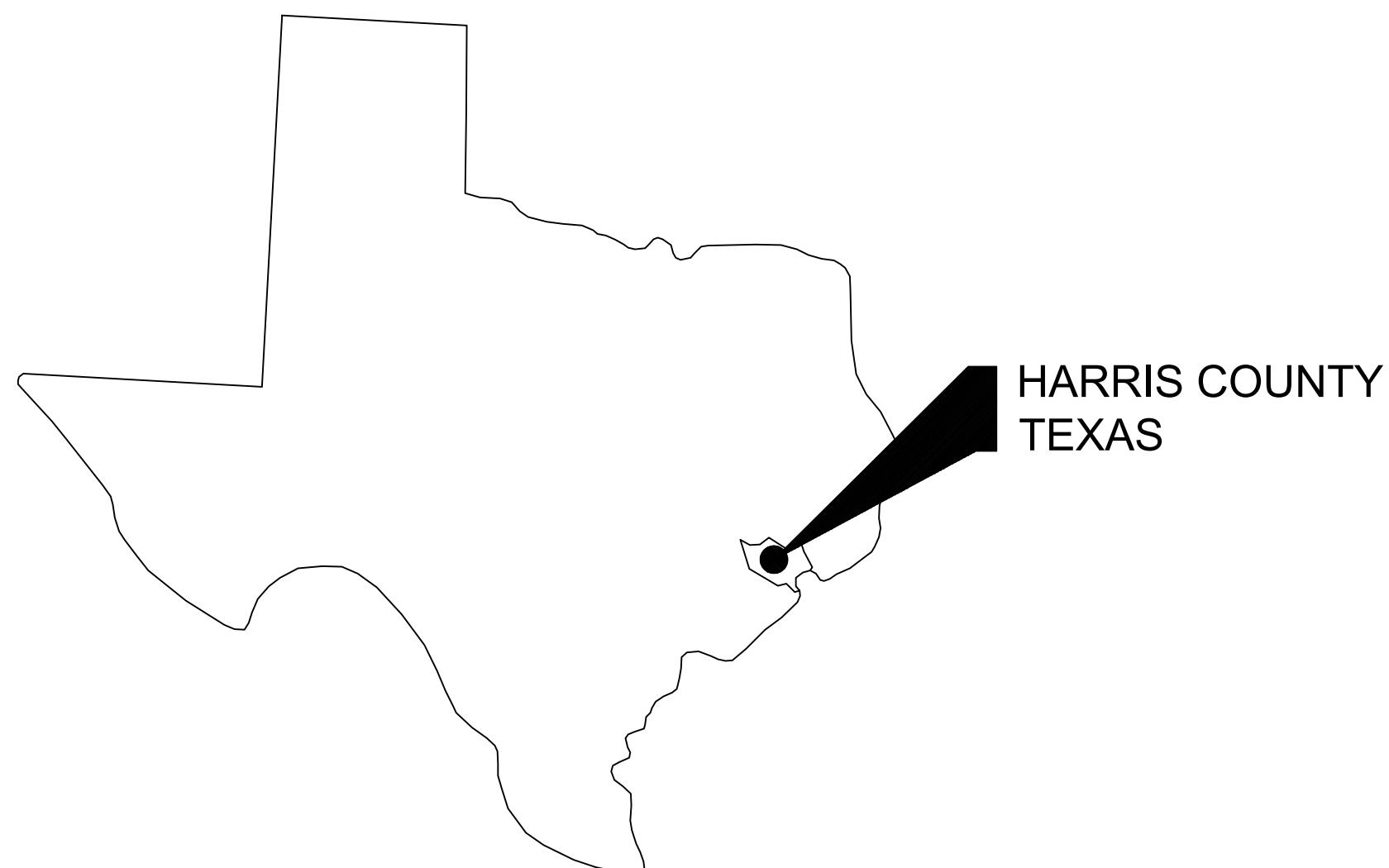


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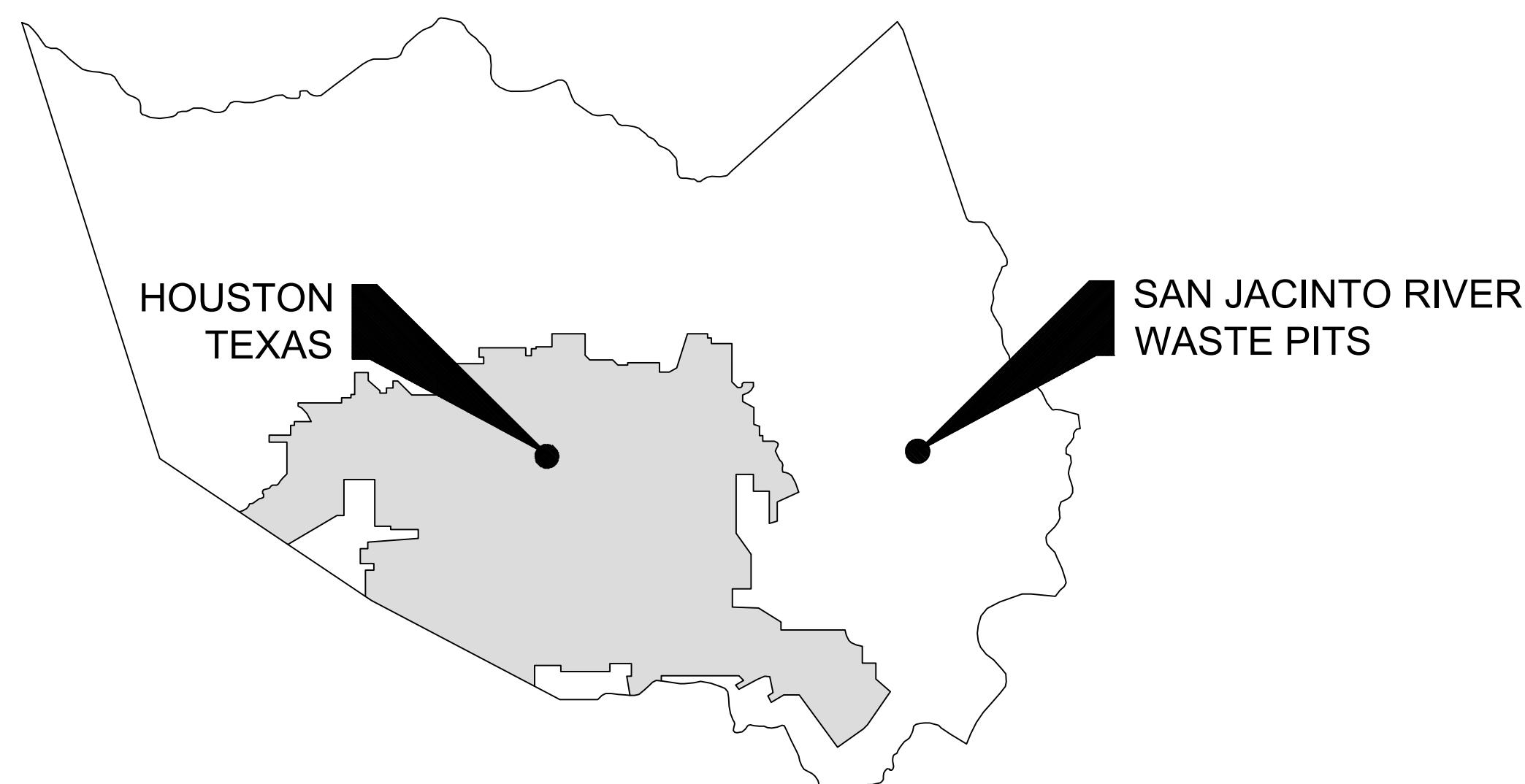
Design Drawing Package

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

MAY 2025
11215702



STATE OF TEXAS VICINITY MAP



HARRIS COUNTY VICINITY MAP



IMAGE - © 2020 Microsoft Corporation © 2020 Digital Globe © CNES (2020) Distribution Airbus DS

LOCATION MAP



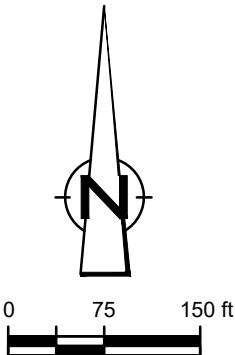
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W. Beal 5/23/25
N. Fogel 5-23-2025
S. Chilka 05/23/2025



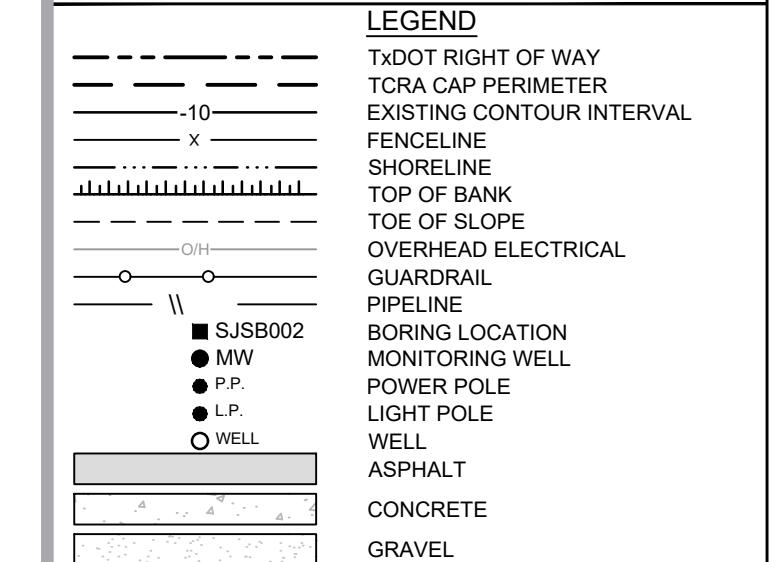
S. Chilka 05/23/2025



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Client
**SAN JACINTO RIVER
WASTE PITS**

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

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

No. Issue Drawn Approved Date

Drawn JC Designer RI

Drafting 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

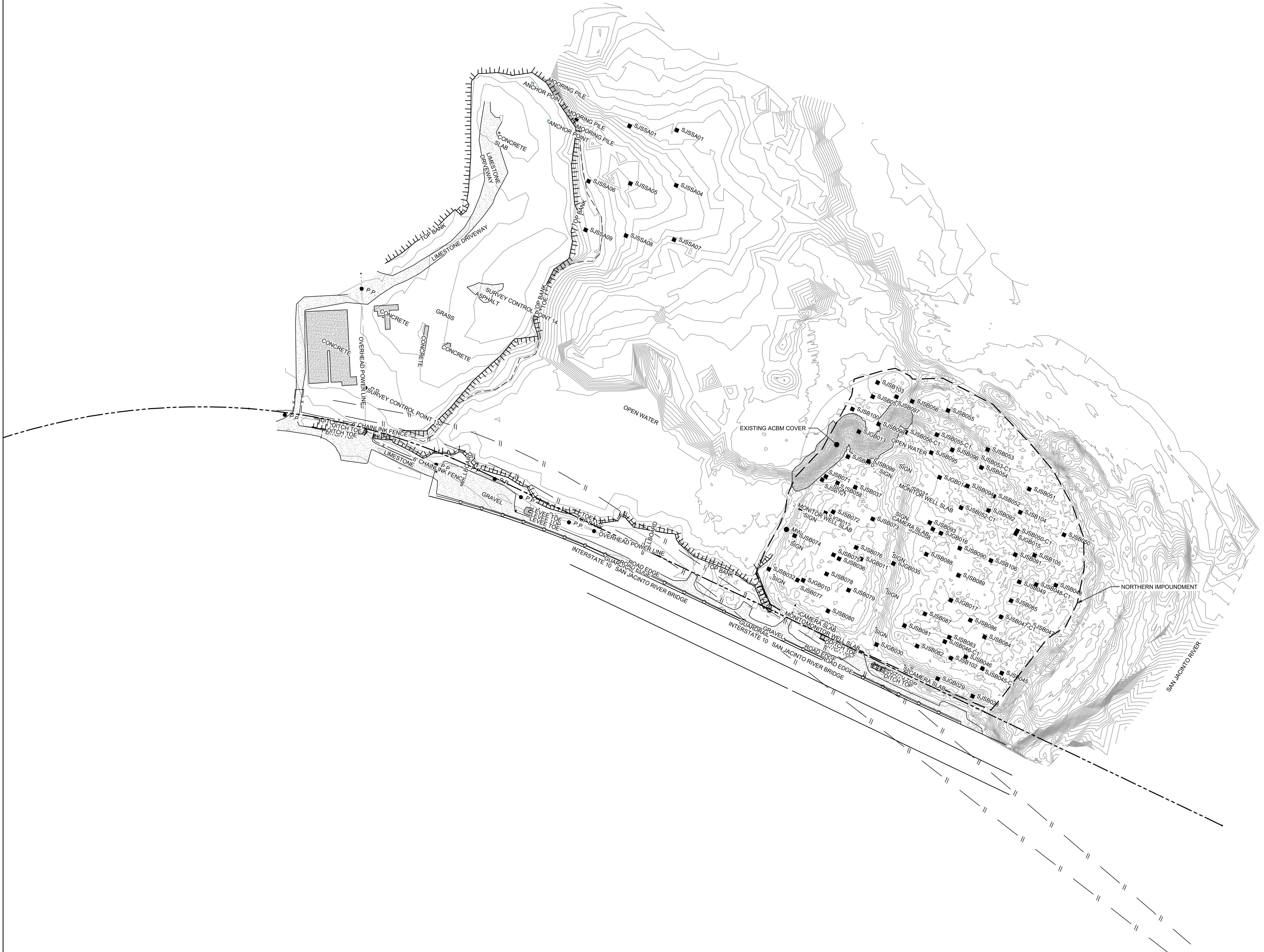
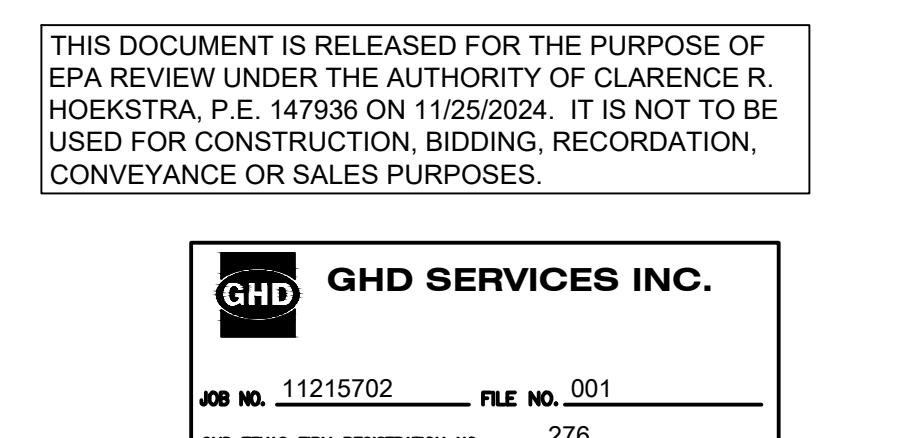
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**OVERALL
PLAN**

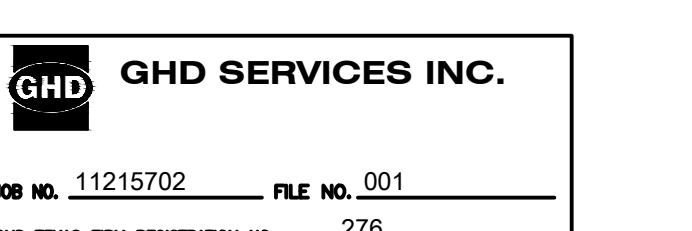
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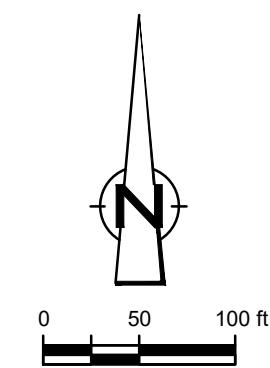


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LEGEND	
	TXDOT RIGHT OF WAY
	TCRA CAP PERIMETER
	EXISTING CONTOUR INTERVAL
	FENCELINE
	SHORELINE
	TOP BANK
	TOE OF SLOPE
	OVERHEAD ELECTRICAL
	GUARDRAIL
	PIPELINE
	BORING LOCATION
	MONITORING WELL
	POWER POLE
	LIGHT POLE
	WELL
	MATERIAL TO BE EXCAVATED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

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 RI

Drafting BS Design Check LL

Project Coordinator CM Date May 22, 2025

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Scale 1" = 100'

Original Size

Arch D Bar is one inch on original size drawing

0 1"

Project No. 11215702

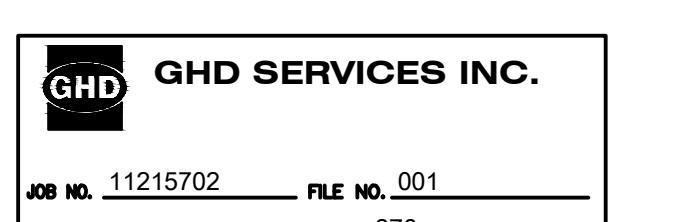
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EXISTING CONDITIONS

Sheet No.

C-02

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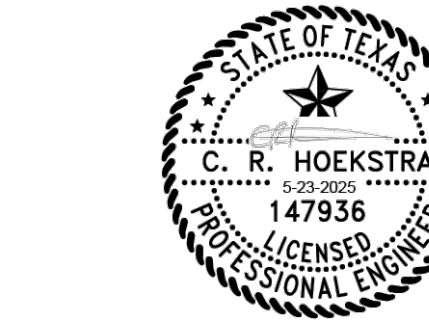


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LEGEND

— DASHED LINE: TXDOT RIGHT OF WAY
— SOLID LINE: TCRA CAP PERIMETER
— DASHED LINE: EXISTING CONTOUR INTERVAL
— FENCE LINE: FENCE LINE
— DASHED LINE: SHORELINE
— SOLID LINE: TOP OF BANK
— DASHED LINE: TOE OF SLOPE
— SOLID LINE: O/H
— O: GUARDRAIL
— PIPELINE: PIPELINE
■ SJSB002: BORING LOCATION
● MW: MONITORING WELL
● P.P.: POWER POLE
● L.P.: LIGHT POLE
○ WELL: WELL
— SOLID LINE: MATERIAL TO BE EXCAVATED
— HATCHED LINE: EXISTING BERM TO BE EXCAVATED
— HATCHED LINE: FOR POTENTIAL TESTING AND REUSE
— HATCHED LINE: EXISTING BERM TO REMAIN
— CONCRETE: CONCRETE
— GRAVEL: GRAVEL
— ASPHALT: ASPHALT
— AZ26-700 PILE: AZ26-700 PILE
— AZ36-700 PILE: AZ36-700 PILE
— AZ42-700 PILE: AZ42-700 PILE
— SOLID LINE: FRP BARRIER WALL
— BROWN: PLANNED IMPROVEMENTS FOR NORTHERN IMPOUNDMENT ACCESS
— SOIL TYPE S1: SOIL TYPE S1
— SOLID LINE: RAISED BENCH
— HATCHED LINE: EXTERIOR SCOUR PROTECTION
— HATCHED LINE: INTERIOR SCOUR PROTECTION

SAN JACINTO RIVER WASTE PITS

Project

NORTHERN IMPOUNDMENT

THIRD FINAL 100% REMEDIAL DESIGN

HARRIS COUNTY, TEXAS

HARRIS COUNTY, TEXAS				
9	THIRD 100% EPA SUBMITTAL	JC	CRH	05/23/2025

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 LT. HARRELL SURVEY, A 220 HARRIS COUNTY, TEXAS, CORPSEND LEX

IN THE J. T. HARRELL SURVEY, A-330 HARRIS COUNTY, TEXAS, COBBFENDLEY,
2402-028-01, JUNE 28, 2024

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HOEKSTRA, P.E. 147937, WILLIAM ALLEN BEAL, P.E.
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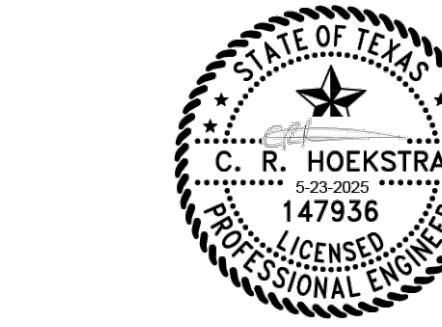
THIRD 100% FPA SUBMITTAL

Sheet No _____

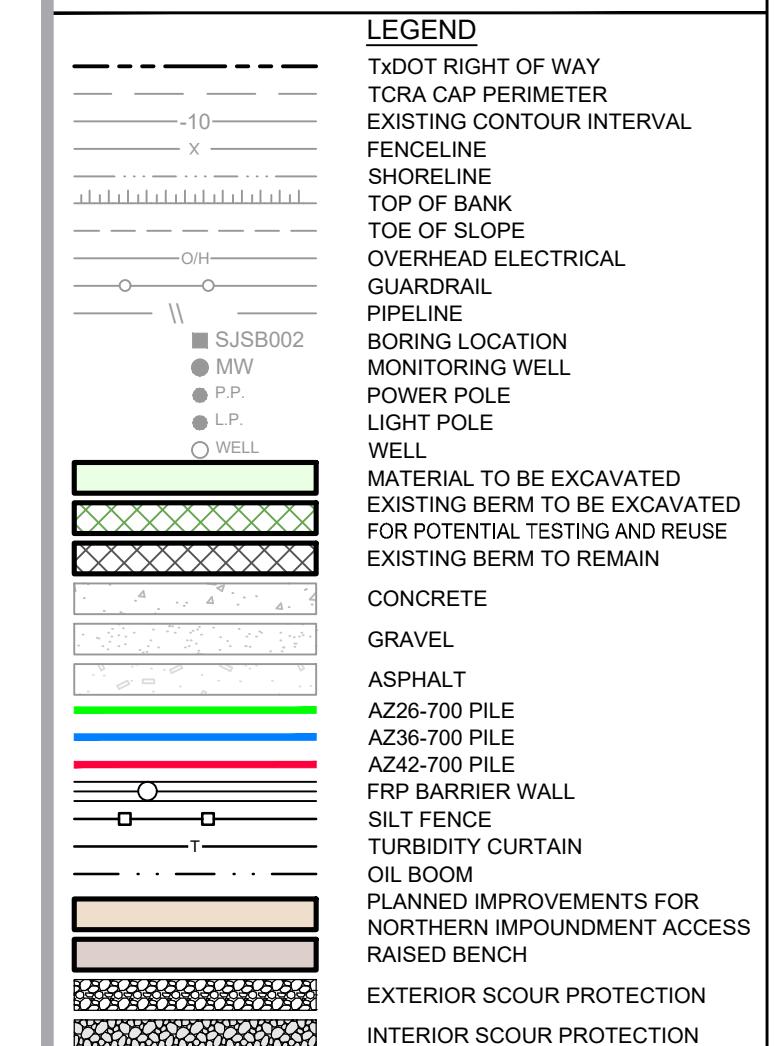
C-03



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Client
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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 Check	BS	Design Check	LL
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Project Coordinator	CM	Date	May 23, 2025
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Scale **1" = 100'**

Original Size	Bar is one inch on original size drawing
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Arch D	0
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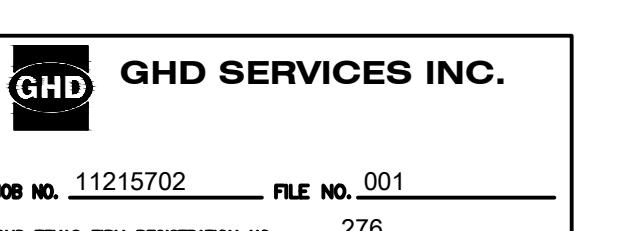
Project No.	11215702
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Title	SOIL EROSION AND SEDIMENT CONTROL PLAN OVERALL
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Sheet No.	
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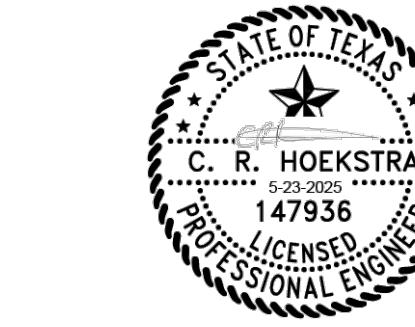
C-04

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—	TCRA CAP PERIMETER
—	EXISTING CONTOUR INTERVAL
—	FENCELINE
—	SHORELINE
—	TOE 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	CONCRETE
GRAVEL	GRAVEL
ASPHALT	ASPHALT
—	AZ26-700 PILE
—	AZ42-700 PILE
—	AZ42-700 PILE
—	FRP BARRIER WALL
—	SILT FENCE
—	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

Drafting BS Design LL

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Project No. 11215702

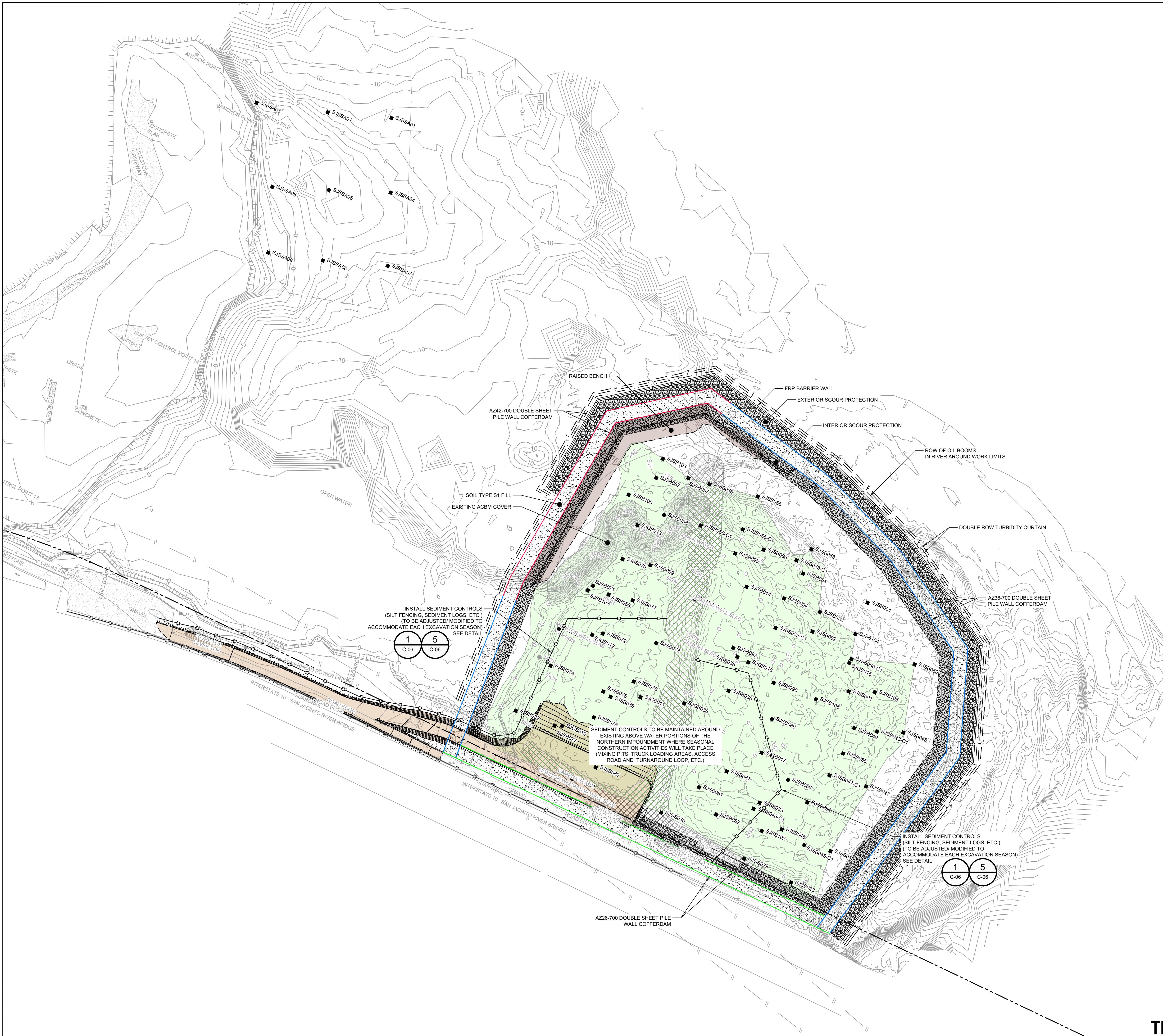
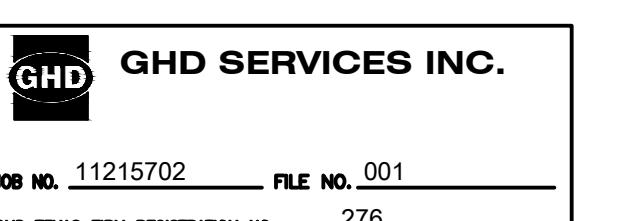
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**SOIL EROSION AND
SEDIMENT CONTROL PLAN
SEASONAL**

Sheet No.

C-05

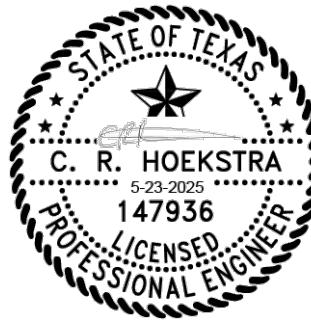
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WASTE PITS**

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 Arch D Bar is one inch on original size drawing

0 1" 1"

Project No. 11215702

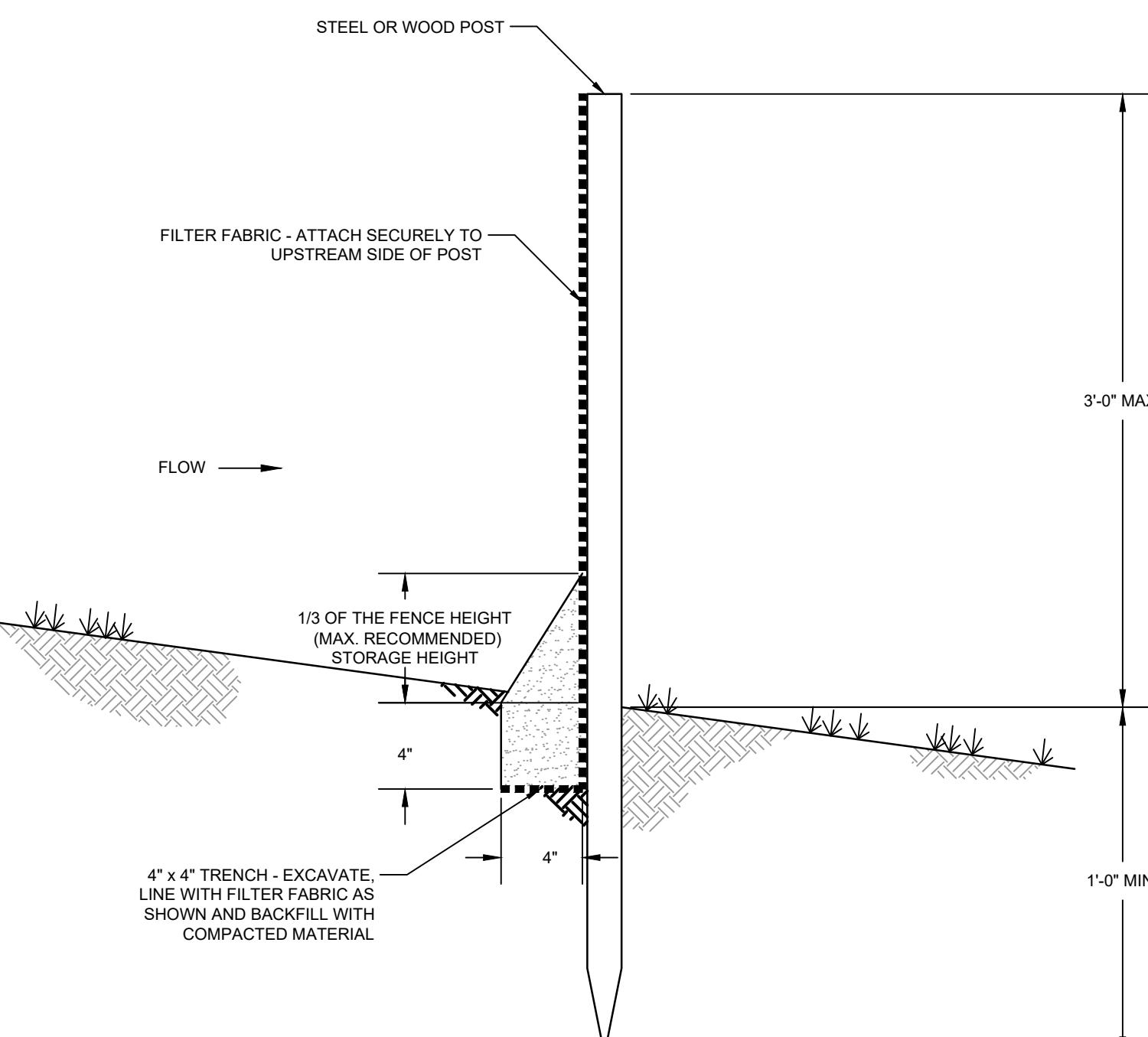
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**SOIL EROSION AND
SEDIMENT CONTROL DETAILS**

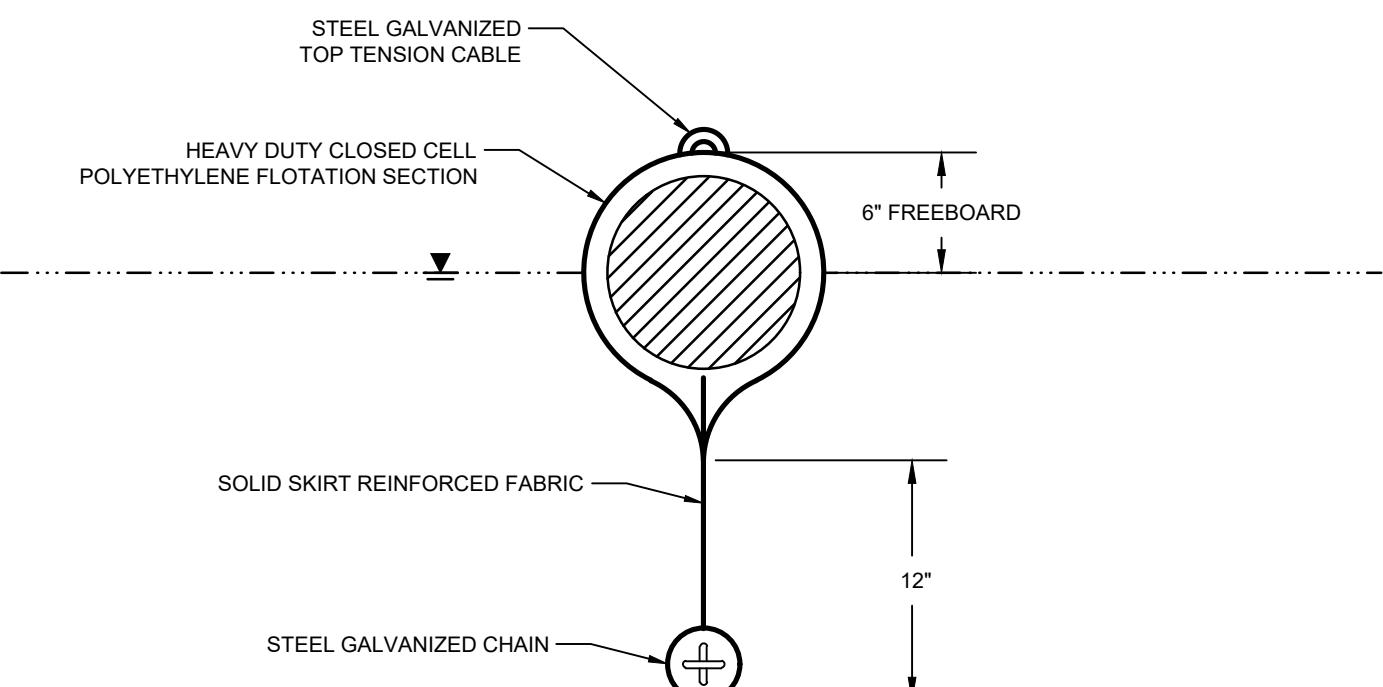
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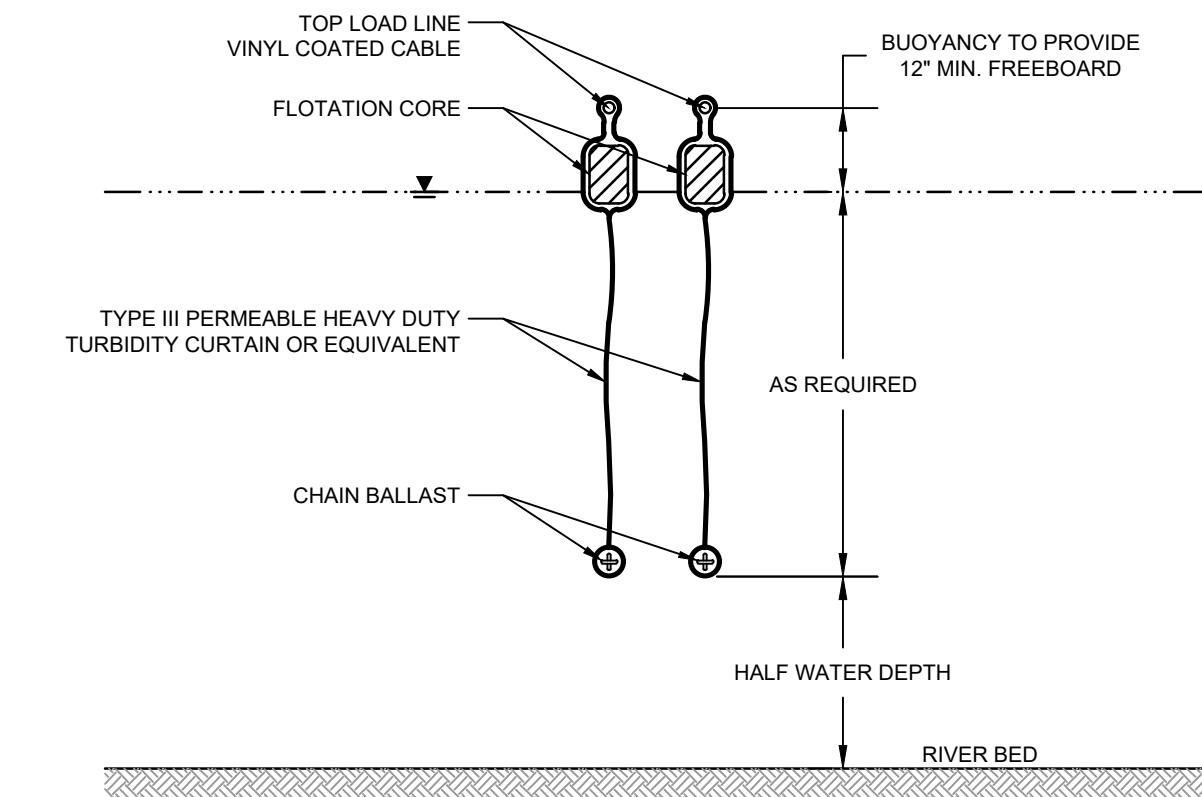
THIRD 100% EPA SUBMITTAL



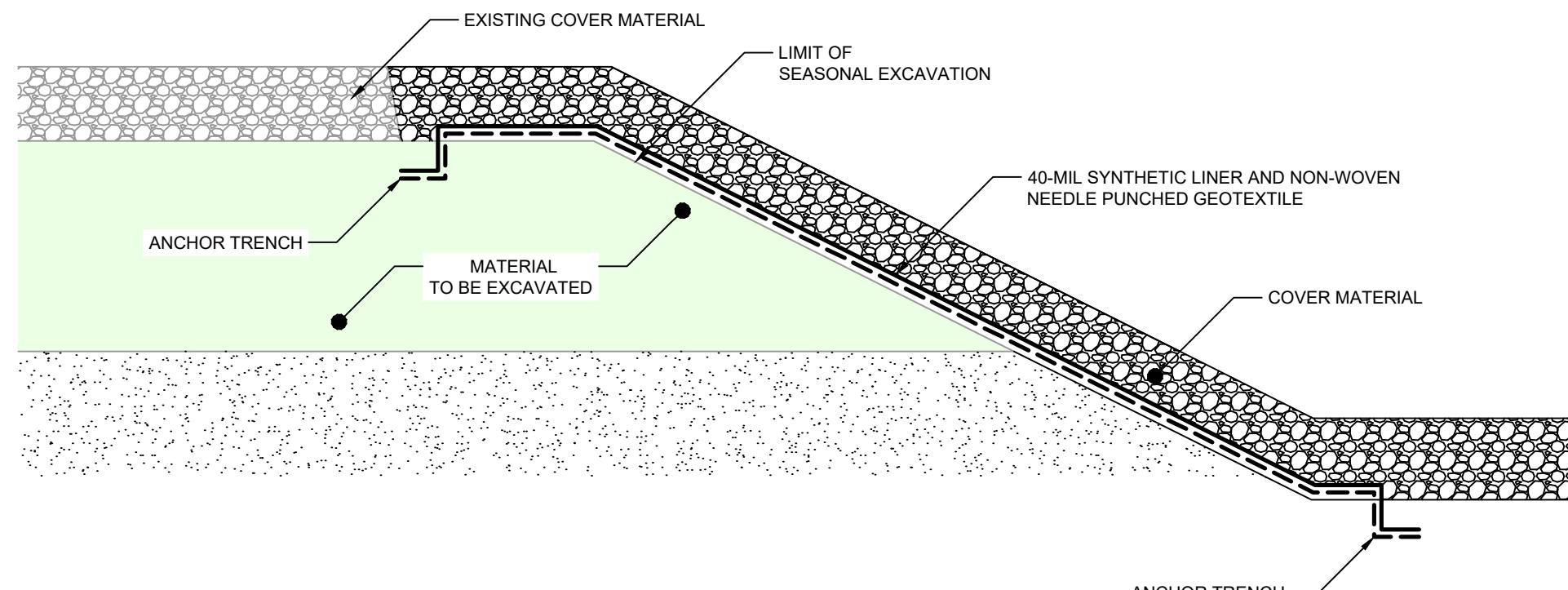
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N.T.S. C-05



