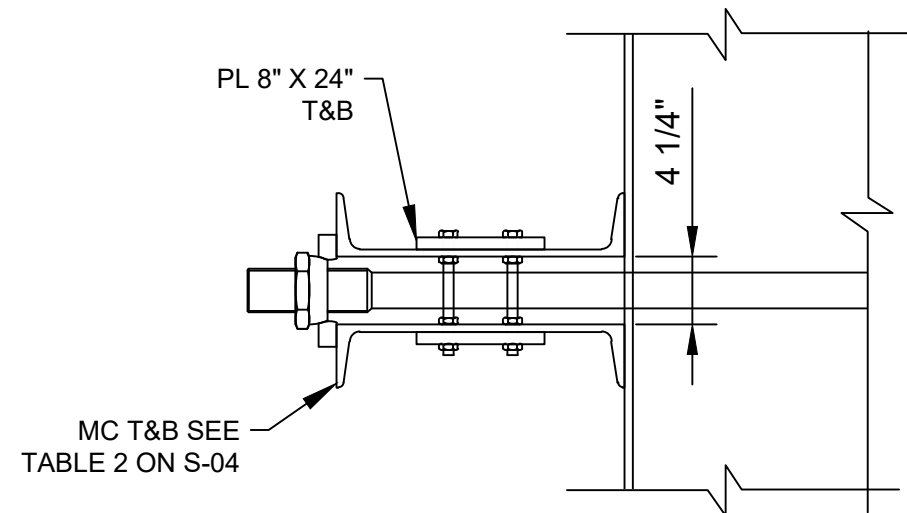
DETAIL 3 THREE SHEET PILE CONNECTOR  
SCALE: NTS



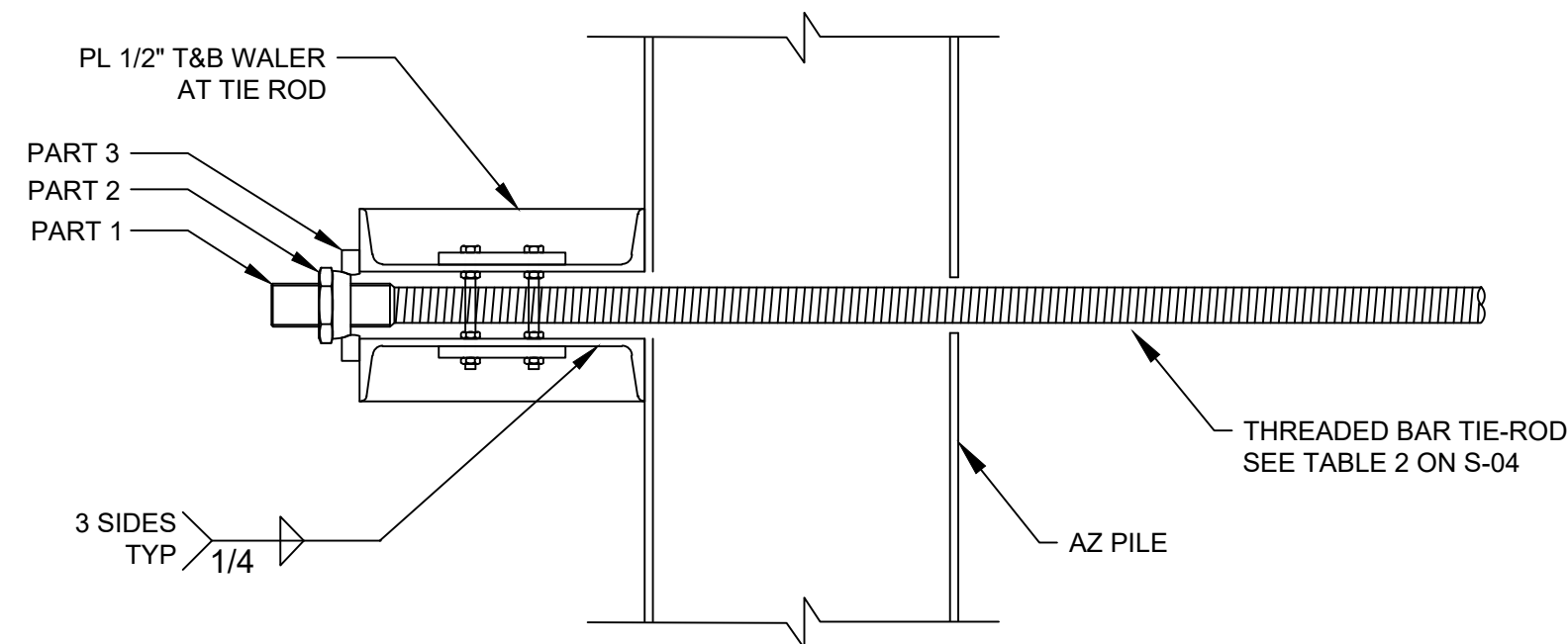
DETAIL 4 CORNER CONNECTOR ALTERNATIVE A  
SCALE: NTS



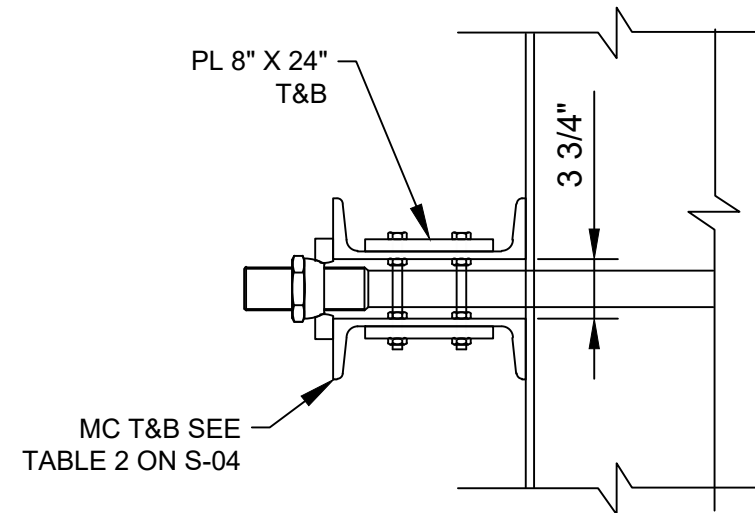
DETAIL 5 CORNER CONNECTOR ALTERNATIVE B  
SCALE: NTS



SECTION A SPLICE CONNECTION  
SCALE: 1"=1'-0"

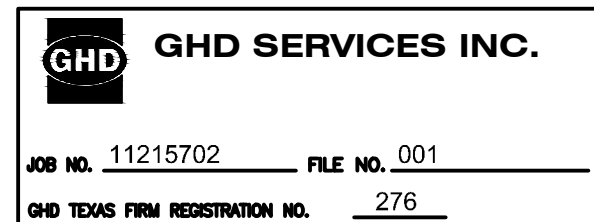


SECTION B TIE ROD CONNECTION  
SCALE: 1"=1'-0"



SECTION C SPLICE CONNECTION  
SCALE: 1"=1'-0"

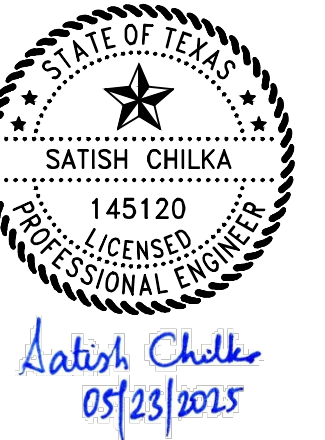
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Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

6	THIRD 100% EPA SUBMITTAL	DS	SC	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	DS	Designer	KM	
Drafting Check		Design Check	SC	
Project Coordinator	CM	Date	May 22, 2025	
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Project No. 11215702

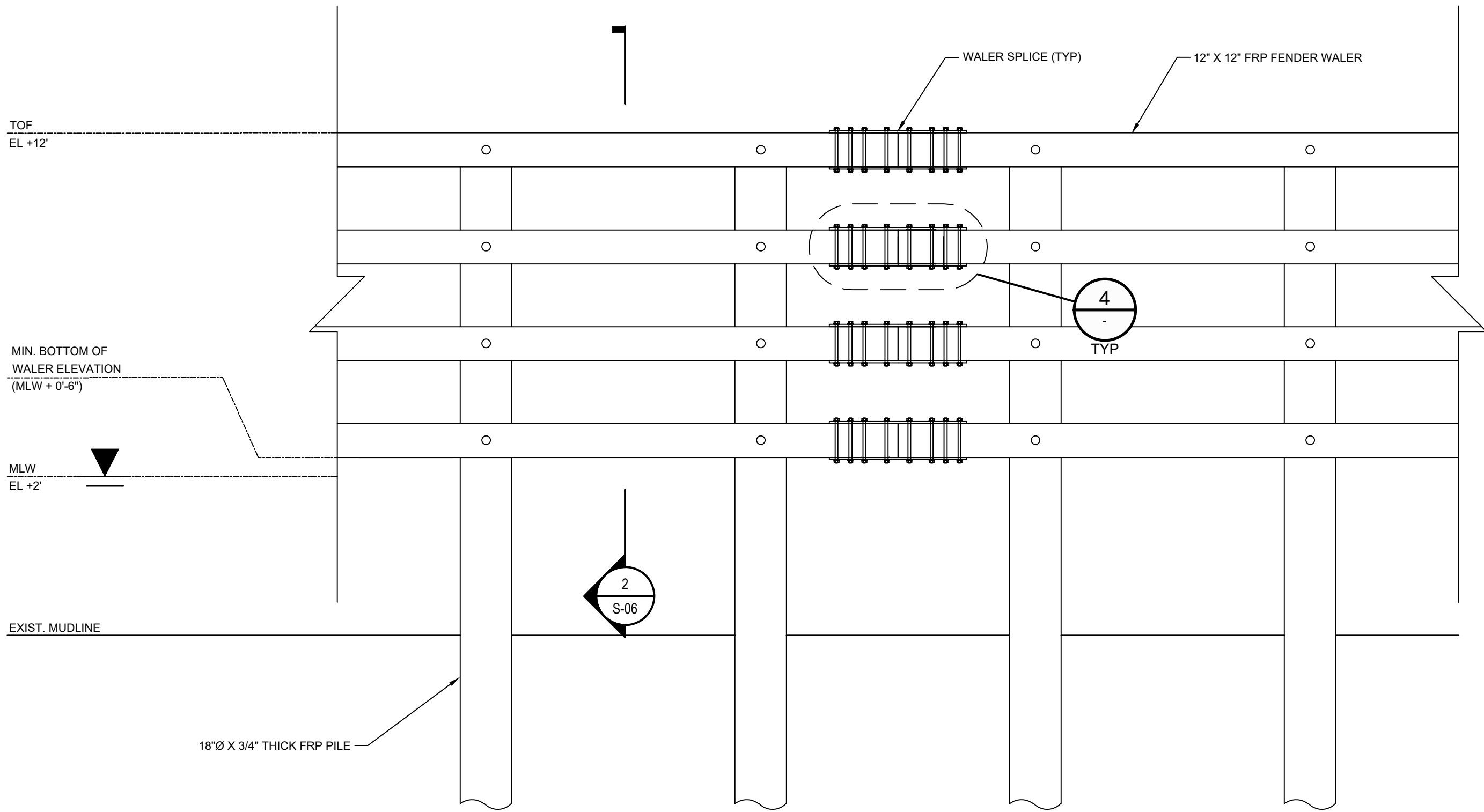
Title  
**STRUCTURAL  
DETAILS 2 OF 2**

Sheet No.