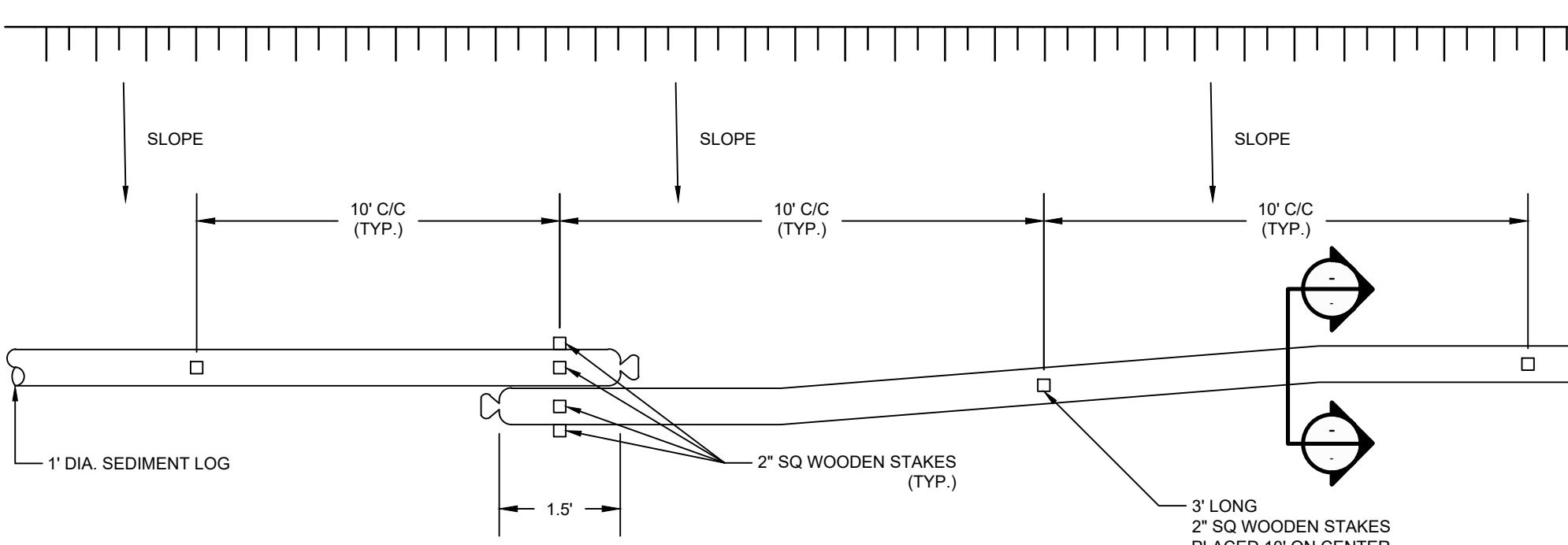
DETAIL 2 NON-ABSORBENT OIL BOOM
N.T.S. C-04



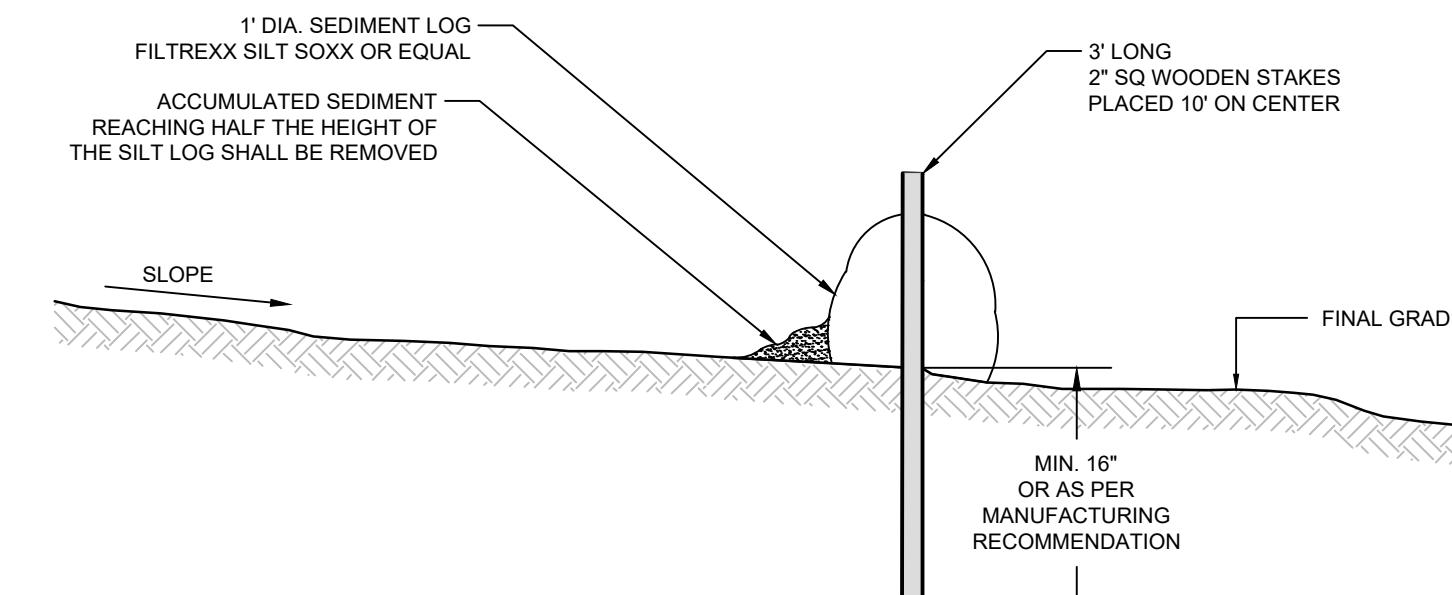
DETAIL 3 TURBIDITY CURTAINS
N.T.S. C-04



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



PLAN



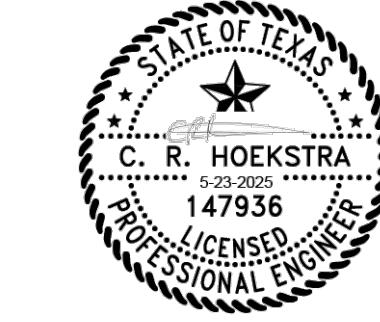
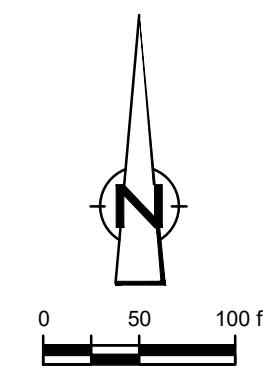
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DETAIL 5 SEDIMENT LOG
N.T.S. C-05



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—	TCRA CAP PERIMETER
—	EXISTING CONTOUR INTERVAL
—	FENCELINE
—	SHORELINE
—	TOP 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	CONCRETE
GRAVEL	GRAVEL
ASPHALT	ASPHALT
—	A228-700 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 RI

Drafting BS Design LL

Check 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

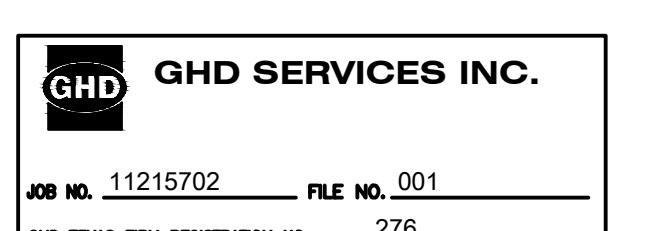
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**PROJECT TRAFFIC
CONTROL PLAN**

Sheet No.

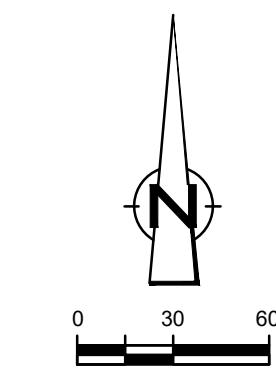
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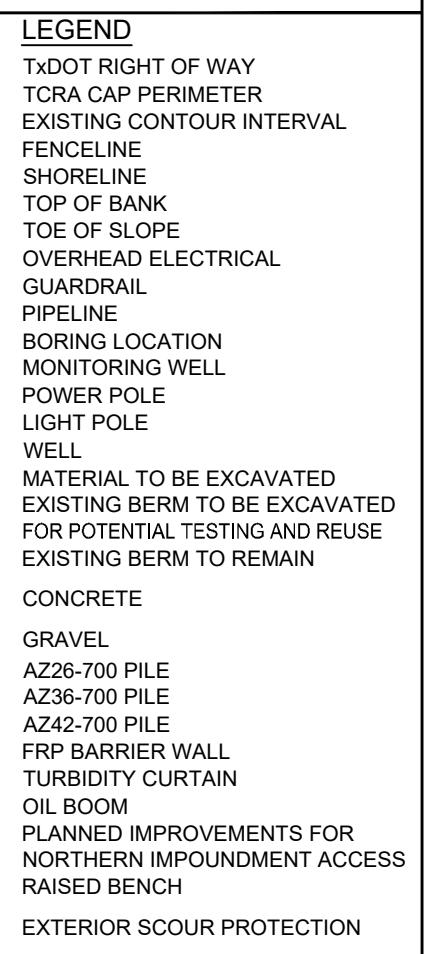




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SAN JACINTO RIVER WASTE PITS

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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Drawn JC Designer RI

Drafting Check BS Design Check LL

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

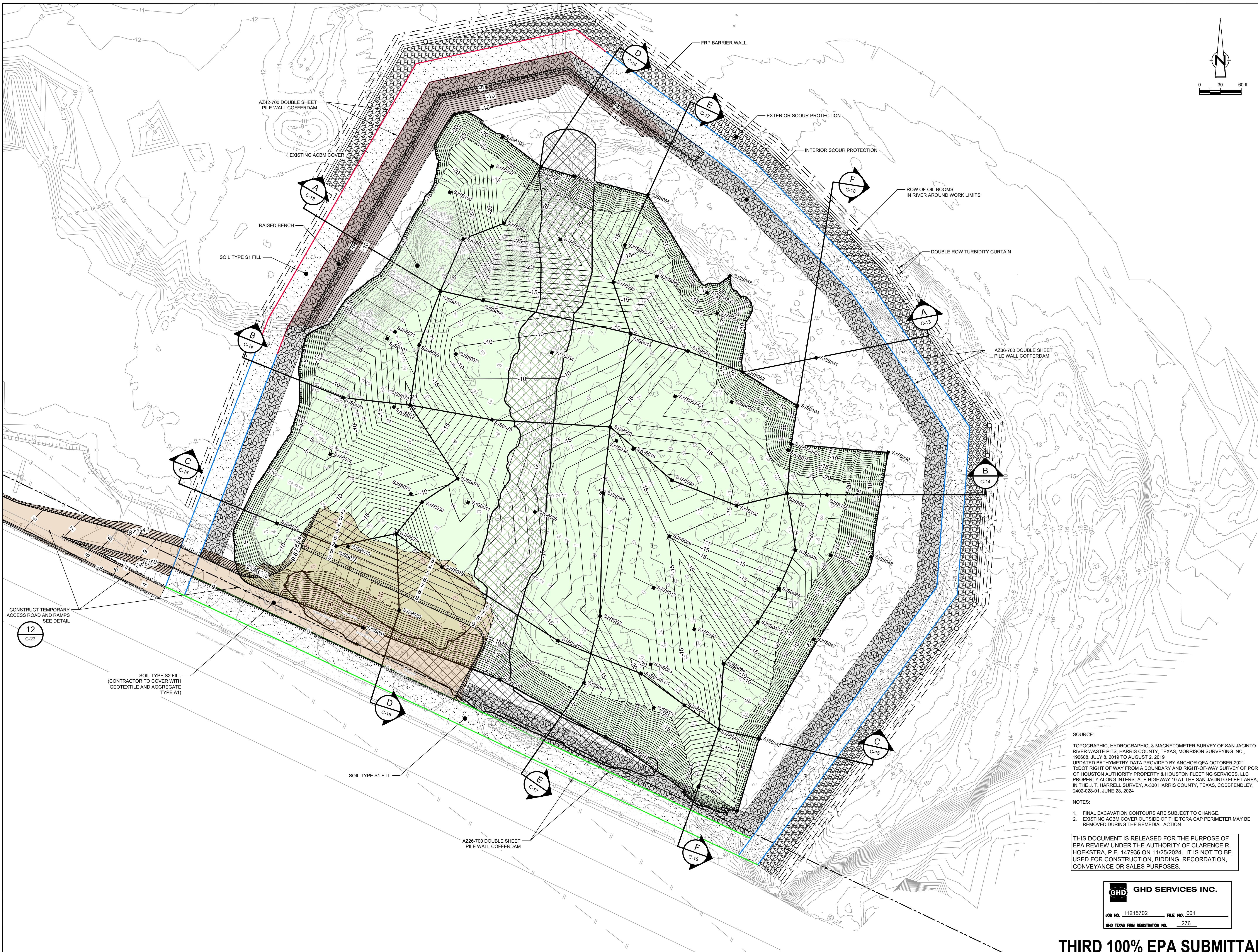
EXCAVATION PLAN OVERALL

Sheet No.

C-08

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Sheet 9 of 83





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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
- CONCRETE
- GRAVEL
- A236-700 PILE
- A242-700 PILE
- FRP BARRIER WALL
- TURBIDITY CURTAIN
- OIL BOOM
- RAISED BENCH
- EXTERIOR SCOUR PROTECTION
- INTERIOR SCOUR PROTECTION

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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Check	CM	Date	May 23, 2025
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Project	Coordinator	Scale	1" = 20'
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Arch D	Original Size	Bar is one inch on	original size drawing
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Project No.	11215702		
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Title			
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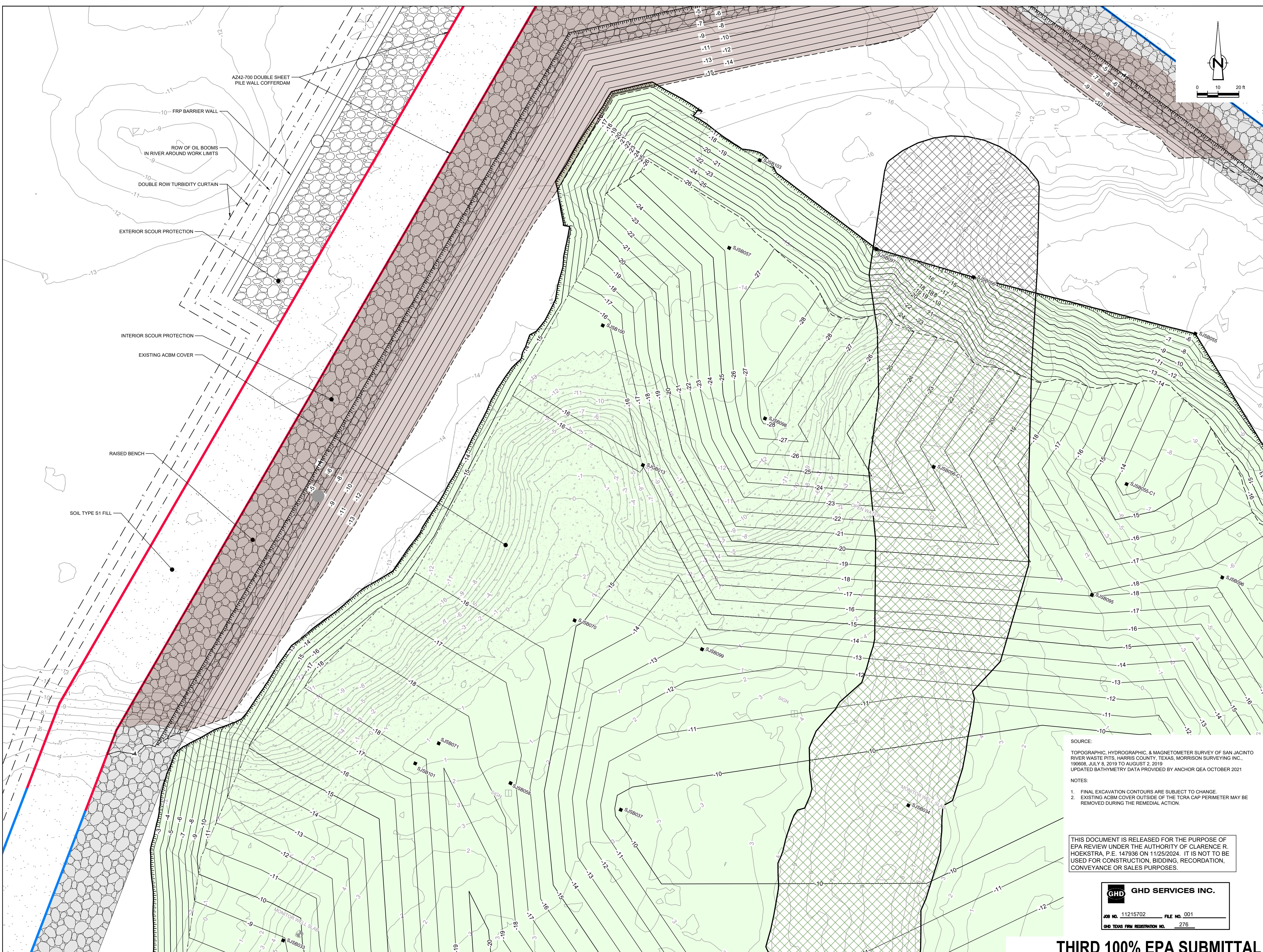
EXCAVATION PLAN NORTHWEST

Sheet No.	
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C-09

THIRD 100% EPA SUBMITTAL

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





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LEGEND
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— TCRA CAP PERIMETER
— EXISTING CONTOUR INTERVAL
— FENCELINE
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— 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
— A236-700 PILE
— A242-700 PILE
— FRP BARRIER WALL
— TURBIDITY CURTAIN
— OIL BOOM
— EXTERIOR SCOUR PROTECTION
— AZ36-700 DOUBLE SHEET PILE WALL COFFERDAM
— 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 22, 2025

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Project No. 11215702

Title

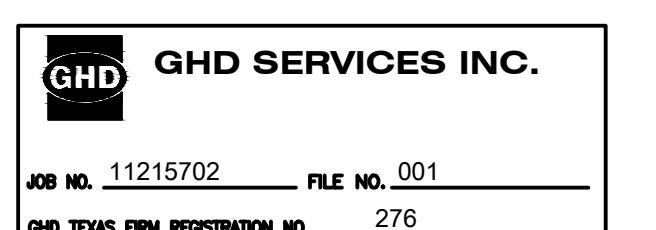
**EXCAVATION PLAN
NORTHEAST**

Sheet No.

C-10

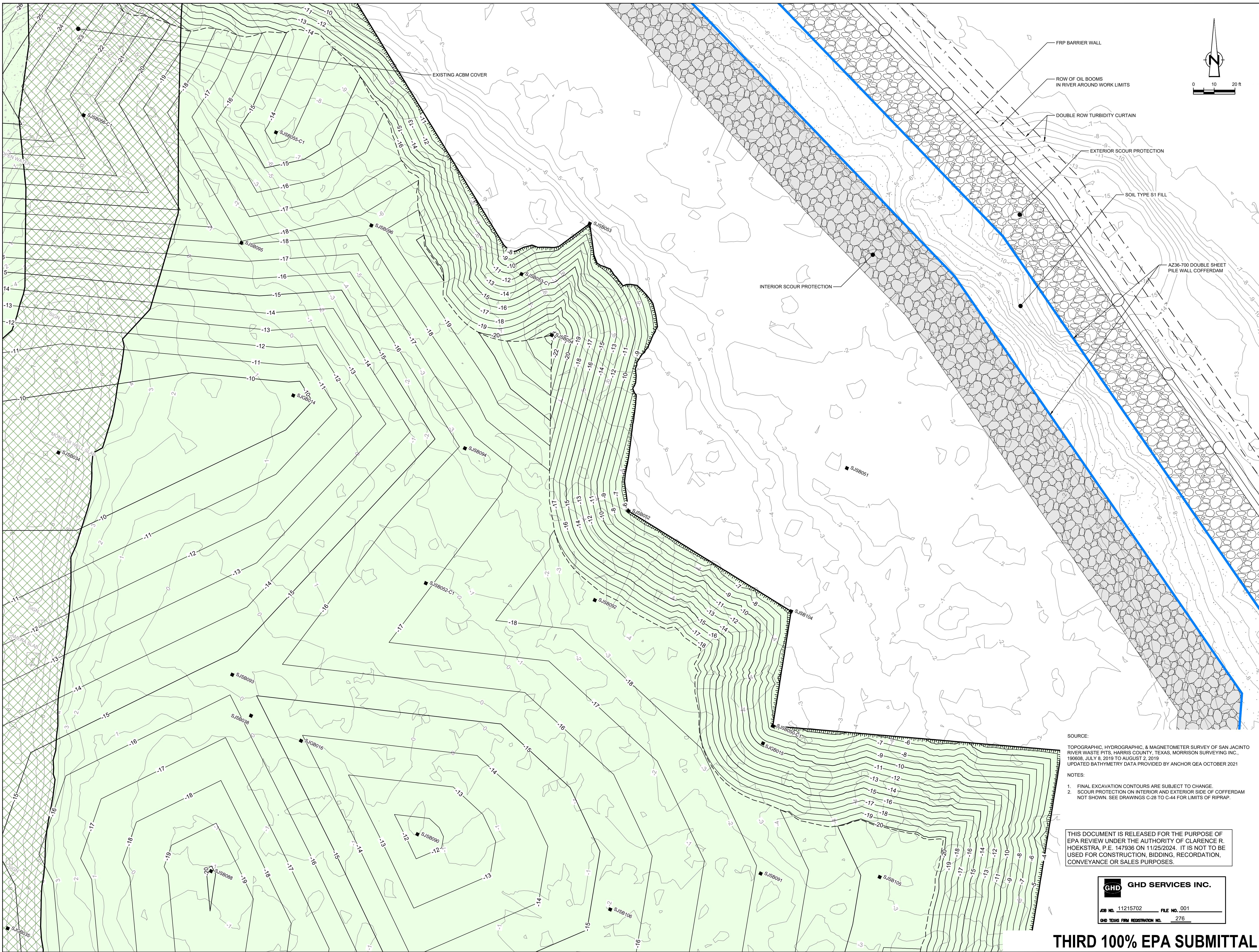
THIRD 100% EPA SUBMITTAL

Sheet 11 of 83



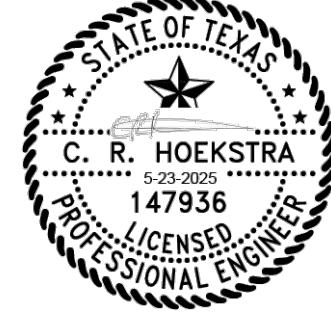
JOB NO. 11215702 FILE NO. 001

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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
— GRAVEL
— A226-700 PILE
— A236-700 PILE
— A242-700 PILE
— FRP BARRIER WALL
— TURBIDITY CURTAIN
— OIL BOOM
— EXTERIOR SCOUR PROTECTION
— INTERIOR SCOUR PROTECTION

SAN JACINTO RIVER WASTE PITS

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

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Drafting Check BS Design Check LL

Project Coordinator CM Date May 22, 2025

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Title

EXCAVATION PLAN SOUTHEAST

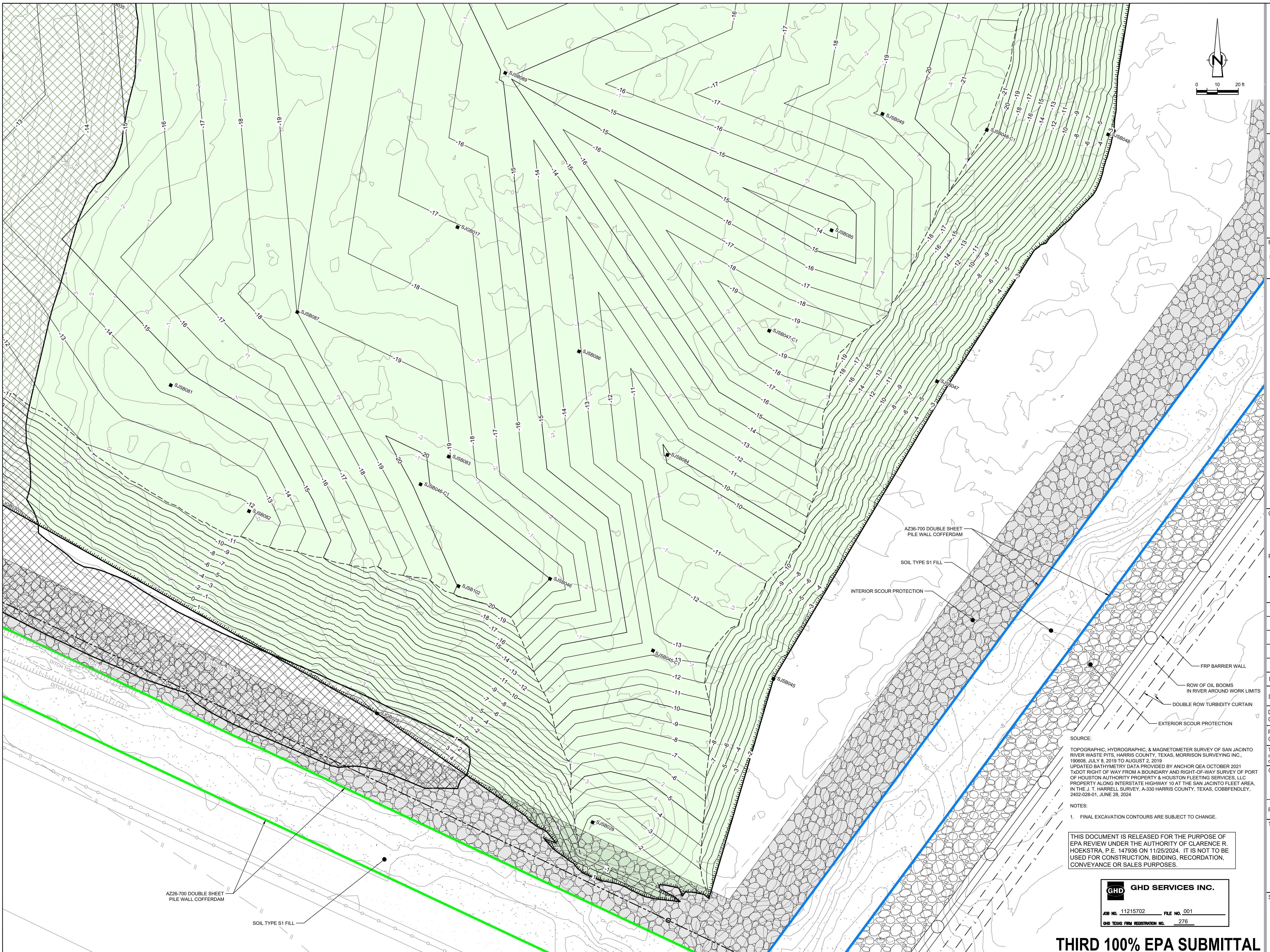
Sheet No.

C-11

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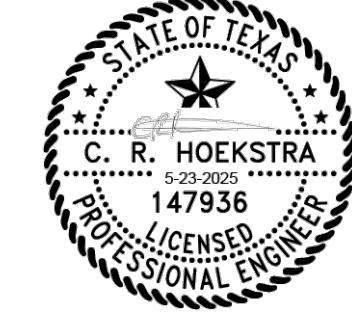


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LEGEND
— TXDOT RIGHT OF WAY
— TCR CAP PERIMETER
— EXISTING CONTOUR INTERVAL
— FENCELINE
— SHORELINE
— TOP BANK
— TOE OF SLOPE
— OVERHEAD ELECTRICAL
— GUARDRAIL
— PIPELINE
— BORING LOCATION
— MONITORING WELL
— POWER POLE
— LIGHT POLE
— WELL
— MATERIAL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

SAN JACINTO RIVER WASTE PITS

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

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0 1"

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Title

EXCAVATION PLAN SOUTHWEST

Sheet No.

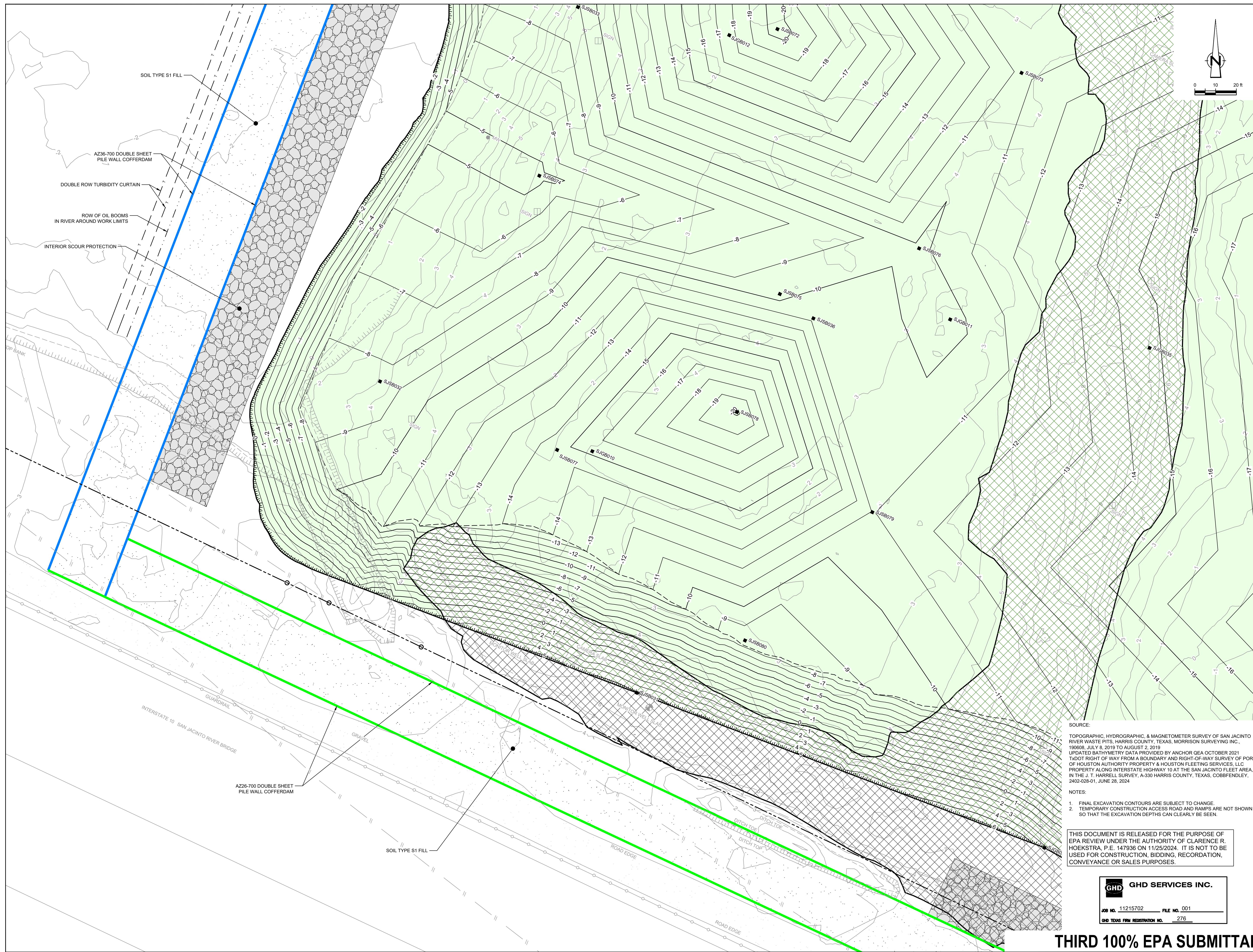
C-12

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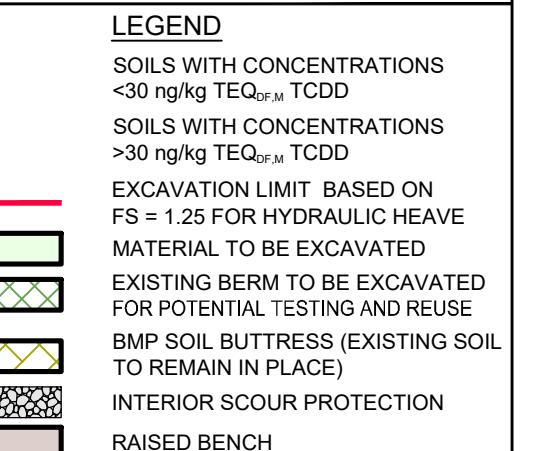




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Project No. 11215702

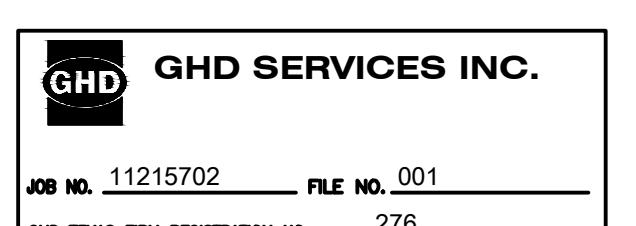
Title

**EXCAVATION SECTION
1 OF 6**

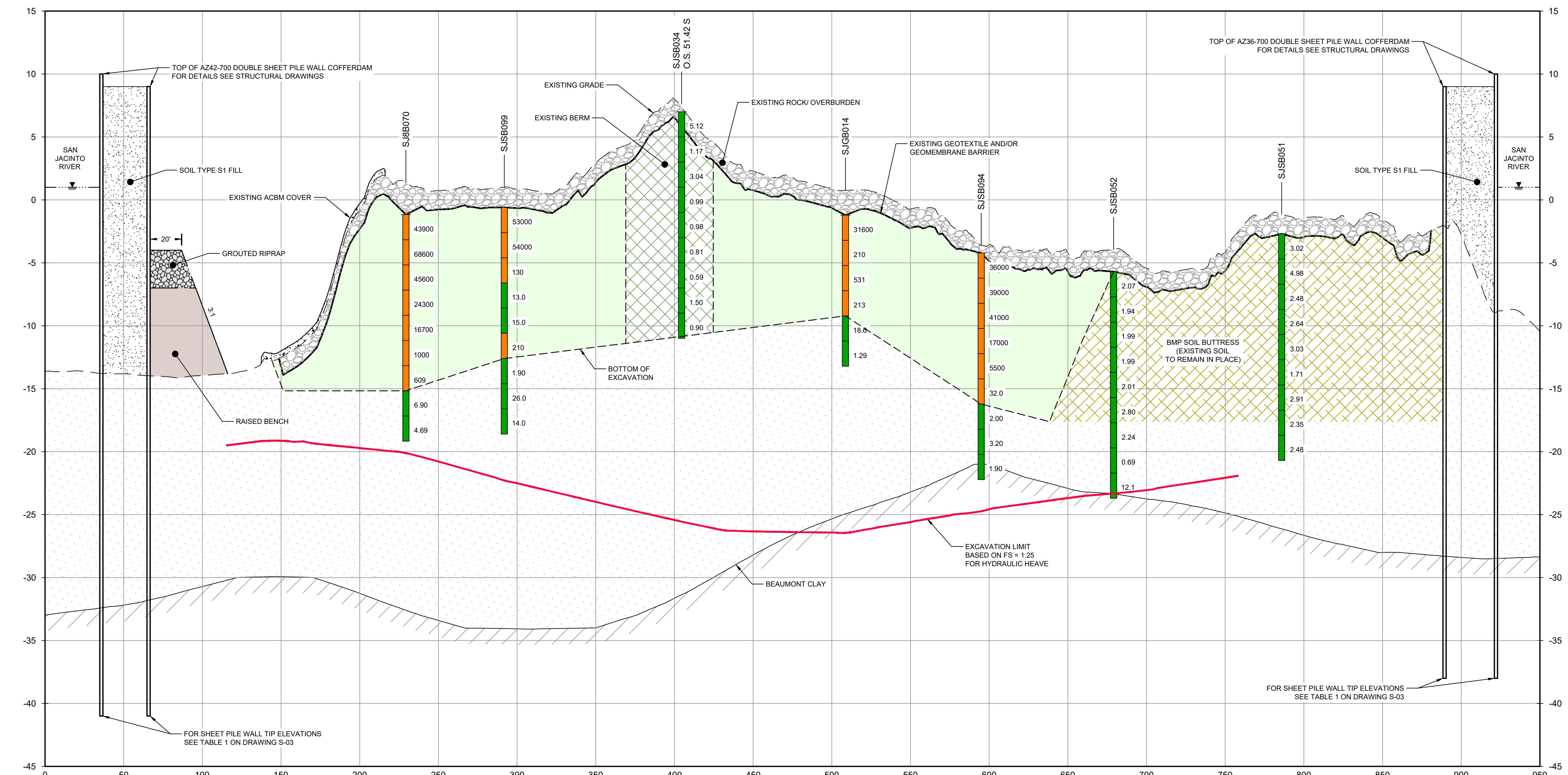
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LEGEND
█ SOILS WITH CONCENTRATIONS <30 mg/kg TEQ₉₀ TCDD
█ SOILS WITH CONCENTRATIONS >30 mg/kg TEQ₉₀ TCDD
— EXCAVATION LIMIT BASED ON FS = 1.25 FOR HYDRAULIC HEAVE
█ MATERIAL TO BE EXCAVATED
█ EXISTING BERM TO BE EXCAVATED
█ FOR POTENTIAL TESTING AND 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

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Drawn JC Designer RH

Drafting BS Design Check LL

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0 1"

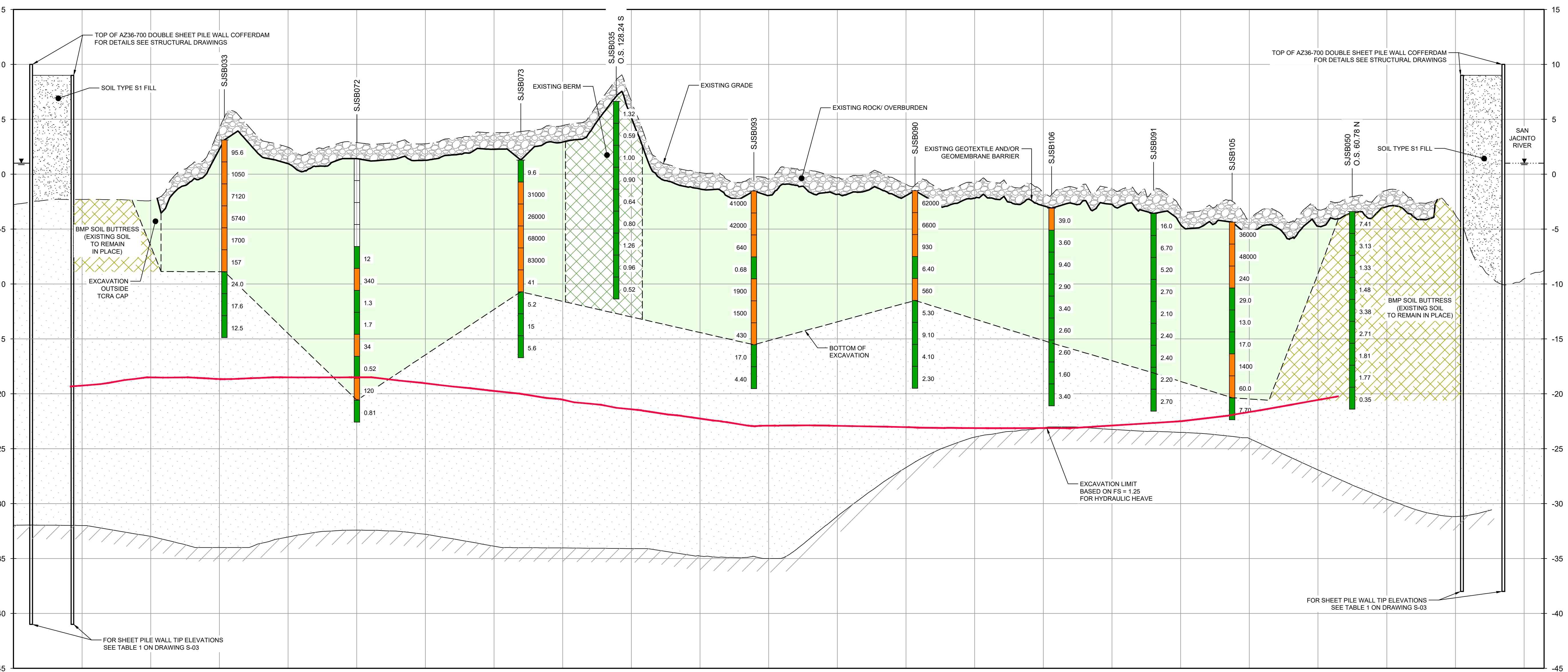
Project No. 11215702

Title

**EXCAVATION SECTION
2 OF 6**

Sheet No.