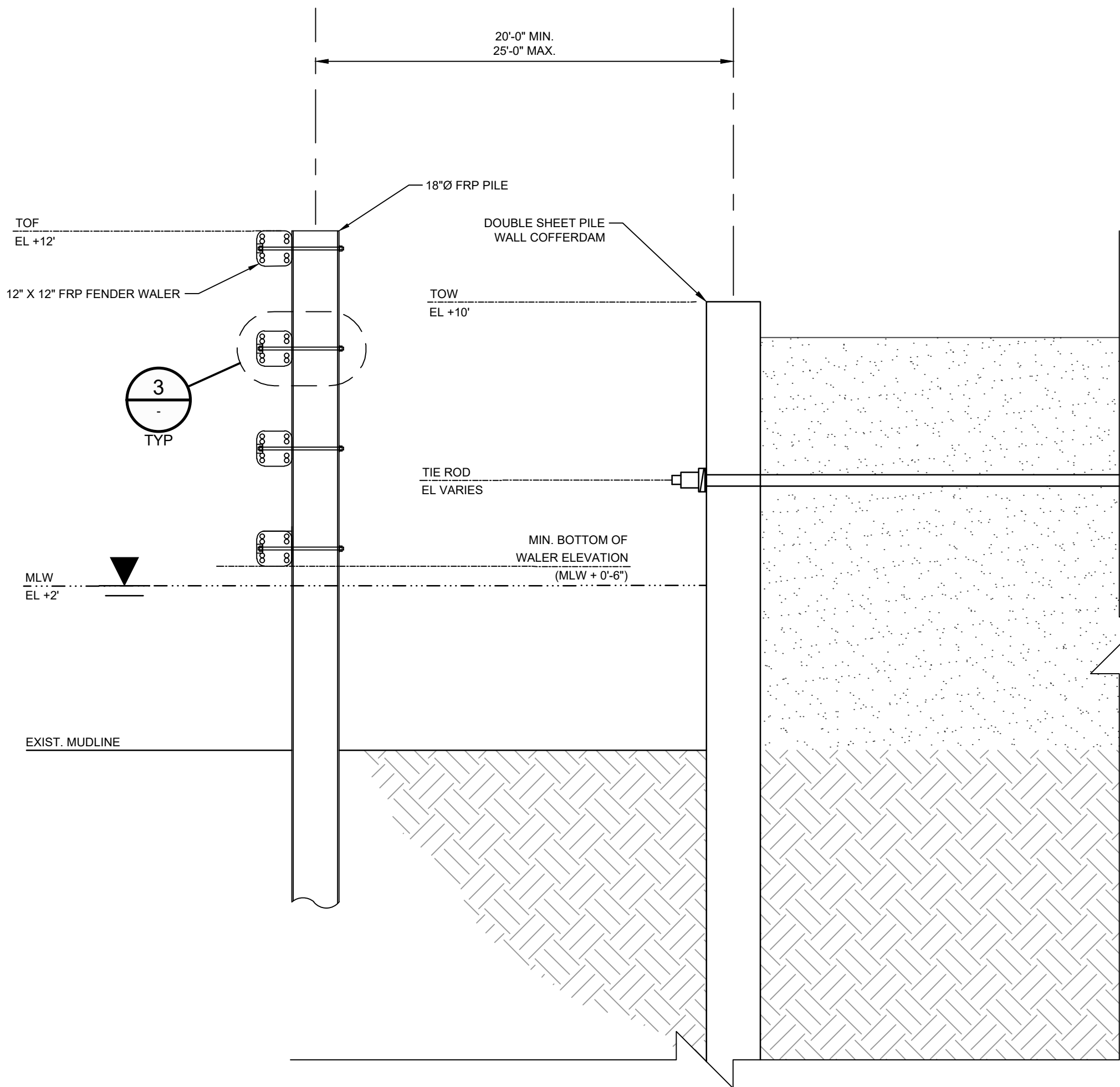
S-05

Sheet 63 of 83

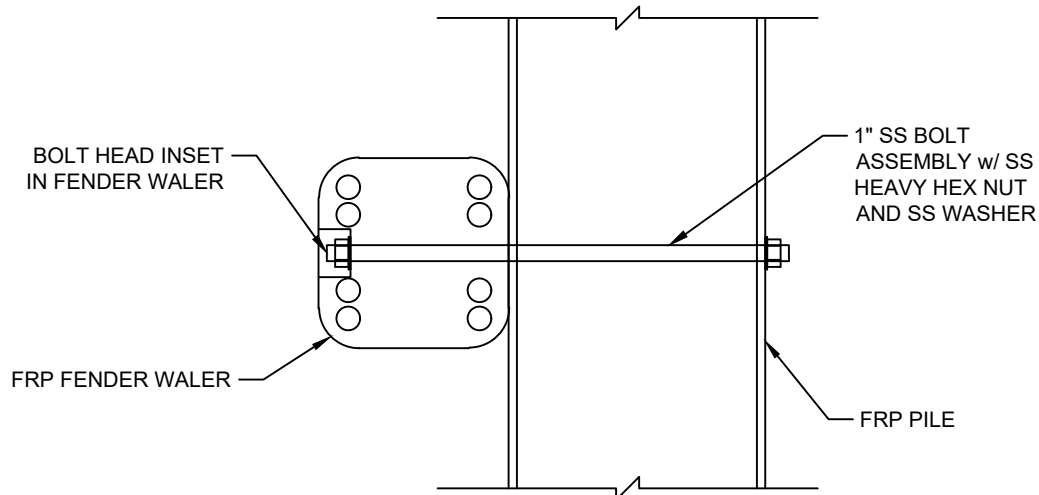




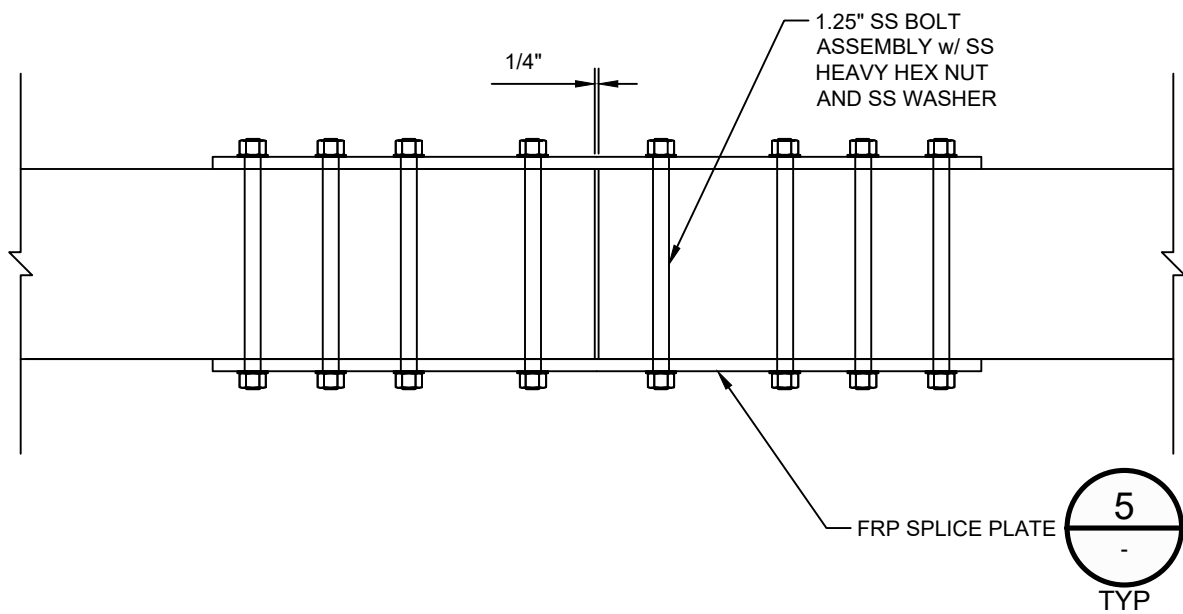
DETAIL 1 TYPICAL FRP BARRIER ELEVATION  
SCALE: 1"=3'-0"



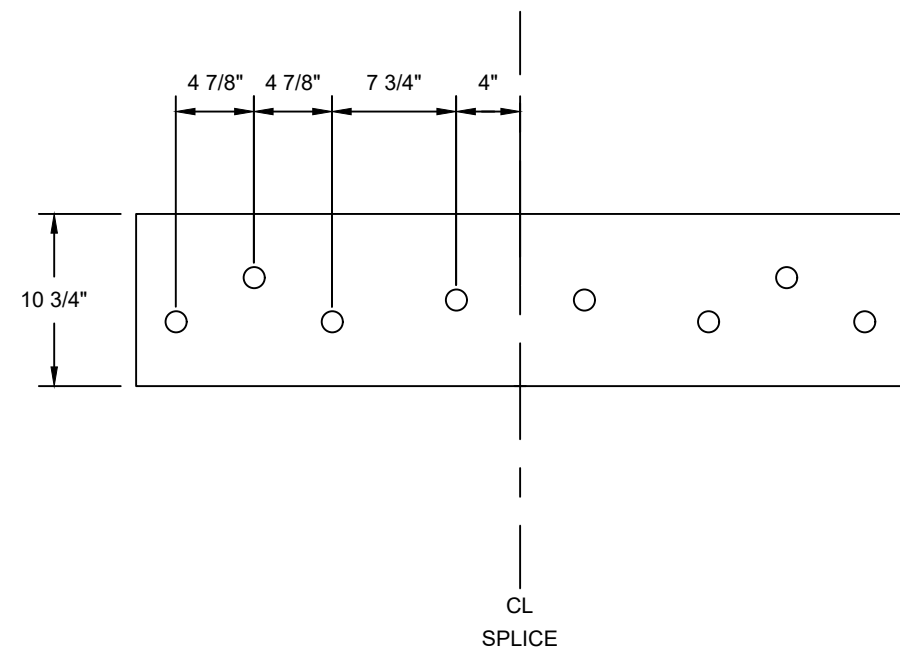
DETAIL 2 TYPICAL FRP BARRIER SECTION  
SCALE: 1"=3'-0"



DETAIL 3 TYPICAL WALER SECTION  
SCALE: 1"=1'-0"

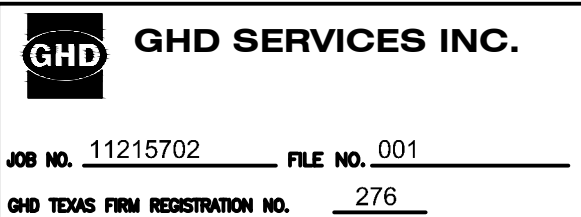


DETAIL 4 TYPICAL WALER SECTION  
SCALE: 1"=1'-0"



DETAIL 5 TYPICAL BOLT PATTERN FOR FRP SPLICE PLATE  
SCALE: 1"=1'-0"

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WASTE PITS**

### Project

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THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

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Drawn	DS	Designer	KM	
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Project Coordinator	CM	Date	May 22, 2025	
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Project No. 11215702