C-14



SECTION B WEST/EAST
HORIZ: 1'=40'
VERT: 1'=5'
C-08

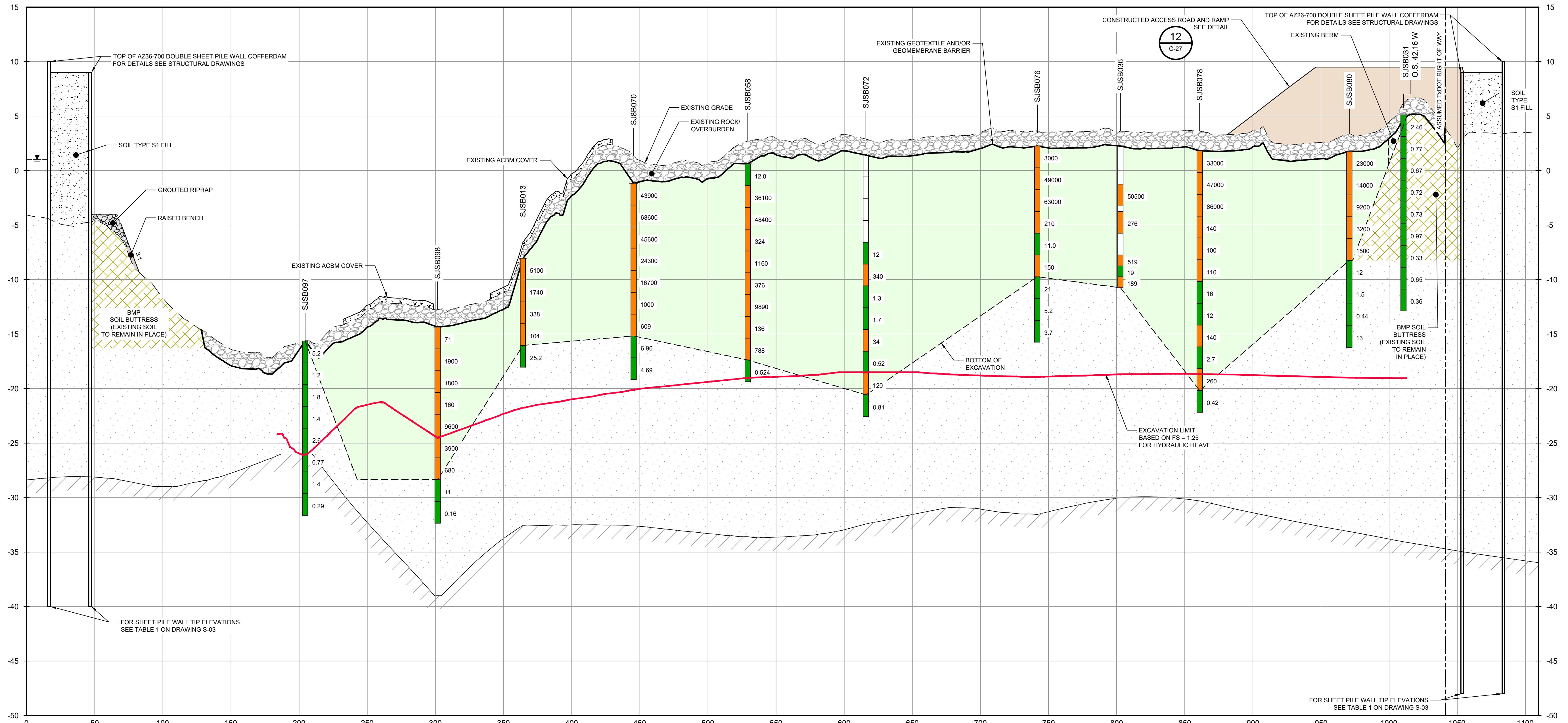
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LEGEND
 SOILS WITH CONCENTRATIONS <30 mg/kg TEC₉₀ TCD
 SOILS WITH CONCENTRATIONS >30 mg/kg TEC₉₀ TCD
 EXCAVATION LIMIT BASED ON FS = 1.25 FOR HYDRAULIC HEAVE
 MATERIAL TO BE EXCAVATED
 EXISTING BERM TO BE EXCAVATED FOR POTENTIAL TESTING AND REUSE
 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**

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

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Drawn JC Designer RH

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Project Coordinator CM Date May 22, 2025

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Project No. 11215702

Title

**EXCAVATION SECTION
5 OF 6**

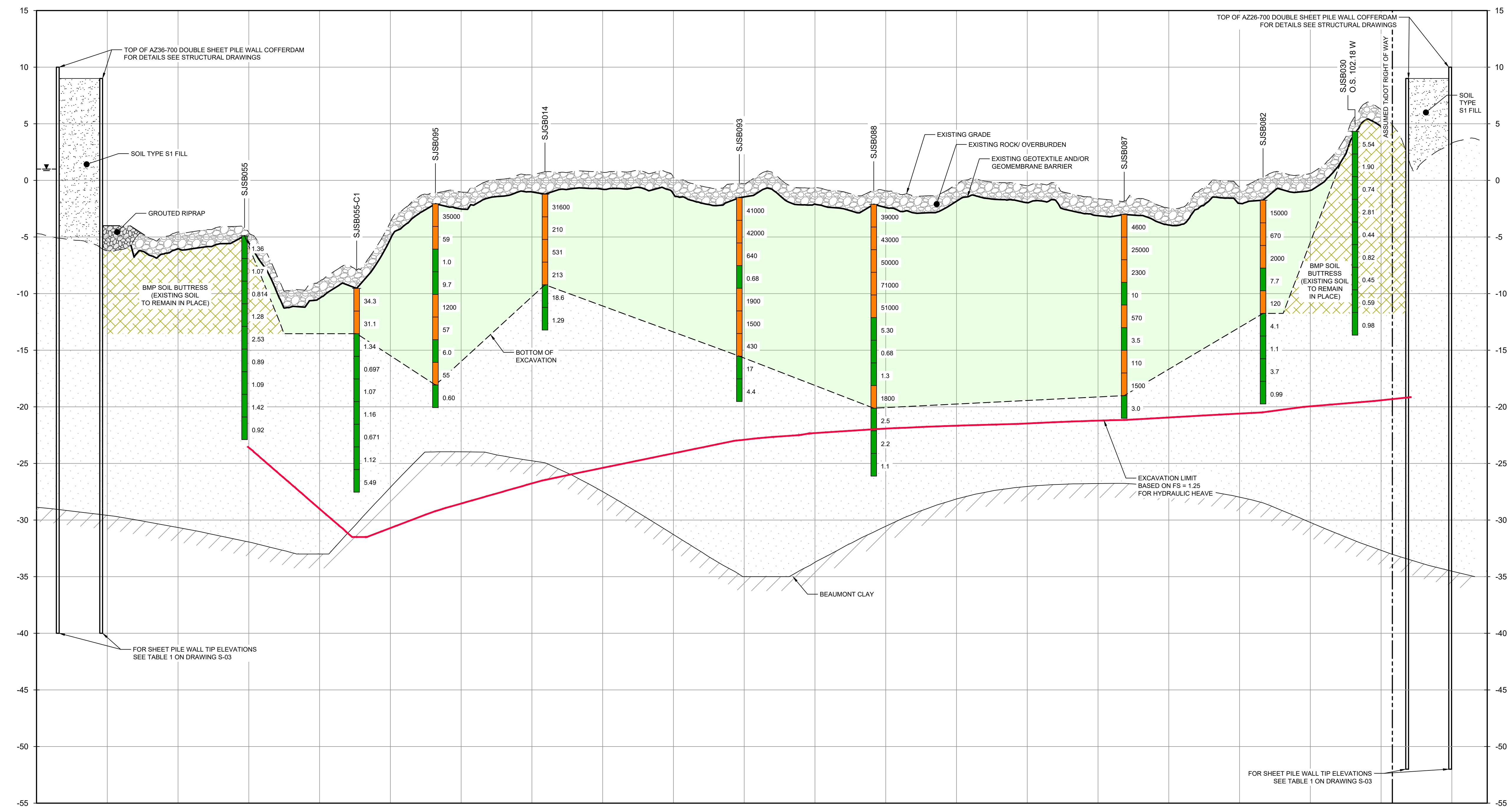
Sheet No.

C-17

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JOB NO. 11215702 FILE NO. 001
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Sheet 18 of 83



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 A.T. HARRELL SURVEY, A-350 HARRIS COUNTY, TEXAS, COBBENDLEY, 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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LEGEND
█ SOILS WITH CONCENTRATIONS <30 mg/kg TEQ₉₀ TCD
█ SOILS WITH CONCENTRATIONS >30 mg/kg TEQ₉₀ TCD
— 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 BS Design Check LL

Project Coordinator CM Date May 22, 2025

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0 1"

Project No. 11215702

Title

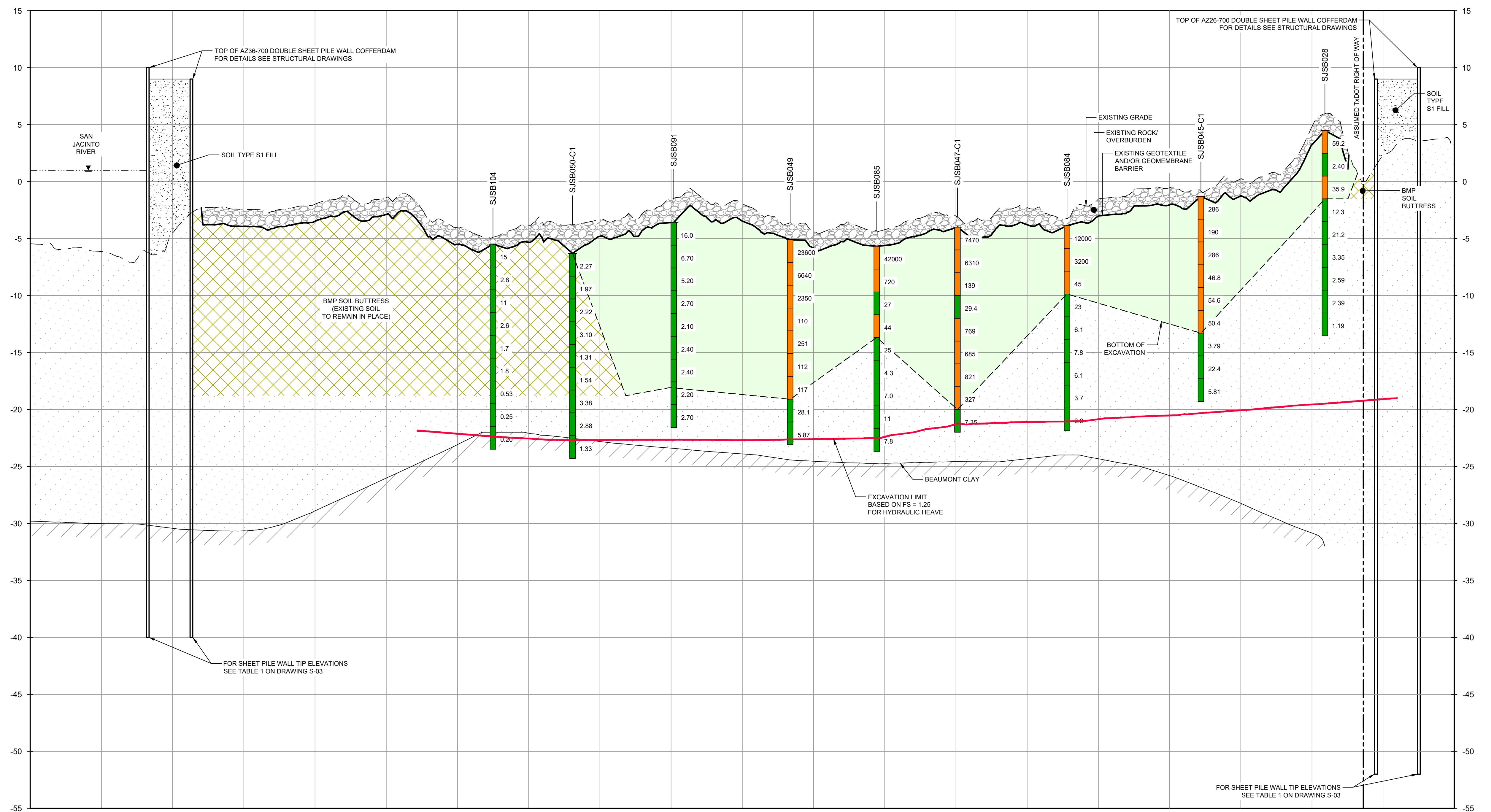
**EXCAVATION SECTION
6 OF 6**

Sheet No.

C-18

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Sheet 19 of 83



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

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. HARRIS SURVEY, A-330 HARRIS COUNTY, TEXAS, COBBPENDELY, 2402-028-0-1, 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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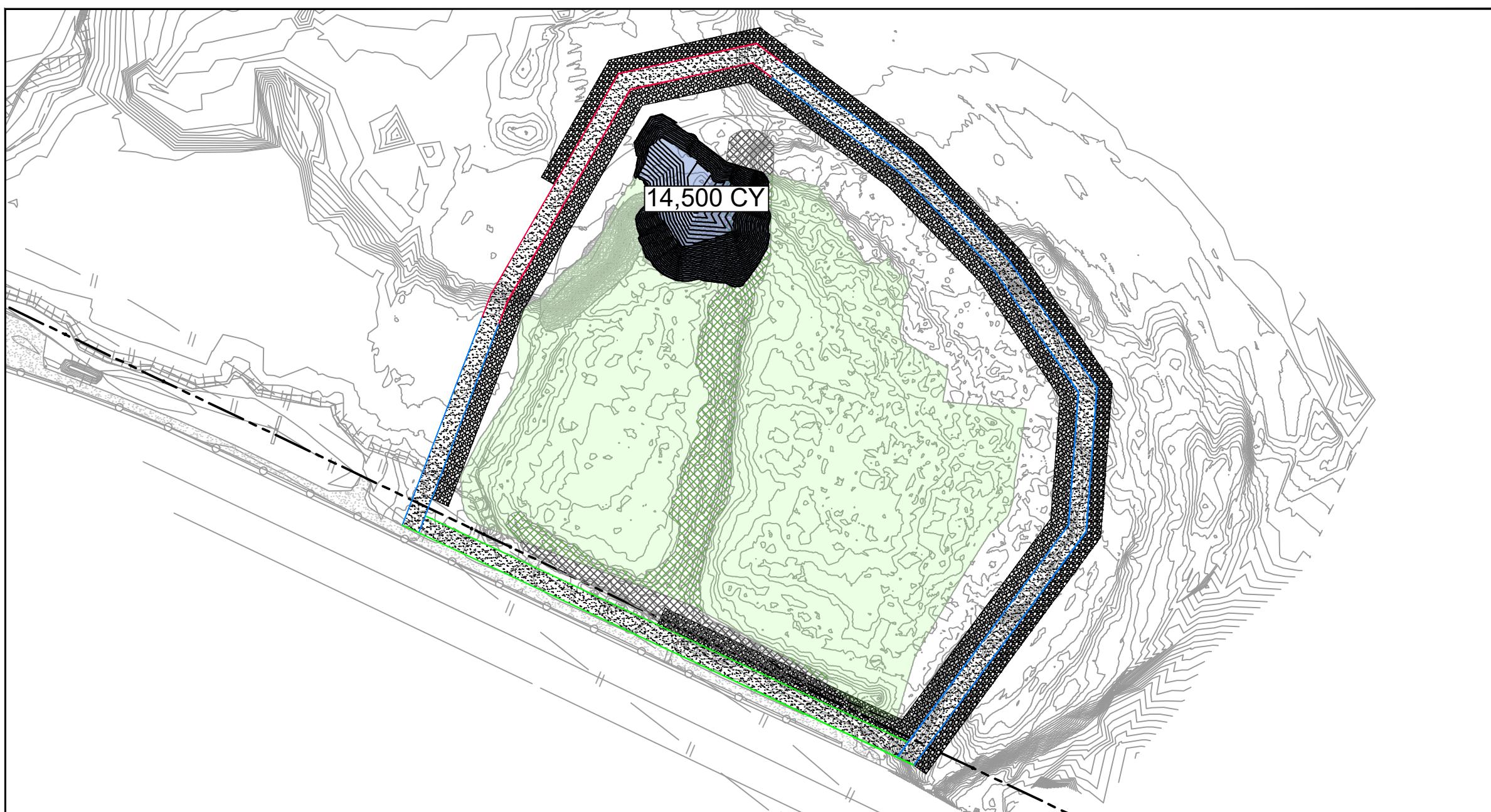
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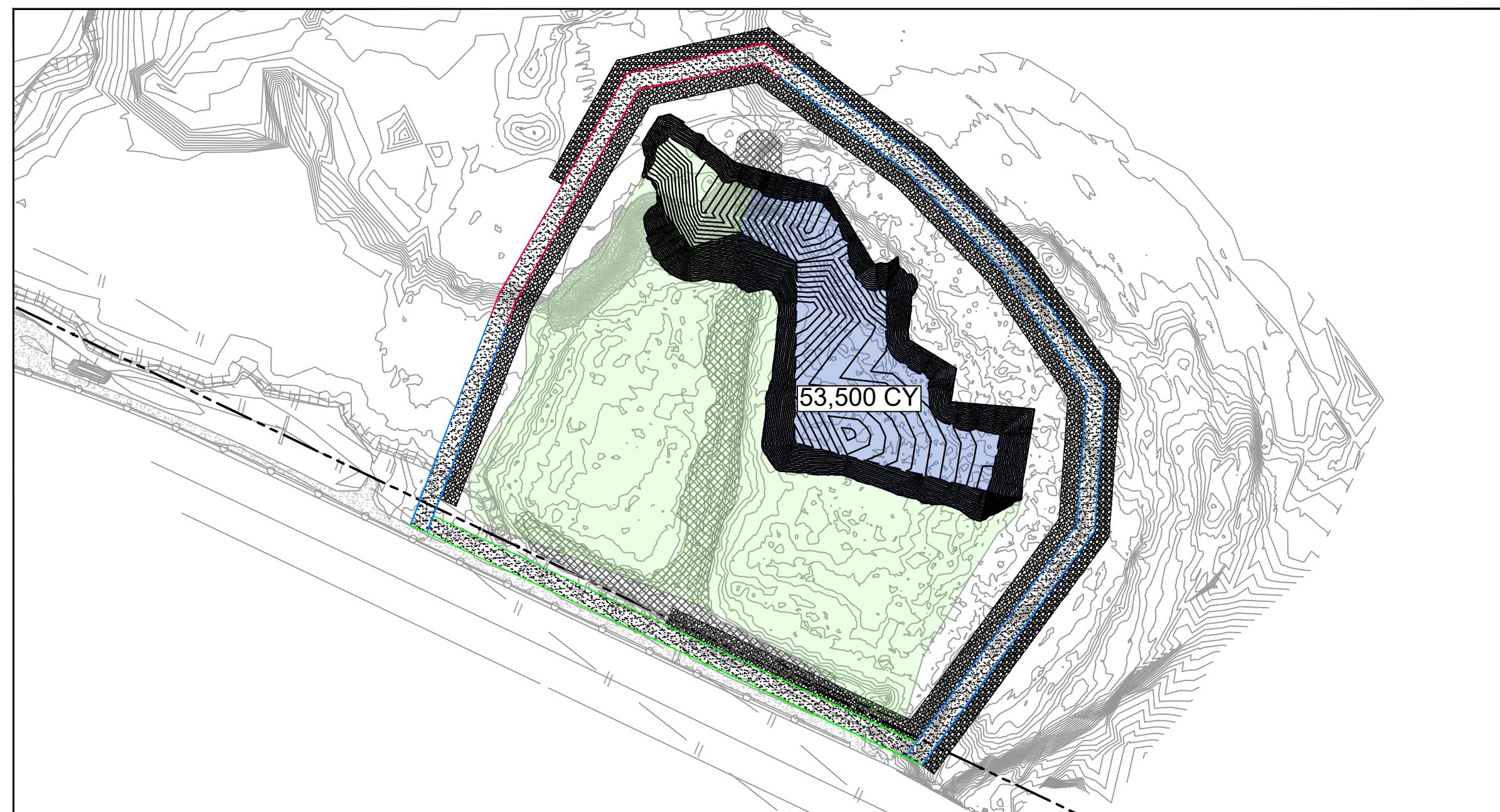
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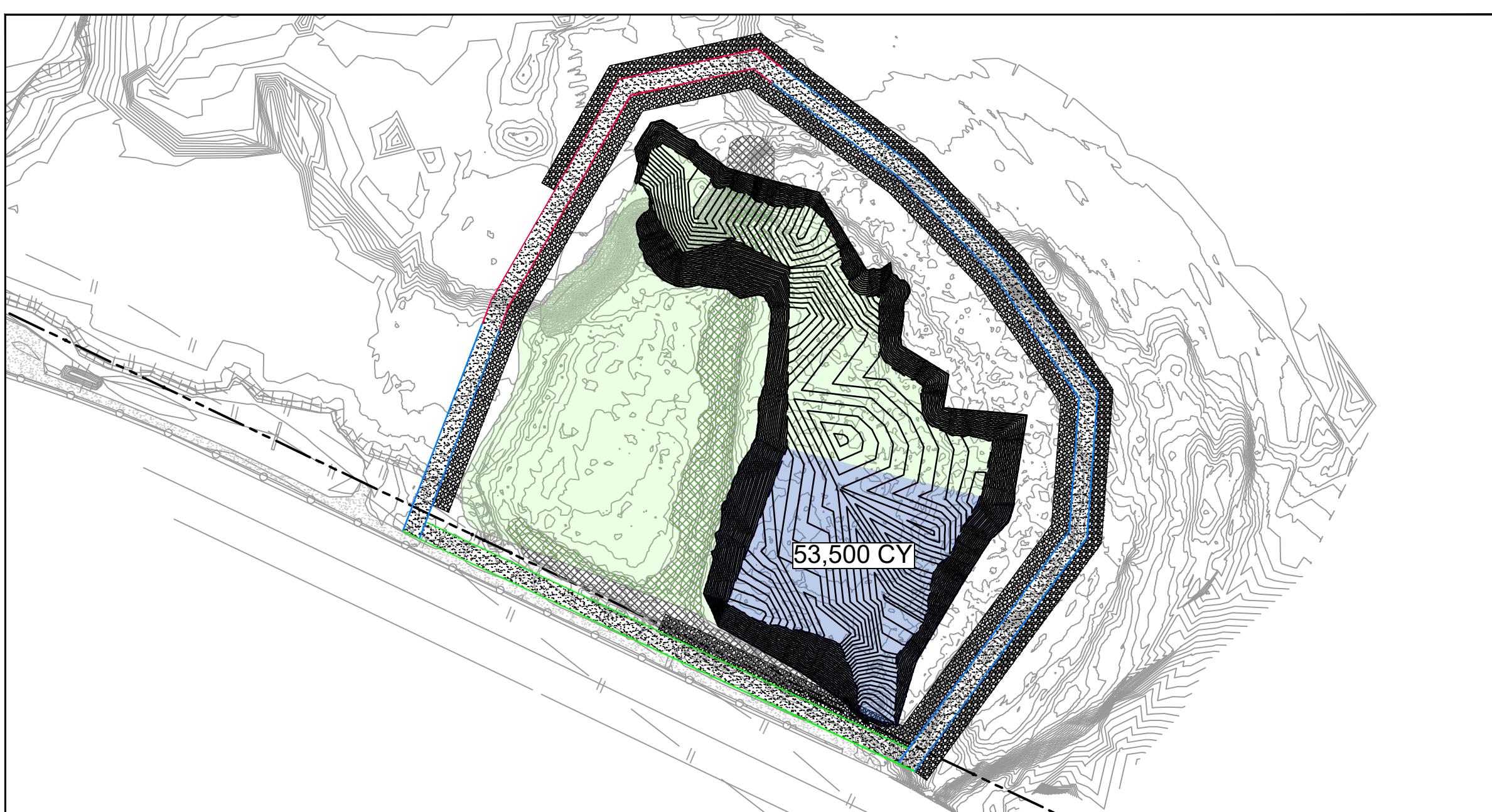
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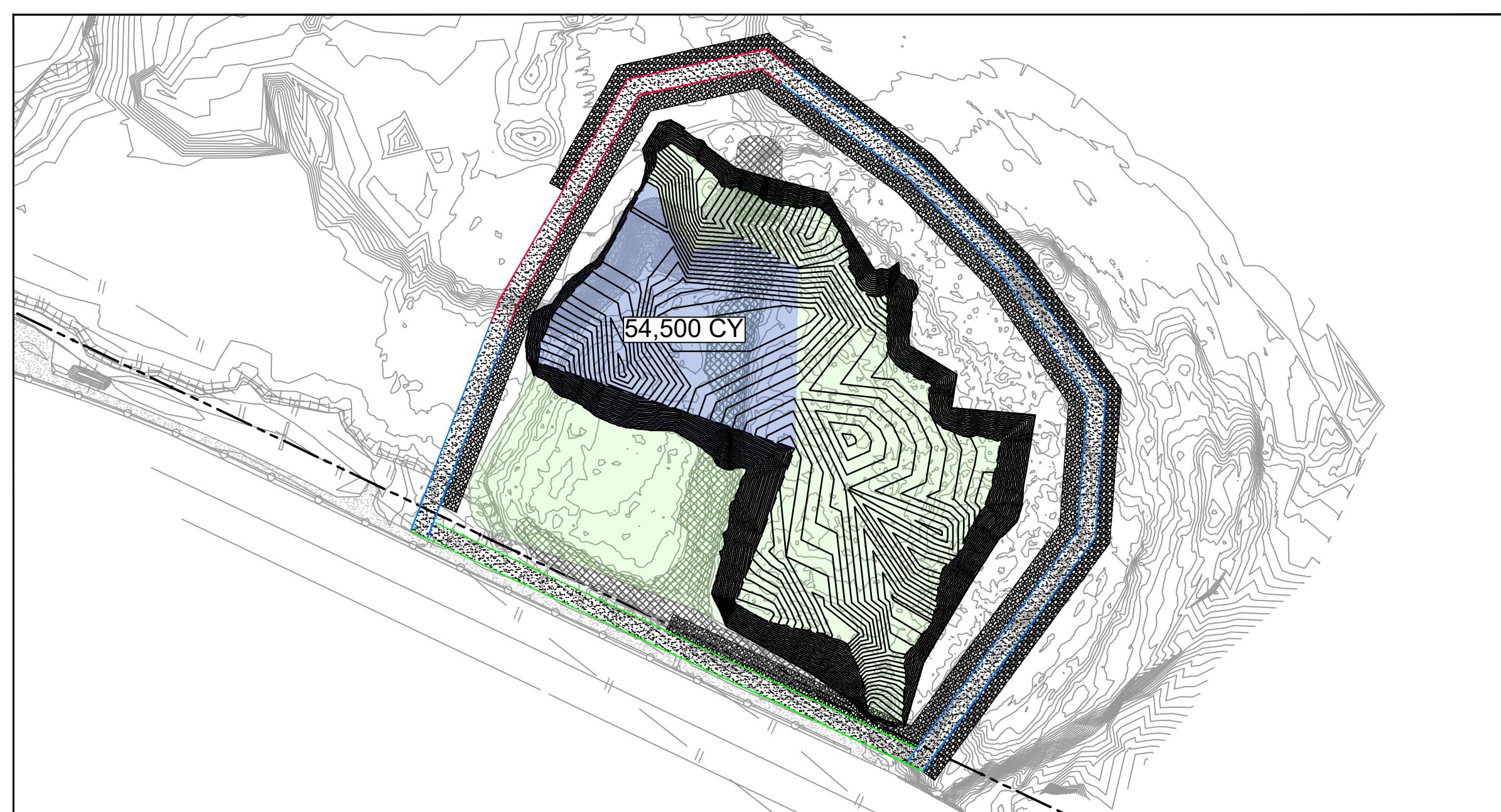
YEAR 2



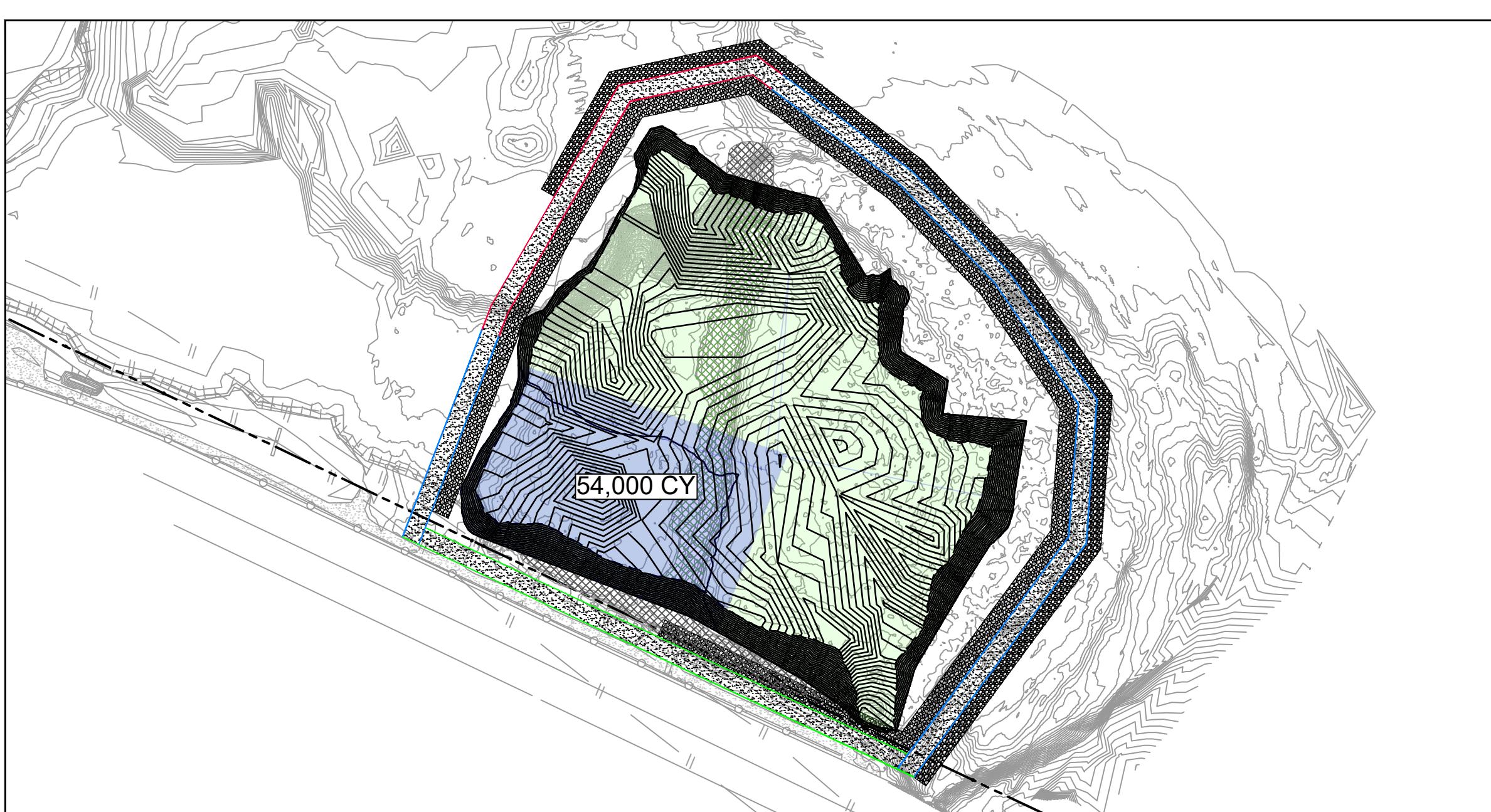
YEAR 3



YEAR 4



YEAR 5



YEAR 6

PHASE	TCRA CAP (CY)	SEASONAL EXCAVATION VOLUMES			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:

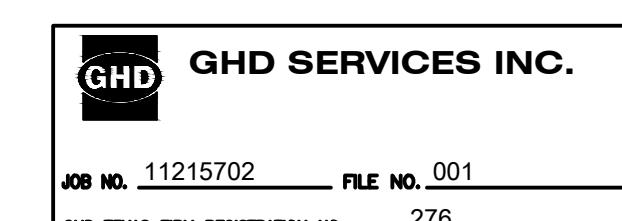
1. CENTER BERM MATERIAL MAY NOT BE IMPACTED MATERIAL. CHEMICAL SAMPLING SHALL BE CONDUCTED ON CENTER BERM MATERIAL. IF DIOXIN CONTAMINATION IS FOUND TO BE PRESENT THEN THE CENTER BERM MATERIAL SHALL BE DISPOSED OFF-SITE AND WILL NOT BE AVAILABLE FOR RE-USE.
2. VOLUME CALCULATIONS CONDUCTED USING TOOLS 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., 190000, 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, COBBENDLEY, 2402-028-01, JUNE 28, 2024.

NOTES:

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

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C-19

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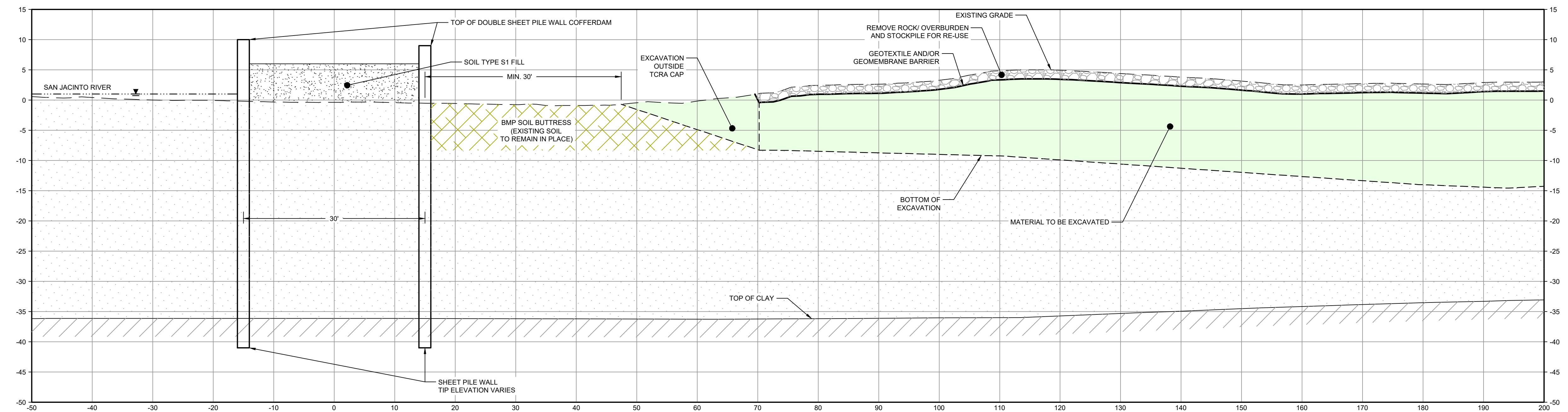
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LEGEND

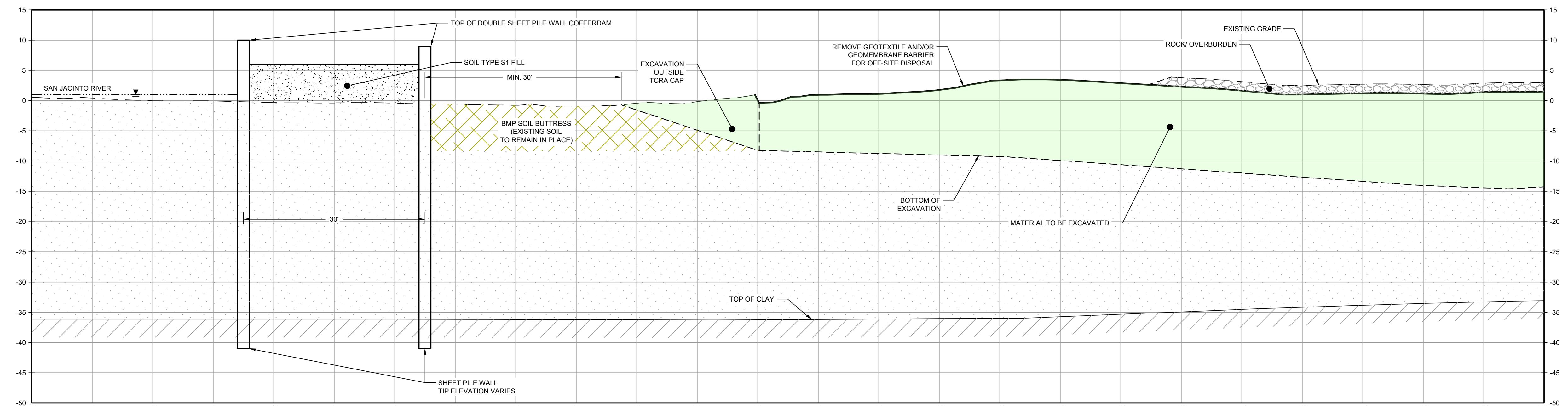
MATERIAL TO BE EXCAVATED
 BMP SOIL BUTTRESS (EXISTING SOIL TO REMAIN IN PLACE)



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

PHASE 1

1' = 10'

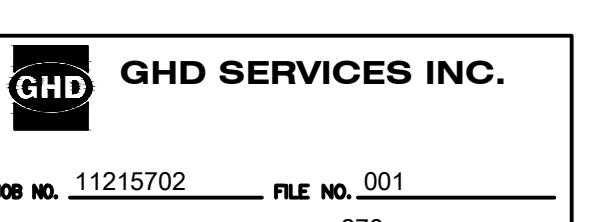


NOTES:
1. REMOVE ROCK LAYER TO BE STOCKPILED ON SITE. REUSED AS TEMPORARY COVER AT END OF SEASONAL EXCAVATION.

PHASE 2

1' = 10'

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Sheet No.

C-20



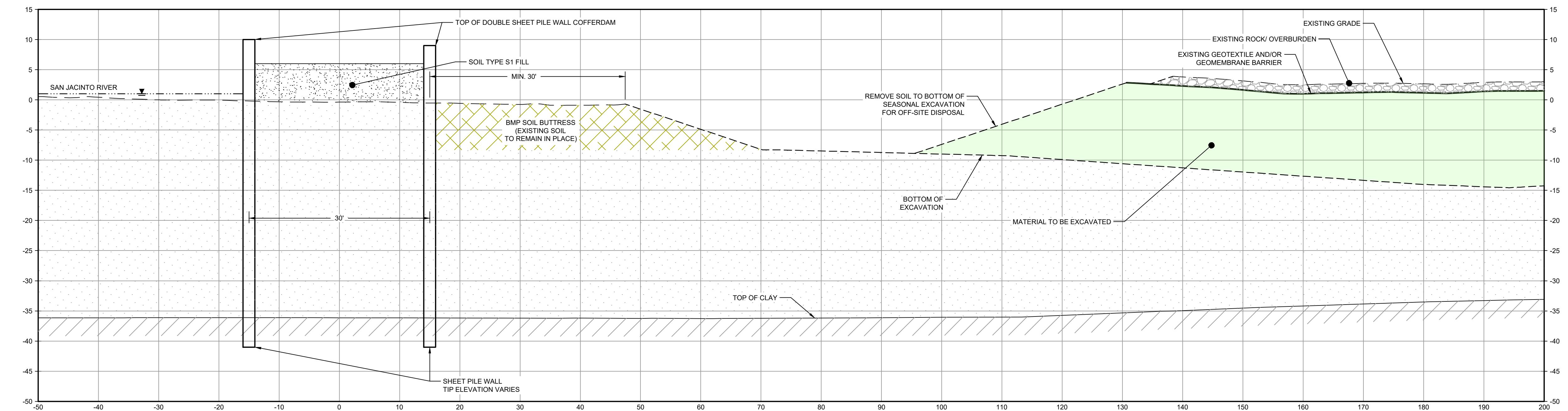
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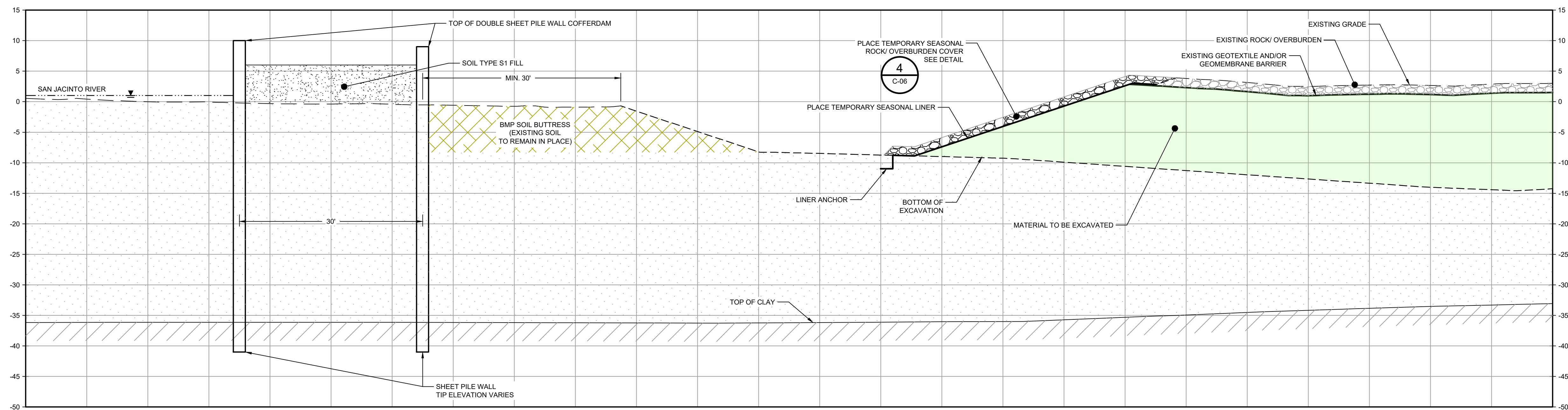
MATERIAL TO BE EXCAVATED
 BMP SOIL BUTTRESS (EXISTING SOIL TO REMAIN IN PLACE)



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

PHASE 3

1' = 10'



PHASE 4

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

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 RI

Drafting BS Design Check LL

Project Coordinator CM Date May 22, 2025

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Scale AS SHOWN

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

0 1"

Project No. 11215702

Title

**TYPICAL EXCAVATION
SEQUENCING
2 OF 2**

Sheet No.