Title

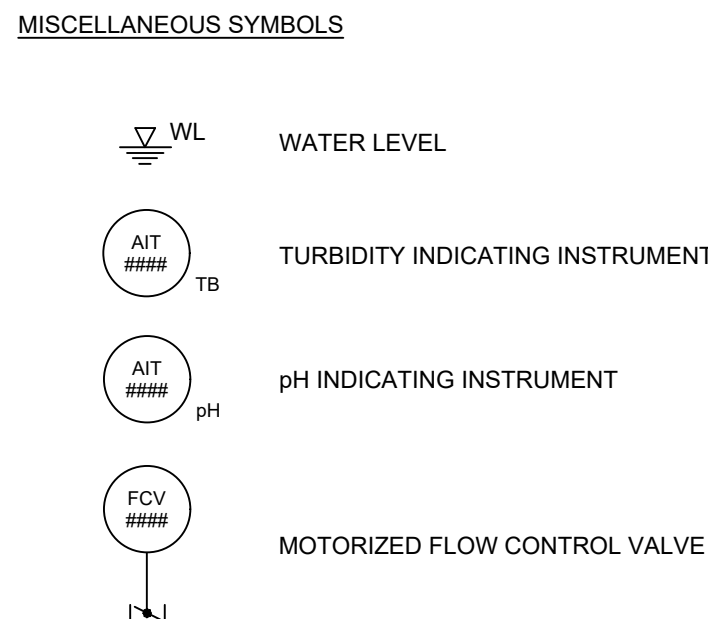
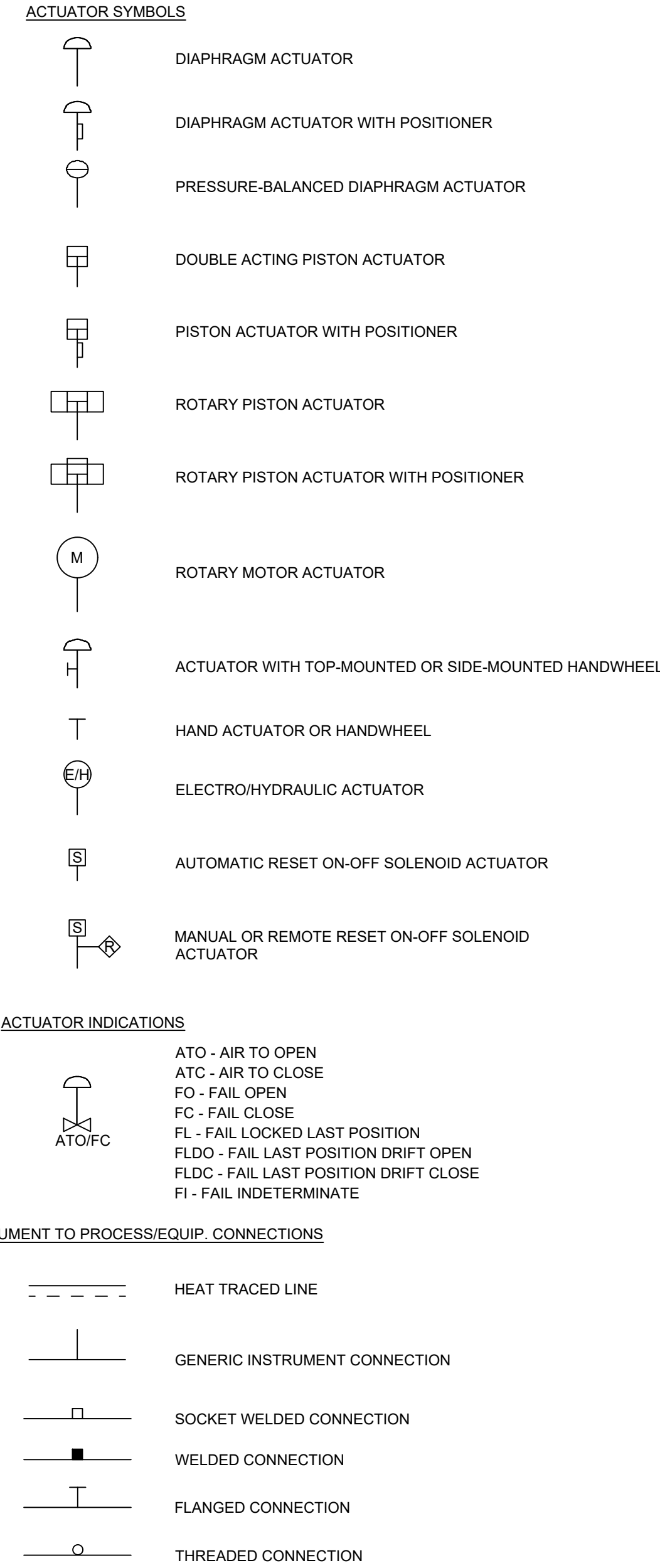
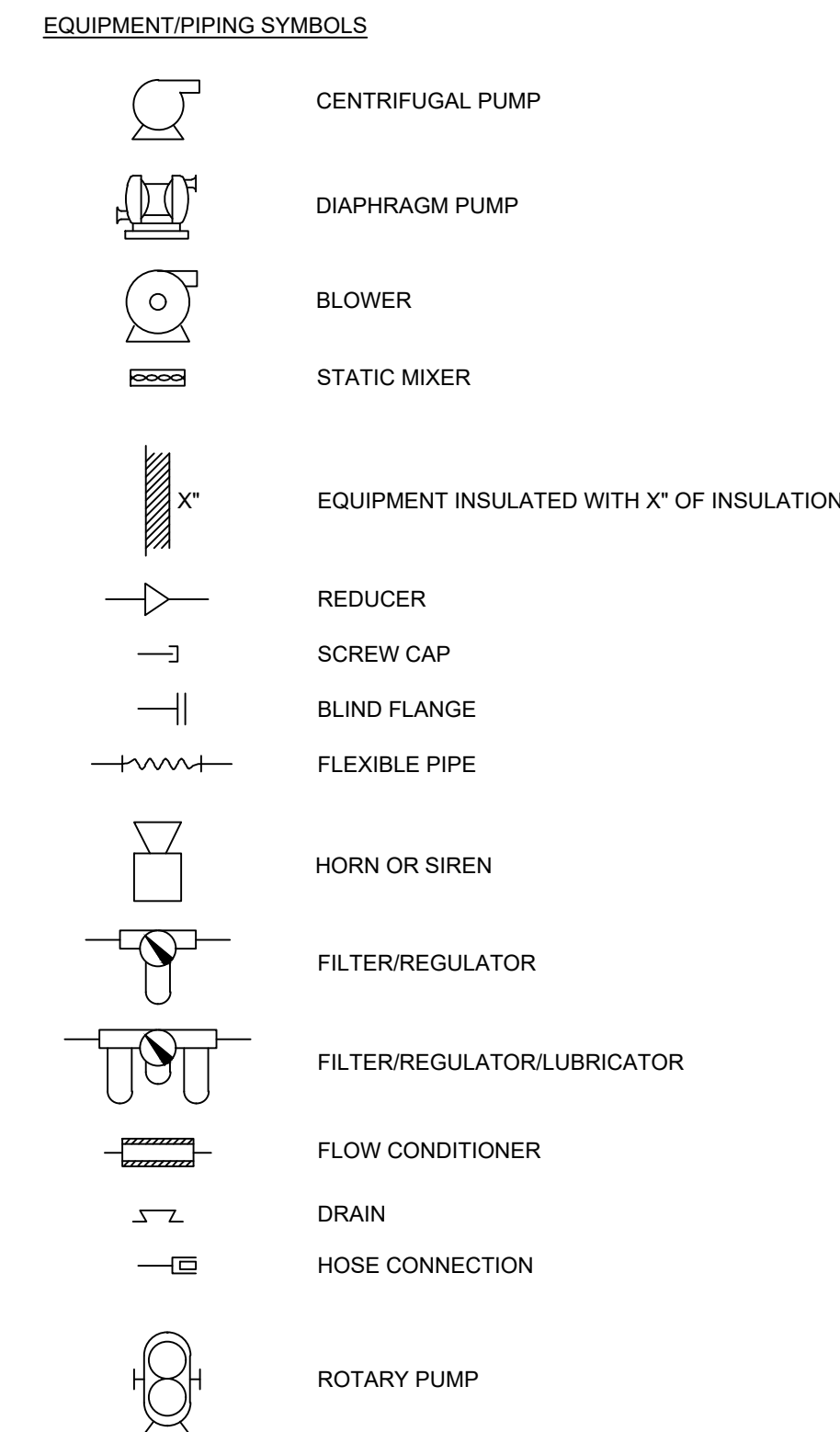
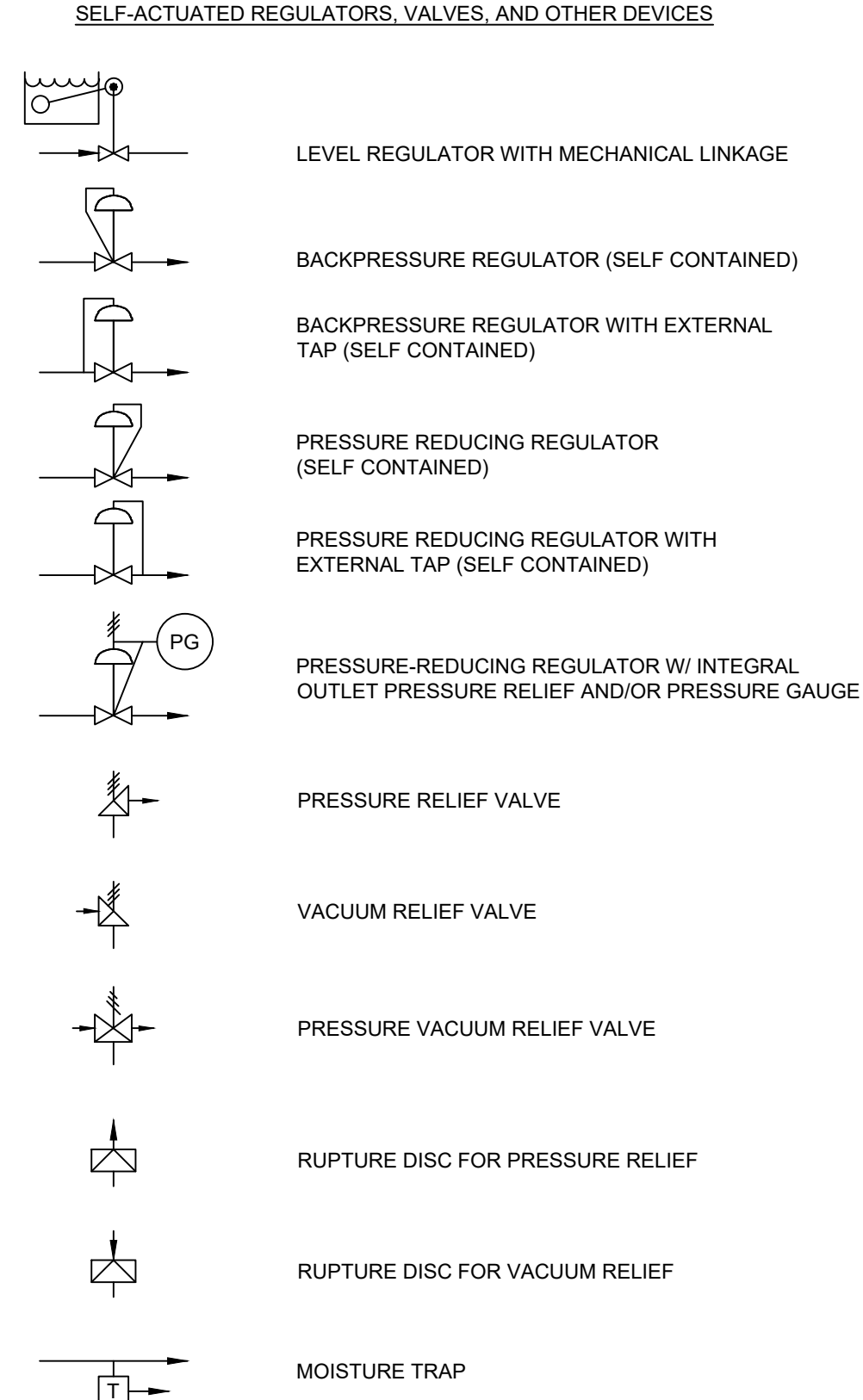
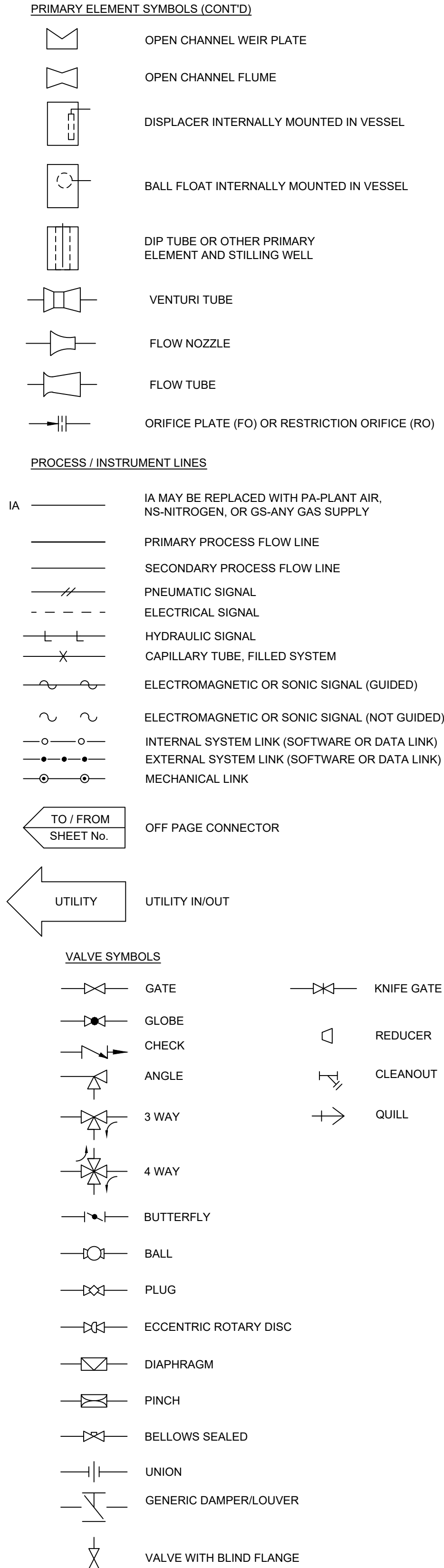
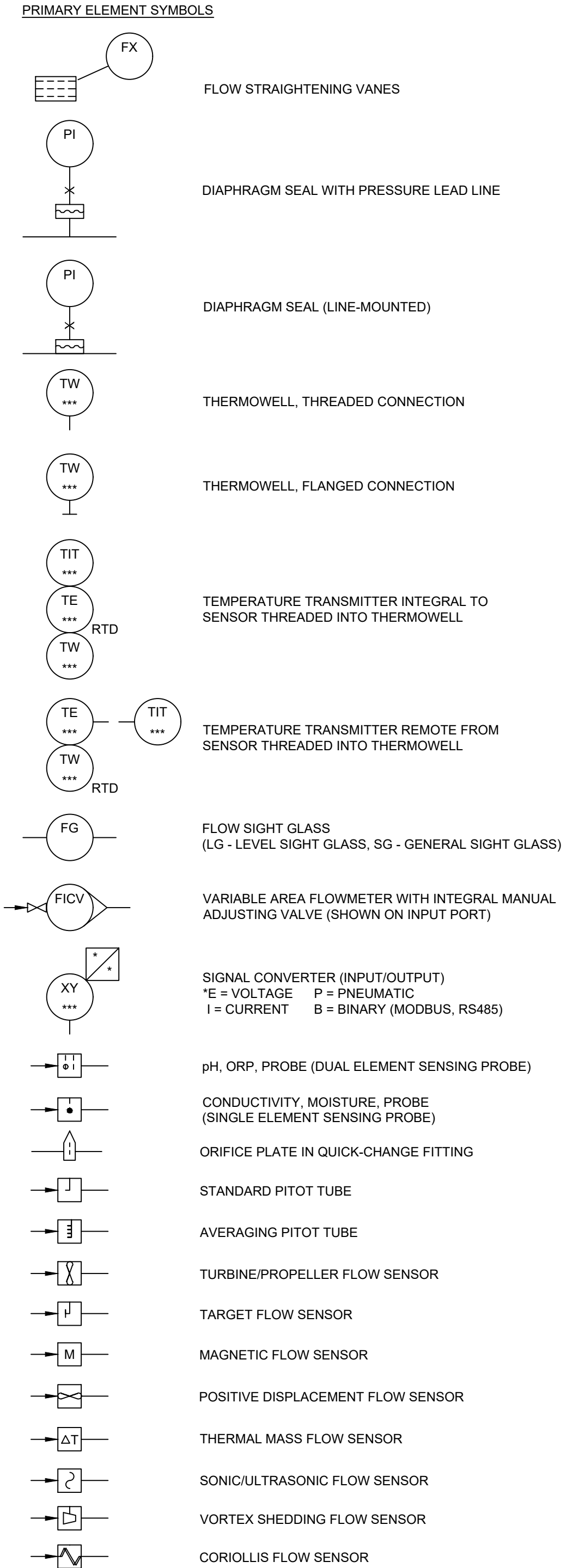
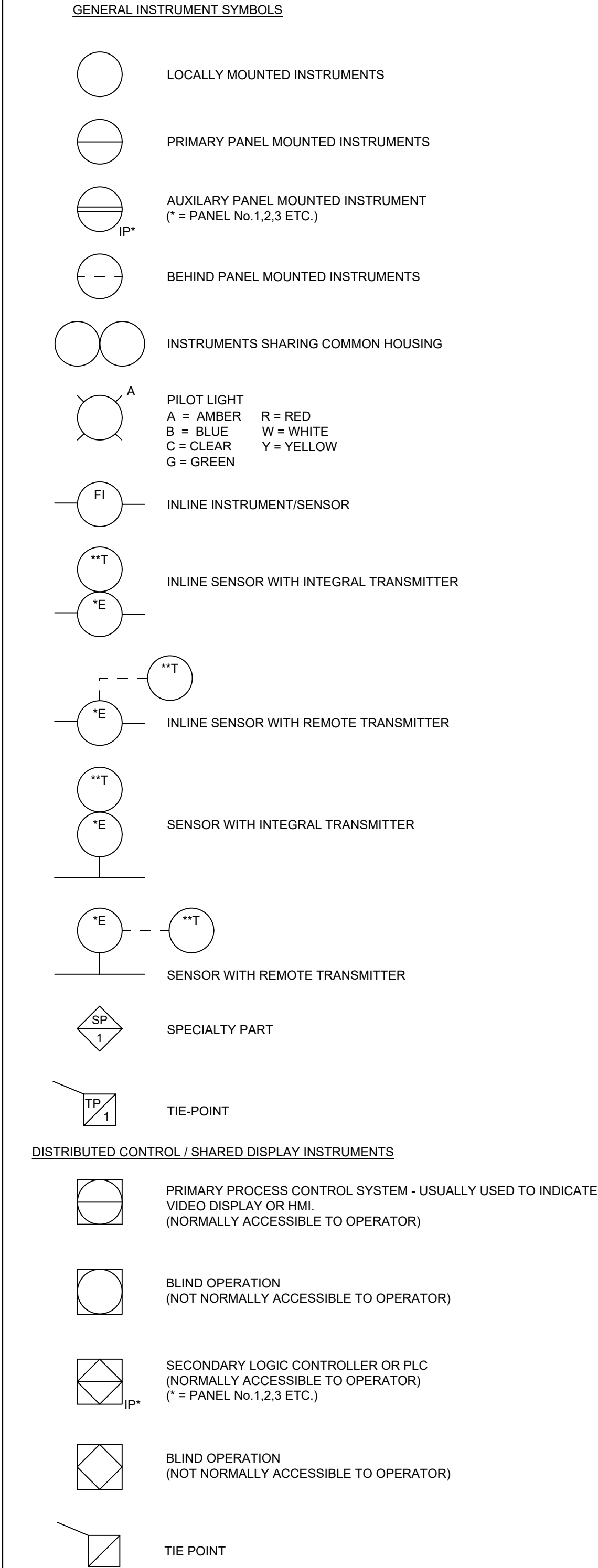
**FRP BARRIER WALL**

Sheet No.

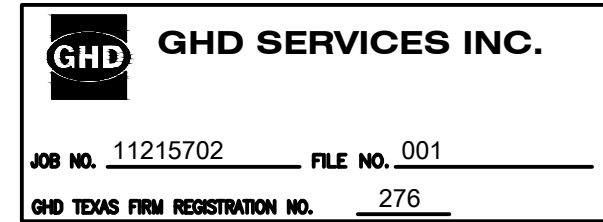
**S-06**

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Project  
**NORTHERN IMPOUNDMENT THIRD FINAL 100% REMEDIAL DESIGN HARRIS COUNTY, TEXAS**

4	THIRD 100% EPA SUBMITTAL	RH	NF	05/23/2025
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Drawn	RH	Designer	NF	
Drafting Check		Design Check	NF	
Project Coordinator	LL	Date	May 22, 2025	
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Project No. 11215702

Title  
**WATER TREATMENT SYSTEM PROCESS FLOW DIAGRAM SYMBOLS**

Sheet No.

**P-000A**

Sheet 65 of 83





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TYPICAL INTERNATIONAL SOCIETY OF AUTOMATION LETTER COMBINATIONS																				
First-Letters	Initiating or Measured Variable	Controllers			Self-Actuated Control Valves	Readout Devices		Switches and Alarm Devices *			Transmitters			Solenoids, Relays, Computing Devices	Primary Element	Test Point	Well or Probe	Viewing Device, Glass	Safety Device	Final Element
		Recording	Indicating	Blind		Recording	Indicating	High **	Low	Comb	Recording	Indicating	Blind							
A	Analysis	ARC	AIC	AC		AR	AI	ASH	ASL	ASHL	ART	AIT	AT	AY	AE	AP	AW			AV
B	Burner/Combustion	BRC	BIC	BC		BR	BI	BSH	BSL	BSHL	BRT	BIT	BT	BY	BE		BW	BG		BZ
C	User's Choice																			
D	User's Choice																			
E	Voltage	ERC	EIC	EC		ER	EI	ESH	ESL	ESHL	ERT	EIT	ET	EY	EE					EZ
F	Flow Rate	FRC	FIC	FC	FCV, FICV	FR	FI	FSH	FSL	FSHL	FRT	FIT	FT	FY	FE	FP		FG		FV
FQ	Flow Quantity	FQRC	FQIC			FQR	FQI	FQSH	FQSL			FQIT	FQT	FQY	FQE					FQV
FF	Flow Ratio	FFRC	FFIC	FFC		FFR	FFI	FFSH	FFSL						FE					FFV
G	User's Choice																			
H	Hand																			
I	Current	IRC	IIC			IR	II	ISH	ISL	ISHL	IRT	IIT	IT	IY	IE					HV
J	Power	JRC	JIC			JR	JI	JSH	JSL	JSHL	JRT	JIT	JT	JY	JE					JV
K	Time	KRC	KIC	KC	KCV	KR	KI	KSH	KSL	KSHL	KRT	KIT	KT	KY	KE					KV
L	Level	LRC	LIC	LC	LCV	LR	LI	LSH	LSL	LSHL	LRT	LIT	LT	LY	LE		LW	LG		LV
M	User's Choice																			
N	User's Choice																			
O	User's Choice																			
P	Pressure/Vacuum	PRC	PIC	PC	PCV	PR	PI	PSH	PSL	PSHL	PRT	PIT	PT	PY	PE	PP			PSV, PSE	PV
PD	Pressure, Differential	PDR	PDIC	PDC	PDCV	PDR	PDI	PDSH	PDSL		PDR	PDIT	PDT	PDY	PE	PP				PDV
Q	Quantity	QRC	QIC			QR	QI	QSH	QSL	QSHL	QRT	QIT	QT	QY	QE					QZ
R	Radiation	RRC	RIC	RC		RR	RI	RSH	RSL	RSHL	RRT	RIT	RT	RY	RE					RZ
S	Speed/Frequency	SRC	SIC	SC	SCV	SR	SI	SSH	SSL	SSHL	SRT	SIT	ST	SY	SE					SV
T	Temperature	TRC	TIC	TC	TCV	TR	TI	TSH	TSL	TSHL	TRT	TIT	TT	TY	TE	TP	TW		TSE	TV
TD	Temperature, Differential	TDRC	TDIC	TDC	TDCV	TDR	TDI	TDSH	TDSL		TDR	TDIT	TDT	TDY	TE	TP	TW			TDV
U	Multivariable					UR	UI							UY						UV
V	Vibration/Machinery Analysis					VR	VI	VSH	VSL	VSHL	VRT	VIT	VT	VY	VE					VZ
W	Weight/Force	WRC	WIC	WC	WCV	WR	WI	WSH	WSL	WSHL	WRT	WIT	WT	WY	WE					WZ
WD	Weight/Force, Differential	WDRC	WDIC	WDC	WDCV	WDR	WDI	WDSH	WDSL		WDR	WDIT	WDT	WDY	WE					WDZ
X	Unclassified																			
Y	Event/State/Presence		YIC	YC		YR	YI	YSH	YSL				YT	YY	YE					YZ
Z	Position/Dimension	ZRC	ZIC	ZC	ZCV	ZR	ZI	ZSH	ZSL	ZSHL	ZRT	ZIT	ZT	ZY	ZE					ZV
ZD	Gauging/Deviation	ZDRC	ZDIC	ZDC	ZDCV	ZDR	ZDI	ZDSH	ZDSL		ZDRT	ZDIT	ZDT	ZDY	ZDE					ZDV

NOTE: THIS TABLE IS NOT ALL-INCLUSIVE.