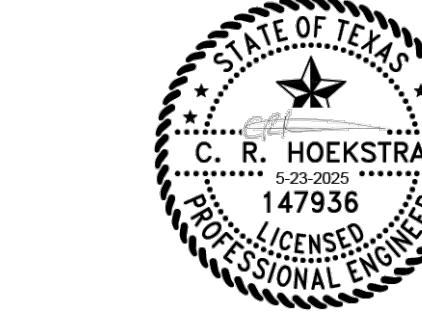
C-21

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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
	A226-700 PILE
	A236-700 PILE
	A242-700 PILE
	EXTERIOR SCOUR PROTECTION
	INTERIOR SCOUR PROTECTION

SAN JACINTO RIVER WASTE PITS

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
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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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Scale 1" = 60'

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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Title	RESTORATION PLAN
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Sheet No.	
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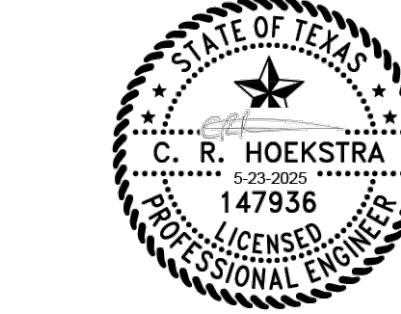
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THIRD 100% EPA SUBMITTAL



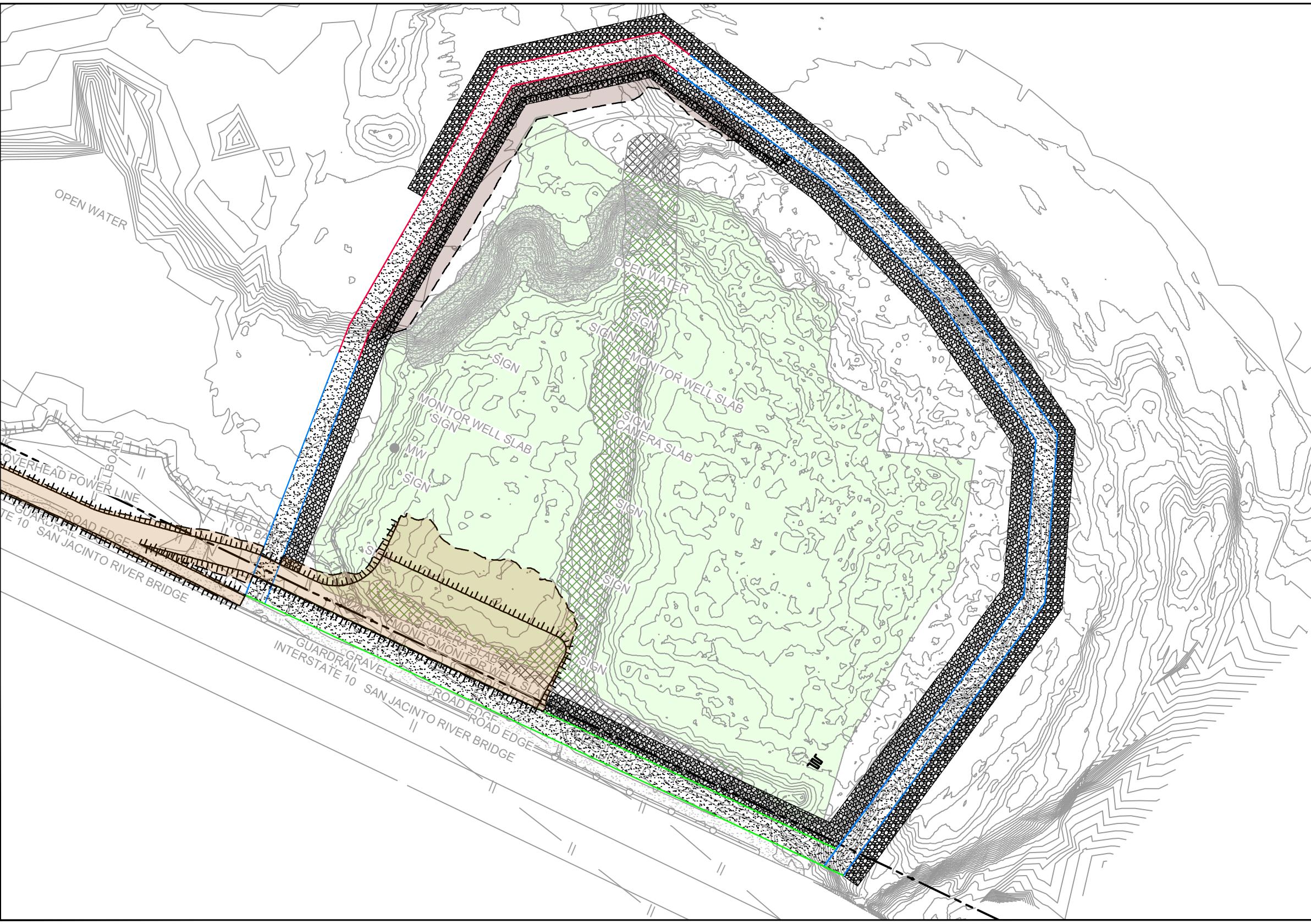


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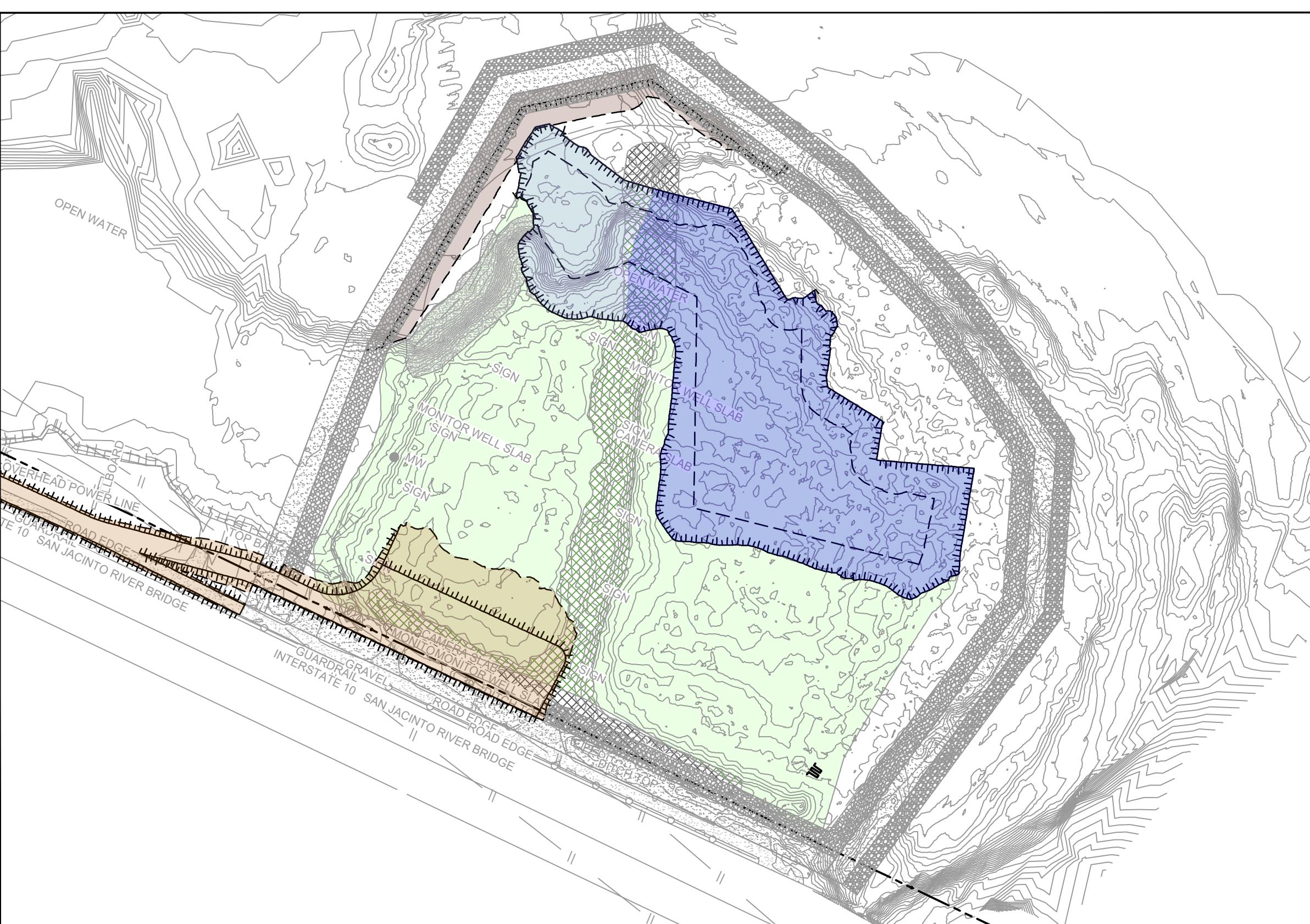
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	TXDOT RIGHT OF WAY
	TCRA CAP PERIMETER
	EXISTING CONTOUR INTERVAL
	FENCELINE
	SHORELINE
	TOE OF BANK
	TOE OF SLOPE
	OVERHEAD ELECTRICAL
	GUARDRAIL
	PIPELINE
	BORING LOCATION
	MONITORING WELL
	POWER POLE
	LIGHT POLE
	WELL
	MATERIAL TO BE EXCAVATED
	EXISTING BERM TO BE EXCAVATED
	FOR POTENTIAL TESTING AND REUSE
	EXISTING BERM TO REMAIN
	CONCRETE
	GRAVEL
	A236-700 PILE
	A236-700 PILE
	A242-700 PILE
	PHASE OF EXCAVATION
	PLANNED IMPROVEMENTS FOR NORTHERN IMPOUNDMENT ACCESS
	RAISED BERM
	EXTERIOR SCOUR PROTECTION
	INTERIOR SCOUR PROTECTION



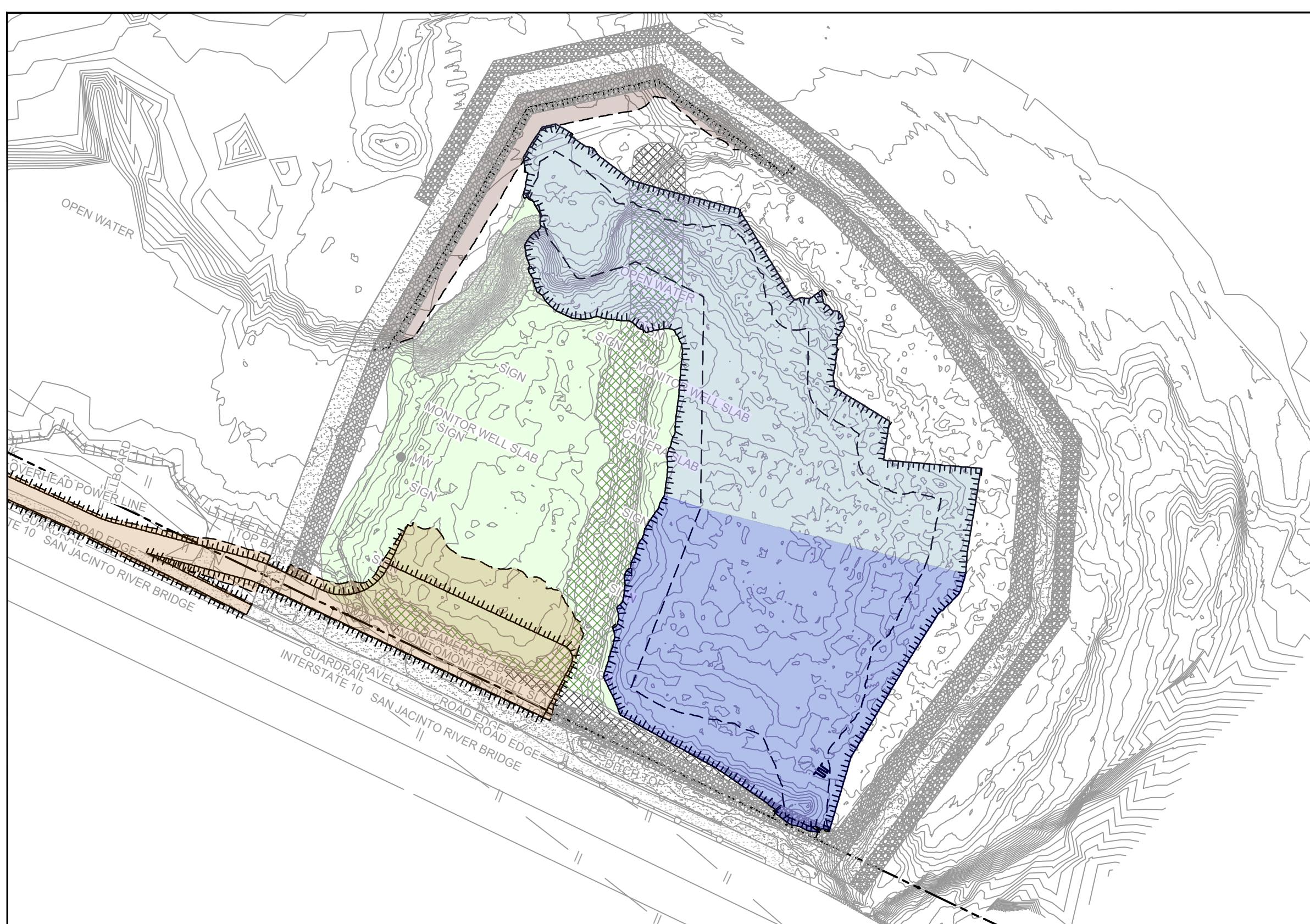
YEAR 1 - BMP INSTALLATION AND SITE PREPARATION



YEAR 2 - EXCAVATION SEASON 1

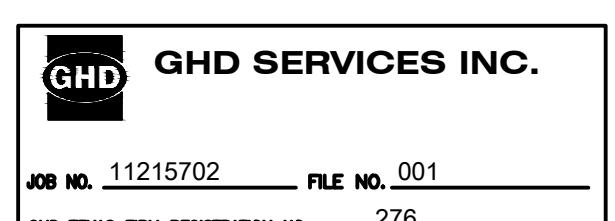


YEAR 3 - EXCAVATION SEASON 2



YEAR 4 - EXCAVATION SEASON 3

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THIRD 100% EPA SUBMITTAL

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
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Drawn	JC	Designer RI
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Drafting Check	BS	Design Check LL
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Project Coordinator	CM	Date May 23, 2025
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Original Size	Bar is one inch on original size drawing
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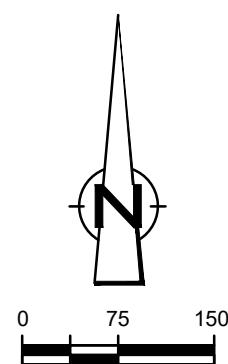
Arch D	0 1"
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Project No.	11215702
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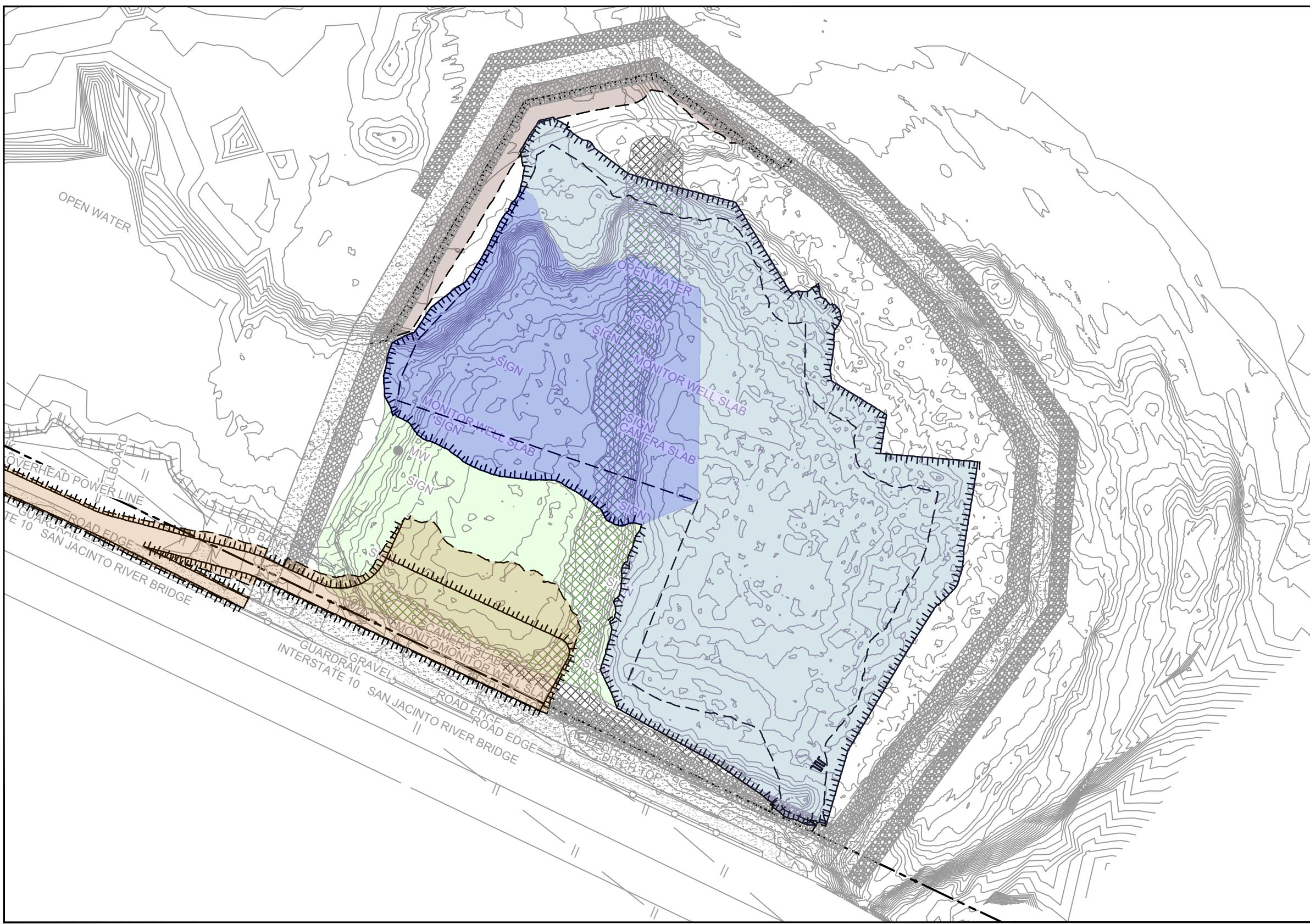
Title	CONSTRUCTION SEQUENCING 1 OF 2
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Sheet No.	
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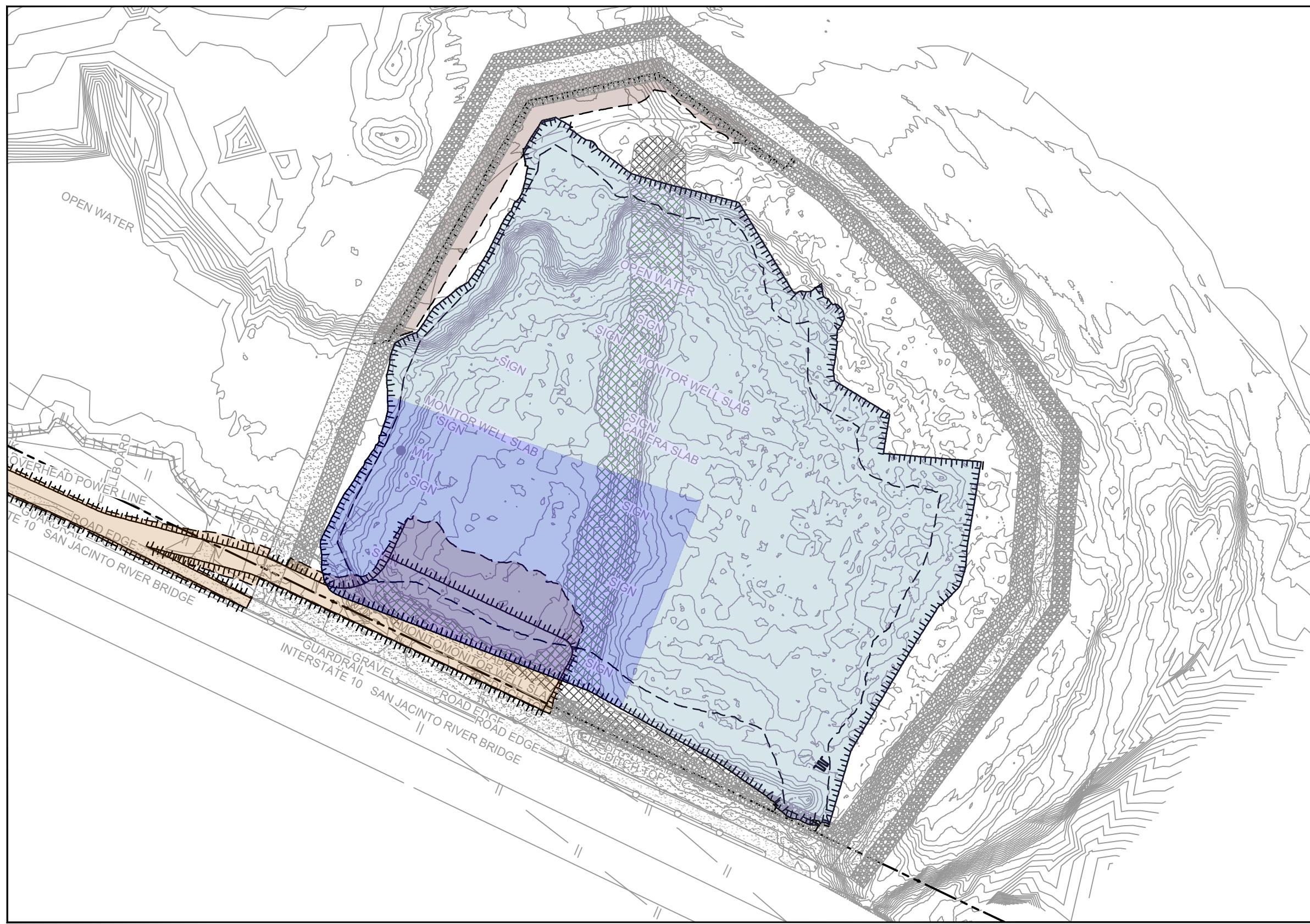
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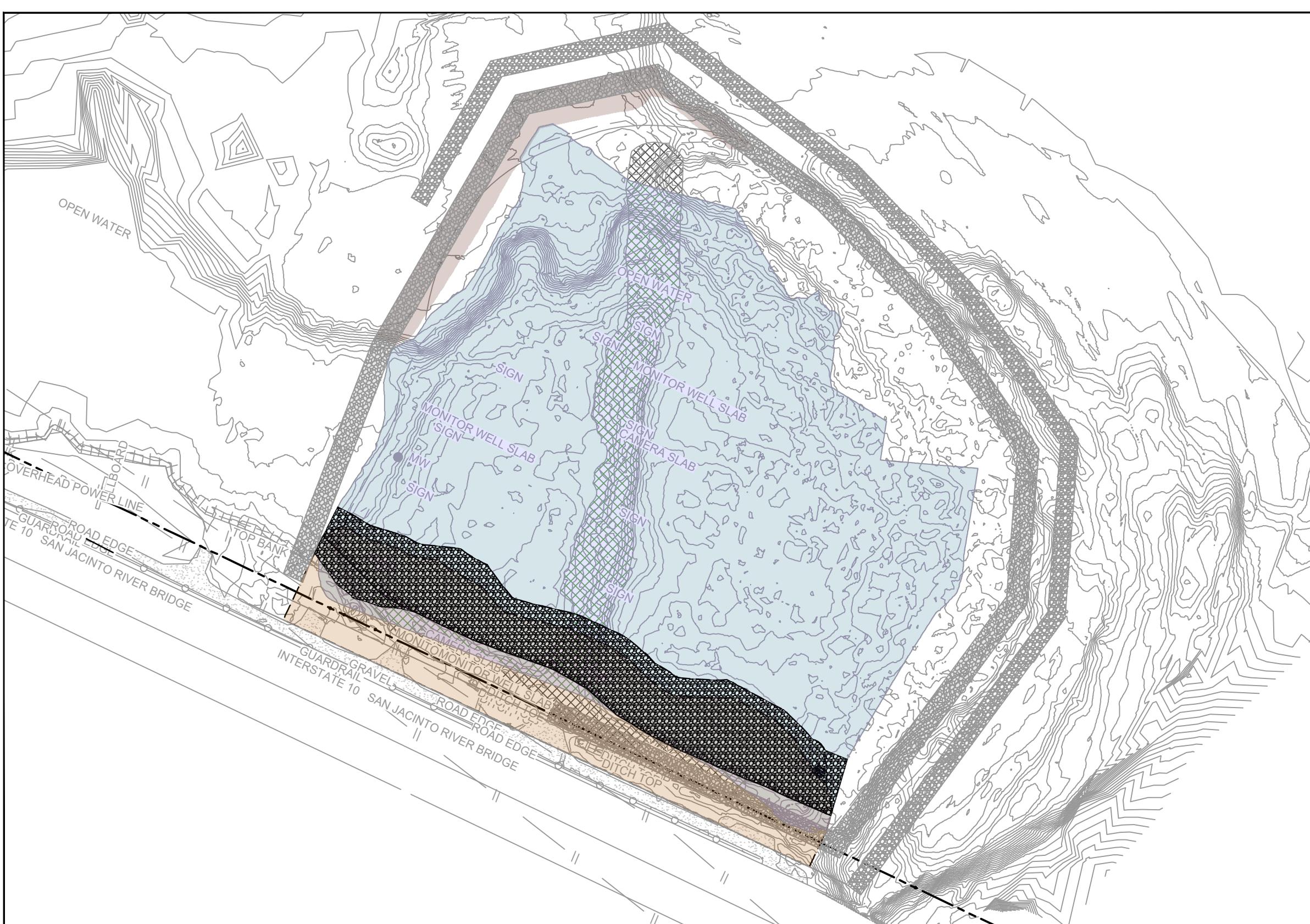
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YEAR 5 - EXCAVATION SEASON 4



YEAR 6 - EXCAVATION SEASON 5



YEAR 7 - BMP REMOVAL AND SITE RESTORATION

SOURCE:

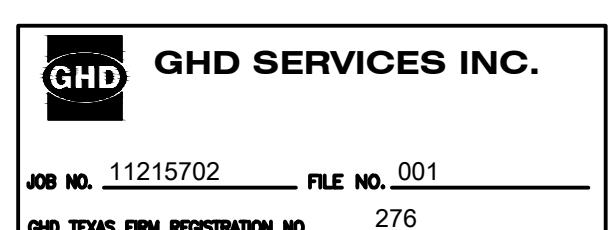
TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PIT, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608, JULY 8, 2019 TO AUGUST 2, 2019
UPDATED BATHYMETRY DATA PROVIDED BY ANCHOR QEA OCTOBER 2021

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 24, 2024

NOTES:

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

Sheet No.

CONSTRUCTION
SEQUENCING
2 OF 2

C-24

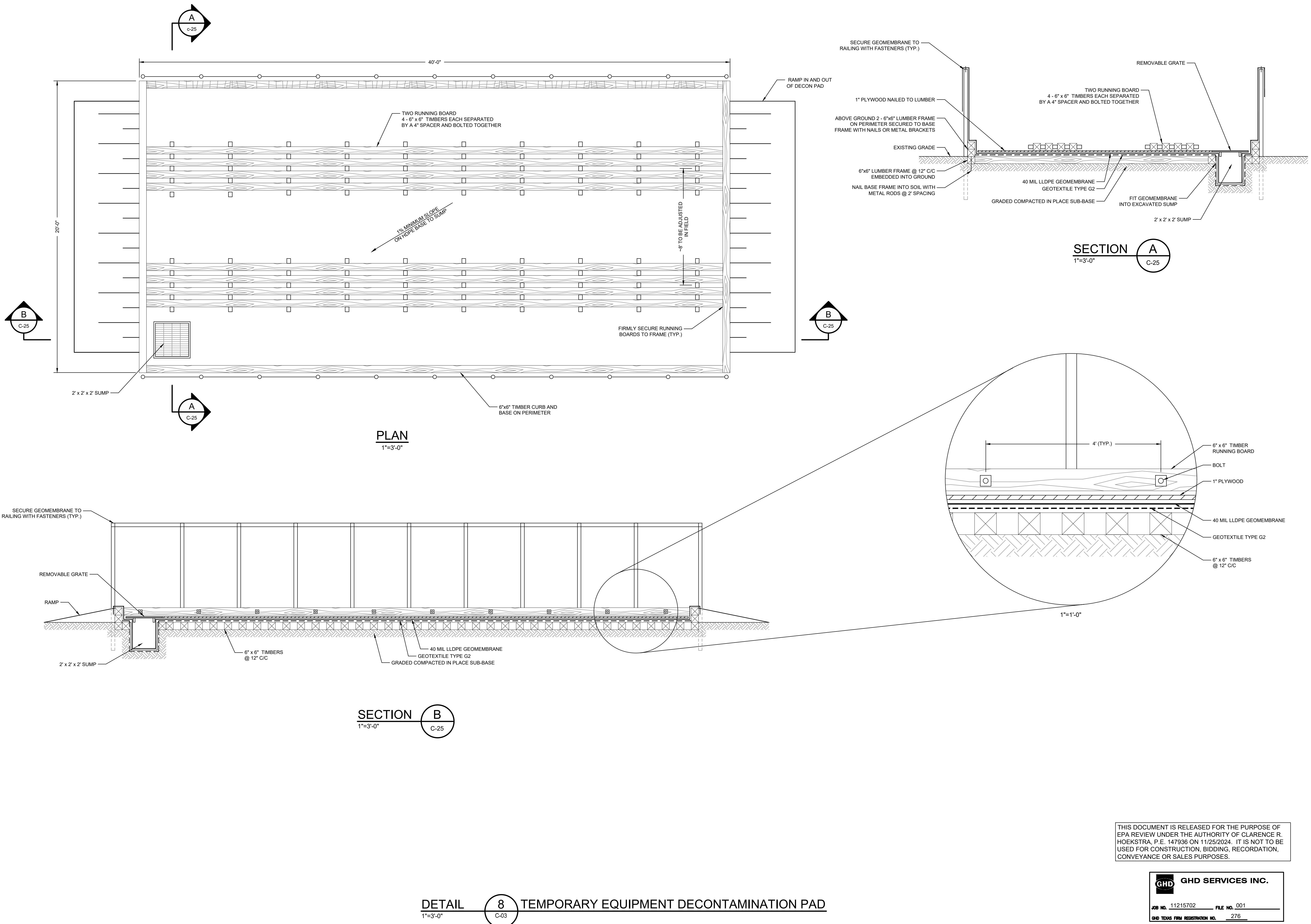
THIRD 100% EPA SUBMITTAL



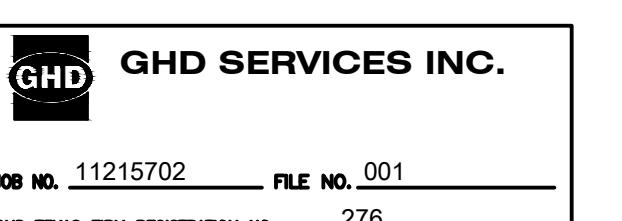
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THIRD 100% EPA SUBMITTAL

Sheet No.

C-25

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 RI

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"

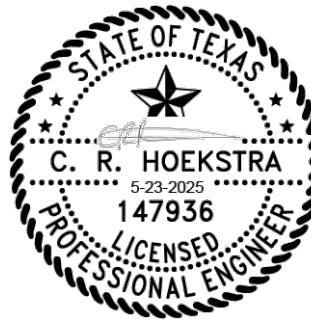
Project No. 11215702

Title

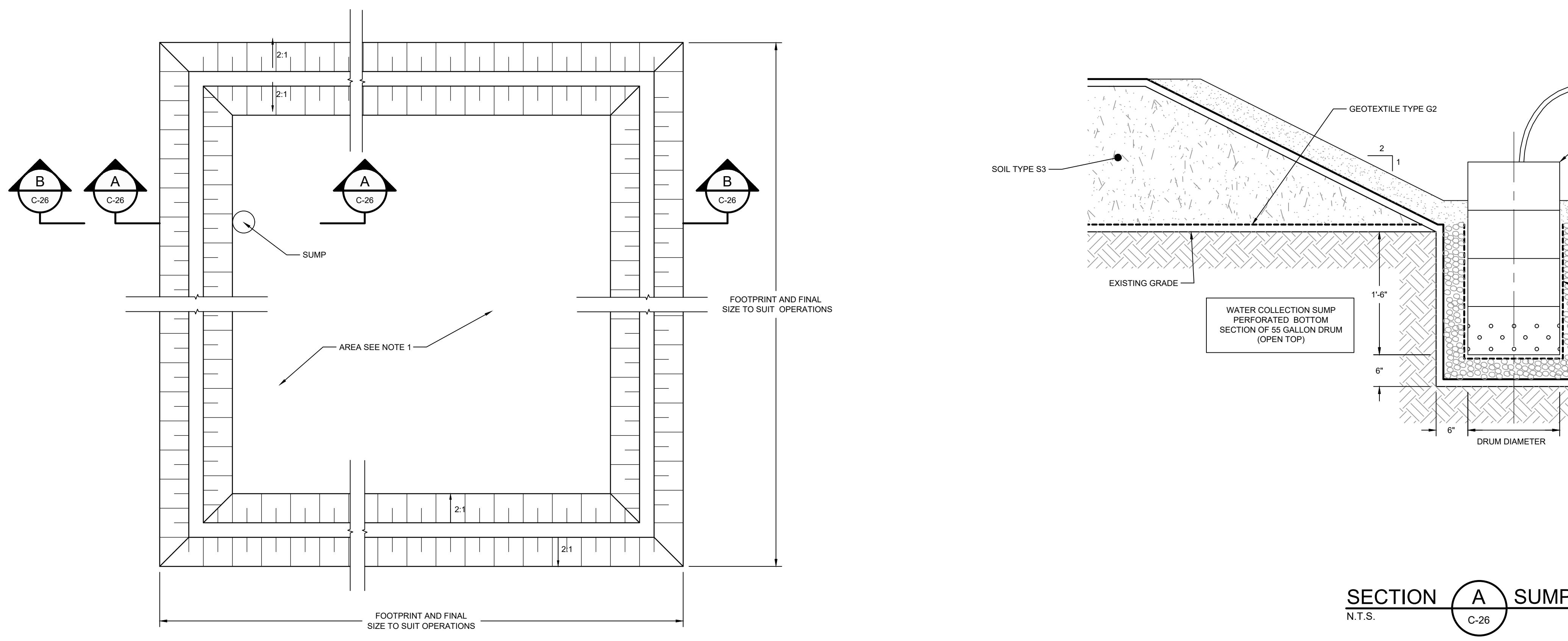
**TYPICAL DETAILS
1 OF 3**



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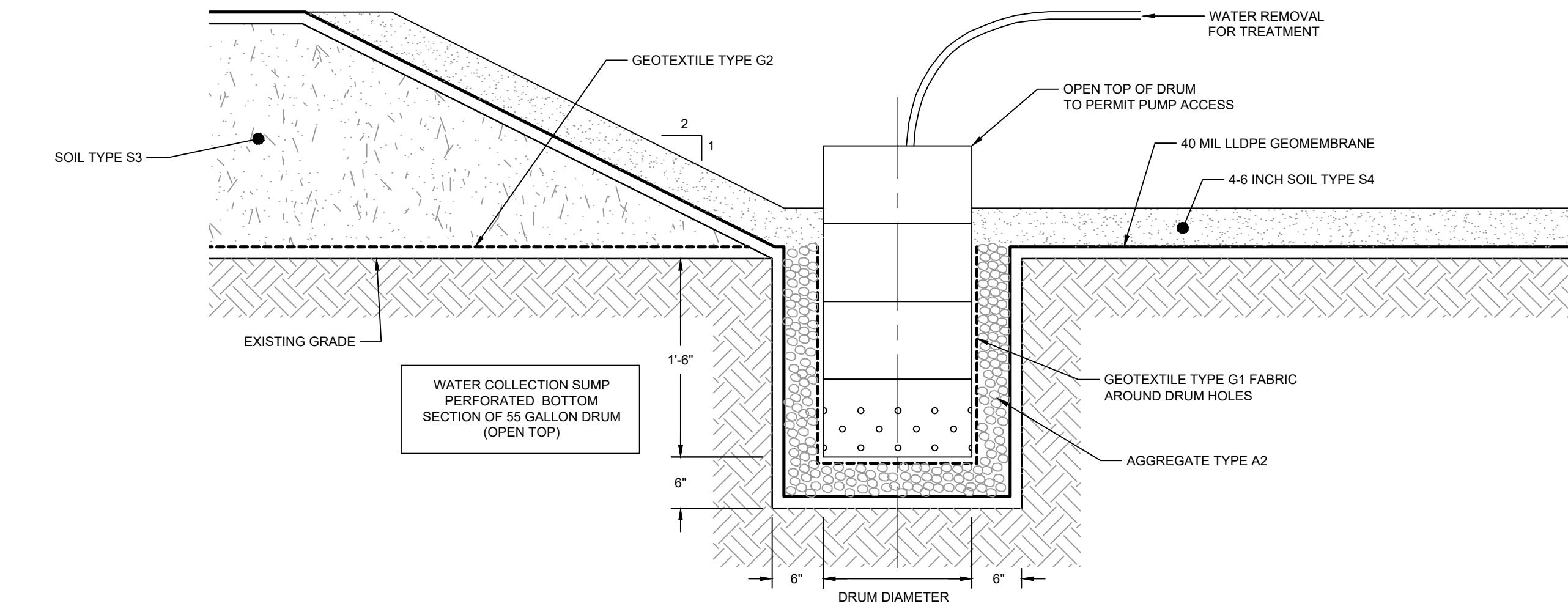
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PLAN

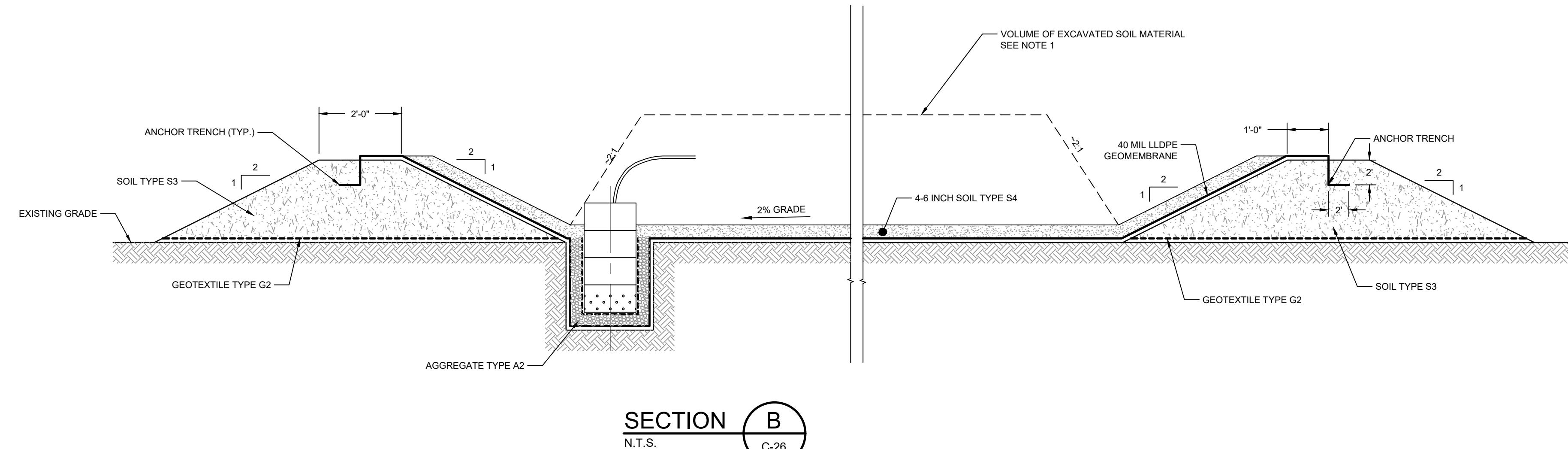
N.T.S.

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 A-SUMP

N.T.S.



SECTION B

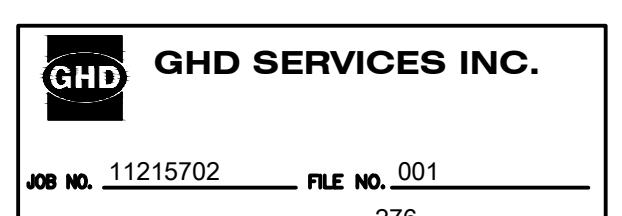
N.T.S.

DETAIL 9 TEMPORARY DEWATERING FACILITY

N.T.S.

C-03

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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

No. Issue Drawn Approved Date

Drawn JC Designer RI

Drafting BS Design Check LL

Project Coordinator CM Date May 22, 2025

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Scale N.T.S.

Original Size

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

Project No. 11215702

Title

**TYPICAL DETAILS
2 OF 3**

Sheet No.

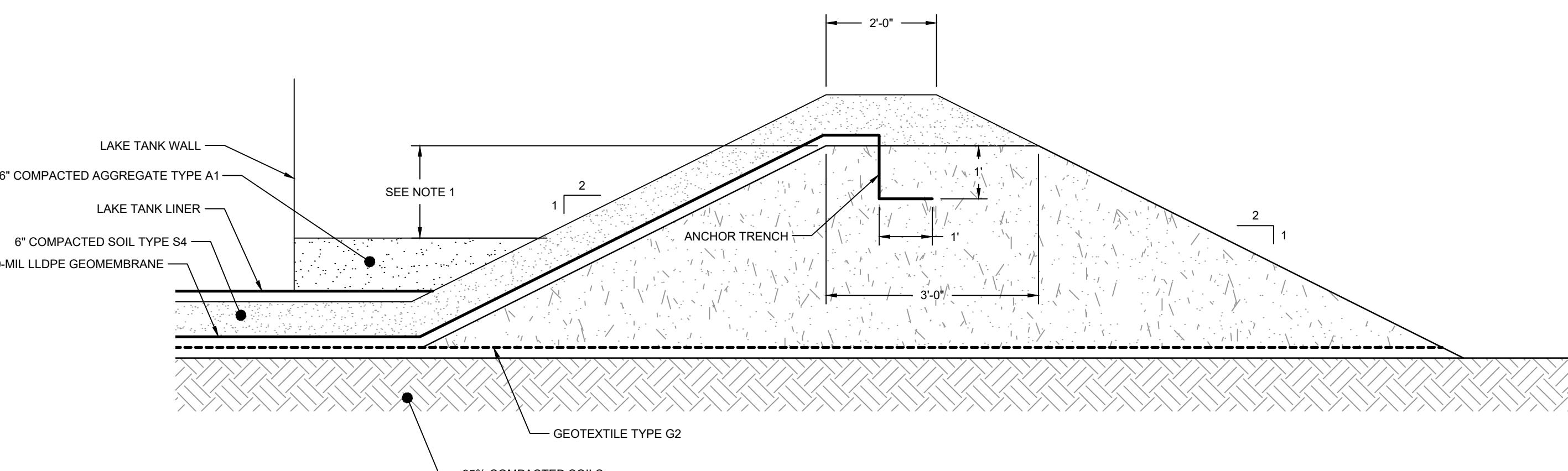
C-26



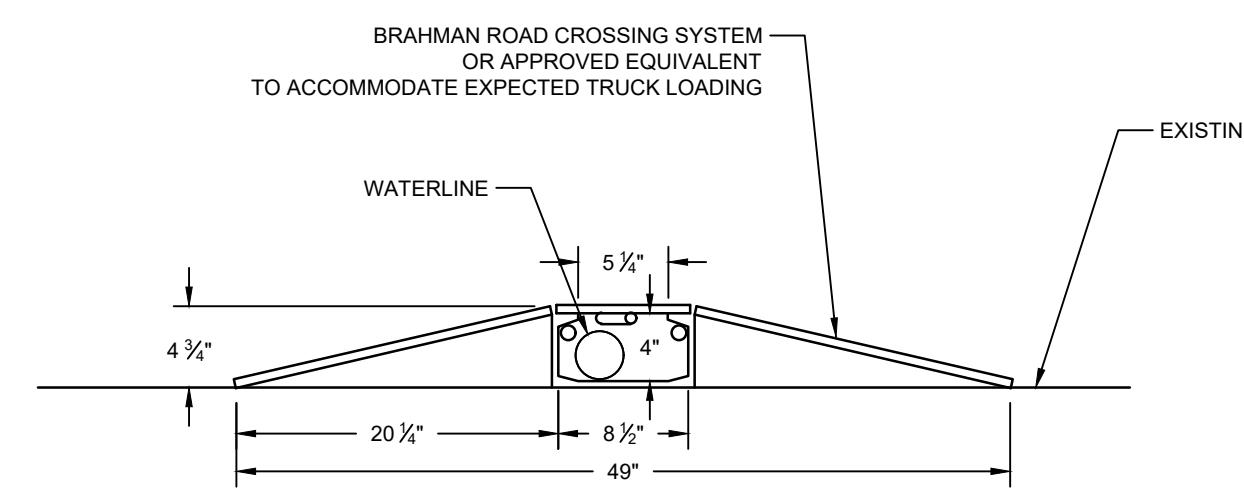
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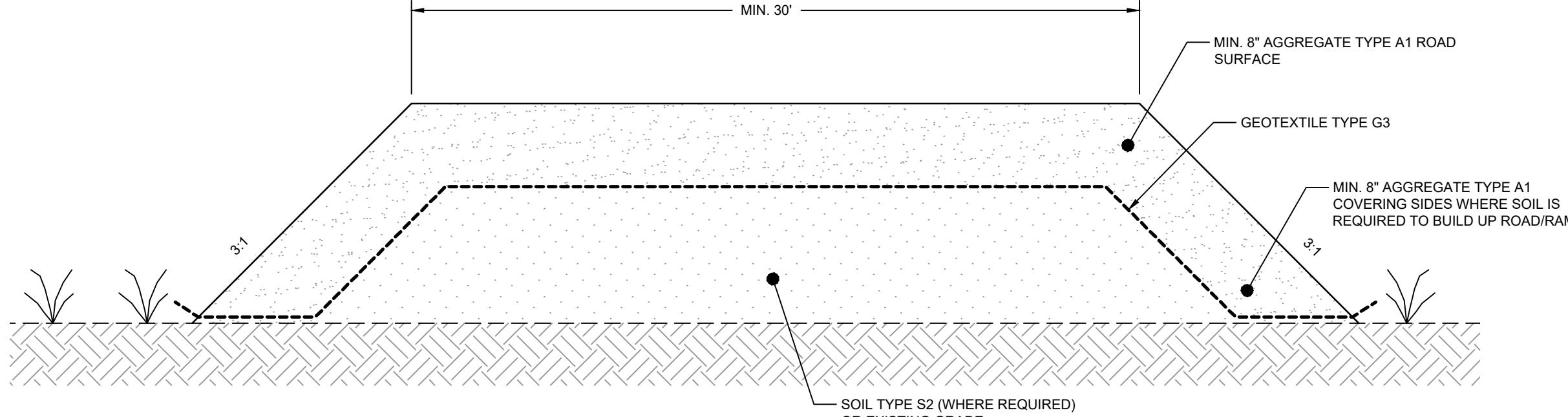
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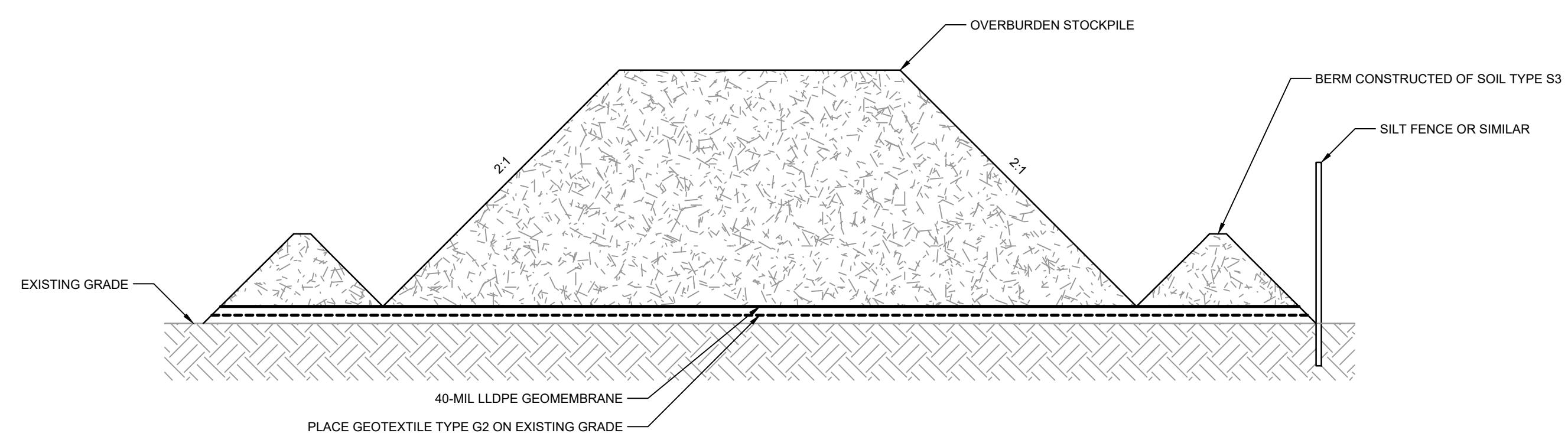
DETAIL 10 WTS SECONDARY CONTAINMENT BERM
N.T.S. C-55, P-011, P-013,
P-014



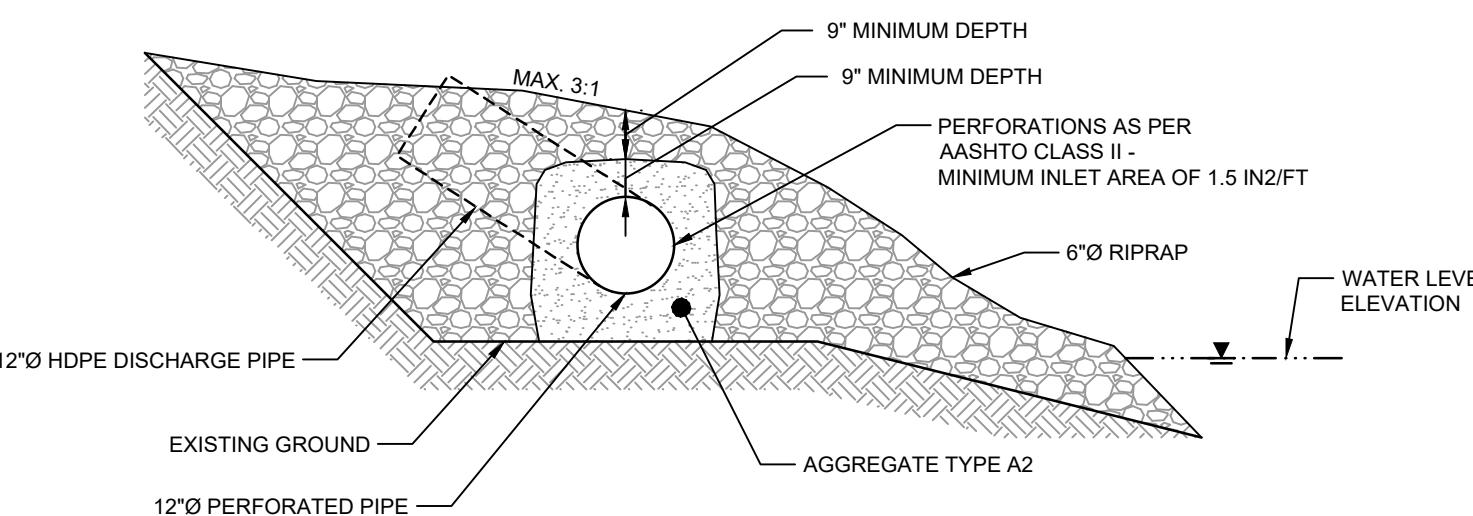
DETAIL 11 TEMPORARY PIPE
CROSSING PROTECTION
1'=1'-0"



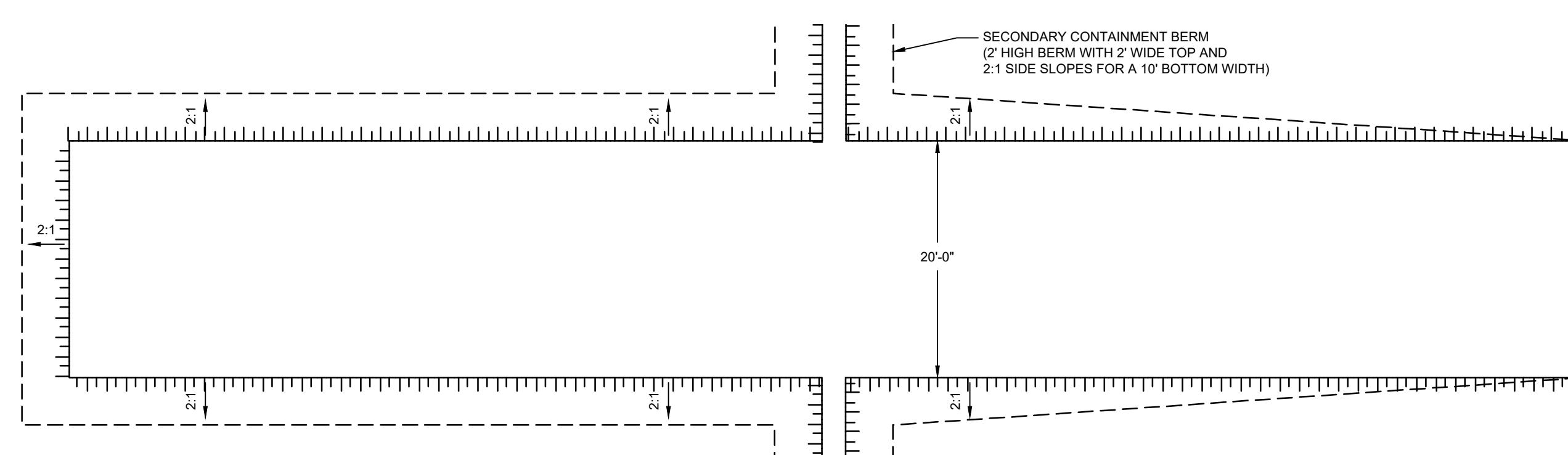
DETAIL 12 TEMPORARY ACCESS ROAD/ RAMPS
N.T.S. C-03



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

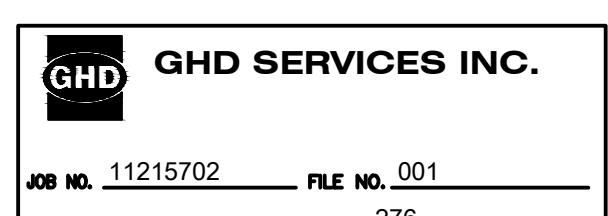


DETAIL 14 RIVER DISCHARGE DIFFUSER
N.T.S.



DETAIL 15 ACCESS PLATFORM
N.T.S.

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GHD TEXAS FIRM REGISTRATION NO. 276

Sheet No.

C-27

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Sheet 28 of 83

Client
**SAN JACINTO RIVER
WASTE PITS**

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

7	THIRD 100% EPA SUBMITTAL	J.C.	CRH	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	J.C.	Designer RI		
Drafting Check	BS	Design Check LL		
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

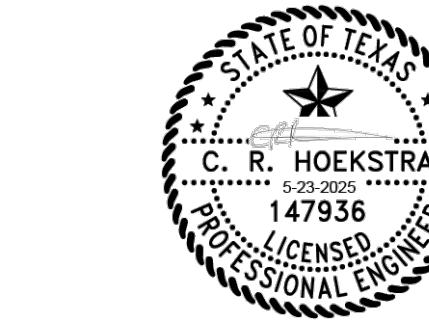
Title

**TYPICAL DETAILS
3 OF 3**

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- - - - - TXDOT RIGHT OF WAY
 - - - - - TCRA CAP PERIMETER
 - - - - - EXISTING CONTOUR INTERVAL
 - - - - - FENCELINE
 - - - - - SHORELINE
 - - - - - TOP OF BANK
 - - - - - TOE OF SLOPE
 - - - - - OVERHEAD ELECTRICAL
 - - - - - GUARDRAIL
 - - - - - PIPELINE
 ■ SJSB002
 ● MW
 ● P.P.
 ● L.P.
 ○ WELL
 ■ MATERIAL TO BE EXCAVATED
 ■ EXISTING BERM TO BE EXCAVATED
 ■ 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

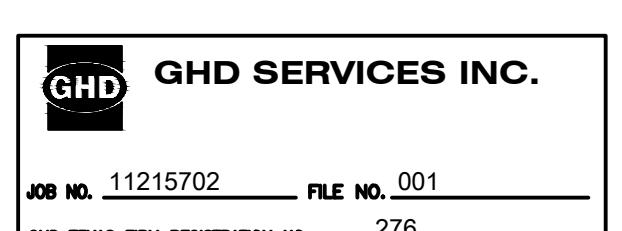
HARRIS COUNTY, TEXAS

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

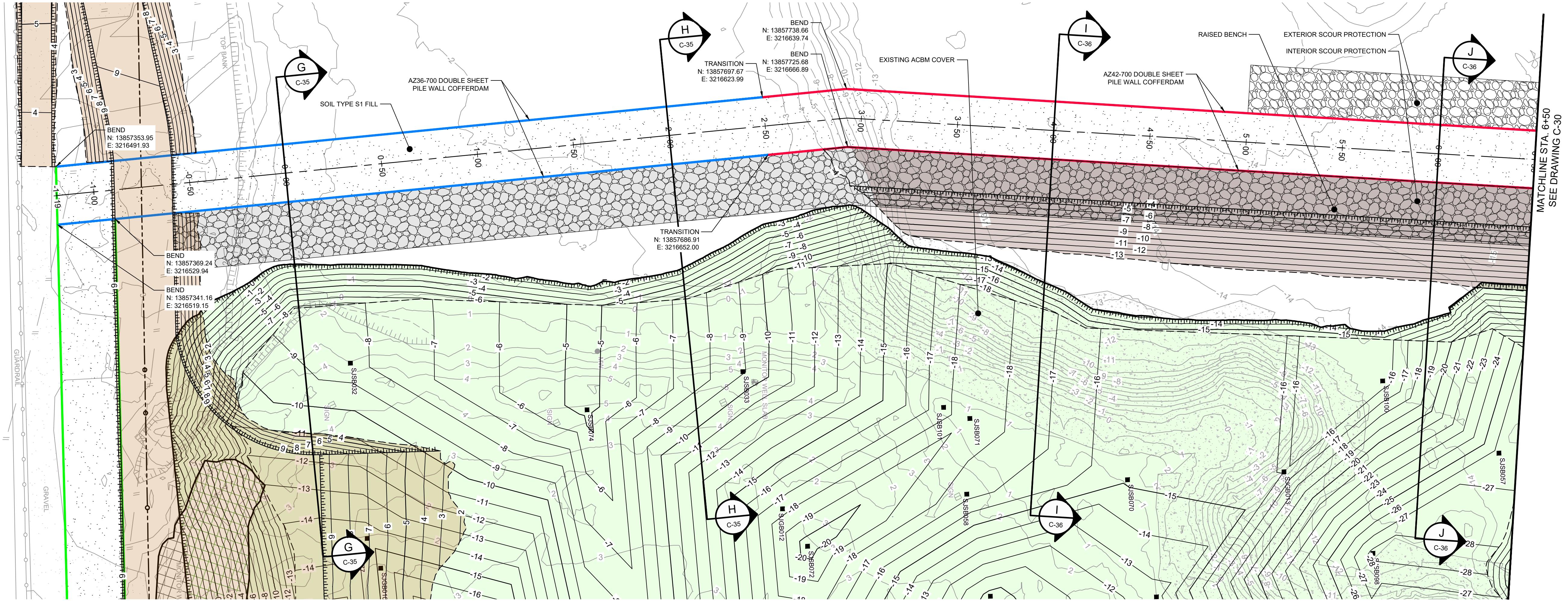
Title

PILE WALL LAYOUT PLAN

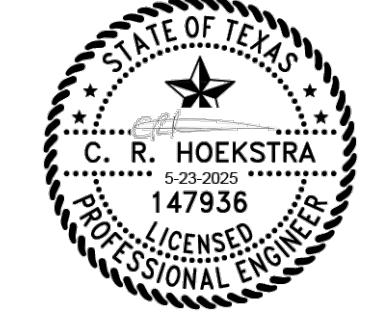
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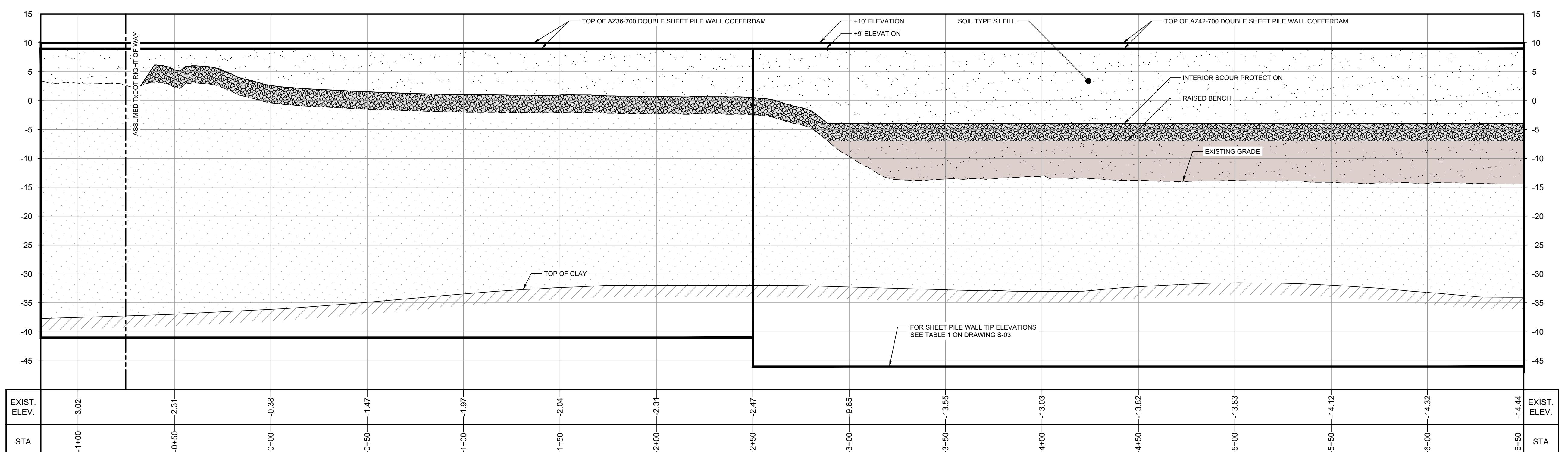
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LEGEND

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- TCRA CAP PERIMETER
- EXISTING CONTOUR INTERVAL
- FENCELINE
- SHORELINE
- TOE 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
- AZ42-700 PILE
- PLANNED IMPROVEMENTS FOR NORTHERN IMPOUNDMENT ACCESS
- RAISED BENCH
- EXTERIOR SCOUR PROTECTION
- INTERIOR SCOUR PROTECTION

PLAN

1" = 30'



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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0 1" Project No. 11215702

Title

DOUBLE PILE WALL
PLAN AND PROFILE
1 OF 4

Sheet No.

C-29

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 BENTONVILLE AND RIGHT-OF-WAY SURVEY OF PORT OF HARRIS COUNTY PROPERTY, P.H. STROUD & ASSOCIATES INC. PROPERTY ALONG INTERSTATE HIGHWAY 10 AT THE SAN JACINTO FLEET AREA, IN THE J.T. HARRELL SURVEY, A-339 HARRIS COUNTY, TEXAS, COBBENDLEY, 2402-028-01, JUNE 28, 2024

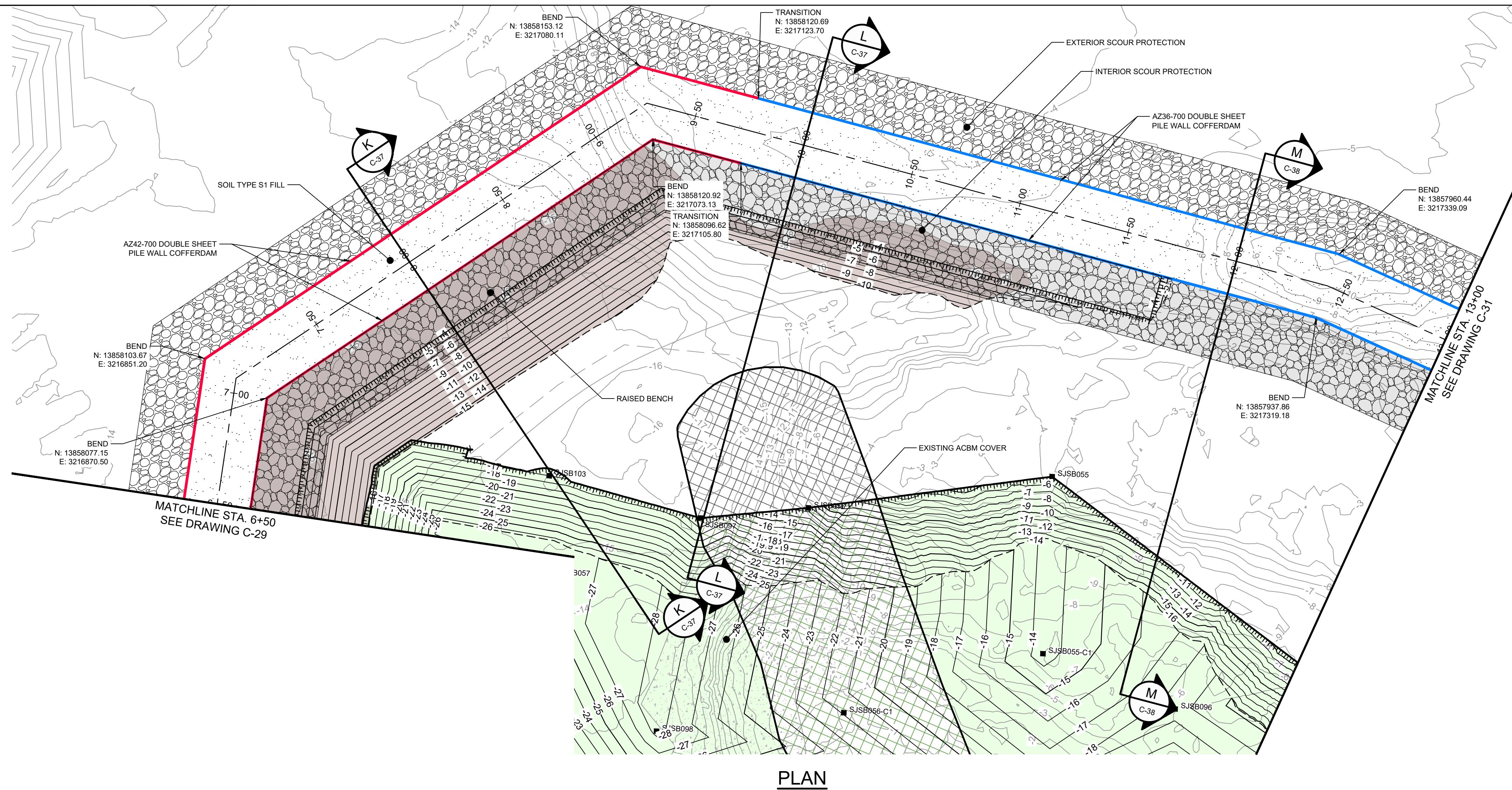
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JOB NO. 11215702 FILE NO. 001
GHD TEXAS FIRM REGISTRATION NO. 276

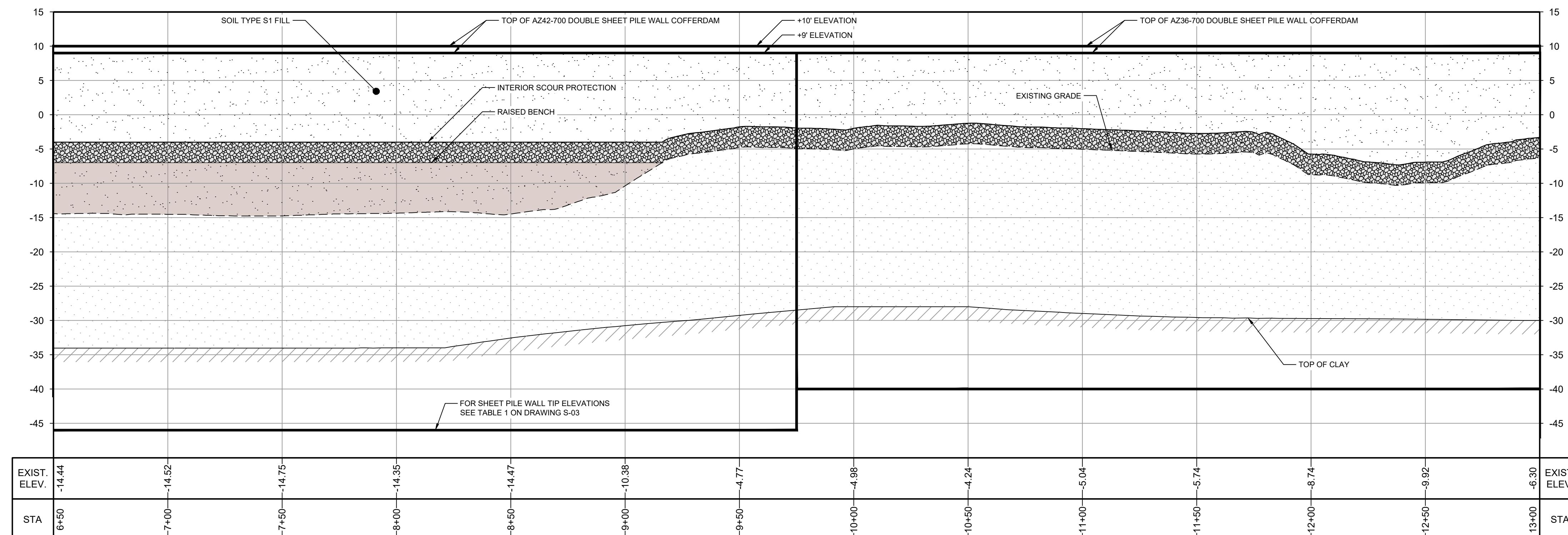
THIRD 100% EPA SUBMITTAL

Sheet 30 of 83



PLAN

$$1'' = 30'$$



PROFILE F

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

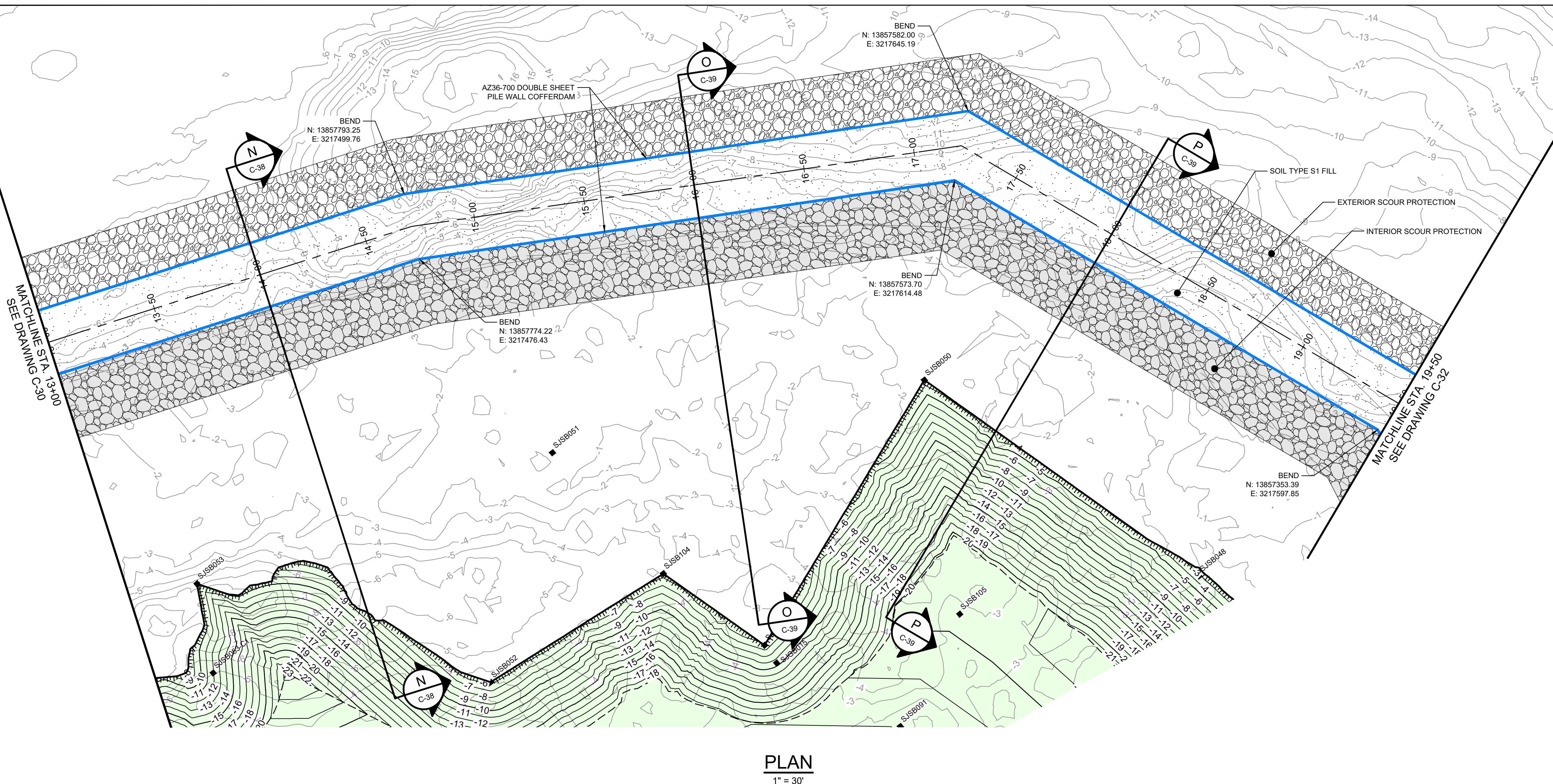
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GHD SERVICES INC.

THIRD 100% EPA SUBMITTAL

C-30



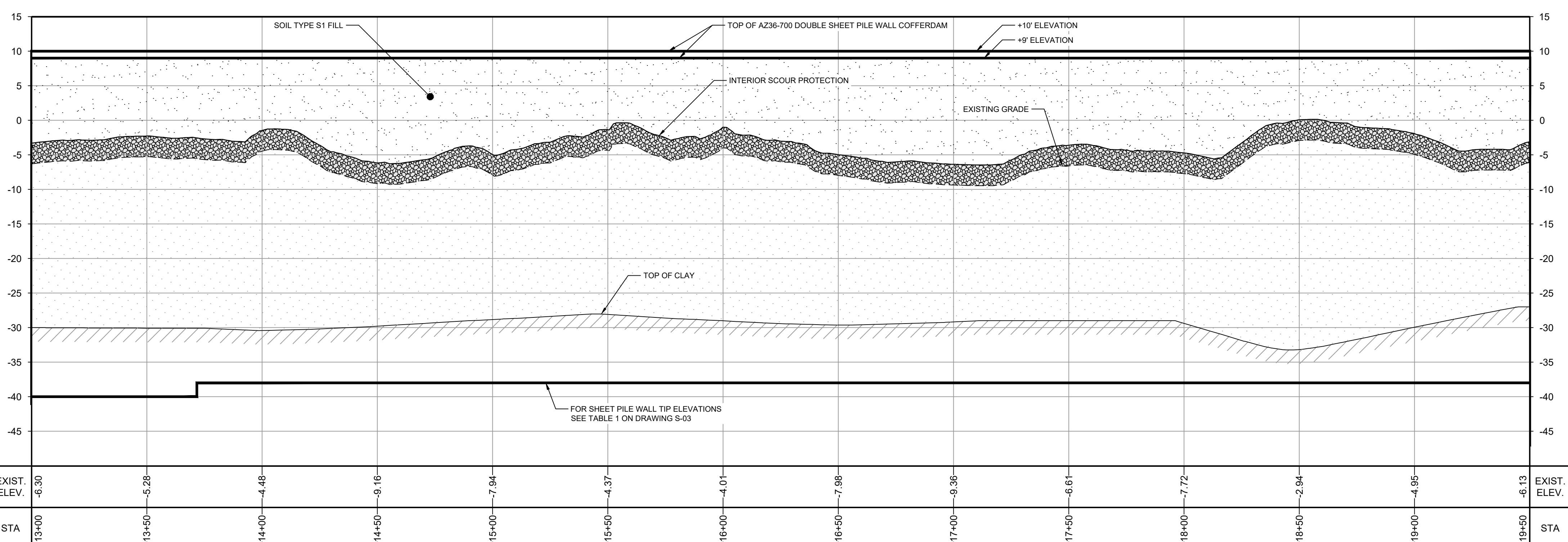
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LEGEND

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 - - - - - TCRA CAP PERIMETER
 - - - - - EXISTING CONTOUR INTERVAL
 - - - - - FENCELINE
 - - - - - SHORELINE
 - - - - - TOP OF BANK
 - - - - - TOE OF SLOPE
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 - - - - - GUARDRAIL
 - - - - - PIPELINE
 ■ 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
 ■ AZ26-700 PILE
 ■ AZ36-700 PILE
 ■ AZ42-700 PILE
 ■ EXTERIOR SCOUR PROTECTION
 ■ INTERIOR SCOUR PROTECTION



PROFILE

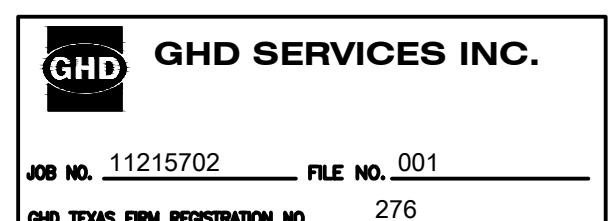
HORIZ: 1" = 30'
VERT: 1" = 10'

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.
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Sheet No

C-31

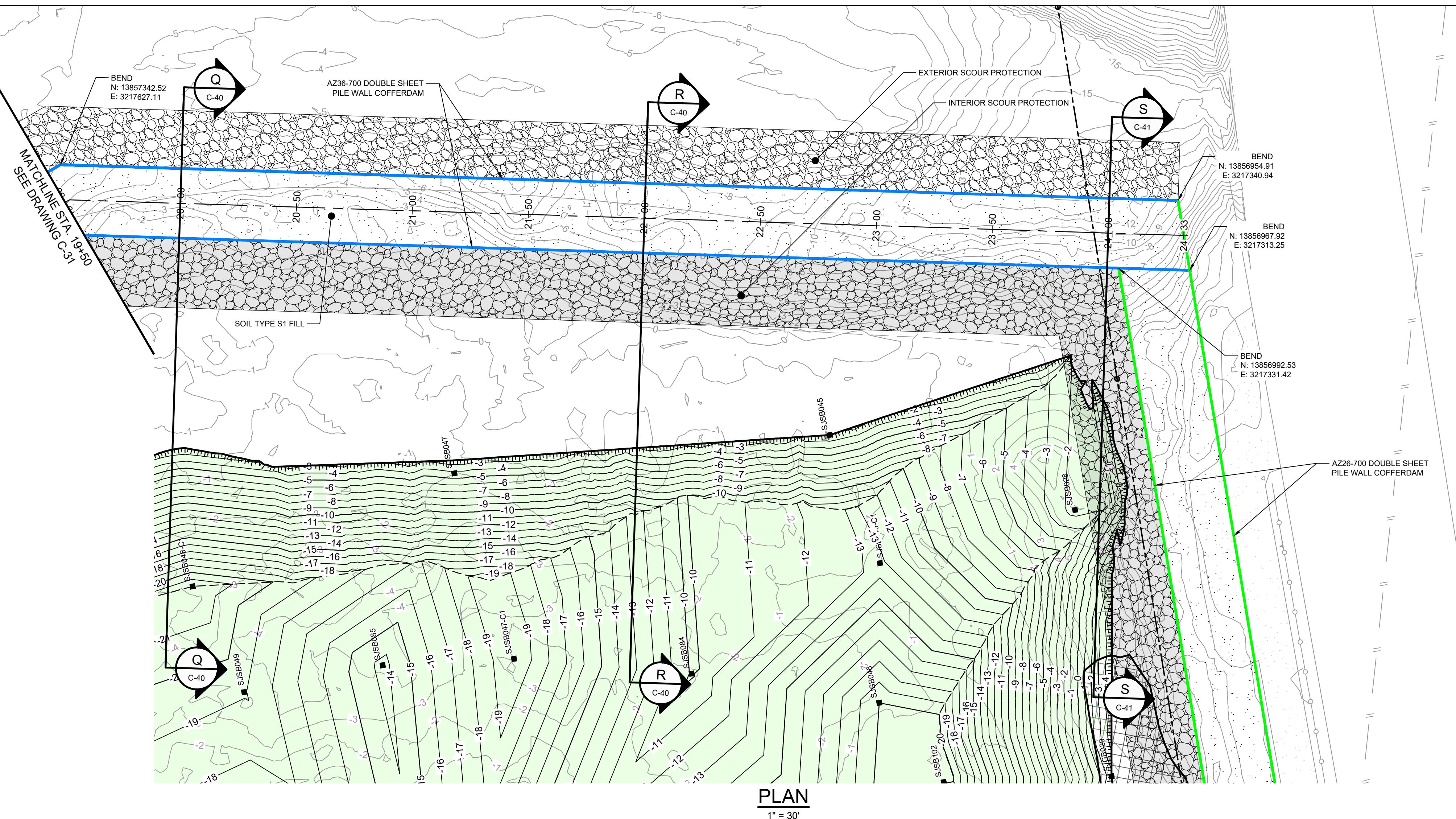


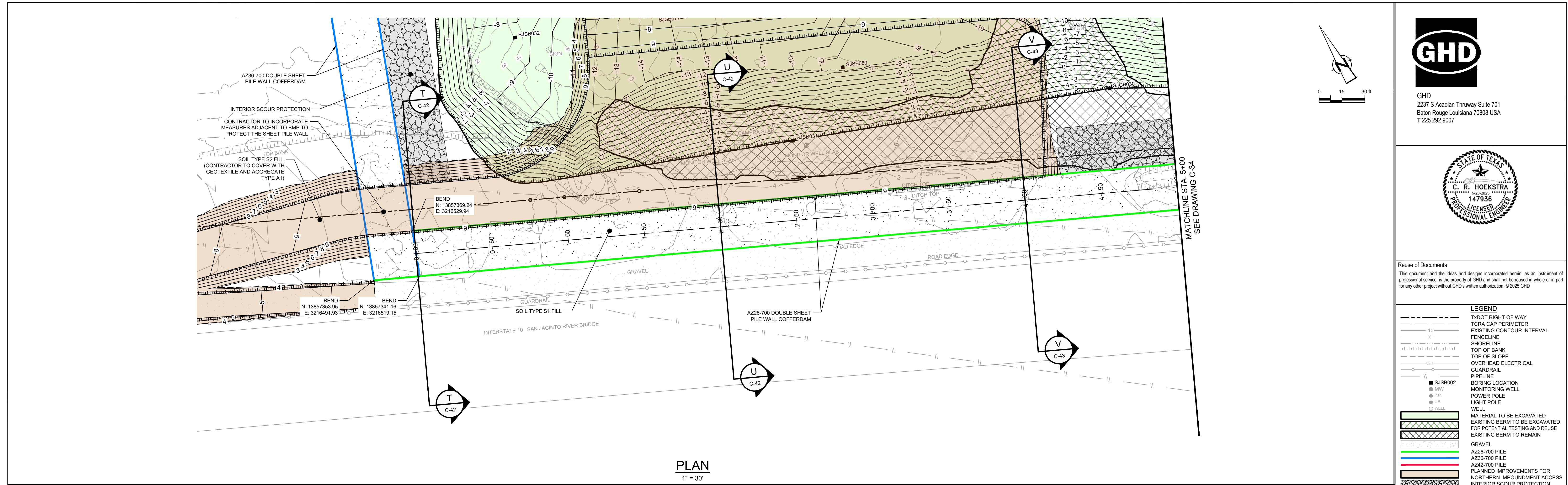
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LEGEND	
	TXDOT RIGHT OF WAY
	TCRA CAP PERIMETER
	EXISTING CONTOUR INTERVAL
	FENCELINE
	SHORELINE
	TOP OF BANK
	TOE OF SLOPE
	OVERHEAD ELECTRICAL
	PIPELINE
	BORING LOCATION
	MONITORING WELL
	POWER POLE
	WELL
	MATERIAL TO BE EXCAVATED
	EXISTING BERM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





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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
- AZ26-700 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 RI

Drafting Check BS Design Check LL

Project Coordinator CM Date May 22, 2025

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Scale AS SHOWN

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

Project No. 11215702

Title

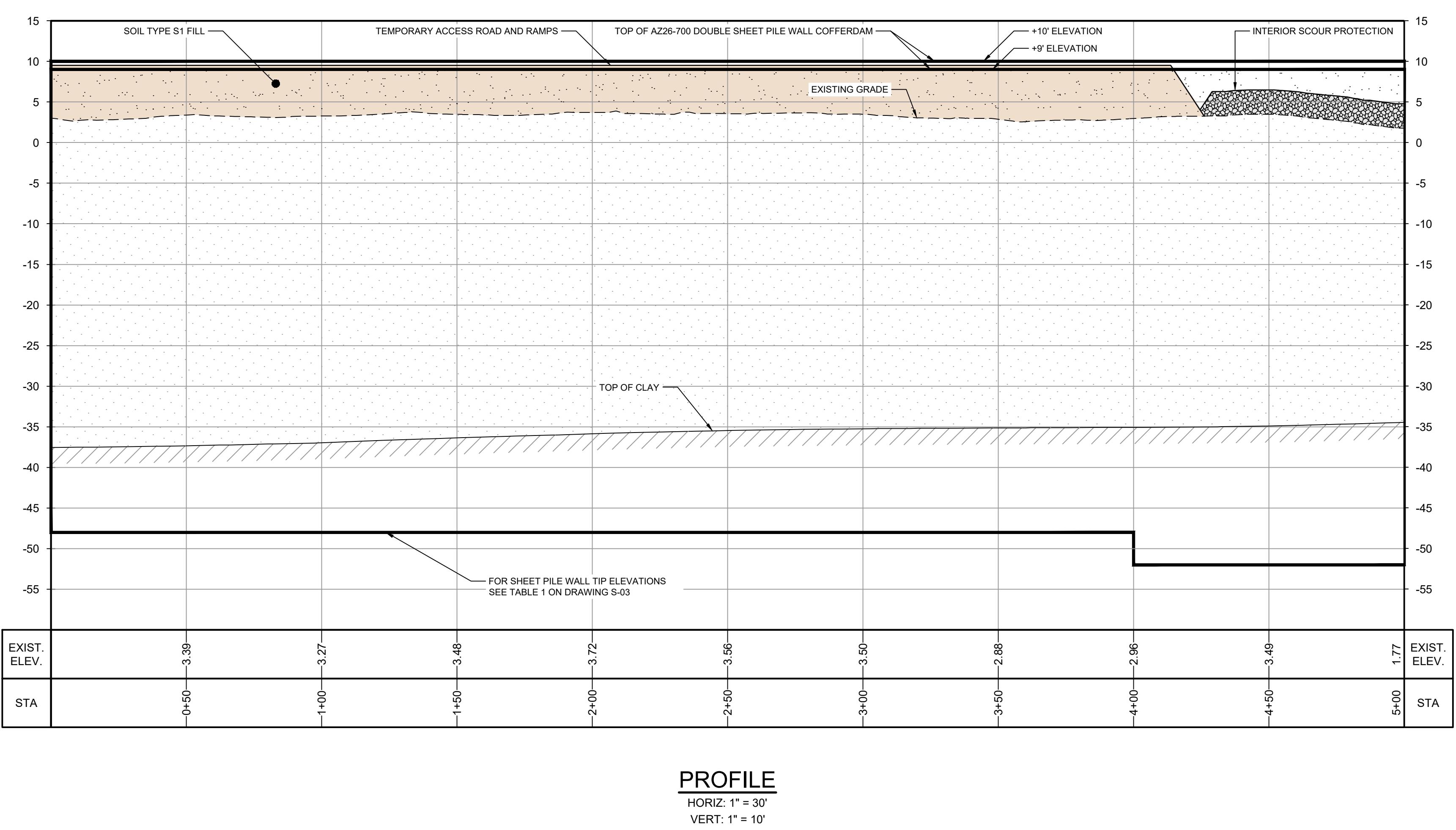
**PILE WALL
PLAN AND PROFILE
1 OF 2**

Sheet No.