OTHER POSSIBLE COMBINATIONS:

\* A, ALARM, THE ANNUNCIATING DEVICE, MAY BE USED IN THE SAME FASHION AS S, SWITCH, THE ACTUATING DEVICE.

\*\* THE LETTERS H AND L MAY BE OMITTED IN THE UNDEFINED CASE.

ABBREVIATIONS:

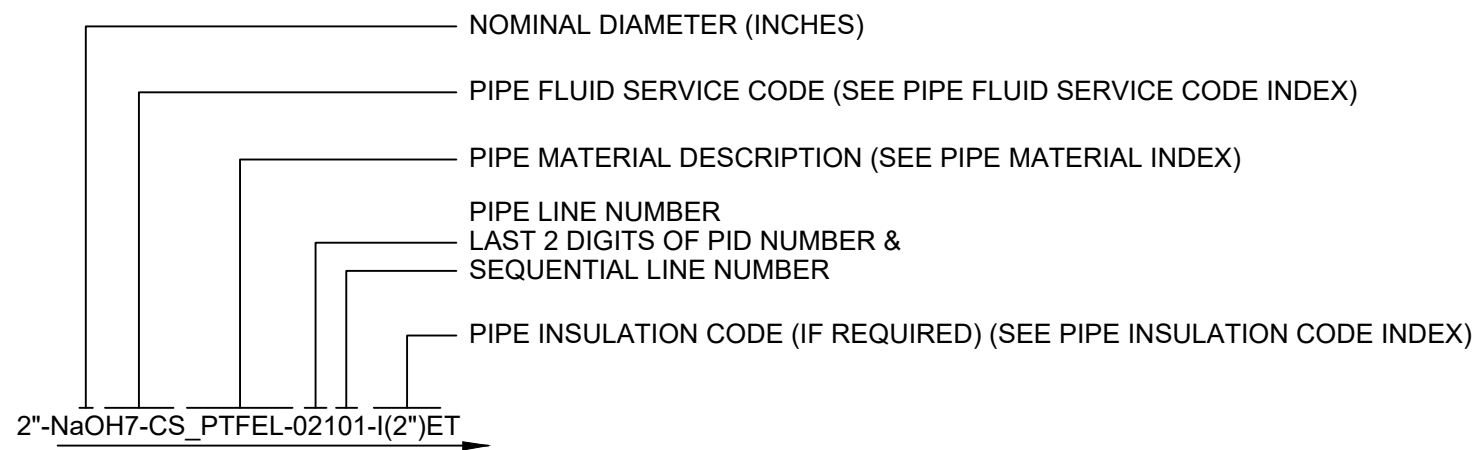
INSTRUMENTS

HOA - HAND/OFF/AUTO  
LOR - LOCAL/OFF/REMOTE  
OPN - OPEN  
CLS - CLOSE  
STPT - SETPOINT  
ES - EMERGENCY STOP  
DA - DOUBLE ACTING  
NC - NORMALLY CLOSED  
NO - NORMALLY OPEN  
ST - START / ENABLE  
SP - STOP / DISABLE  
JOG - PUMP MOTOR  
SA - SINGLE ACTING

PIPE FLUID SERVICE CODE INDEX  
SEE PIPING SPECIFICATIONS FOR DETAILS

CODE	SERVICE
CL21	CHLORINE LIQUID OR GAS
CTW1	COOLING TOWER WATER
CW3	PROCESS WATER
CW4	CHILLED WATER
NaOH	CAUSTIC SODA SOLUTION
GCO	GLYCOL
N2O	NITROGEN (DRY COMPRESSED GAS)
SI	STEAM
CI	CONDENSATE
PV	PROCESS VENT
STS	STORM SEWER
PR	PROCESS RELIEF
GW	GROUNDWATER
DR	DRAIN
IA	INSTRUMENT AIR
VE	VAPOR EXTRACTION
NPW	NON POTABLE WATER
H2SO4	SULFURIC ACID
DW	DOMESTIC WATER
INF	INFLUENT WATER (CONTACT WATER)
EFF	EFFLUENT WATER (TREATED WATER)
SLG	SLUDGE
BW	BACKWASH
COAG	COAGULANT
POLY	POLYMER
OS	ORGANOSULFIDE
DEC	DECANT WATER
CONT	CONTAINMENT AREA DRAINAGE

LINE DESIGNATION



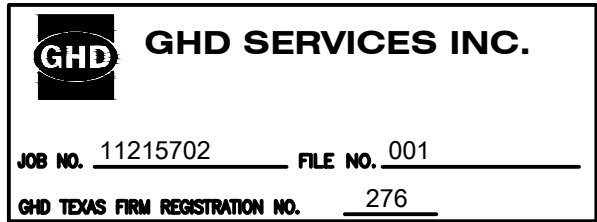
PIPE MATERIAL INDEX  
SEE PIPING SPECIFICATIONS FOR DETAILS

MAT'L	DESCRIPTION	SPEC
CS_40	CARBON STEEL SCHEDULE 40 PIPE	
CS_80	CARBON STEEL SCHEDULE 80 PIPE	
316L_10	316L STAINLESS STEEL SCHEDULE 10 PIPE	
304_40	304 STAINLESS STEEL SCHEDULE 40 PIPE	
316L_ST	316L STAINLESS STEEL TUBING	
304_ST	304 STAINLESS STEEL TUBING	
CS_T	CARBON STEEL TUBING	
CU_T	COPPER TUBING	
PE_T	POLYETHYLENE TUBING	
CS_PTFEL	CARBON STEEL PTFE LINED PIPE	
CS-PFAL	CARBON STEEL PFA LINED PIPE	
CS-GL	CARBON STEEL GLASS LINED PIPE	
CPVC_80	CPVC SCHEDULE 80 PIPE	
PCV_80	PVC SCHEDULE 80 PIPE	
304_10	304 STAINLESS STEEL SCHEDULE 10 PIPE	
FRP	FIBERGLASS REINFORCED PIPE	
HDPE_11	HIGH-DENSITY POLYETHYLENE SDR-11	
FRH	FLEXIBLE RUBBER HOSE	
304L_ST	304L STAINLESS STEEL TUBING	
304L_10	304L STAINLESS STEEL SCHEDULE 10 PIPE	
304L_ST	TEFLON TUBING, CPVC CARRIER AND CONTAINMENT PIPE	
HDPE_DW_11	HIGH-DENSITY POLYETHYLENE SDR-11, DOUBLE WALLED CARRIER AND CONTAINMENT PIPE	
PTFE_CPVC	TEFLON TUBING, CPVC CARRIER AND CONTAINMENT PIPE	

PIPE INSULATION CODE INDEX  
SEE PIPING SPECIFICATIONS FOR DETAILS

CODE	DESCRIPTION
I(2")	INSULATED (2")
NI	NOT INSULATED
JKT	JACKETED PIPE
I(2")ET	INSULATED (2") AND ELECTRICALLY TRACED
I(2")ST	INSULATED (2") AND STEAM TRACED
I(2")JKT	INSULATED (2") AND JACKETED

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Project  
**NORTHERN IMPOUNDMENT THIRD FINAL 100% REMEDIAL DESIGN HARRIS COUNTY, TEXAS**


4	THIRD 100% EPA SUBMITTAL	RH	NF	05/23/2025
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No.	Issue	Drawn	Approved	Date
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Drawn	RH	Designer	NF	
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Drafting Check	Design Check	NF		
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Project Coordinator	LL	Date	May 22, 2025	
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Project No.	11215702			
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Title  
**WATER TREATMENT SYSTEM PROCESS FLOW DIAGRAM SCHEDULES**

Sheet No.

P-000B





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4	THIRD 100% EPA SUBMITTAL	SH	NF	05/23/2025
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Drawn	SH	Designer	NF	
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Original Size		Bar is one inch on original size drawing 0 1"		
Arch D				

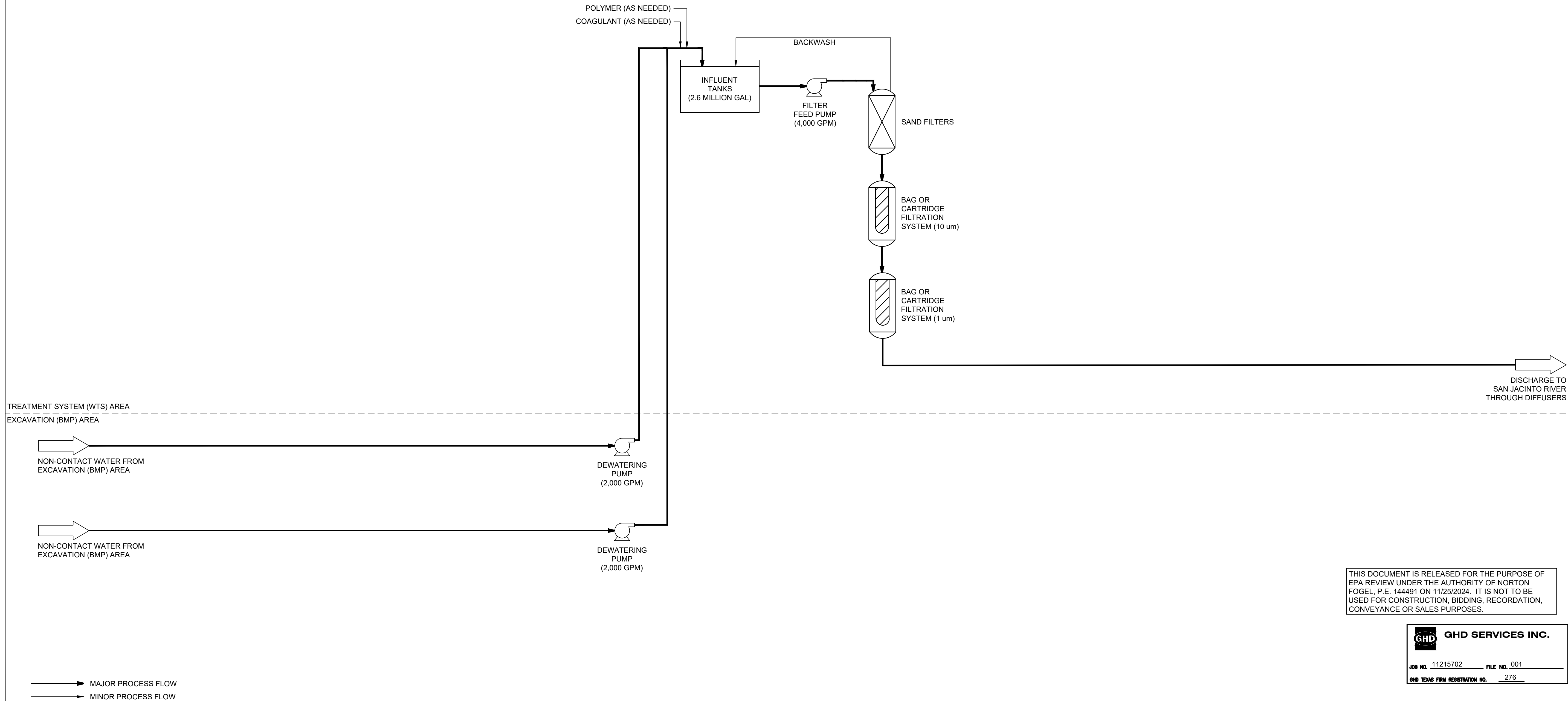
Project No. 11215702

Title  
**WATER TREATMENT SYSTEM  
PROCESS FLOW DIAGRAM  
(NON-CONTACT WATER)**

Sheet No.

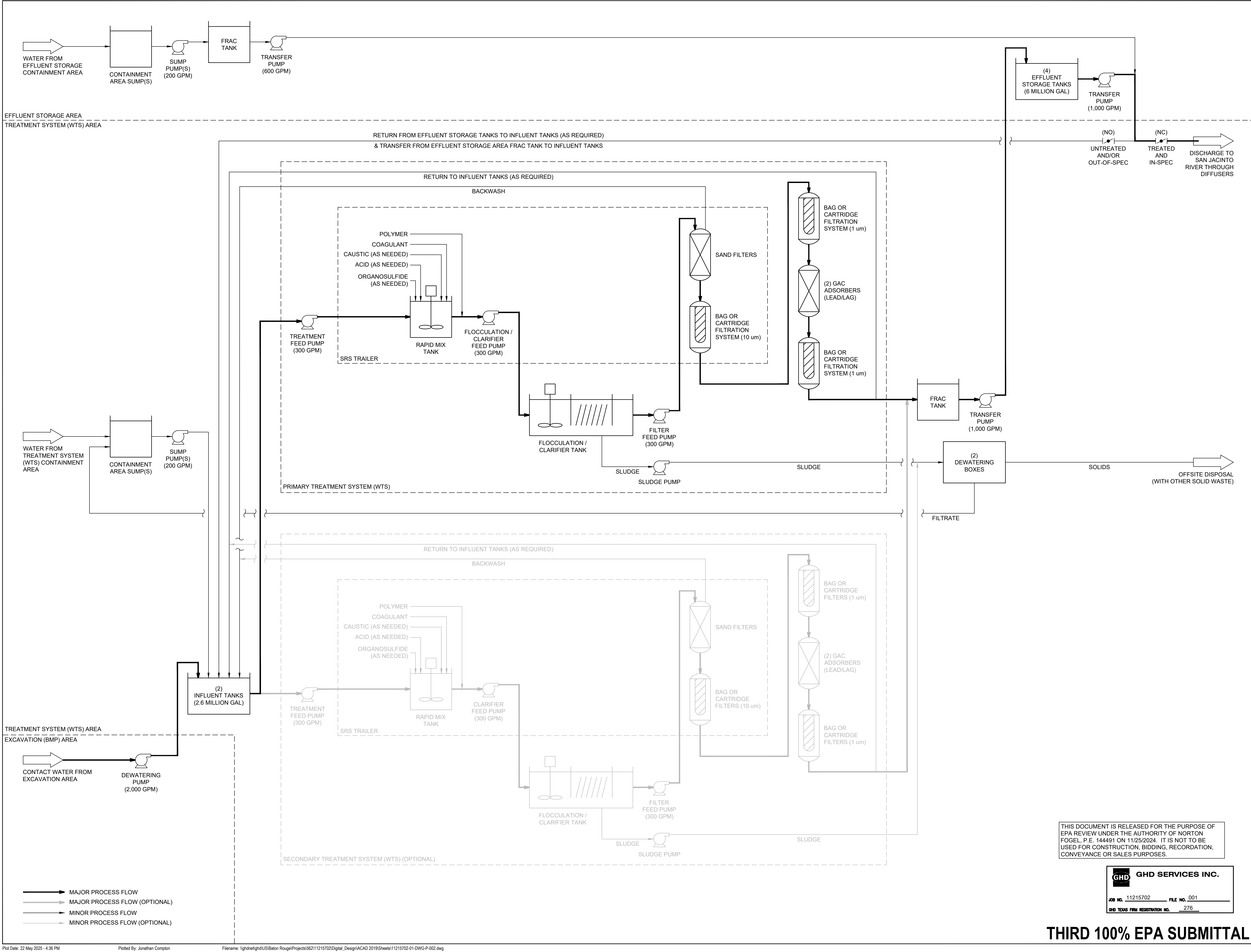
**P-001**

Sheet 67 of 83



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STATE OF TEXAS  
NORTON SIEGEL FOGEL  
144491  
LICENSED PROFESSIONAL ENGINEER  
5-23-2025

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Client  
**SAN JACINTO RIVER WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

4	THIRD 100% EPA SUBMITTAL	RH	NF	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	RH	Designer	NF	
Drafting Check		Design Check	NF	
Project Coordinator	LL	Date	May 22, 2025	
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Original Size		Bar is one inch on original size drawing 0 1"		

Project No. 11215702

Title  
**WATER TREATMENT SYSTEM  
PROCESS FLOW DIAGRAM  
(CONTACT WATER)**

Sheet No.