C-33

THIRD 100% EPA SUBMITTAL

Sheet 34 of 83



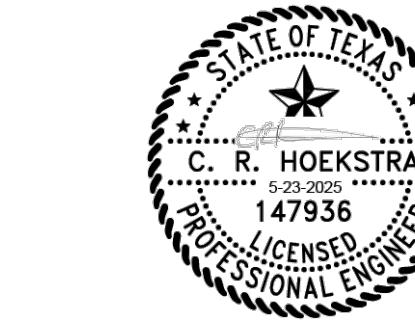
GHD SERVICES INC.

JOB NO. 11215702 FILE NO. 001

GHD TEXAS FIRM REGISTRATION NO. 276

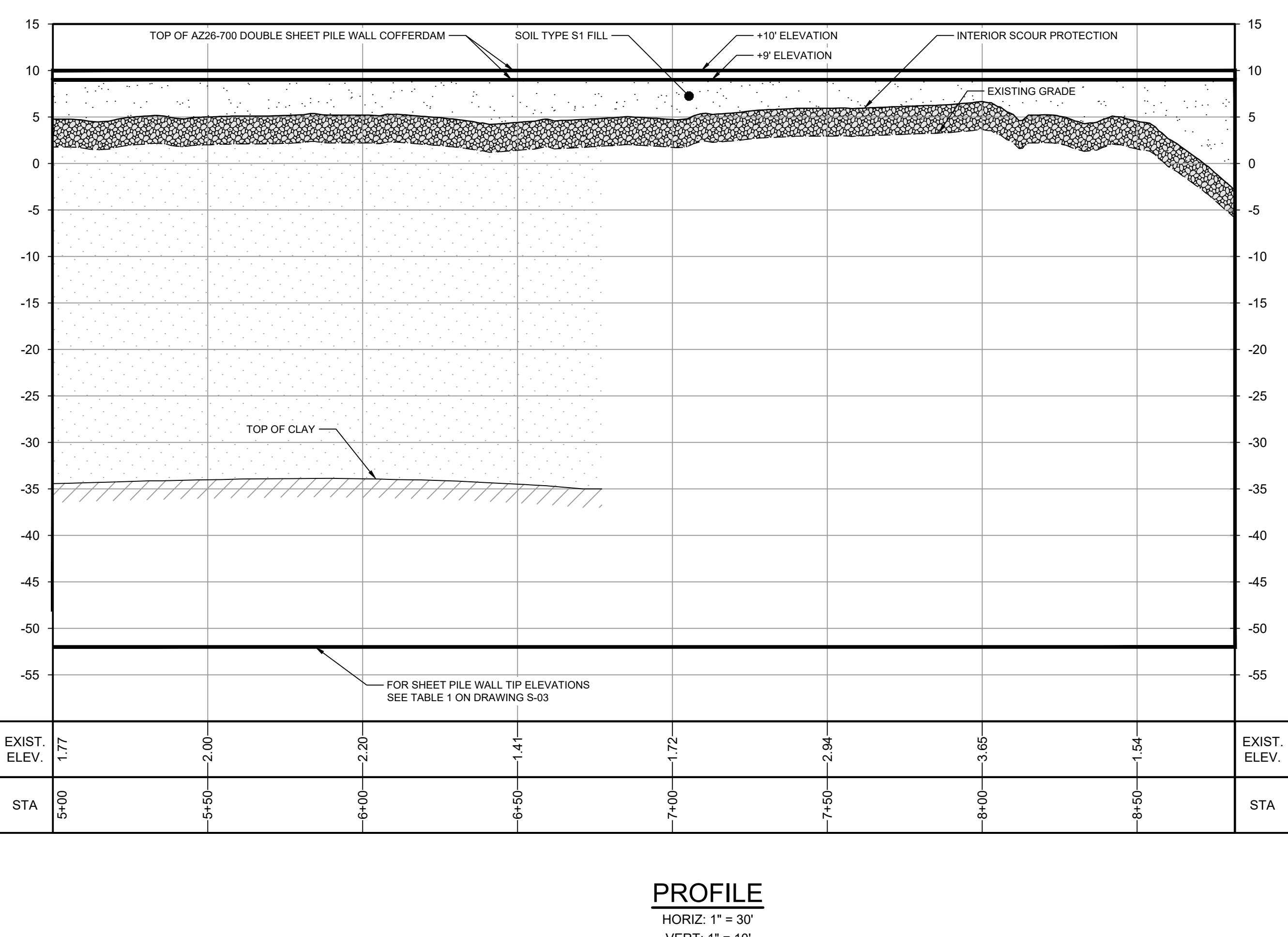
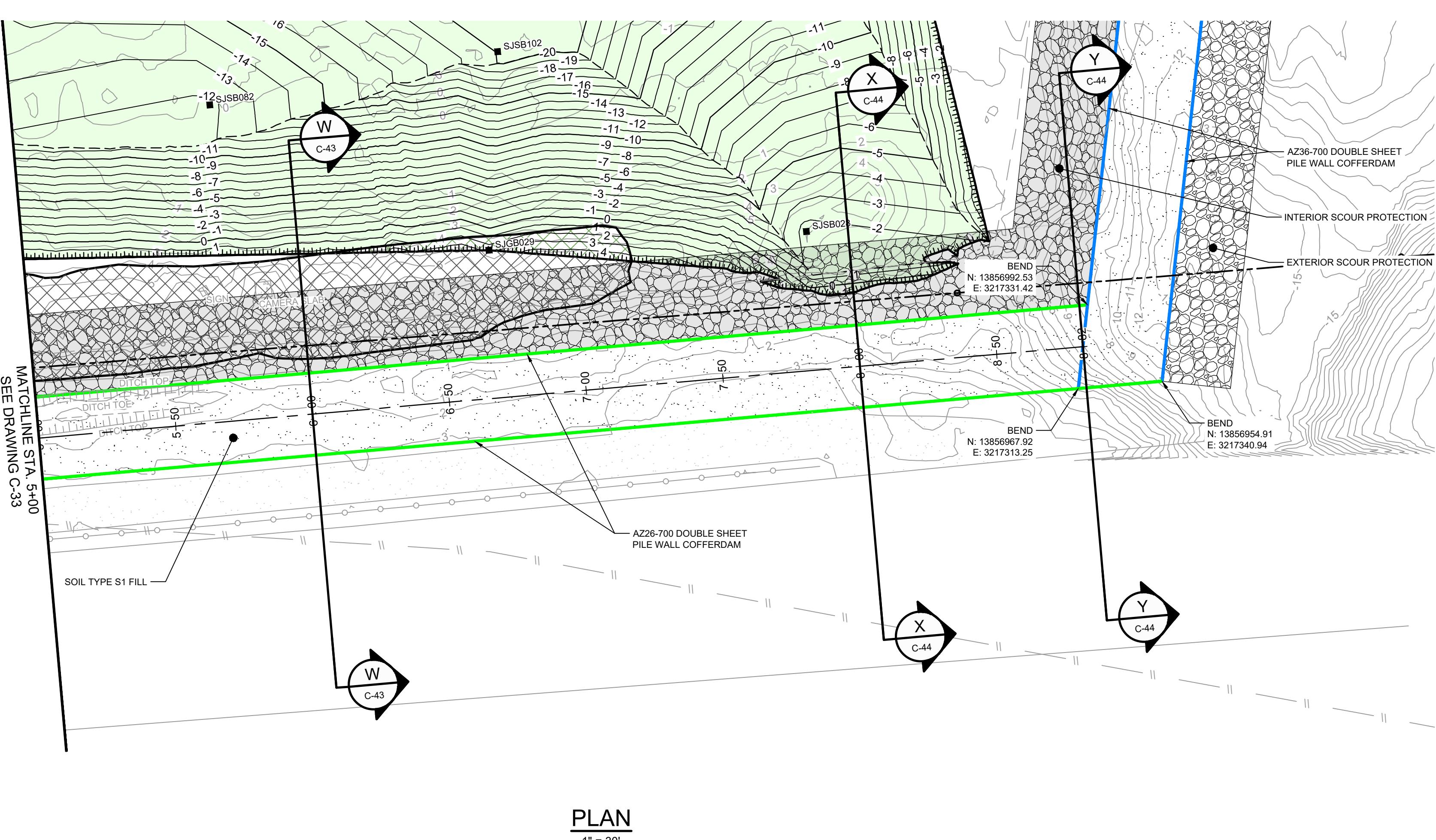


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LEGEND	
—	TXDOT RIGHT OF WAY
TCRA CAP PERIMETER	
EXISTING CONTOUR INTERVAL	
—	FENCELINE
SHORELINE	
TOE OF BANK	
TOE OF SLOPE	
—	OVERHEAD ELECTRICAL
GUARDRAIL	
PIPELINE	
—	BORING LOCATION
MW	MONITORING WELL
P.P.	POWER POLE
P.	LIGHT POLE
WELL	WELL
██████████	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
██████████	EXTERIOR SCOUR PROTECTION
██████████	INTERIOR SCOUR PROTECTION



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

Sheet No.

C-34

Sheet 35 of 83

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 RI

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

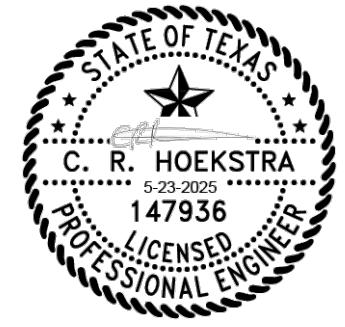
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**PILE WALL
PLAN AND PROFILE
2 OF 2**

Sheet No.



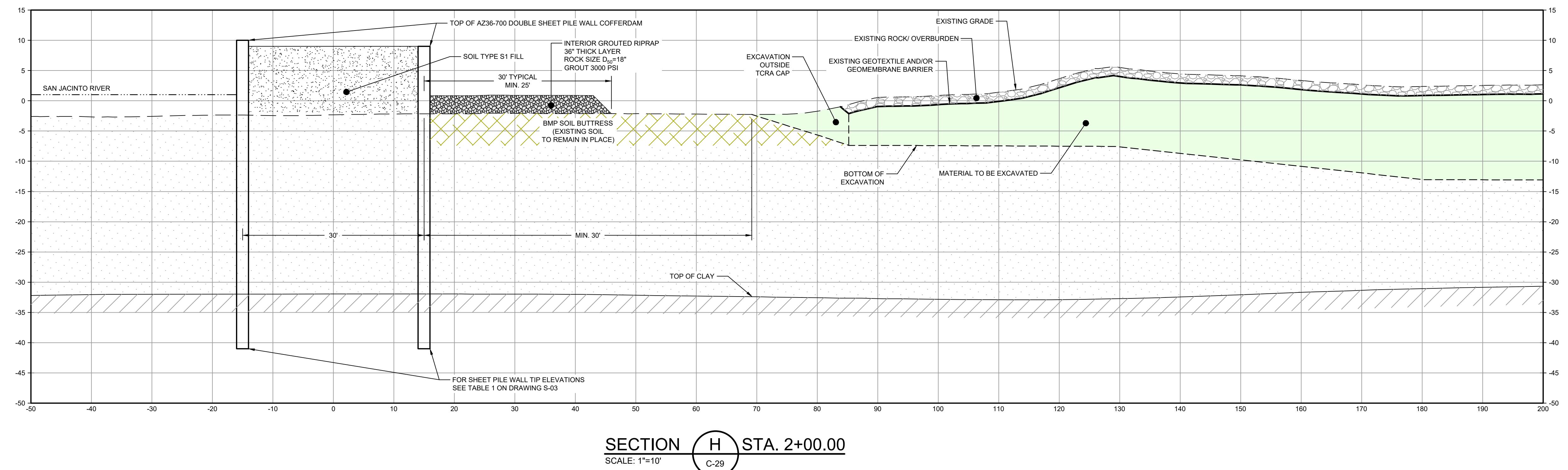
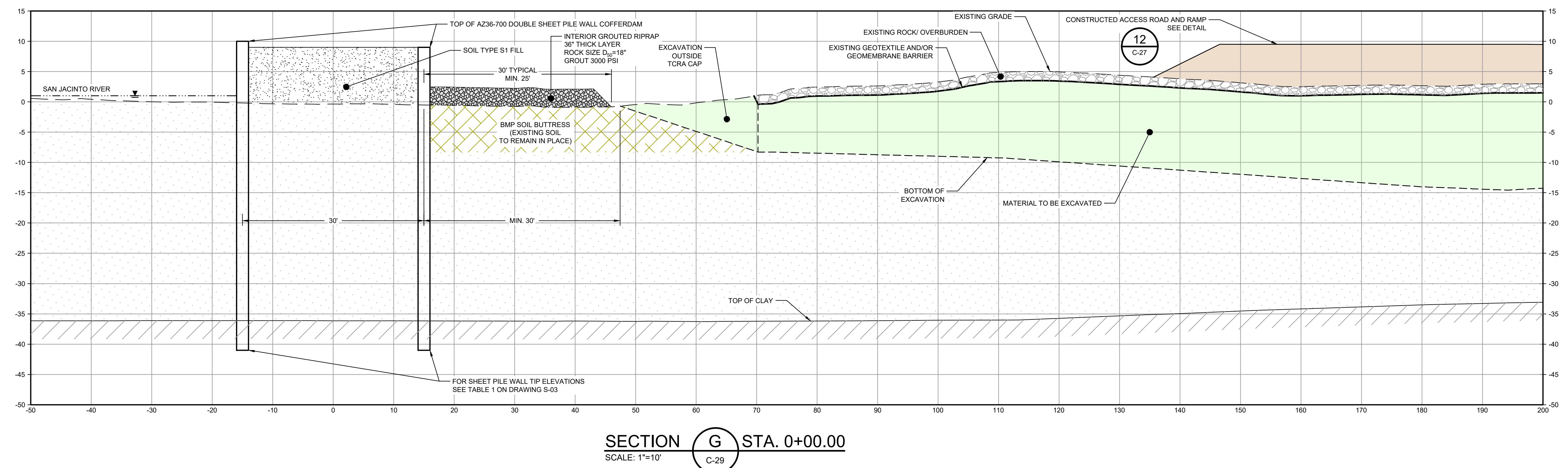
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LEGEND

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



NOTES:
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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 RI

Drafting Check BS Design Check LL

Project Coordinator CM Date May 22, 2025

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0 1"

Project No. 11215702

Title

**DOUBLE PILE WALL SECTIONS
1 OF 7**

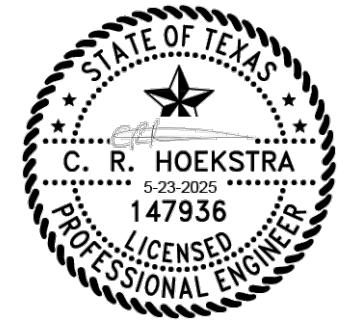
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C-35

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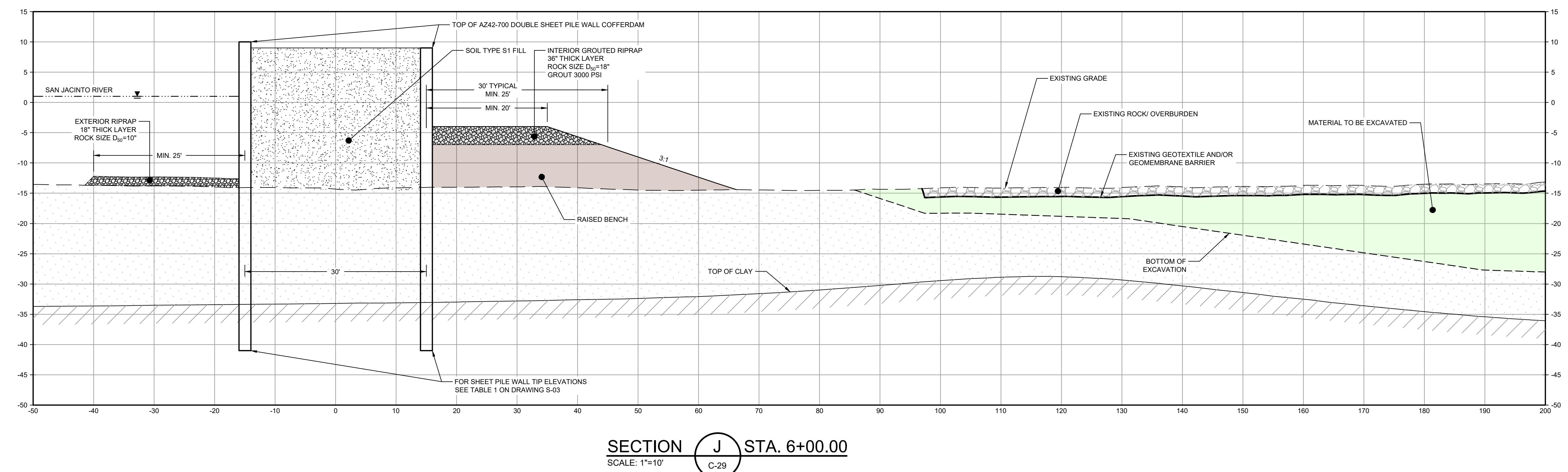
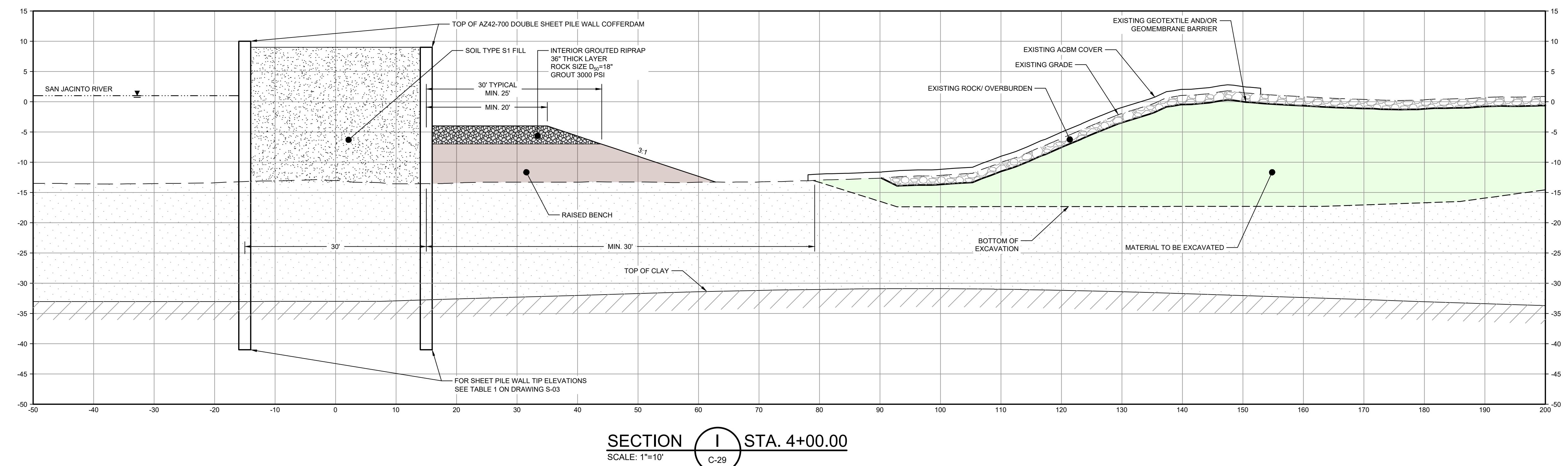
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LEGEND

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



NOTES:
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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**

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

No. Issue Drawn Approved Date

Drawn JC Designer RI

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

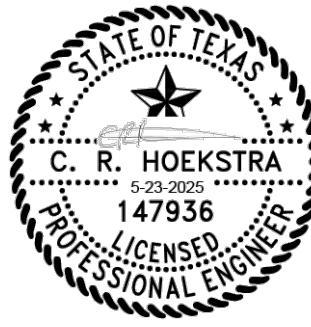
**DOUBLE PILE WALL SECTIONS
2 OF 7**

Sheet No.

C-36



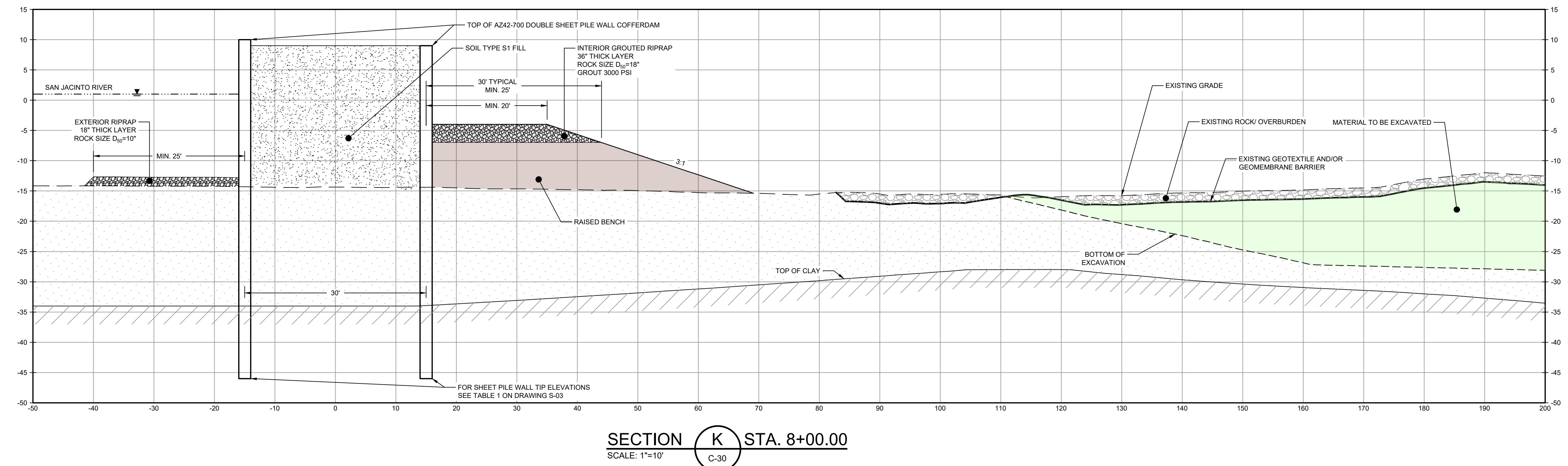
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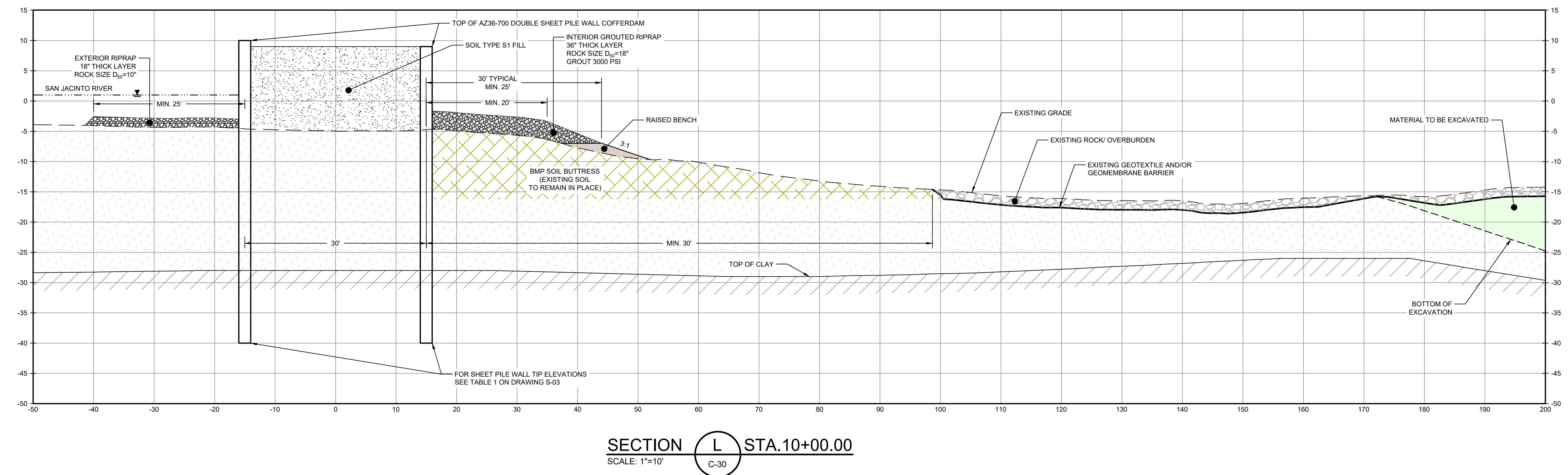
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LEGEND

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



SECTION K STA. 8+00.00
SCALE: 1"=10'
C-30



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

NOTES:

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C-37



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LEGEND

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

No. Issue Drawn Approved Date

Drawn JC Designer RI

Drafting Check BS Design Check LL

Project Coordinator CM Date May 22, 2025

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0 1"

Project No. 11215702

Title

**DOUBLE PILE WALL SECTIONS
4 OF 7**

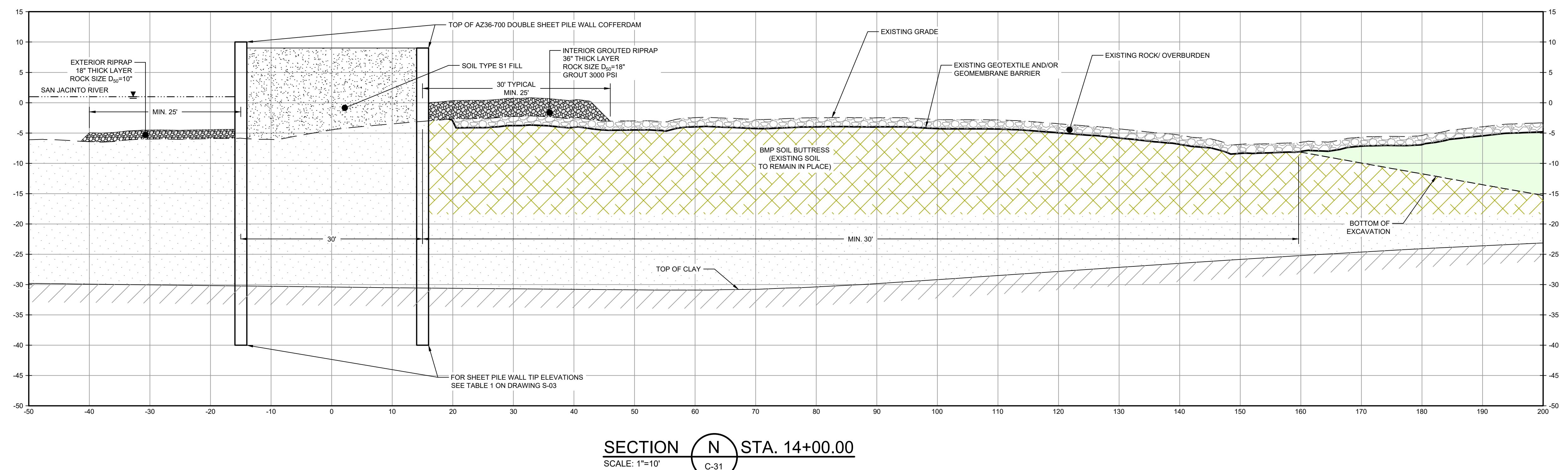
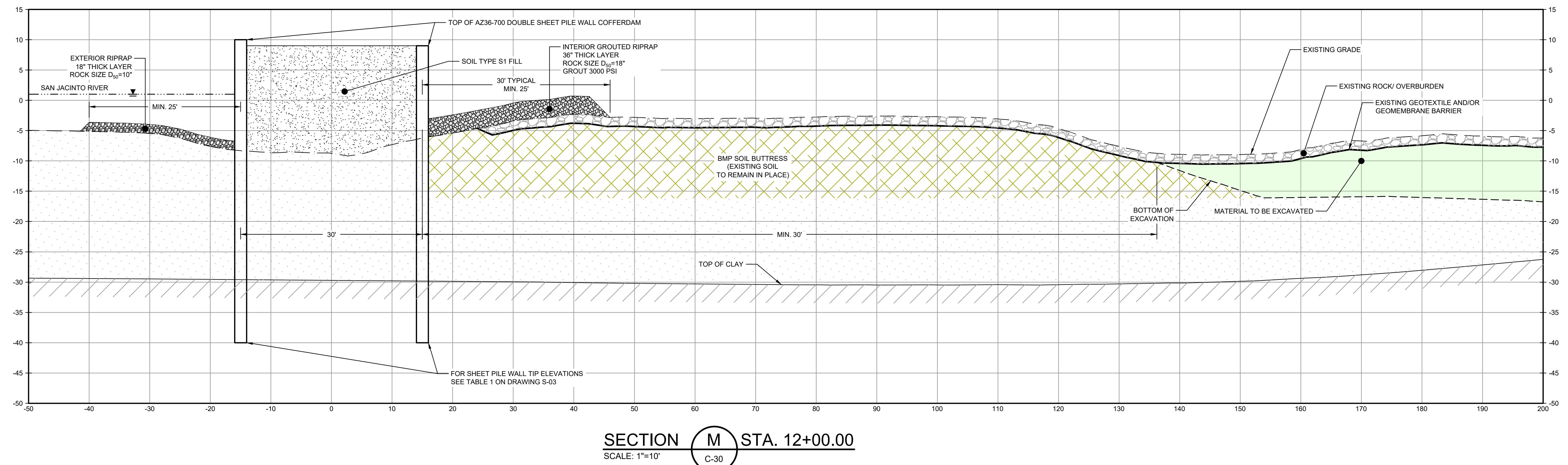
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JOB NO. 11215702 FILE NO. 001
GHD TEXAS FIRM REGISTRATION NO. 276



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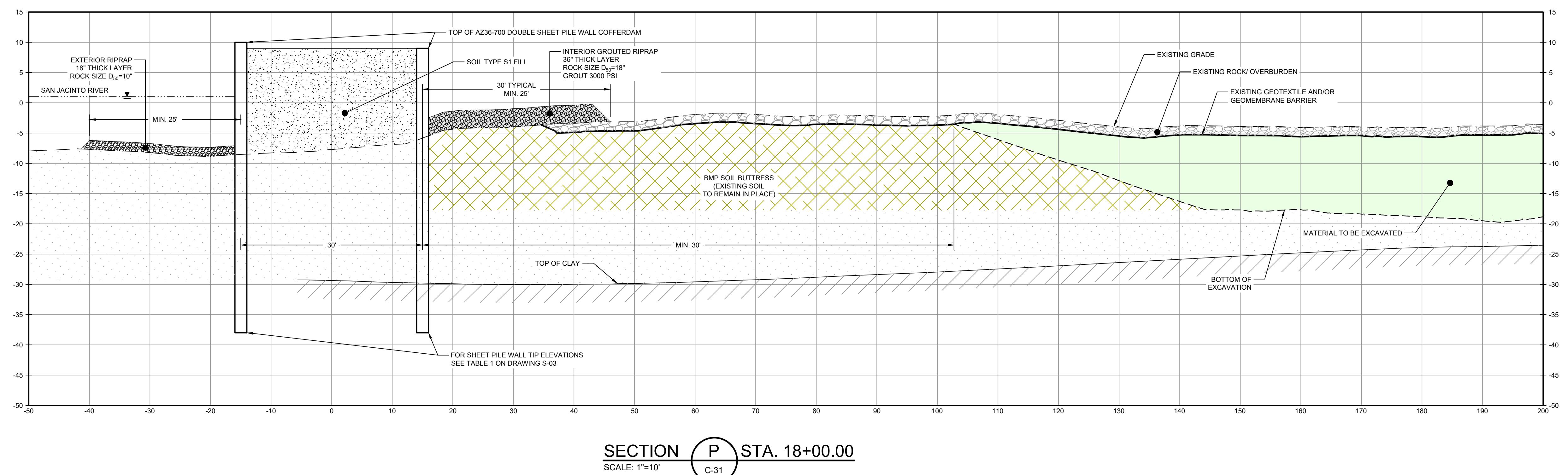
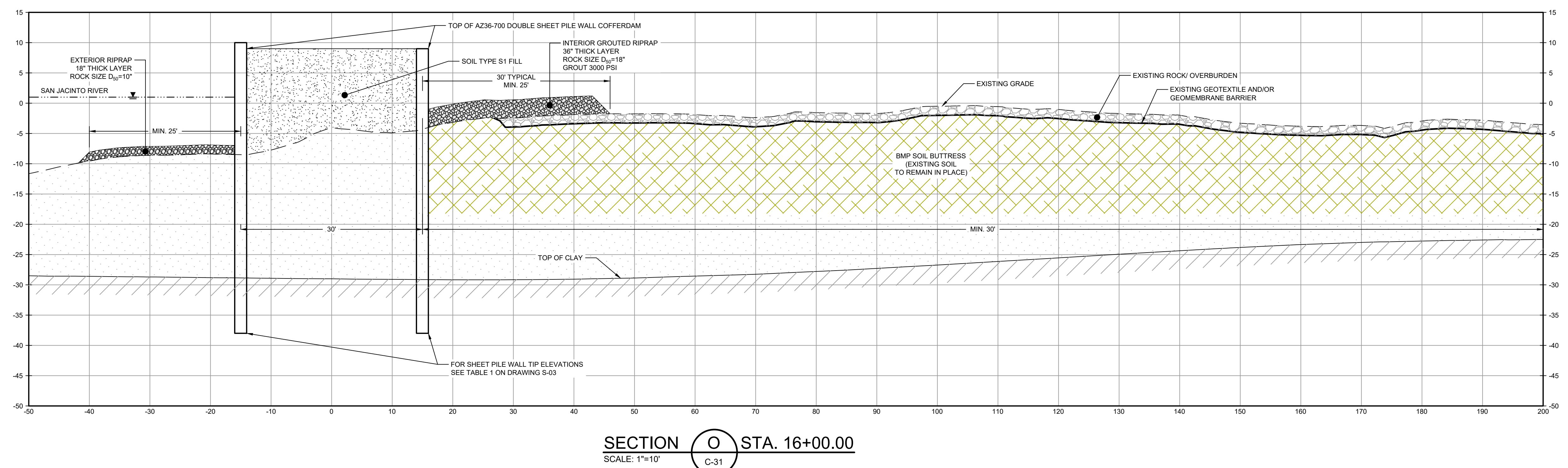
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LEGEND

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



NOTES:
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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**

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

No. Issue Drawn Approved Date

Drawn JC Designer RI

Drafting Check BS Design Check LL

Project Coordinator CM Date May 22, 2025

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0 1"

Project No. 11215702

Title

**DOUBLE PILE WALL SECTIONS
5 OF 7**

Sheet No.

C-39

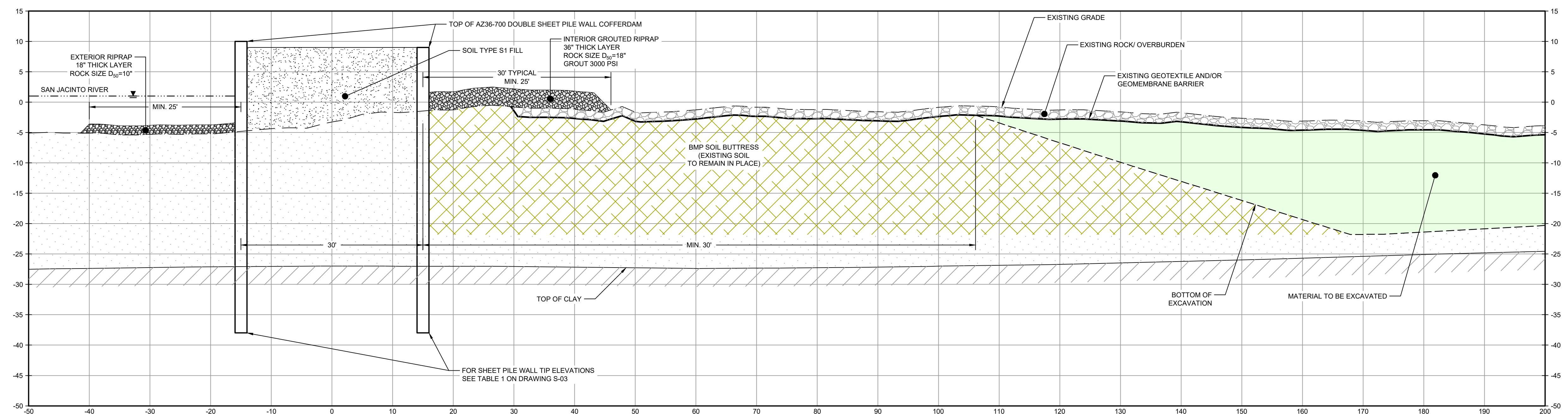


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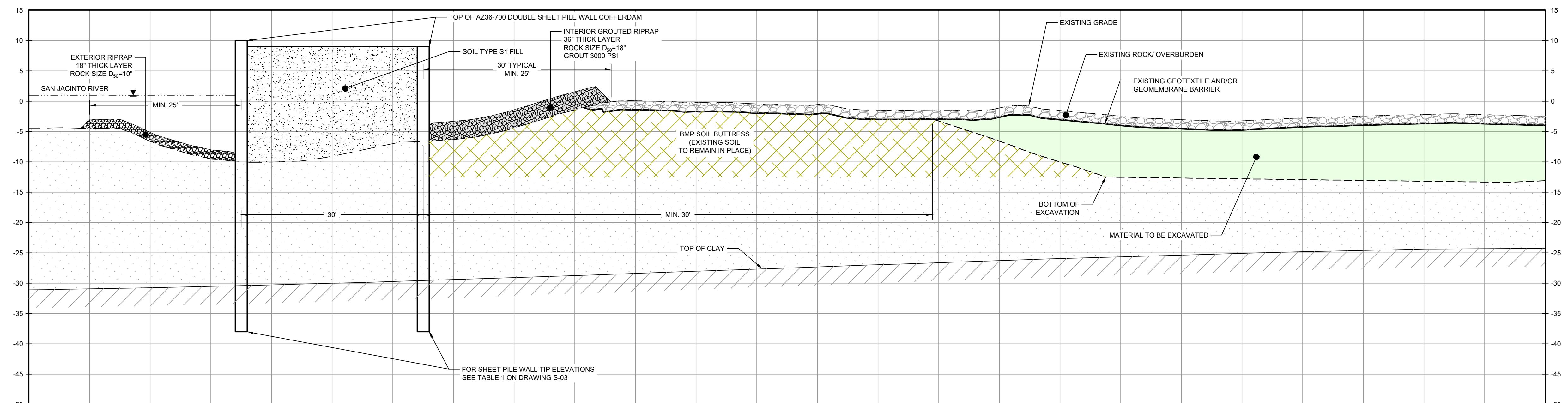
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LEGEND	
	MATERIAL TO BE EXCAVATED
	BMP SOIL BUTTRESS (EXISTING SOIL TO REMAIN IN PLACE)
	EXTERIOR SCOUR PROTECTION
	INTERIOR SCOUR PROTECTION



SECTION Q STA. 20+00.00

SCALE: 1"=10' C-32



SECTION R STA. 22+00.00

SCALE: 1"=10' C-32

NOTES:
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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**

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

No. Issue Drawn Approved Date

Drawn JC Designer RI

Drafting Check BS Design Check LL

Project Coordinator CM Date May 22, 2025

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0 1"

Project No. 11215702

Title

**DOUBLE PILE WALL SECTIONS
6 OF 7**

Sheet No.