P-002

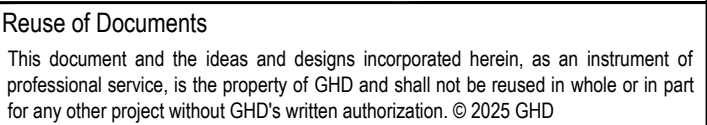
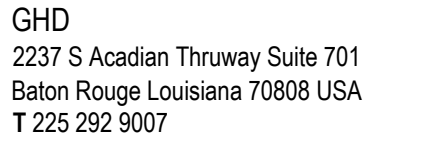
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JOB NO. 11215702 FILE NO. 001  
GHD TEXAS FIRM REGISTRATION NO. 276

THIRD 100% EPA SUBMITTAL







Project Coordinator	LL	Date	May 22, 2025
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Original Size

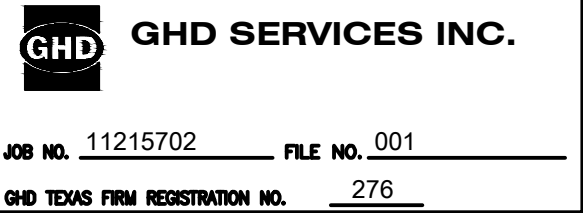
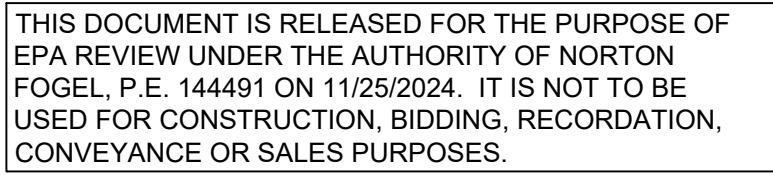
**Arch D**

Bar is one inch on original size drawing

0  1"

**WATER TREATMENT SYSTEM  
P&ID (NON-CONTACT WATER)  
(1 OF 3)**

**P-003**



NOTES:

1. P&IDs ARE CONCEPTUAL ONLY AND ARE TO BE FINALIZED BY CONTRACTOR.
2. FOR CLARITY NOT ALL SYSTEM ELEMENTS (E.G. VALVES, PIPE SIZES) HAVE BEEN SHOWN.
3. CONTRACTOR SHALL PROVIDE PROVISIONS TO DIRECT EQUIPMENT DECONTAMINATION WATER TO WATER TREATMENT SYSTEM OR TO AN ADJACENT CONTAINMENT AREA WITH PUMPING SYSTEM.
4. CONTRACTOR SHALL PROVIDE AN ADEQUATE NUMBER OF SUMPS AND PUMPS TO DEWATER CONTAINMENT AREA AFTER A LARGE RAIN EVENT TO RESUME ACTIVITIES.



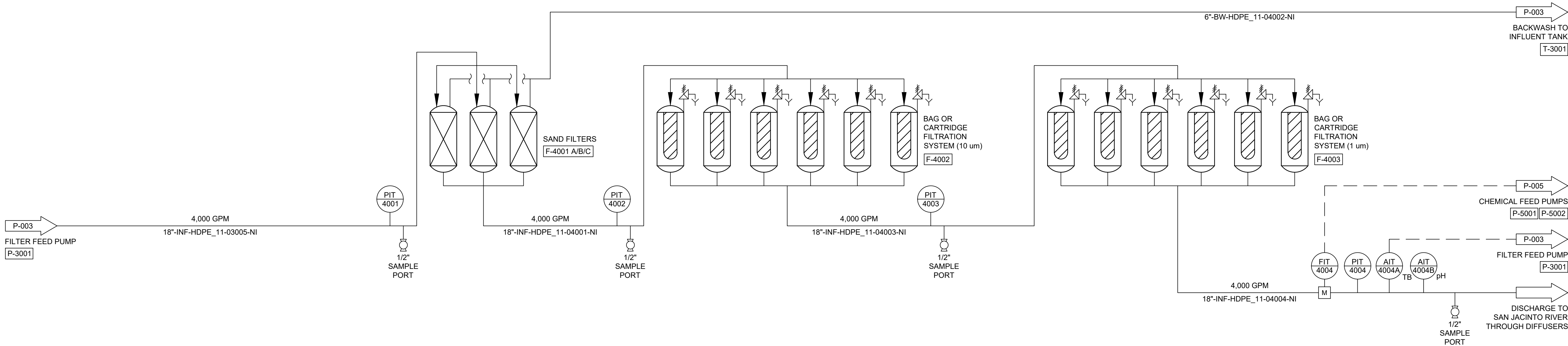


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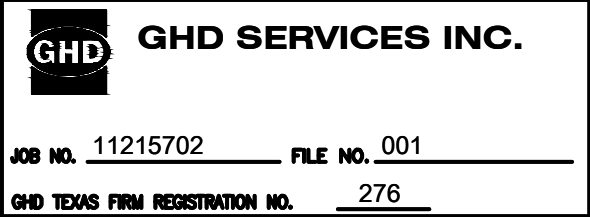
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  2. FOR CLARITY NOT ALL SYSTEM ELEMENTS (E.G. VALVES, PIPE SIZES) HAVE BEEN SHOWN.
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**SAN JACINTO RIVER  
WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

4	THIRD 100% EPA SUBMITTAL	SH	NF	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	SH	Designer	NF	
Drafting Check		Design Check	NF	
Project Coordinator	LL	Date	May 22, 2025	
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Original Size				
Arch D				Bar is one inch on original size drawing 0 1"

Project No. 11215702

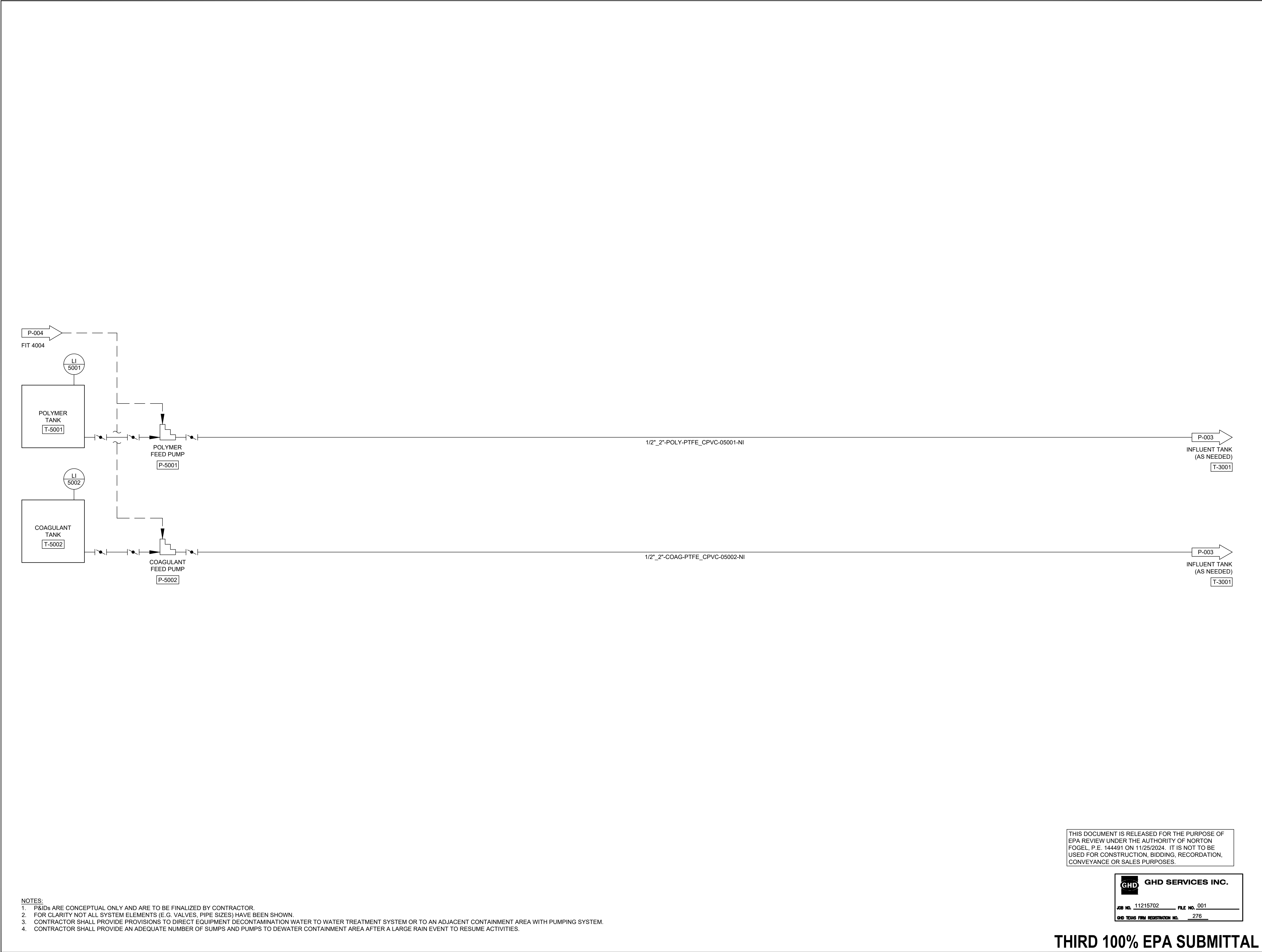
Title

**WATER TREATMENT SYSTEM  
P&ID (NON-CONTACT WATER)  
(2 OF 3)**

Sheet No.

**P-004**





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WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

4	THIRD 100% EPA SUBMITTAL	SH	NF	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	SH	Designer	NF	
Drafting Check		Design Check	NF	
Project Coordinator	LL	Date	May 22, 2025	
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Original Size		Bar is one inch on original size drawing 0 1"		
Arch D				

Project No. 11215702

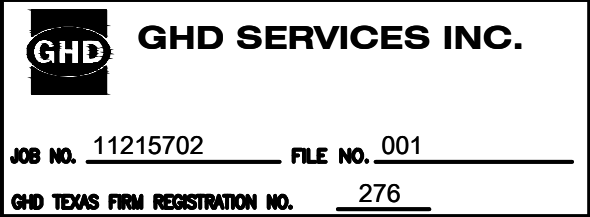
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**WATER TREATMENT SYSTEM  
P&ID (NON-CONTACT WATER)  
(3 OF 3)**

Sheet No.

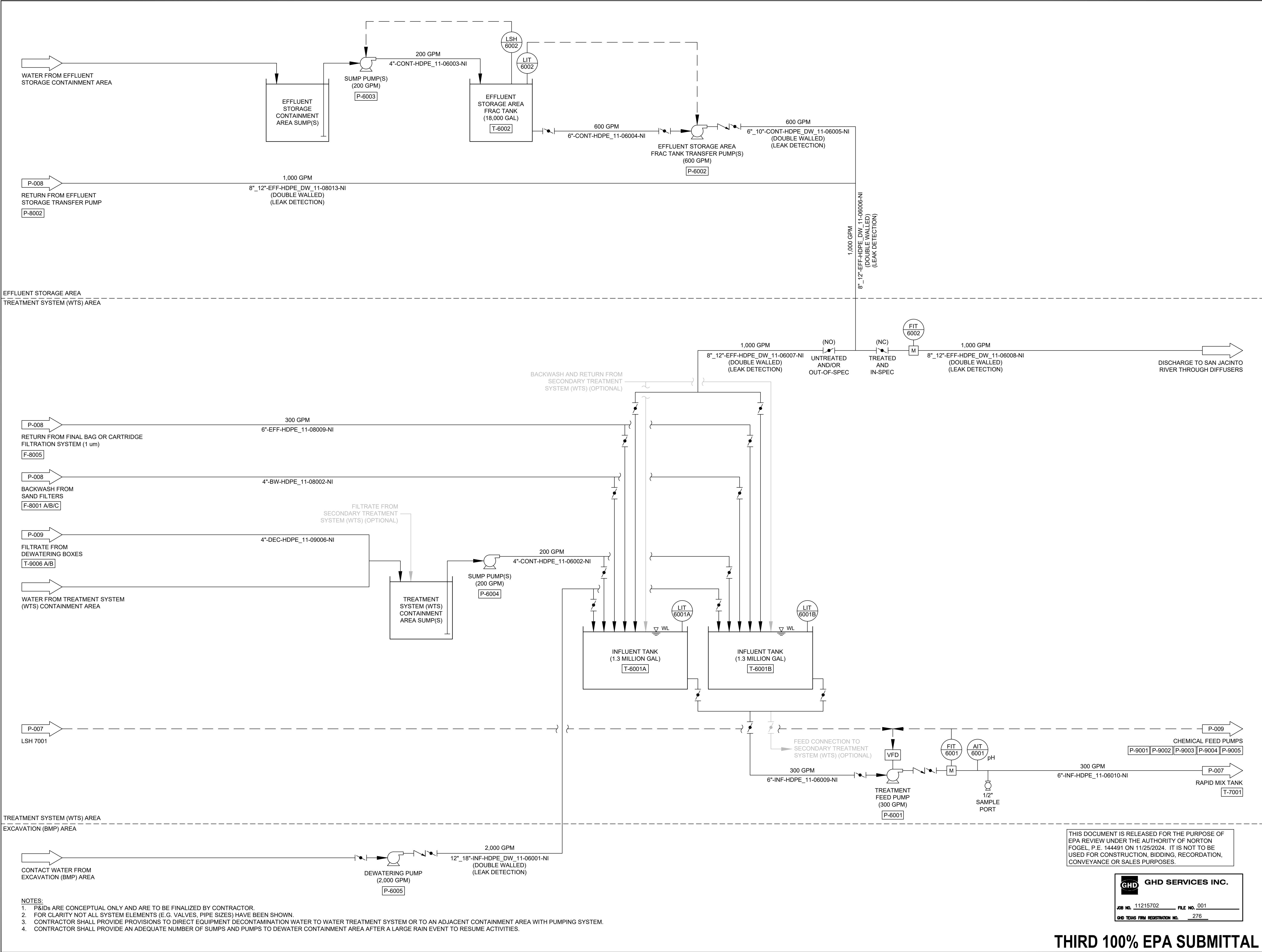
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**SAN JACINTO RIVER  
WASTE PITS**

#### Project

**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

4 THIRD 100% EPA SUBMITTAL RH NF 05/23/2025

No. Issue Drawn Approved Date

Drawn RH Designer NF

Drafting Check Design Check NF

Project Coordinator LL Date May 22, 2025

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Original Size

**Arch D**  
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0 1"

Project No. 11215702

Title

**WATER TREATMENT SYSTEM  
P&ID (CONTACT WATER)  
(1 OF 4)**

Sheet No.

**P-006**

Sheet 72 of 83

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Project

**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

4 THIRD 100% EPA SUBMITTAL SH NF 05/23/2025

No.	Issue	Drawn	Approved	Date
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Drawn	SH	Designer	NF	
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Drafting Check	Design Check	NF		
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Project Coordinator	LL	Date	May 22, 2025	
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Original Size	Bar is one inch on original size drawing			
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Arch D	0 1"			
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Project No. 11215702

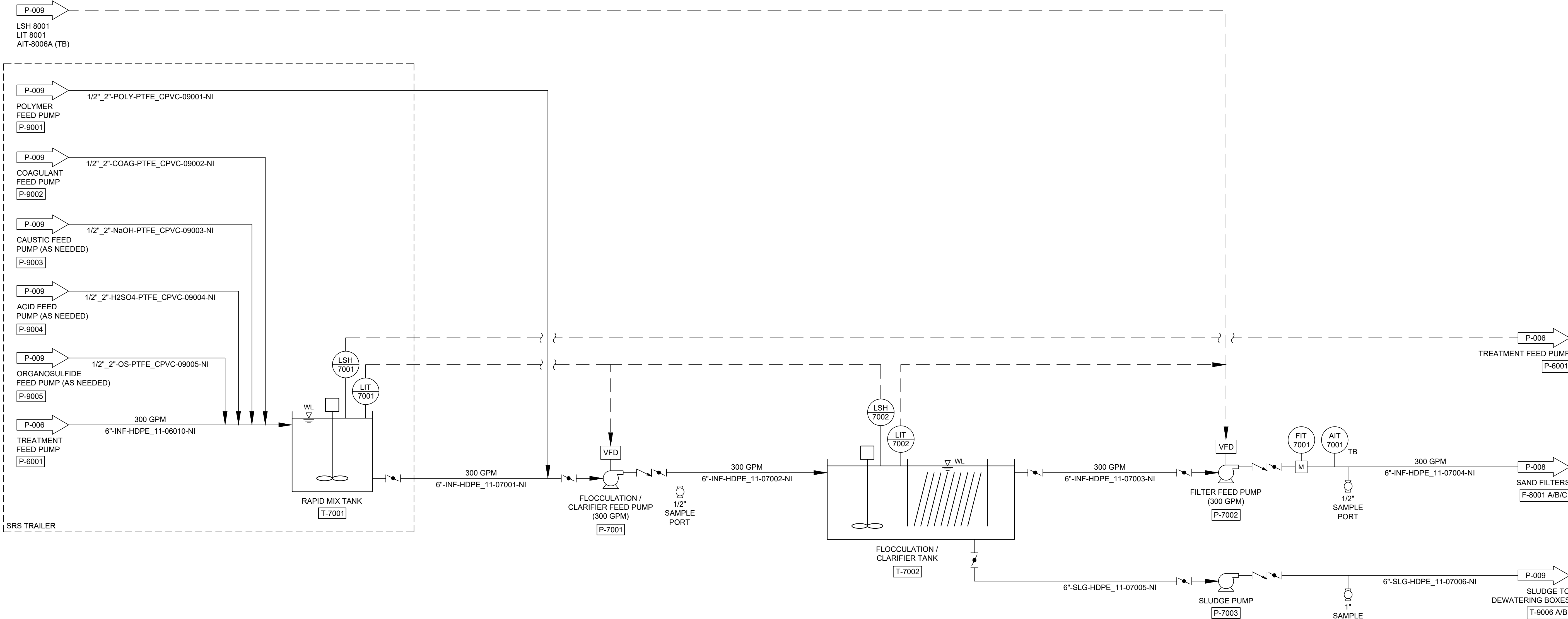
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**WATER TREATMENT SYSTEM  
P&ID (CONTACT WATER)  
(2 OF 4)**

Sheet No.

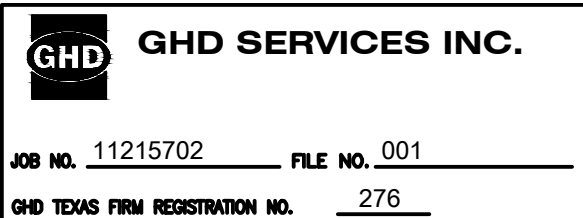
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Sheet 73 of 83



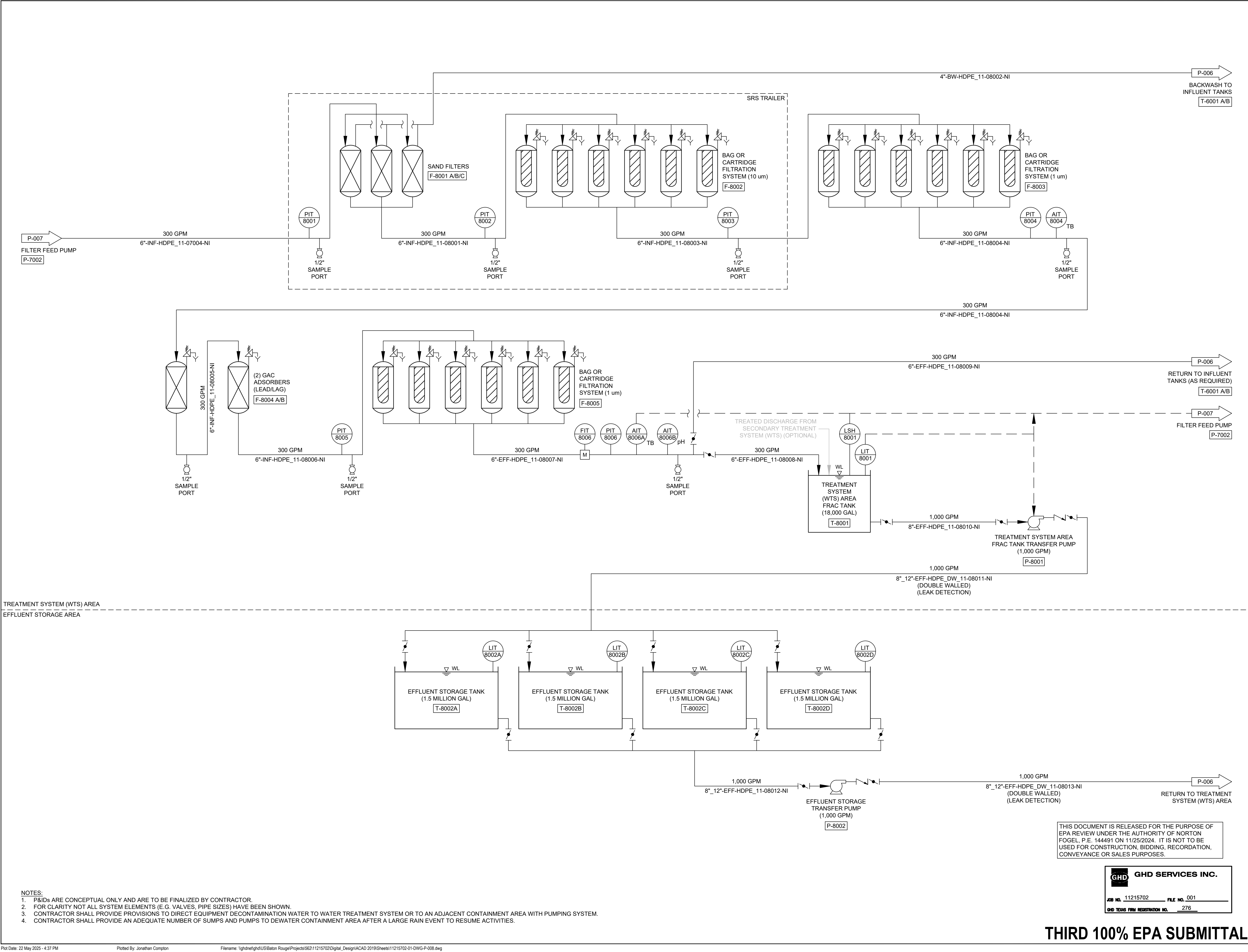
- NOTES:
- P&IDs ARE CONCEPTUAL ONLY AND ARE TO BE FINALIZED BY CONTRACTOR.
  - FOR CLARITY NOT ALL SYSTEM ELEMENTS (E.G. VALVES, PIPE SIZES) HAVE BEEN SHOWN.
  - CONTRACTOR SHALL PROVIDE PROVISIONS TO DIRECT EQUIPMENT DECONTAMINATION WATER TO WATER TREATMENT SYSTEM OR TO AN ADJACENT CONTAINMENT AREA WITH PUMPING SYSTEM.
  - CONTRACTOR SHALL PROVIDE AN ADEQUATE NUMBER OF SUMPS AND PUMPS TO DEWATER CONTAINMENT AREA AFTER A LARGE RAIN EVENT TO RESUME ACTIVITIES.

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Project  
**NORTHERN IMPOUNDMENT THIRD FINAL 100% REMEDIAL DESIGN HARRIS COUNTY, TEXAS**

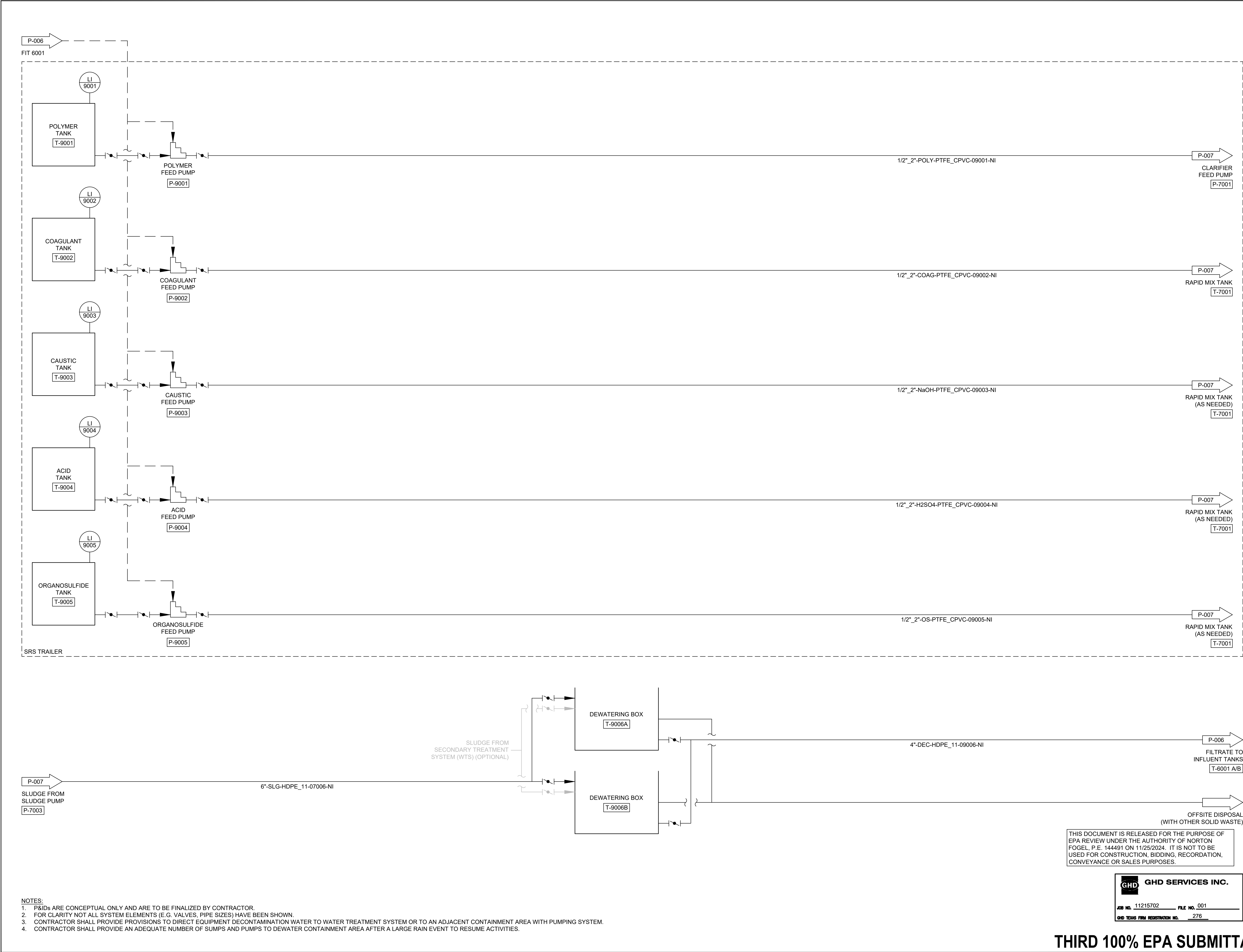
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No.	Issue	Drawn	Approved	Date
Drawn	RH	Designer	NF	
Drafting Check		Design Check	NF	
Project Coordinator	LL	Date	May 22, 2025	
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Original Size	Arch D			
Project No. 11215702		Bar is one inch on original size drawing 0 1"		

Title  
**WATER TREATMENT SYSTEM P&ID (CONTACT WATER) (3 OF 4)**

Sheet No.

**P-008**





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Client  
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Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

4	THIRD 100% EPA SUBMITTAL	RH	NF	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	RH	Designer	NF	
Drafting Check		Design Check	NF	
Project Coordinator	LL	Date	May 22, 2025	
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Original Size		Bar is one inch on original size drawing 0 1"		
Arch D				

Project No. 11215702

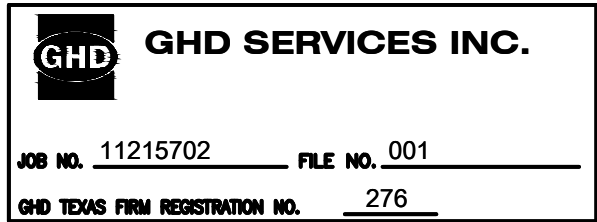
Title  
**WATER TREATMENT SYSTEM  
P&ID (CONTACT WATER)  
(4 OF 4)**

Sheet No.

**P-009**

Sheet 75 of 83

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WASTE PITS**  
Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

4	THIRD 100% EPA SUBMITTAL	RH	NF	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	RH	Designer	NF	
Drafting Check		Design Check	NF	
Project Coordinator	LL	Date	May 22, 2025	
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Original Size		Bar is one inch on original size drawing 0 1"		
Arch D				

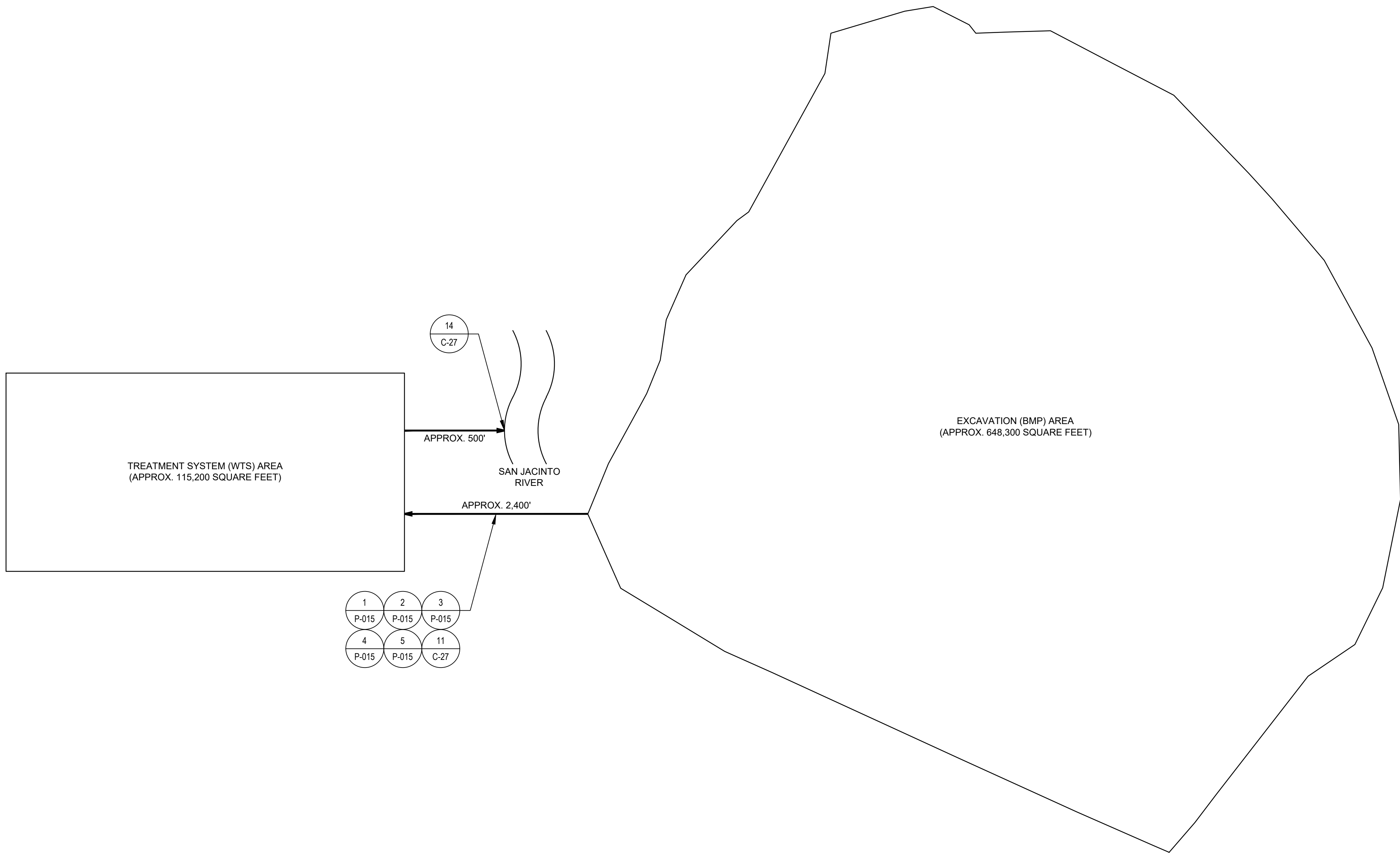
Project No. 11215702

Title  
**WATER TREATMENT SYSTEM  
SITE PLAN  
(NON-CONTACT WATER)**

Sheet No.