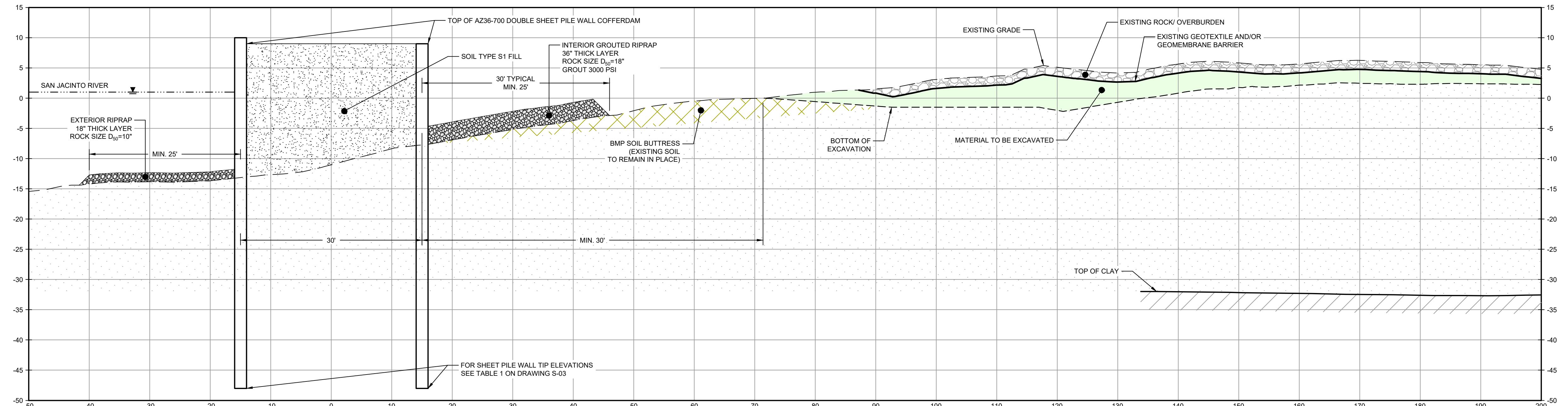
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LEGEND

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

Project No. 11215702

Title

**DOUBLE PILE WALL SECTIONS
7 OF 7**

Sheet No.

C-41

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

THIRD 100% EPA SUBMITTAL



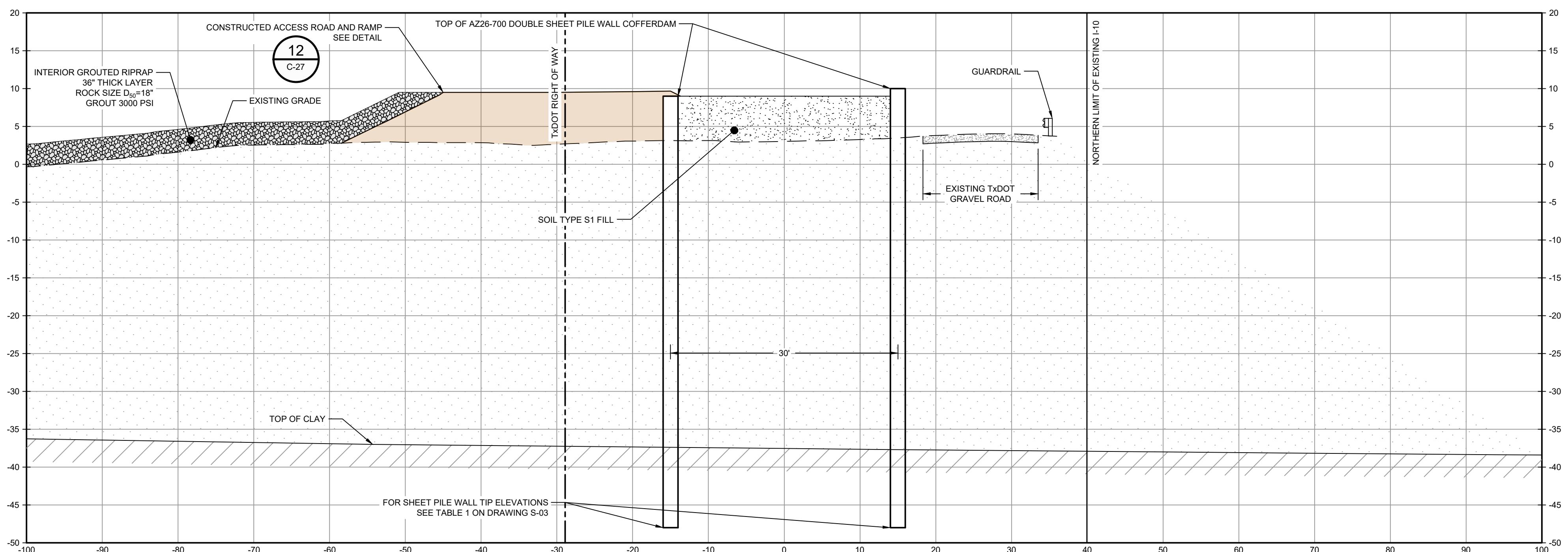
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LEGEND

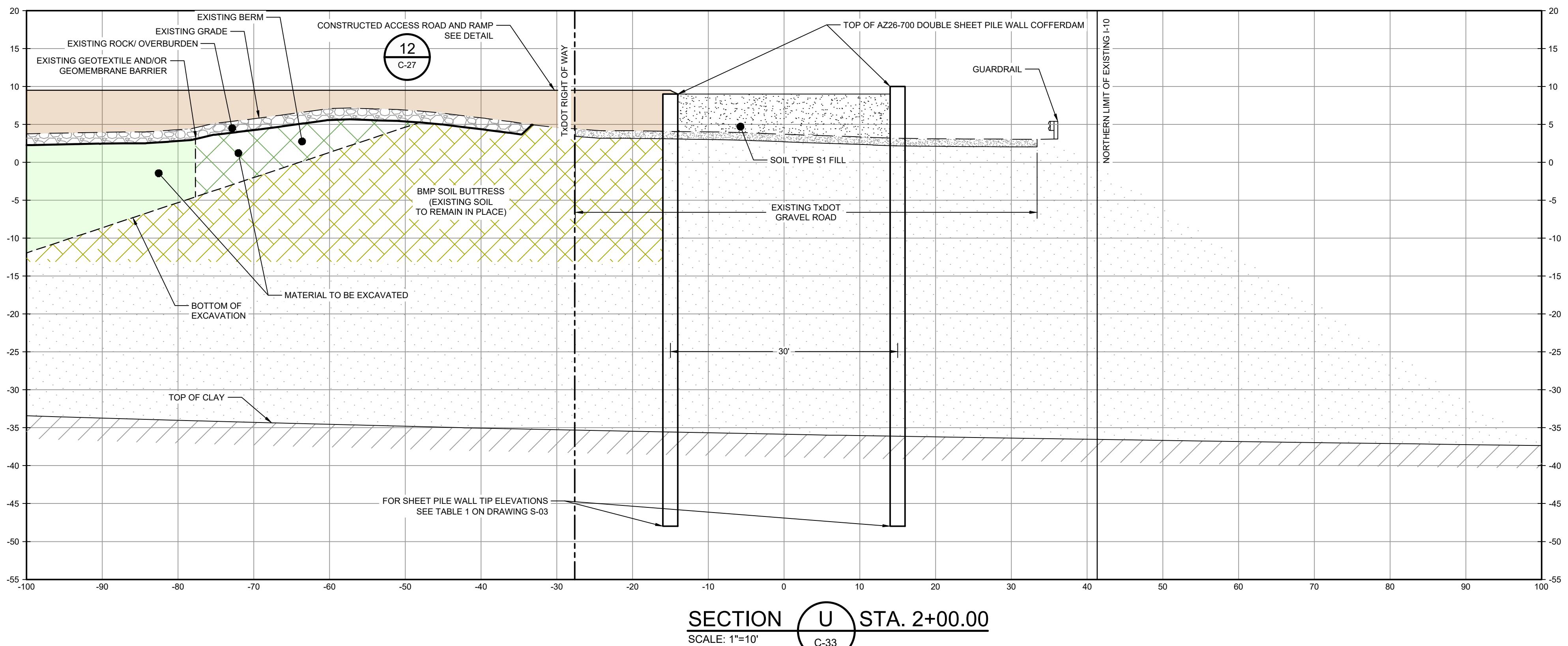
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	PLANNED IMPROVEMENTS FOR NORTHERN IMPOUNDMENT ACCESS
	EXISTING BERM TO BE EXCAVATED FOR POTENTIAL TESTING AND REUSE
	INTERIOR SCOUR PROTECTION



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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



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 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.

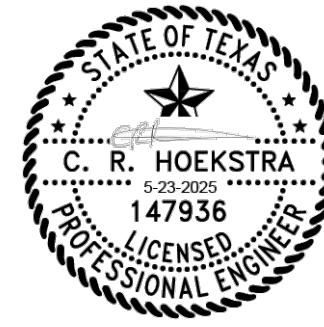
C-42

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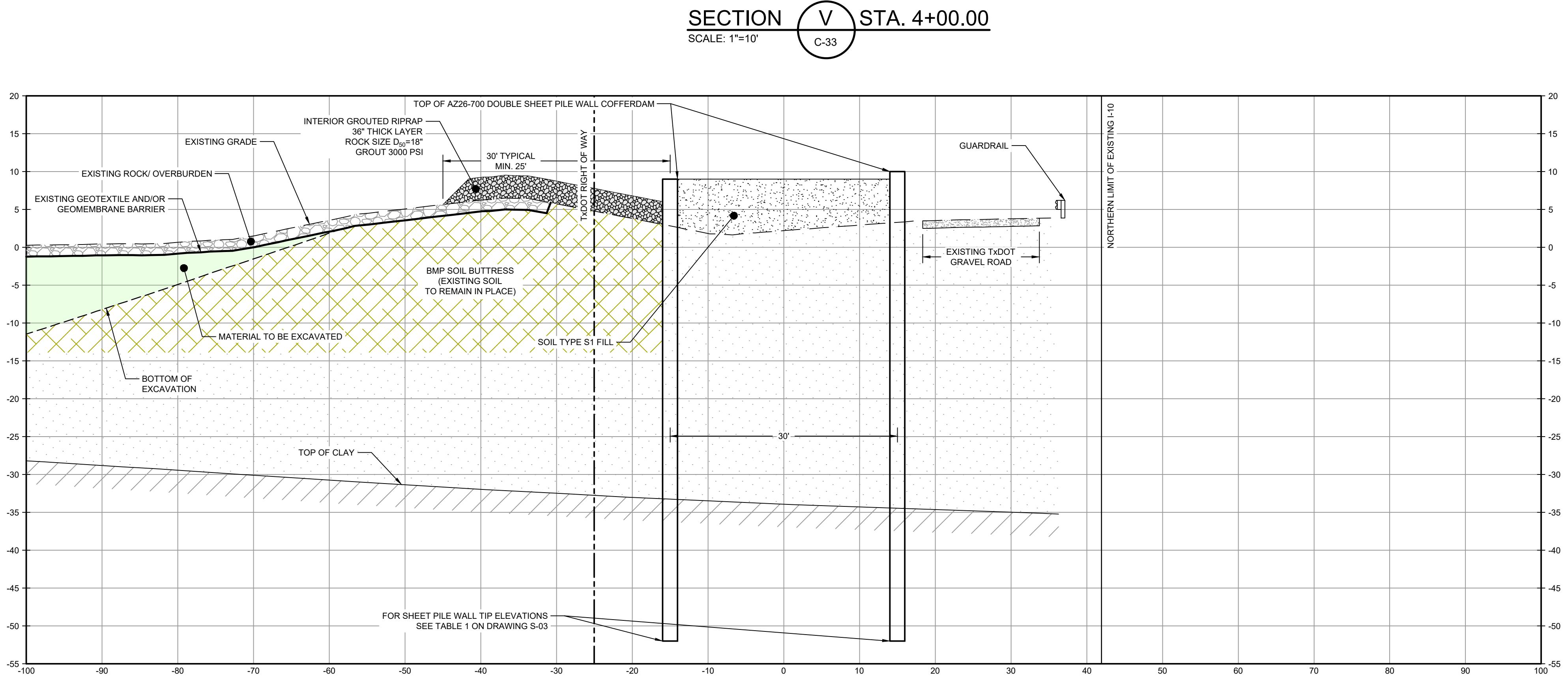
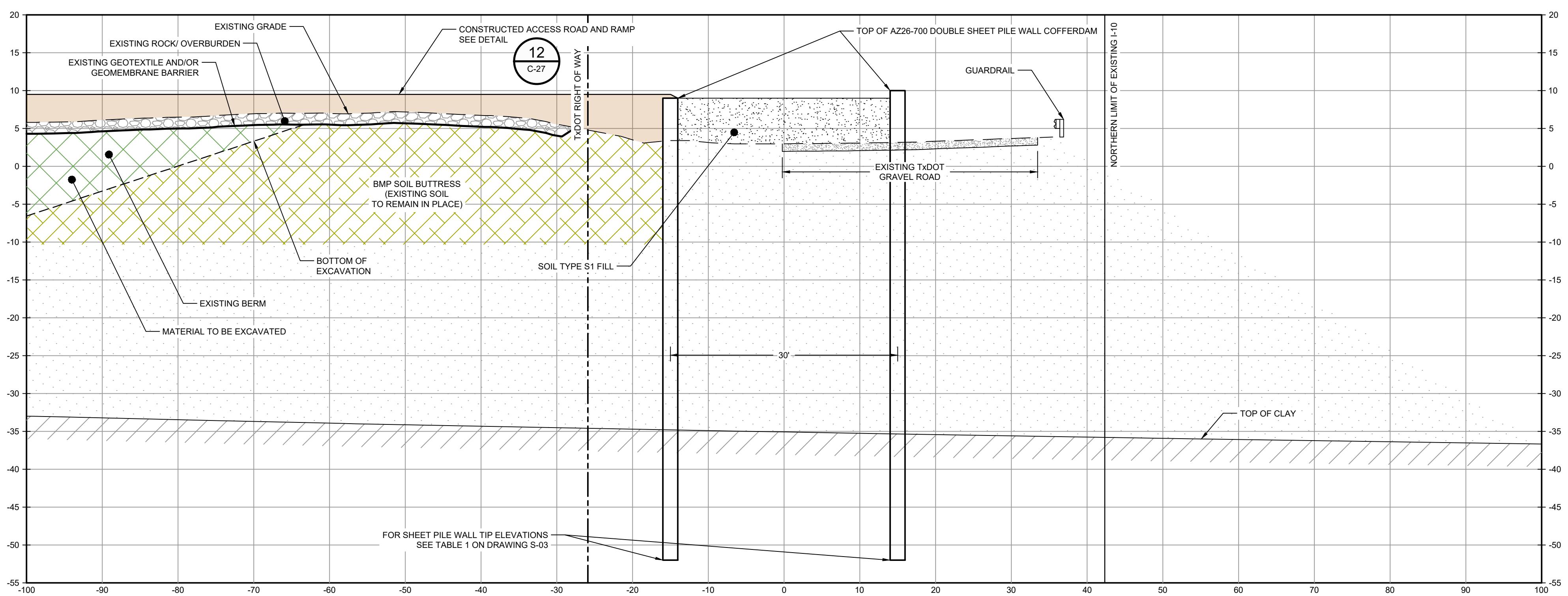
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LEGEND

	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



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**

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

No. Issue Drawn Approved Date

Drawn JC Designer RH

Drafting BS Design Check LL

Project Coordinator CM Date May 22, 2025

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Project No. 11215702

Title

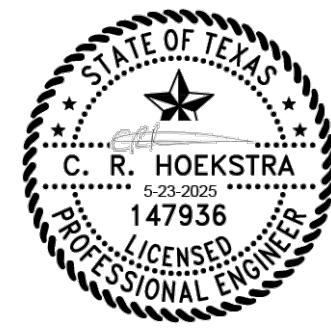
**SOUTH WALL SECTIONS
2 OF 3**

Sheet No.

C-43



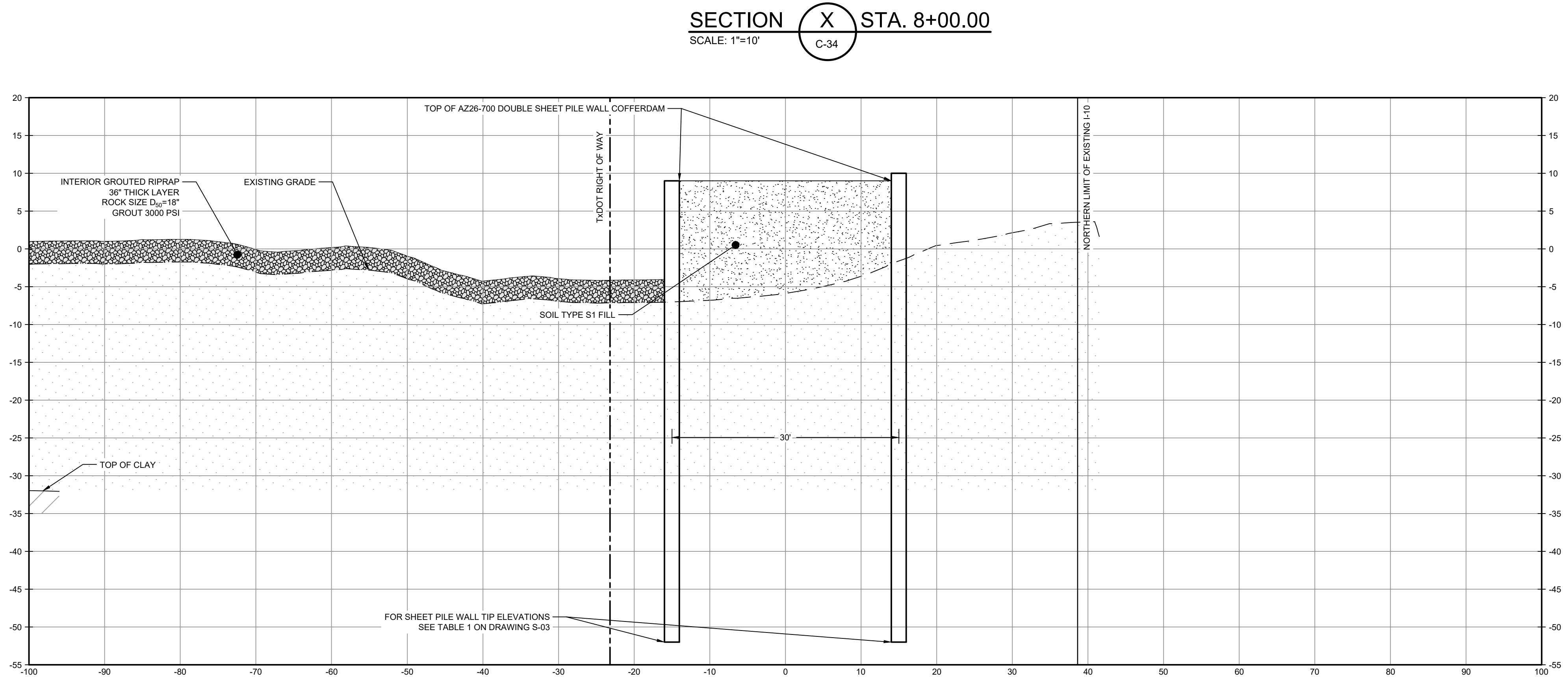
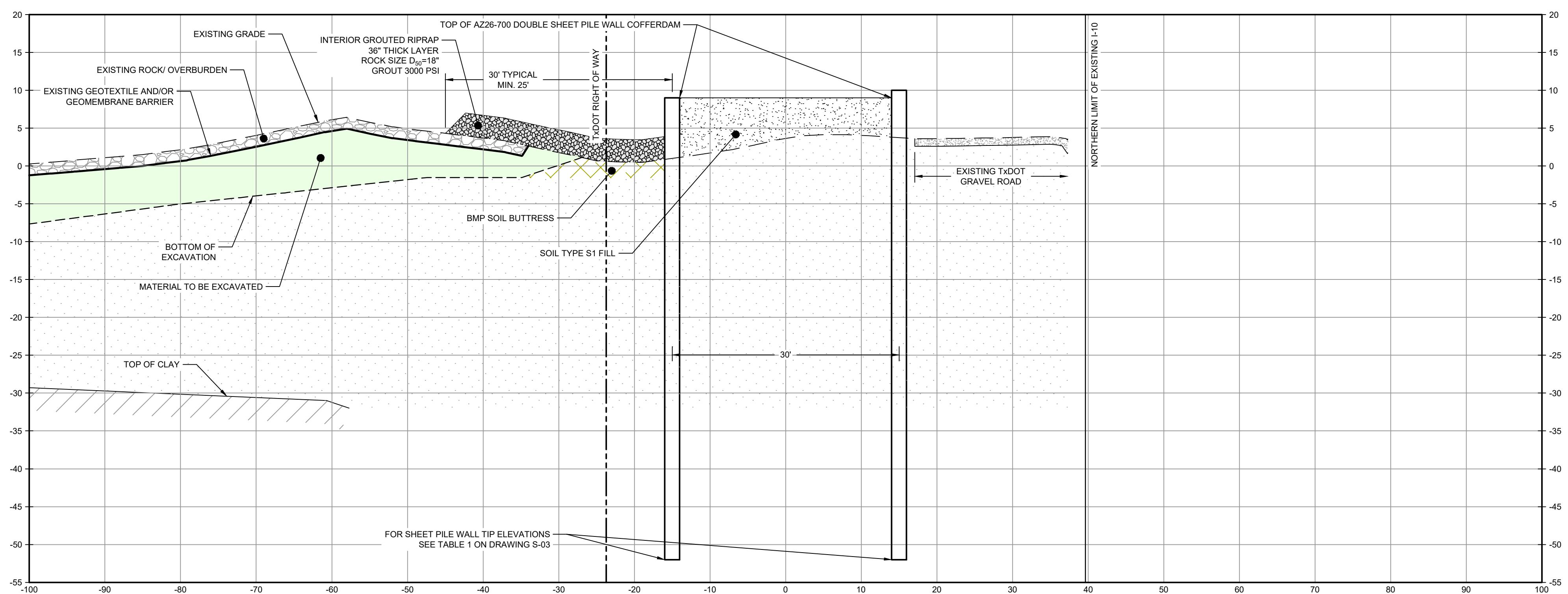
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LEGEND

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



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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 RI

Drafting BS Design Check LL

Project Coordinator CM Date May 22, 2025

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Project No. 11215702

Title
**SOUTH WALL SECTIONS
3 OF 3**

Sheet No.

C-44

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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
— 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
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No.	Issue	Drawn	Approved	Date
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Drawn	JC	Designer	RH
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Drafting	BS	Design	WB
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Check	CM	Date	May 23, 2025
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Scale 1" = 20'

Original Size	Bar is one inch on original size drawing
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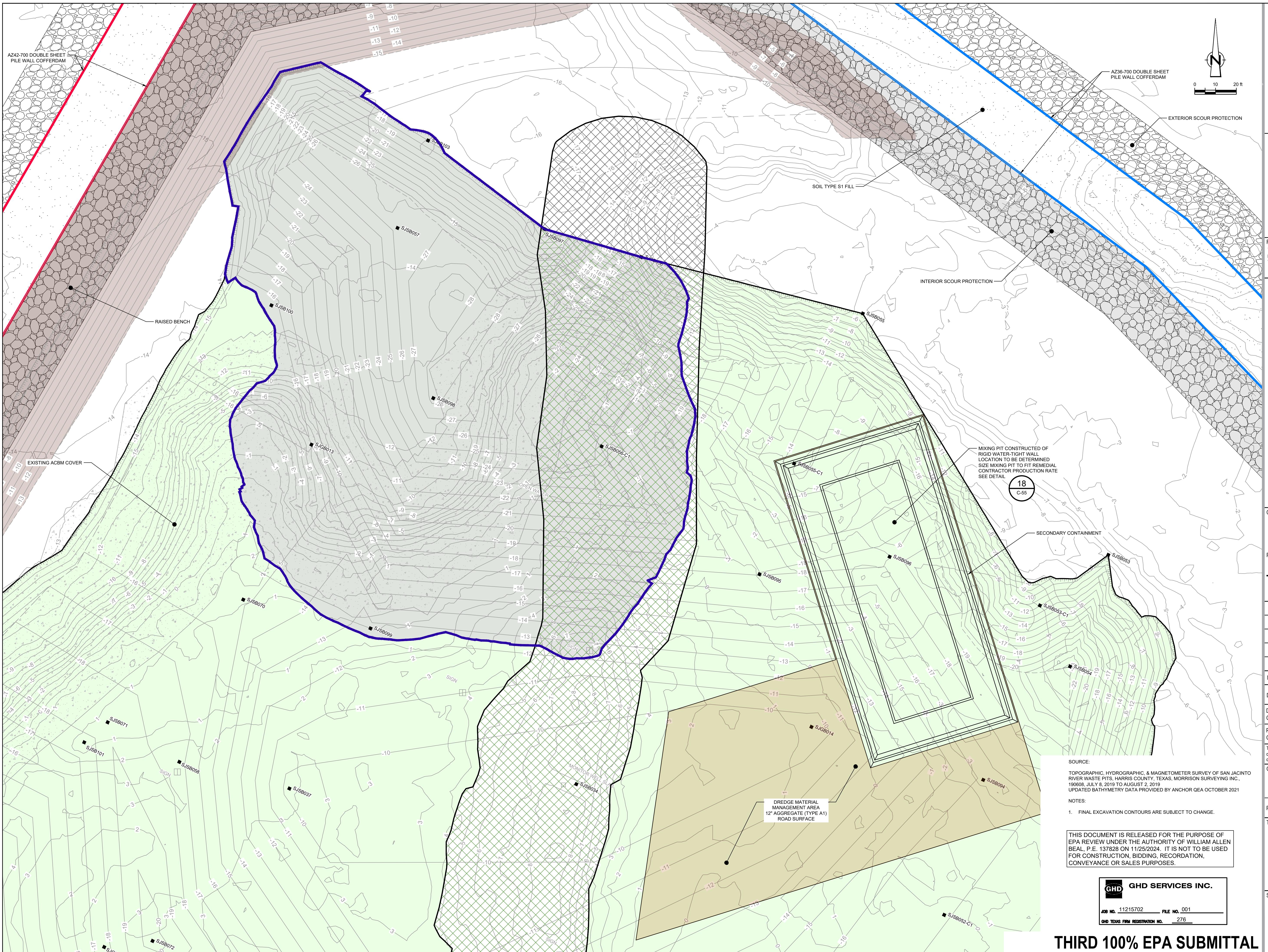
Arch D	0	1"
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Project No.	11215702
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Title	DREDGING NORTHWEST CORNER WORKS PLAN
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Sheet No.	C-45
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LEGEND	
—	TXDOT RIGHT OF WAY
—	TCRA CAP PERIMETER
—	EXISTING CONTOUR INTERVAL
—	FENCELINE
—	SHORELINE
—	TOE 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

SAN JACINTO RIVER WASTE PITS

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 RI

Drafting Check BS Design Check WB

Project Coordinator CM Date May 23, 2025

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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

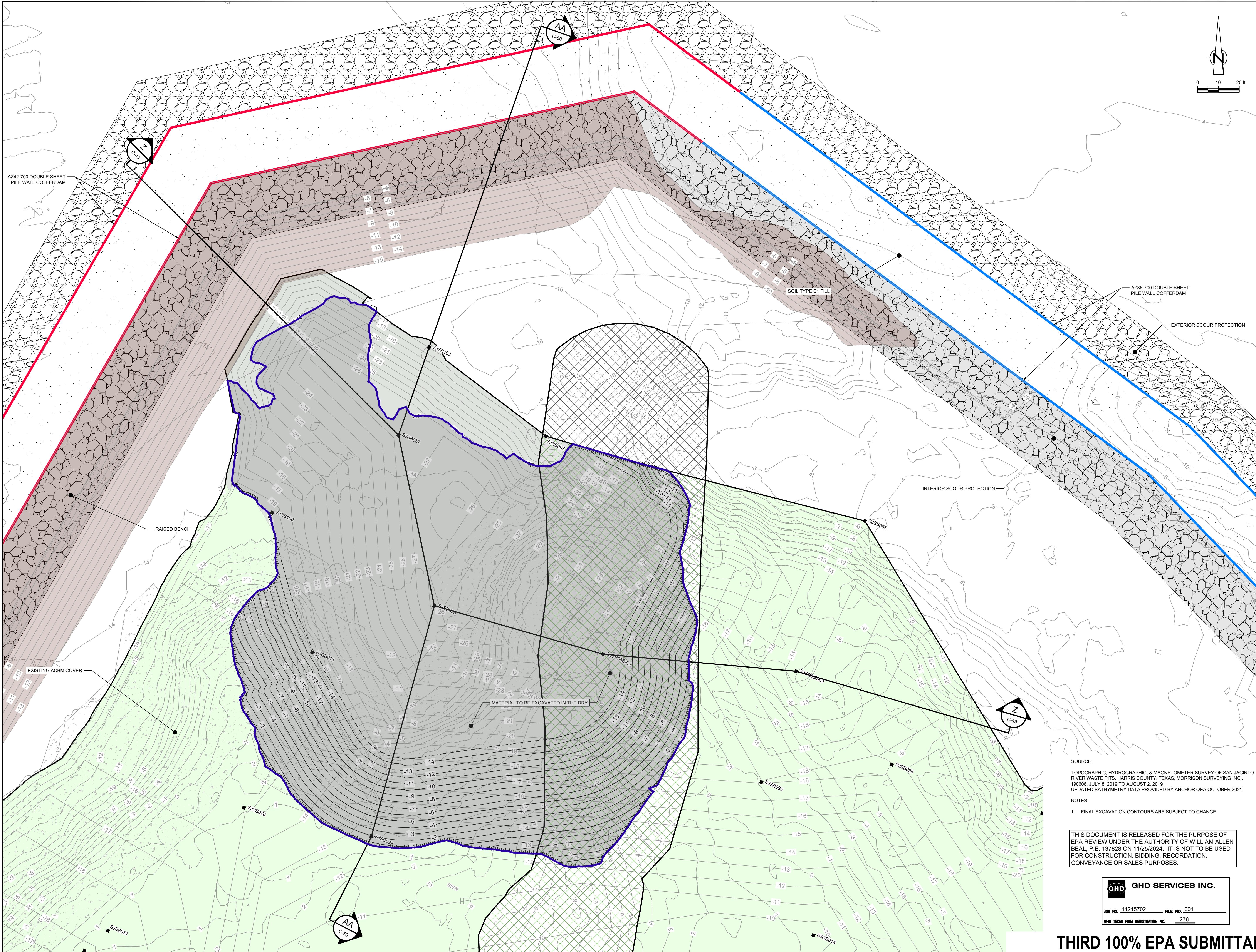
DREDGING NORTHWEST CORNER DRY EXCAVATION

Sheet No.

C-47

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Sheet 48 of 83





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LEGEND	
—	TXDOT RIGHT OF WAY
—	TCRA CAP PERIMETER
—	EXISTING CONTOUR INTERVAL
—	FENCELINE
—	SHORELINE
—	TOE OF BANK
—	TOE OF SLOPE
—	OVERHEAD ELECTRICAL
—	GUARDRAIL
—	PIPELINE
—	BORING LOCATION
—	MONITORING WELL
—	POWER POLE
—	LIGHT POLE
—	WELL
■	SJSB002
●	MW
●	PW
●	PP
●	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

SAN JACINTO RIVER WASTE PITS

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

5 THIRD 100% EPA SUBMITTAL JC WB 05/23/25

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Drawn JC Designer RI

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

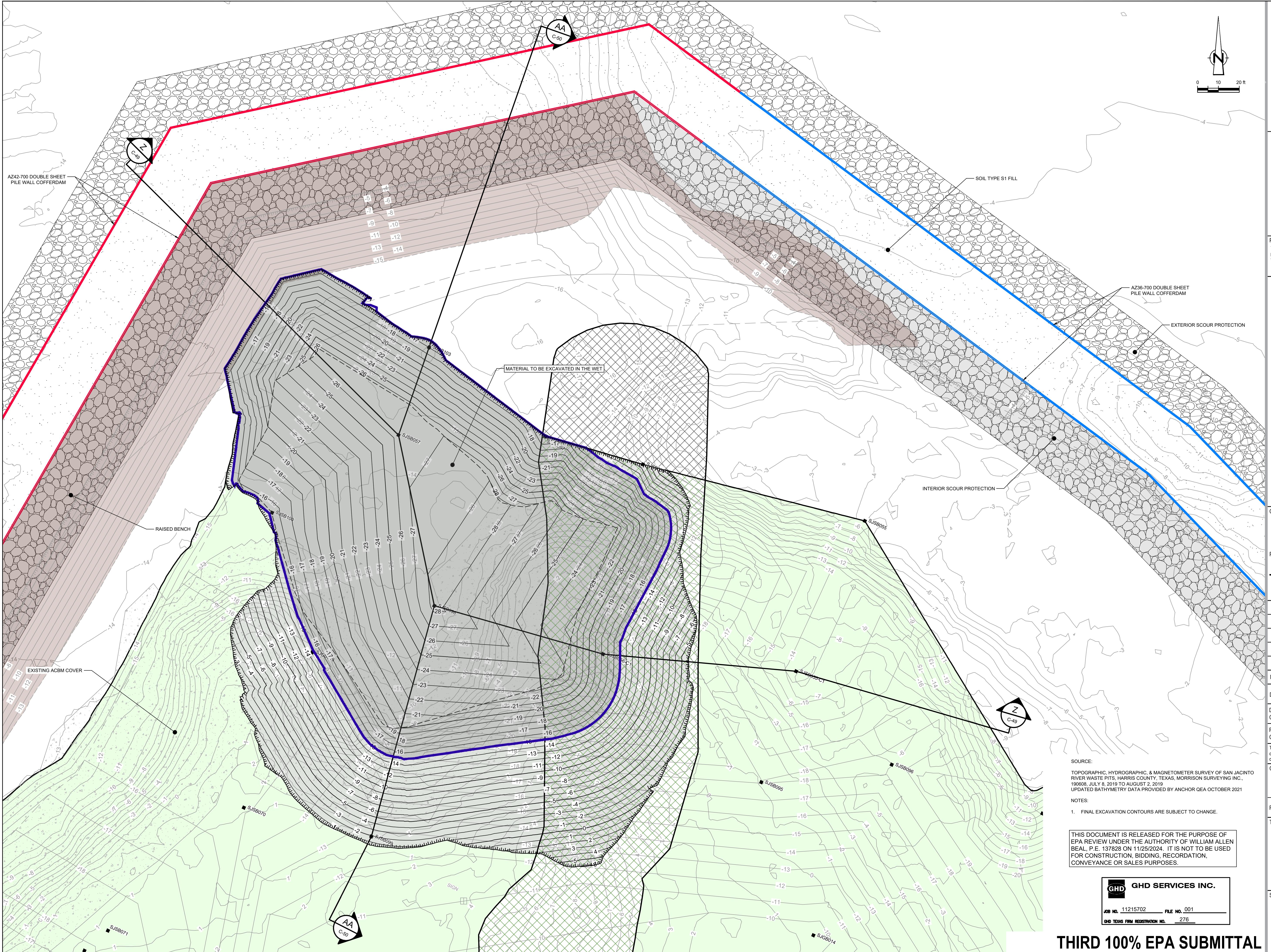
DREDGING NORTHWEST CORNER WET EXCAVATION

Sheet No.

C-48

THIRD 100% EPA SUBMITTAL

Sheet 49 of 83



JOB NO. 11215702 FILE NO. 001

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LEGEND
█ SOILS WITH CONCENTRATIONS <30 mg/kg TEQ₉₀ TCD
█ SOILS WITH CONCENTRATIONS ≥30 mg/kg TEQ₉₀ TCD
— EXCAVATION LIMIT BASED ON FS = 1.25 FOR HYDRAULIC HEAVE
— MATERIAL TO BE EXCAVATED
— EXISTING BERM TO BE EXCAVATED
— EXISTING BERM 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 05/23/25

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Drawn JC Designer RI

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Project Coordinator CM Date May 22, 2025

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0 1" 1"

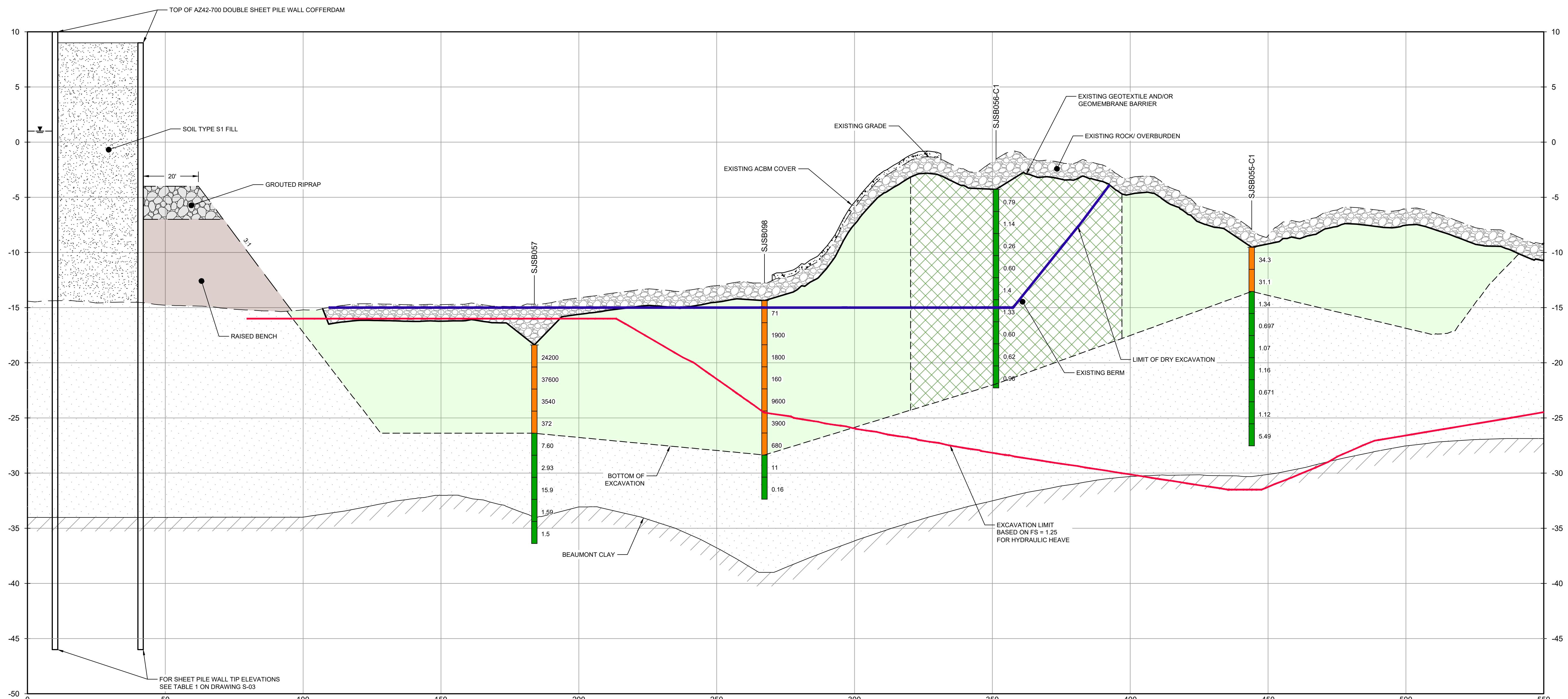
Project No. 11215702

Title
**DREDGING
NORTHWEST CORNER
SECTIONS 1 OF 2**

Sheet No.