**P-010**

Sheet 76 of 83



- NOTES:
- SITE PLANS ARE CONCEPTUAL ONLY AND ARE TO BE FINALIZED BY CONTRACTOR.
  - CONTRACTOR SHALL PROVIDE LEAK DETECTION AT LOW POINT ON ALL PIPELINES (SEE DETAIL 4/P-015).
  - CONTRACTOR SHALL INSTALL BIDIRECTIONAL CLEANOUTS EVERY 500' (MINIMUM) ON ALL PIPELINES.

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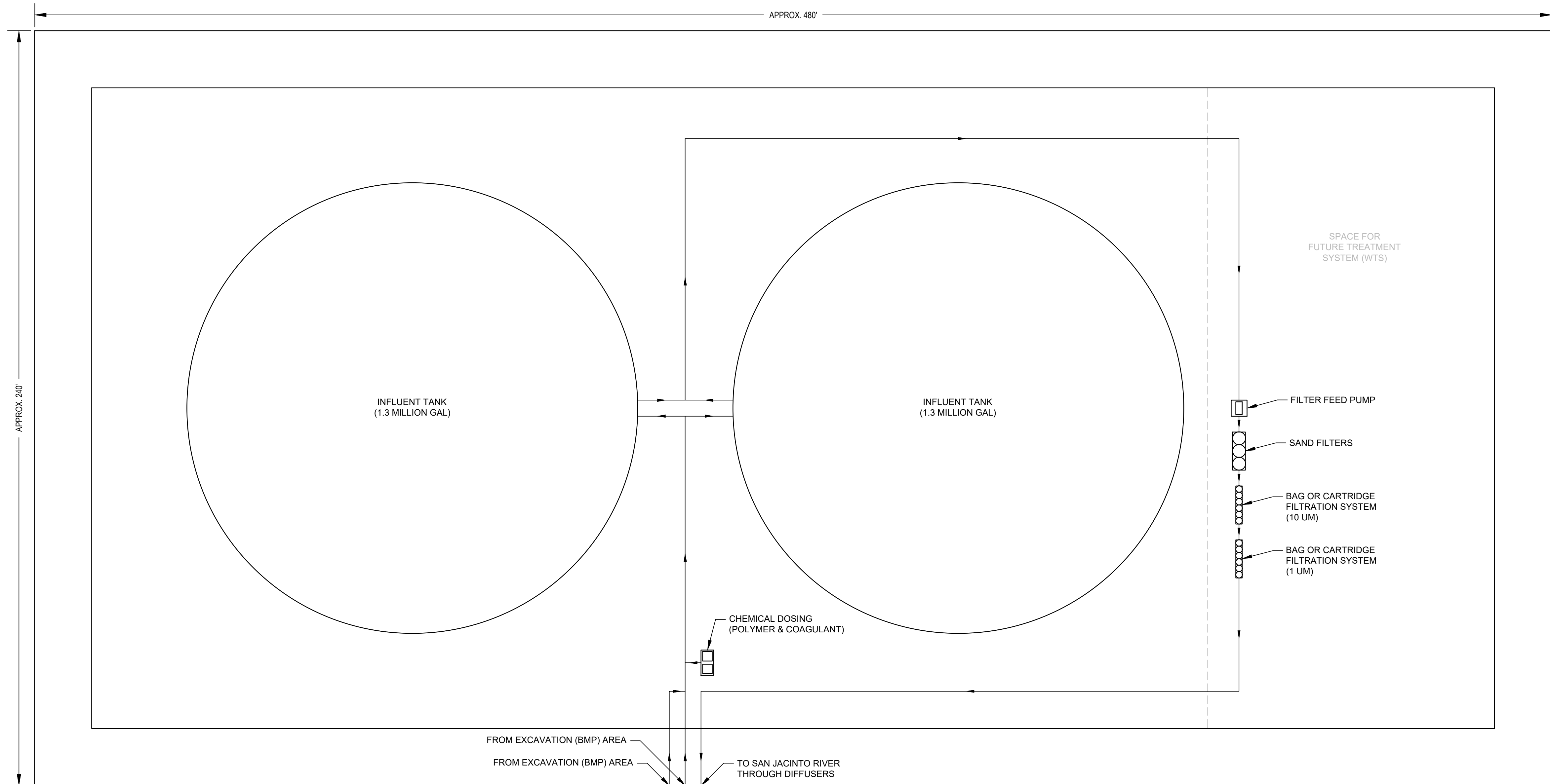
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WASTE PITS**  
Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

3	THIRD 100% EPA SUBMITTAL	RH	NF	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	RH	Designer	NF	
Drafting Check		Design Check	NF	
Project Coordinator	LL	Date	May 22, 2025	
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Original Size		Bar is one inch on original size drawing 0 1"		
Arch D				

Project No. 11215702  
Title  
**WATER TREATMENT SYSTEM  
EQUIPMENT LAYOUT  
(NON-CONTACT WATER)**

Sheet No.  
**P-011**  
Sheet 77 of 83



TREATMENT SYSTEM (WTS) AREA

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GHD SERVICES INC.

JOB NO. 11215702FILE NO. 001

GHD TEXAS FIRM REGISTRATION NO. 276

- NOTES:
- EQUIPMENT LAYOUTS ARE CONCEPTUAL ONLY AND ARE TO BE FINALIZED BY CONTRACTOR.
  - FOR CLARITY NOT ALL SYSTEM ELEMENTS (E.G. VALVES, PIPE SIZES, RETURN LINES) HAVE BEEN SHOWN.

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WASTE PITS**  
Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

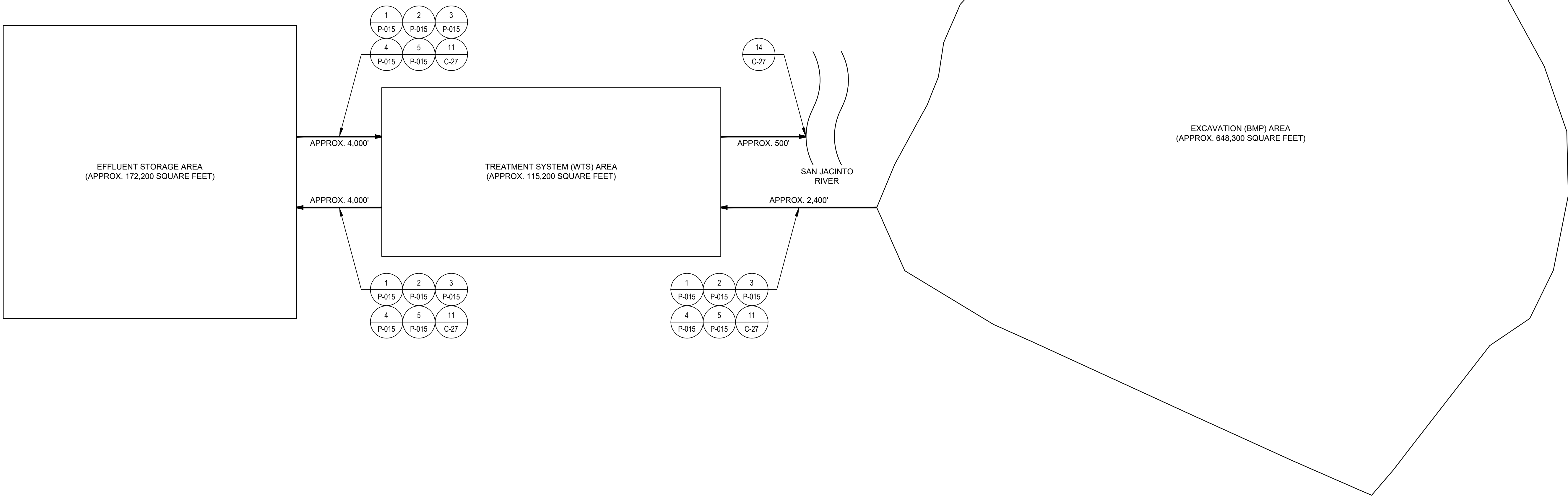
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No.	Issue	Drawn	Approved	Date
Drawn	RH	Designer	NF	
Drafting Check		Design Check	NF	
Project Coordinator	LL	Date	May 22, 2025	
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Original Size		Bar is one inch on original size drawing 0 1"		
Arch D				

Project No. 11215702  
Title

**WATER TREATMENT SYSTEM  
SITE PLAN  
(CONTACT WATER)**

Sheet No.  
**P-012**

Sheet 78 of 83



- NOTES:
- SITE PLANS ARE CONCEPTUAL ONLY AND ARE TO BE FINALIZED BY CONTRACTOR.
  - CONTRACTOR SHALL PROVIDE LEAK DETECTION AT LOW POINT ON ALL PIPELINES (SEE DETAIL 4/P-015).
  - CONTRACTOR SHALL INSTALL BIDIRECTIONAL CLEANOUTS EVERY 500' (MINIMUM) ON ALL PIPELINES.

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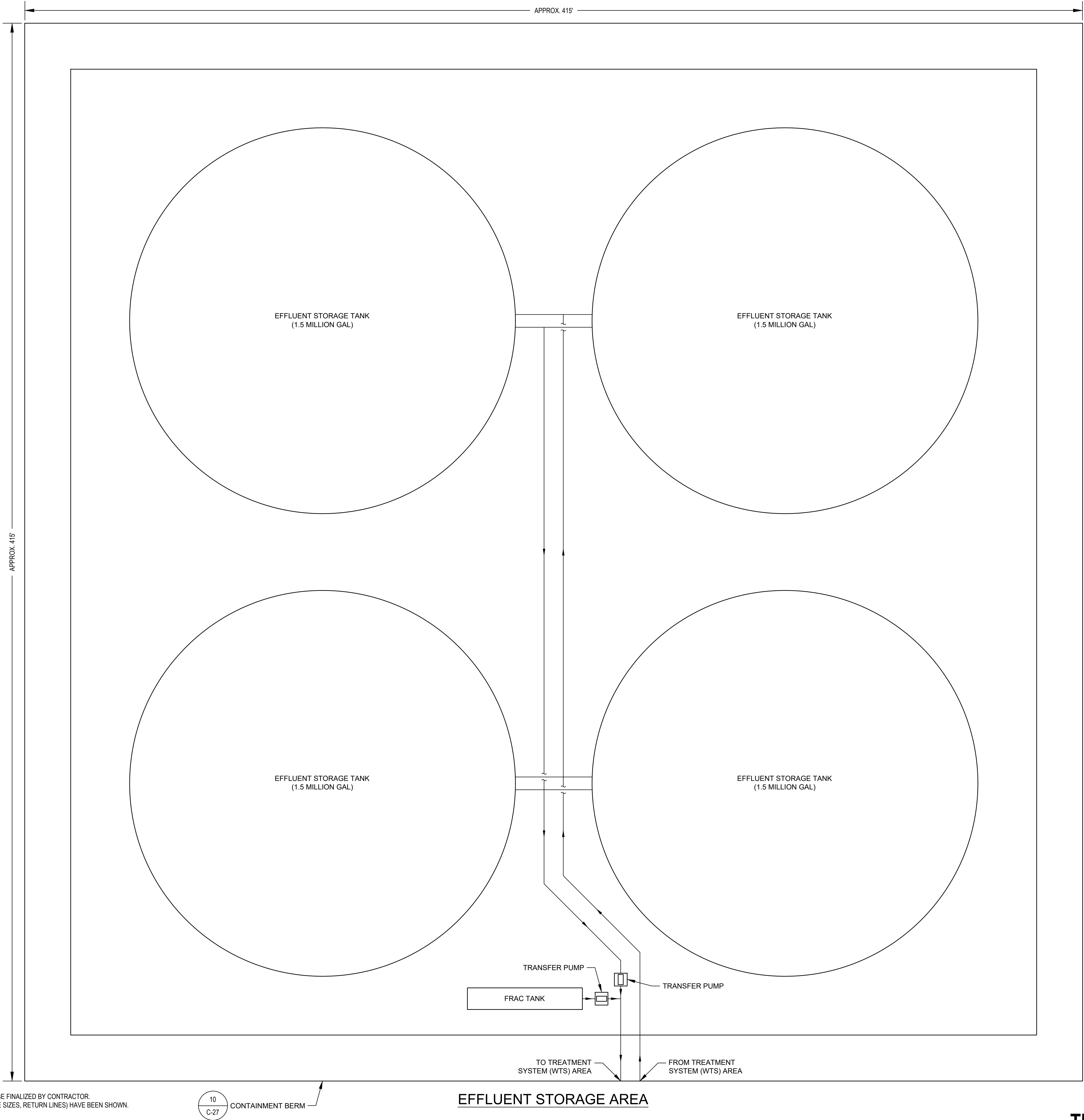
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GHD TEXAS FIRM REGISTRATION NO. 276

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- NOTES:
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WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

4	THIRD 100% EPA SUBMITTAL	RH	NF	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	RH	Designer	NF	
Drafting Check		Design Check	NF	
Project Coordinator	LL	Date	May 22, 2025	
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Original Size		Bar is one inch on original size drawing 0 1"		
Arch D				

Project No. 11215702

Title  
**WATER TREATMENT SYSTEM  
EQUIPMENT LAYOUT  
(CONTACT WATER) (1 OF 2)**

Sheet No.

**P-013**





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Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

4 THIRD 100% EPA SUBMITTAL RH NF 05/23/2025

No.	Issue	Drawn	Approved	Date
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Drawn	RH	Designer	NF
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Drafting Check	Design Check	NF
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Project Coordinator	LL	Date	May 22, 2025
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Original Size	Bar is one inch on original size drawing
Arch D	0 1"

Project No. 11215702

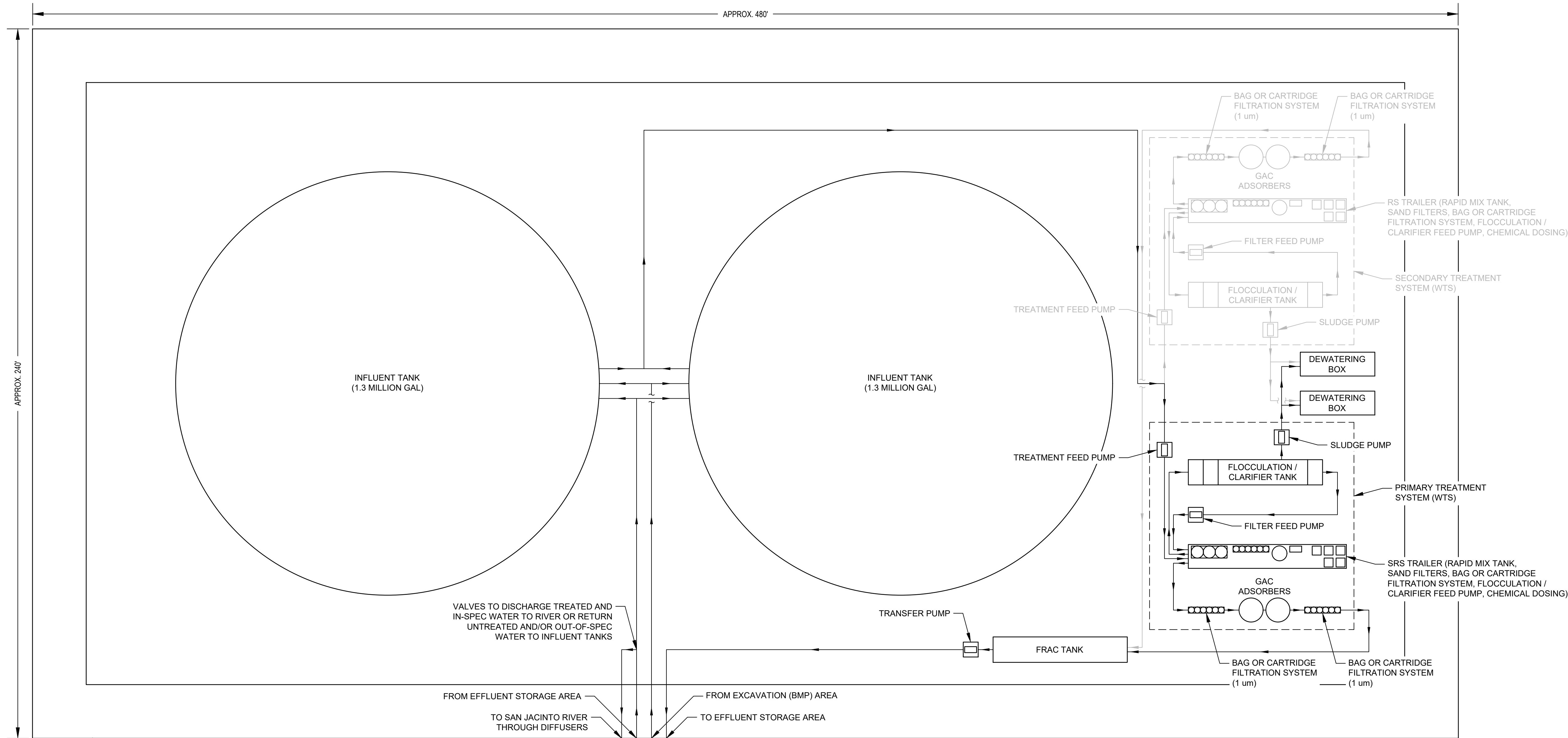
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**WATER TREATMENT SYSTEM  
EQUIPMENT LAYOUT  
(CONTACT WATER) (2 OF 2)**

Sheet No.

**P-014**

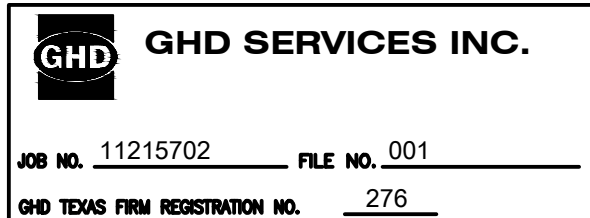
Sheet 80 of 83



**TREATMENT SYSTEM (WTS) AREA**

- NOTES:
- EQUIPMENT LAYOUTS ARE CONCEPTUAL ONLY AND ARE TO BE FINALIZED BY CONTRACTOR.
  - FOR CLARITY NOT ALL SYSTEM ELEMENTS (E.G. VALVES, PIPE SIZES, RETURN LINES) HAVE BEEN SHOWN.

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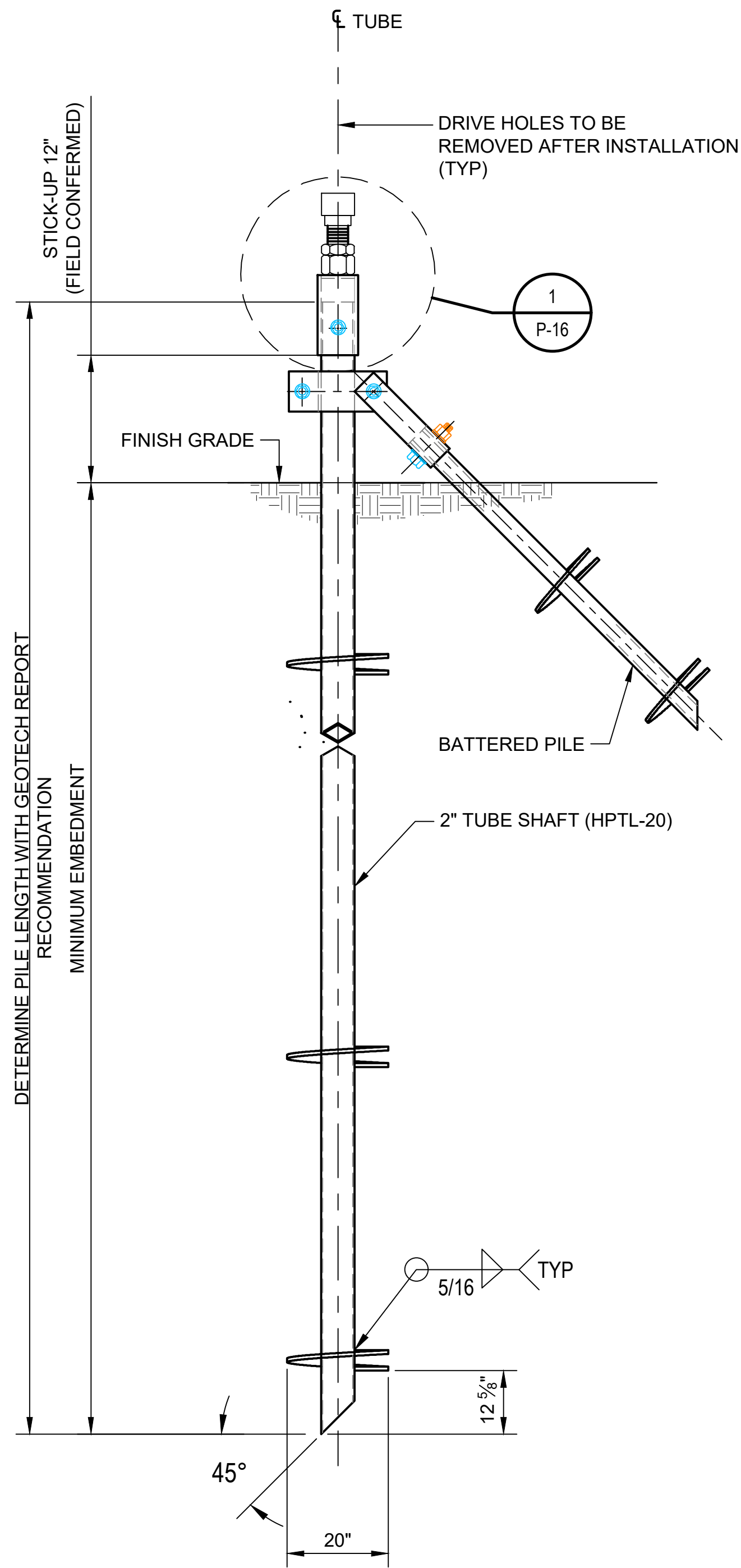


**THIRD 100% EPA SUBMITTAL**

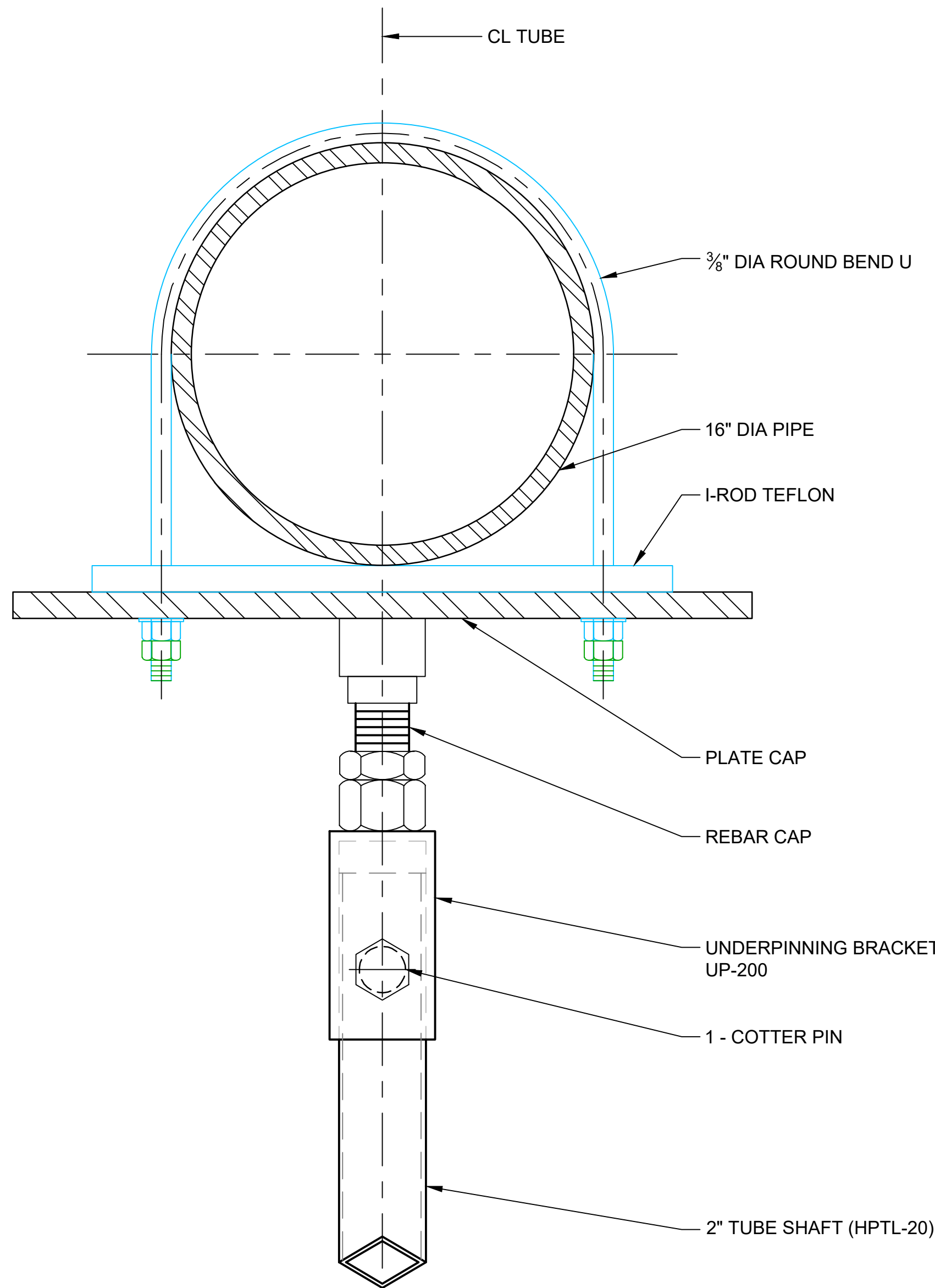








DETAIL A HELICAL COMPOSITE PILE HPTL-20  
SCALE: NTS



DETAIL 1 PIPE SUPPORT BRAKET FOR 16" PIPE  
SCALE: NTS

NOTES:

- CONTRACTOR TO SUB-CONTRACT GEOTECH ENGINEER LICENSE IN THE STATE OF TEXAS FOR THE DESIGN OF PIPE SUPPORTS.
- DESIGN CRITERIA  
BASIC WIND SPEED, V: 143 mph  
WIND EXPOSURE: C  
  
PIPE WEIGHT: 135 bl/ft (ASSUMING 16" STEEL SCH 40 SHELL / 12" HDPE SDR 7)
- USE BATTERED PILE AT EACH END OF THE PIPE RUN WITH A MAXIMUM OF 100 FT SPACING FOR BATTERED PILES.
- HARDWARE TO BE HELI-PILE OR APROVED EQUAL.

CONTACT:  
HELI-PILE  
A: 5135 WARD ROAD  
WHEATRIDGE, CO 80033  
P: 303-423-0591  
W: <https://helipile.com>



GHD  
2237 S Acadian Thruway Suite 701  
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Client  
**SAN JACINTO RIVER  
WASTE PITS**  
  
Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

6	THIRD 100% EPA SUBMITTAL	AL	SC	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	AL	Designer	TN	
Drafting Check		Design Check		
Project Coordinator	CM	Date	May 22, 2025	
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Original Size		Bar is one inch on original size drawing 0 1"		
Arch D				

Project No. 11215702

Title

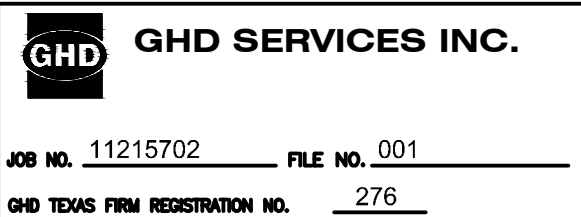
**HELICAL PILE  
DETAILS**

Sheet No.

**P-016**

Sheet 82 of 83

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**THIRD 100% EPA SUBMITTAL**



PUMP SCHEDULE											
PUMP NO.	SERVICE	CAPACITY		ELECTRICITY				MANUFACTUREER	POTENTIAL VENDOR	MODEL	REMARKS
		FLOW (GPM)	HEAD (FT)	KW	HP	VOLTS	PHASE				
P-3001	FILTER FEED (NON-CONTACT WATER)	4,000							TREATMENT VENDOR		
P-3002A	EXCAVATION (BMP) AREA DEWATERING TO INFLUENT TANK	2,000	90						RAIN FOR RENT	DV-200C	
P-3002B	EXCAVATION (BMP) AREA DEWATERING TO INFLUENT TANK	2,000	90						RAIN FOR RENT	DV-200C	
P-6001	TREATMENT FEED	300							TREATMENT VENDOR		
P-6002	EFFLUENT STORAGE AREA FRAC TANK TO INFLUENT TANKS	600	208						RAIN FOR RENT	HH-125C	
P-6003	EFFLUENT STORAGE AREA SUMP TO EFFLUENT STORAGE AREA FRAC TANK	200	9						RAIN FOR RENT	DV-80M	
P-6004	TREATMENT SYSTEM (WTS) AREA SUMP TO INFLUENT TANK	200	24						RAIN FOR RENT	DV-80M	
P-6005	EXCAVATION (BMP) AREA DEWATERING TO INFLUENT TANK	2,000	90						RAIN FOR RENT	DV-200C	
P-7001	FLOCCULATION / CLARIFIER FEED	300							TREATMENT VENDOR		
P-7002	FILTER FEED (CONTACT WATER)	300							TREATMENT VENDOR		
P-7003	CLARIFIER SLUDGE								TREATMENT VENDOR		
P-8001	TREATMENT SYSTEM (WTS) AREA FRAC TANK TO EFFLUENT STORAGE TANKS	1,000	140						RAIN FOR RENT	DV-150I	
P-8002	EFFLUENT STORAGE TANKS TO DIFFUSER OR INFLUENT TANKS	1,000	64						RAIN FOR RENT	DV-200C	



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Client  
**SAN JACINTO RIVER WASTE PITS**

Project  
**NORTHERN IMPOUNDMENT  
THIRD FINAL 100% REMEDIAL DESIGN  
HARRIS COUNTY, TEXAS**

4	THIRD 100% EPA SUBMITTAL	EAW	NF	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	EAW	Designer	WSK	
Drafting Check		Design Check	WSK	
Project Coordinator	CM	Date	May 22, 2025	
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Arch D				

Project No. 11215702


Title

MECHANICAL SCHEDULE

Sheet No.

P-017

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**GHD SERVICES INC.**

JOB NO. 11215702FILE NO. 001

GHD TEXAS FIRM REGISTRATION NO. 276

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