C-49

Sheet 50 of 83



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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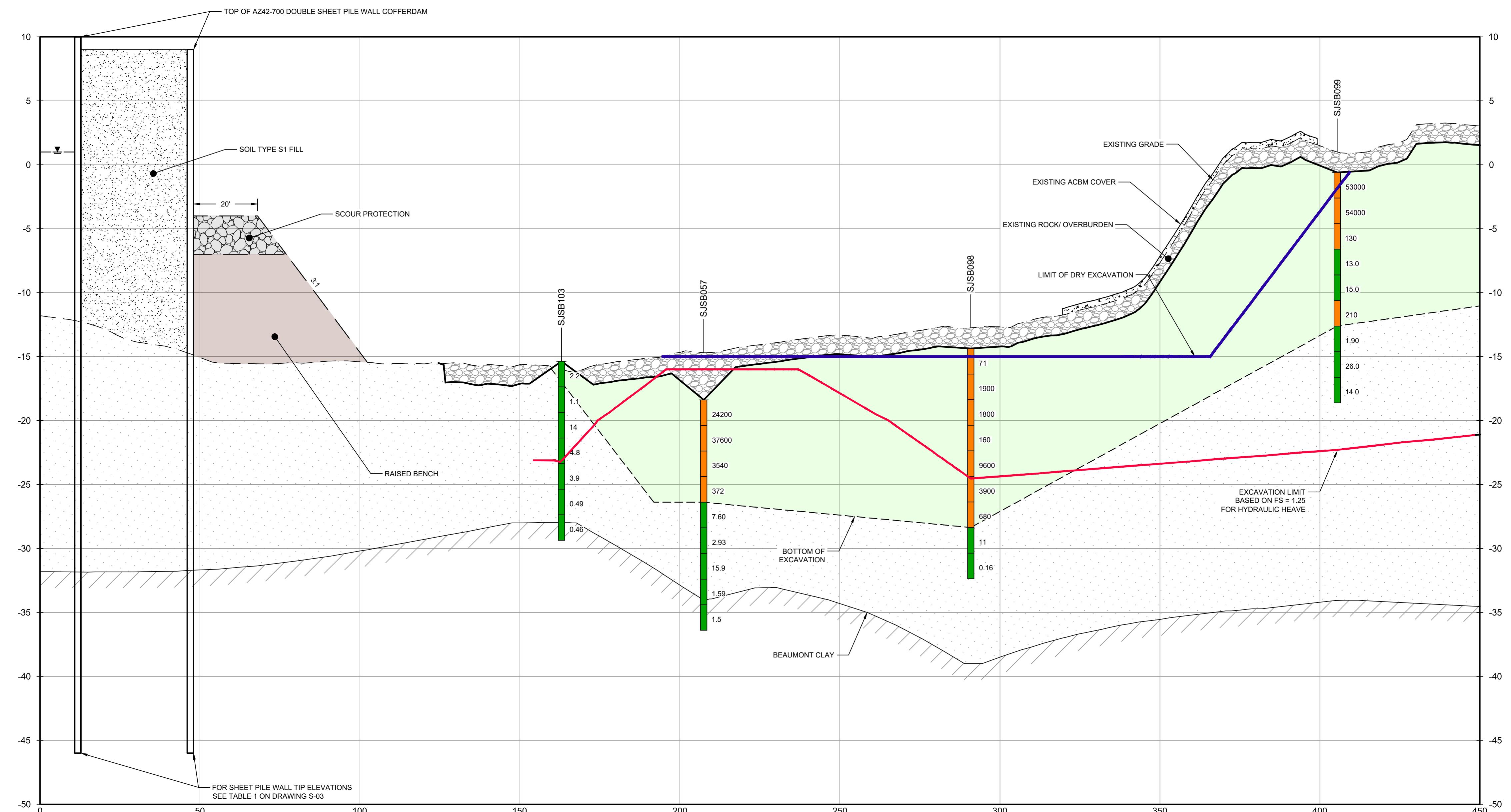
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5/23/25



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LEGEND
█ SOILS WITH CONCENTRATIONS <30 mg/kg TEQ₉₀ TCDD
█ SOILS WITH CONCENTRATIONS >30 mg/kg TEQ₉₀ TCDD
— EXCAVATION LIMIT BASED ON F8 = 1.25 FOR HYDRAULIC HEAVE
— MATERIAL TO BE EXCAVATED
— EXISTING BERM TO BE EXCAVATED
— EXISTING BERM 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

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Drawn JC Designer RI

Drafting Check BS Design Check WB

Project Coordinator CM Date May 22, 2025

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Arch D 0 1"

Project No. 11215702

Title

**DREDGING
NORTHWEST CORNER
SECTIONS 2 OF 2**

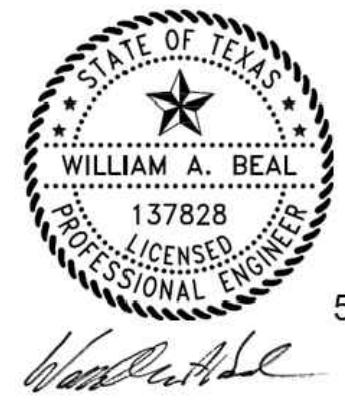
Sheet No.

C-50

Sheet 51 of 83



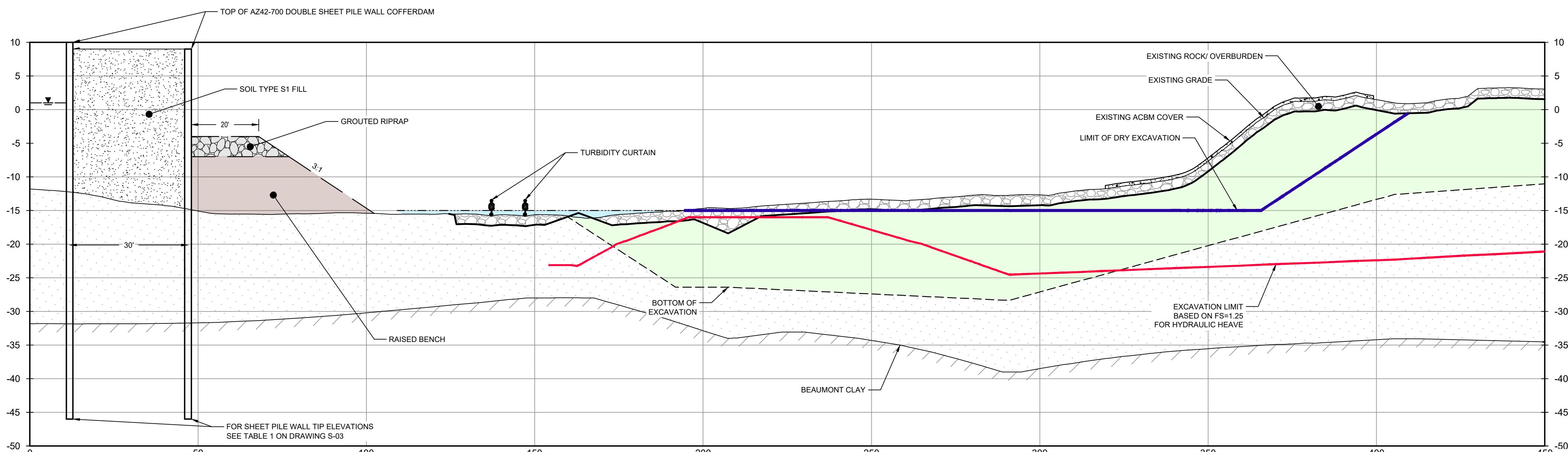
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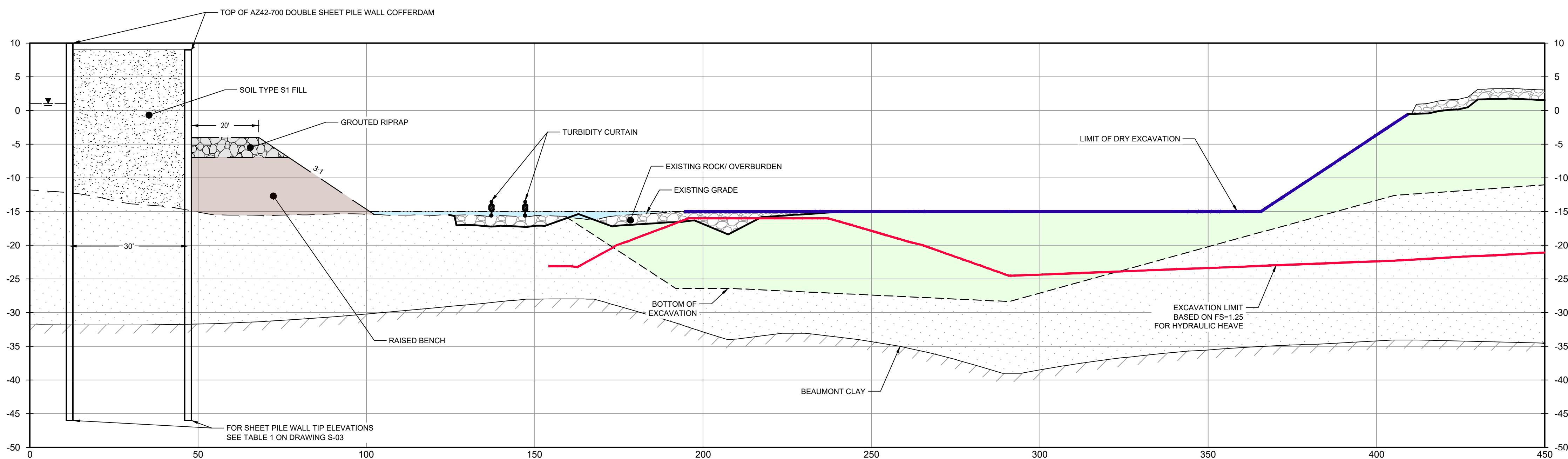
LEGEND

— 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:
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

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

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0 1"

Project No. 11215702

Title

**DREDGING
NORTHWEST CORNER
SEQUENCING 1 OF 3**

Sheet No.

C-51

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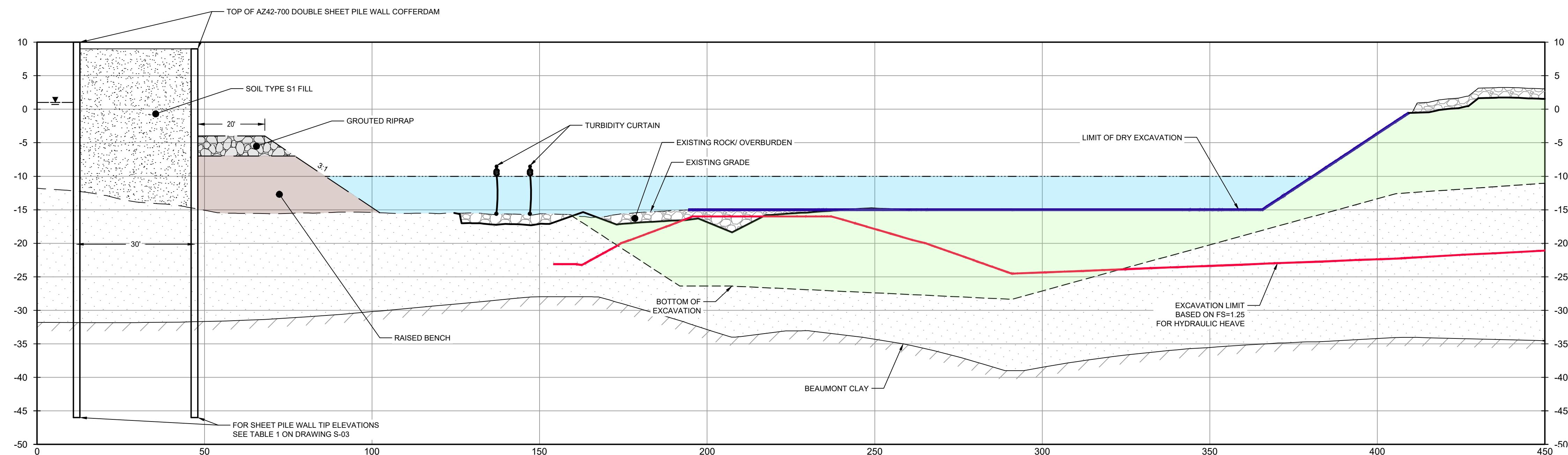
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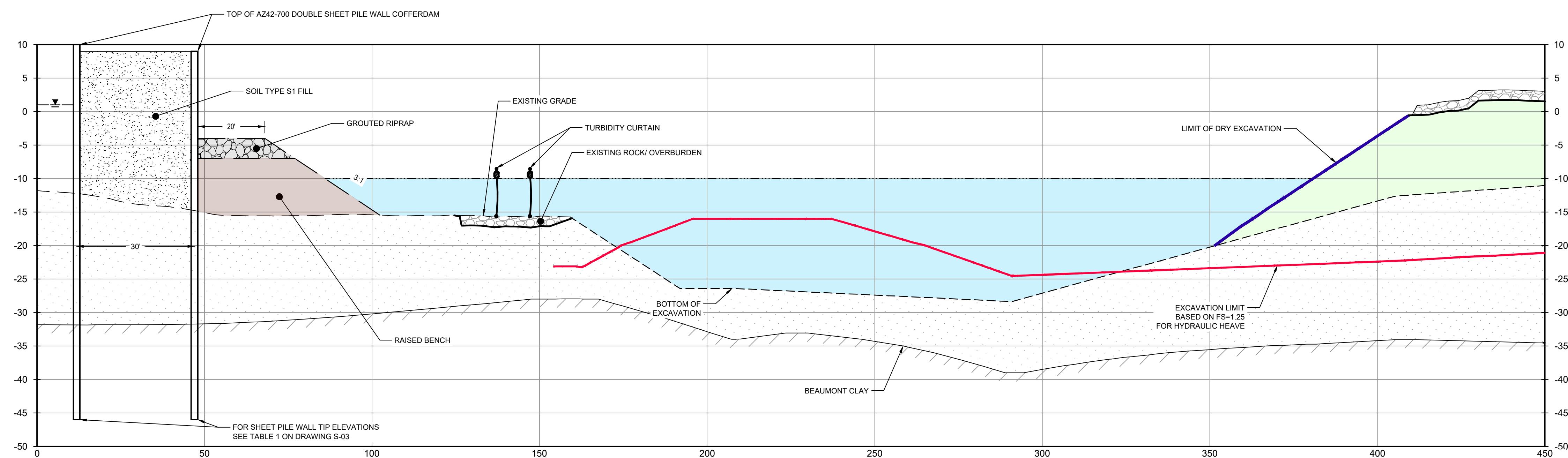
LEGEND

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



PHASE 3

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



PHASE 4

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

NOTES:

1. BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.
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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**

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

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Drawn JC Designer RI

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Original Size

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Project No. 11215702

Title

**DREDGING
NORTHWEST CORNER
SEQUENCING 2 OF 3**

Sheet No.

C-52

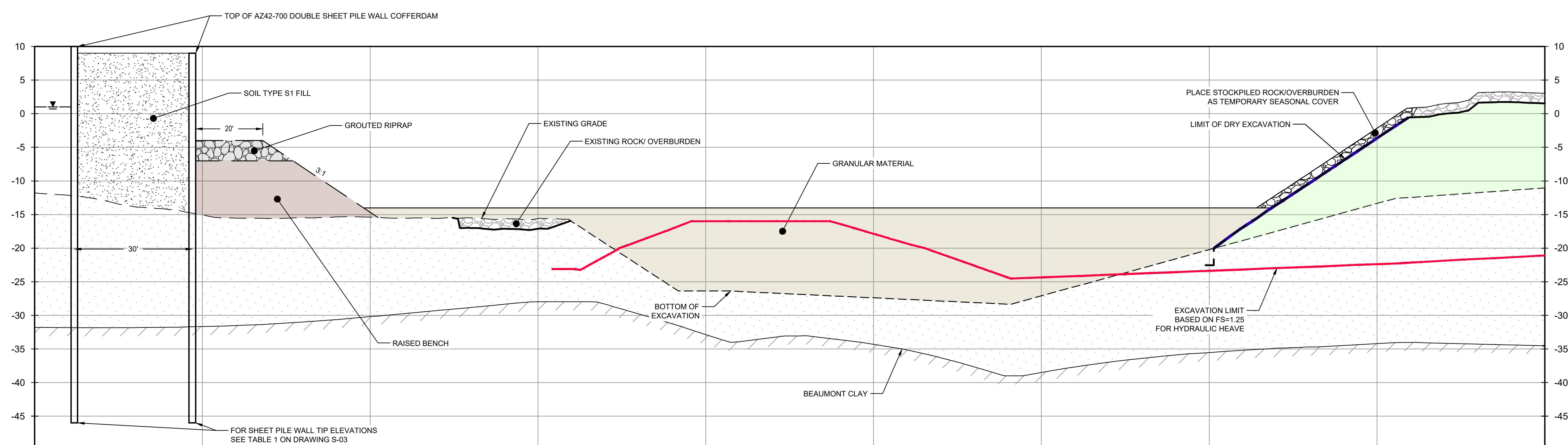
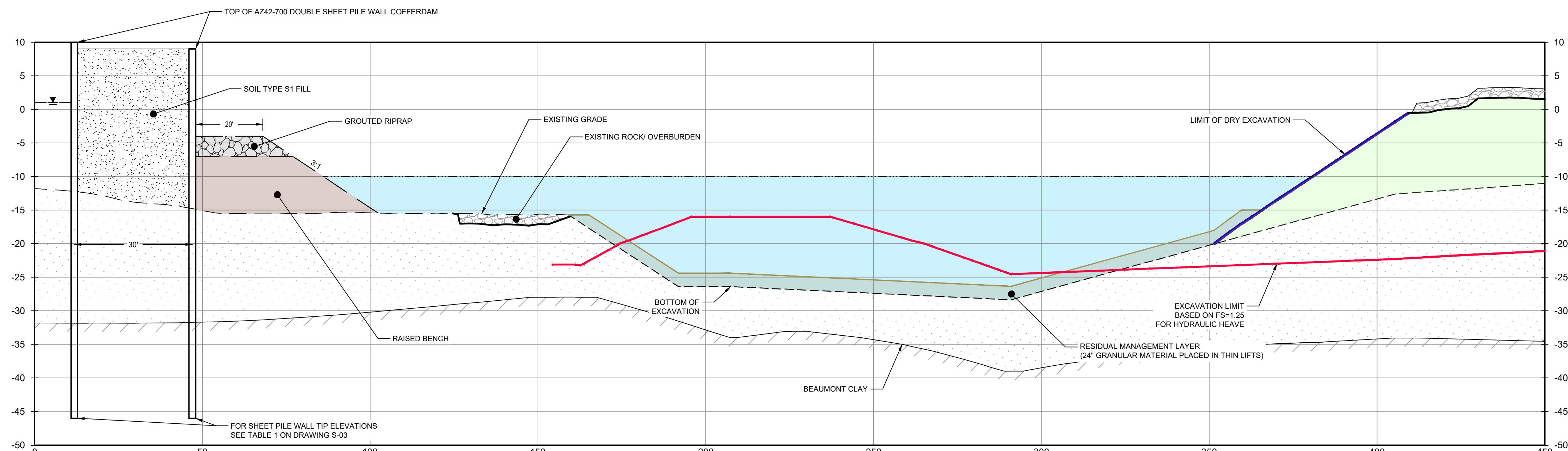


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LEGEND
EXCAVATION LIMIT BASED ON
FS = 1.25 FOR HYDRAULIC HEAVE
MATERIAL TO BE EXCAVATED
GRANULAR MATERIAL



NOTES:
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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

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Drawn JC Designer RI

Drafting Check BS Design Check WB

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

**DREDGING
NORTHWEST CORNER
SEQUENCING 3 OF 3**

Sheet No.

C-53



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LEGEND

- - -	TXDOT RIGHT OF WAY
- - - -	TCRA CAP PERIMETER
.....	EXISTING CONTOUR INTERVAL
.....	FENCELINE
.....	SHORELINE
.....	TOE 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
.....	GRANULAR MATERIAL
.....	EXTERIOR SCOUR PROTECTION
.....	INTERIOR SCOUR PROTECTION

SAN JACINTO RIVER WASTE PITS

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

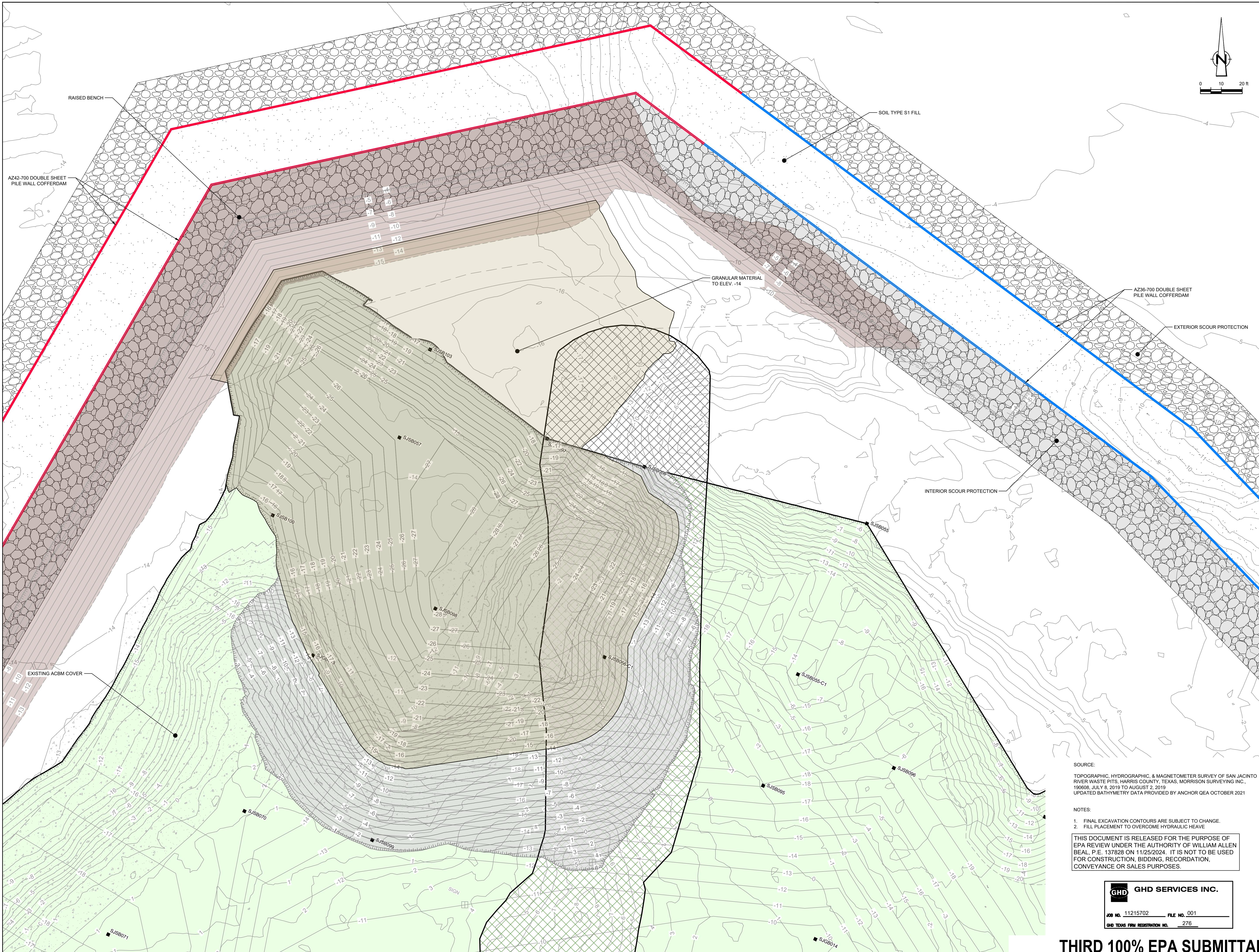
DREDGING NORTHWEST CORNER FINAL GRADE

Sheet No.

C-54

THIRD 100% EPA SUBMITTAL

Sheet 55 of 83

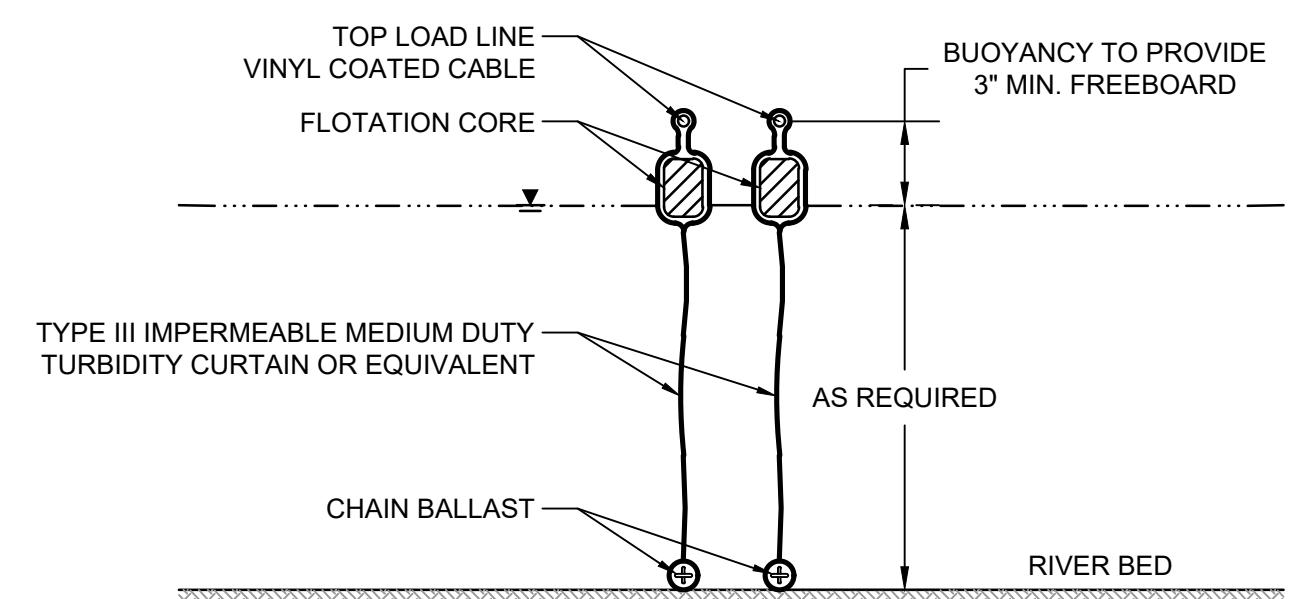




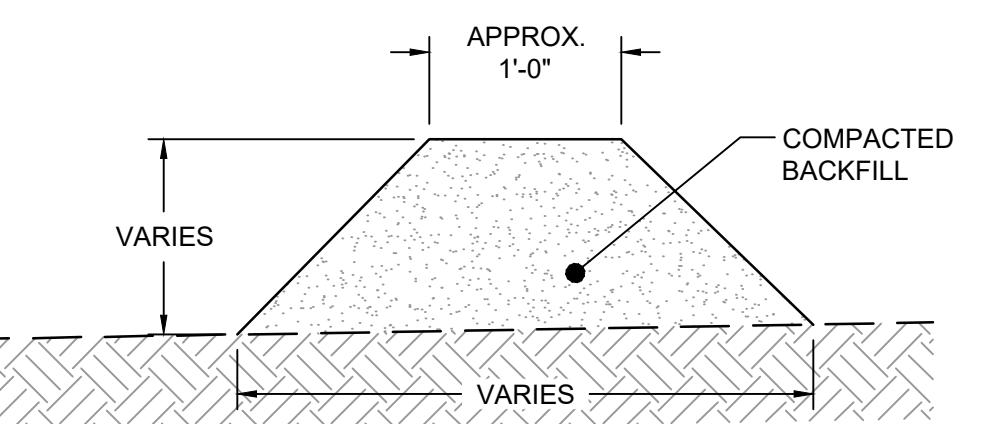
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5/23/25

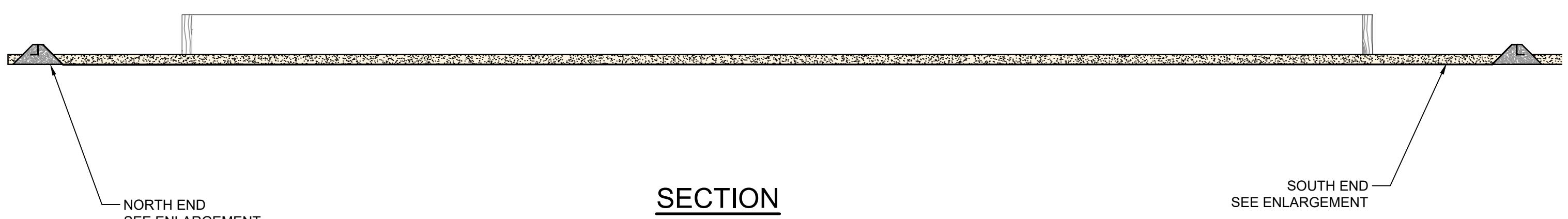


DETAIL 16 DREDGING TURBIDITY CURTAINS
N.T.S. C-46

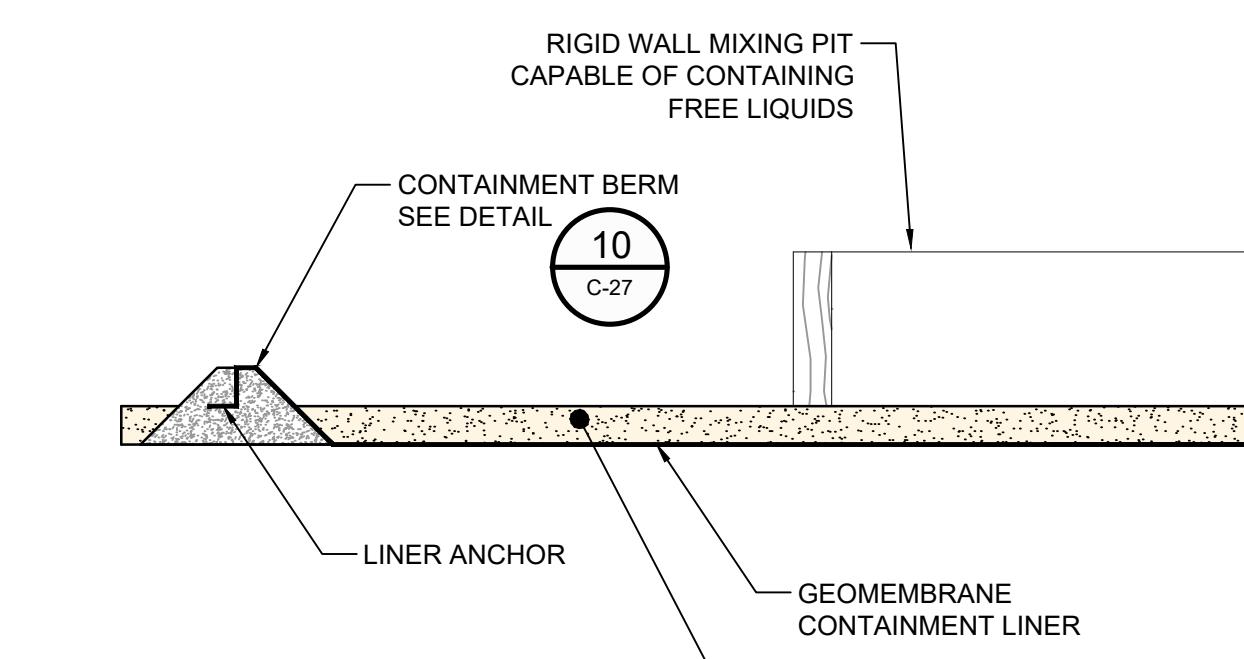


NOTES:
1. TOP WIDTH MAY BE WIDER AND SIDE SLOPES MAY BE FLATTER IF REQUIRED
TO FACILITATE CROSSING CONSTRUCTION TRAFFIC.

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

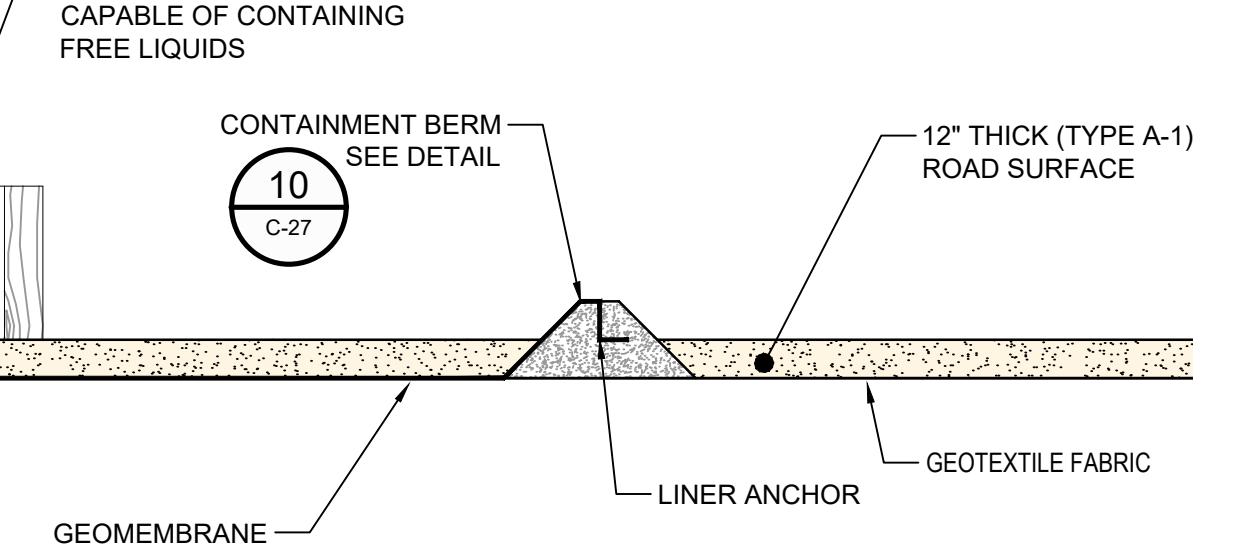


SECTION



NORTH END

NOTES:
1. DIMENSION TO BE DETERMINED BY CONTRACTOR



SOUTH END

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

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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 RI

Drafting BS Design Check WB

Project Coordinator CM Date May 22, 2025

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Scale AS SHOWN

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

Project No. 11215702

Title

**DREDGING
NORTHWEST CORNER
DREDGING DETAILS**

Sheet No.

C-55



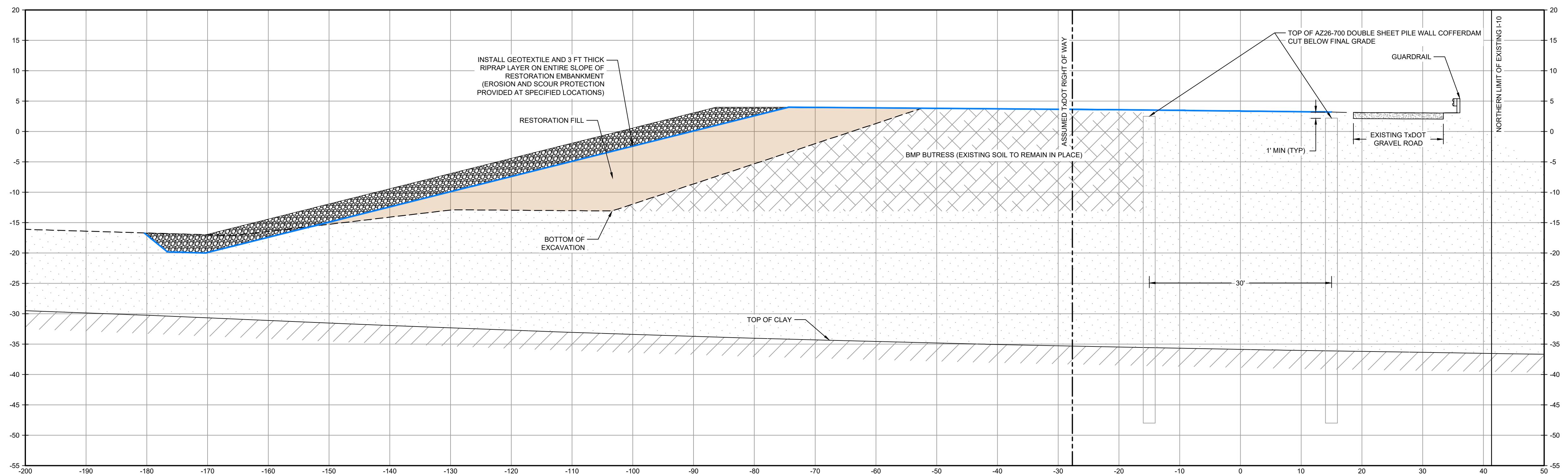
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LEGEND

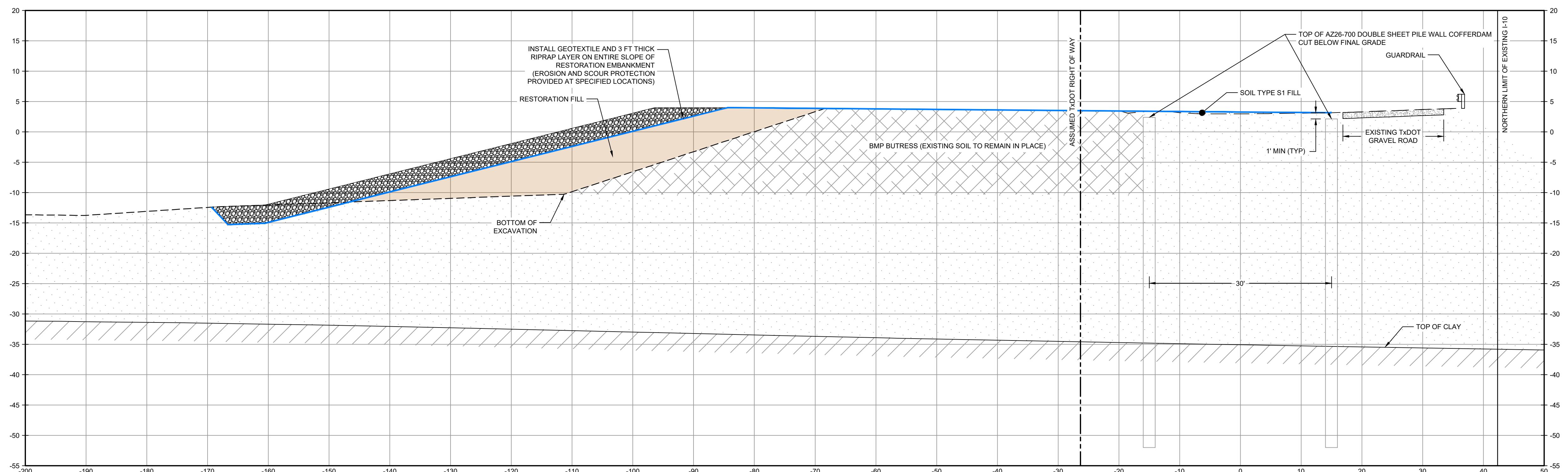
	RESTORED AREA INCLUDING SOIL BACKFILL AND EROSION CONTROL (NOT SHOWN)
	RESTORATION EMBANKMENT RIPRAP



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:

1. 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	J.C.	CRH	05/23/2025
No.	Issue	Drawn	Approved	Date
Drawn	J.C.	Designer	R.H.	
Drafting Check	B.S.	Design Check	W.B.	
Project Coordinator	C.M.	Date	May 22, 2025	
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Original Size	Arch D	Scale	AS SHOWN	
0	Bar is one inch on original size drawing	1"		
Project No. 11215702				

Title
RESTORATION SECTIONS 1 OF 2

Sheet No.

C-56



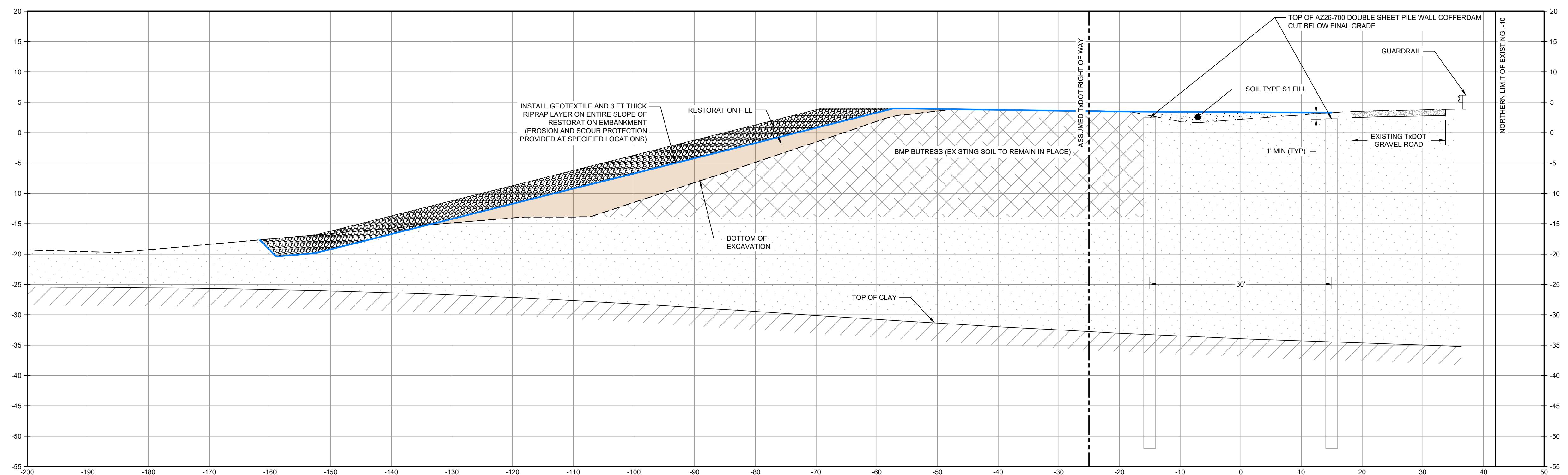
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LEGEND

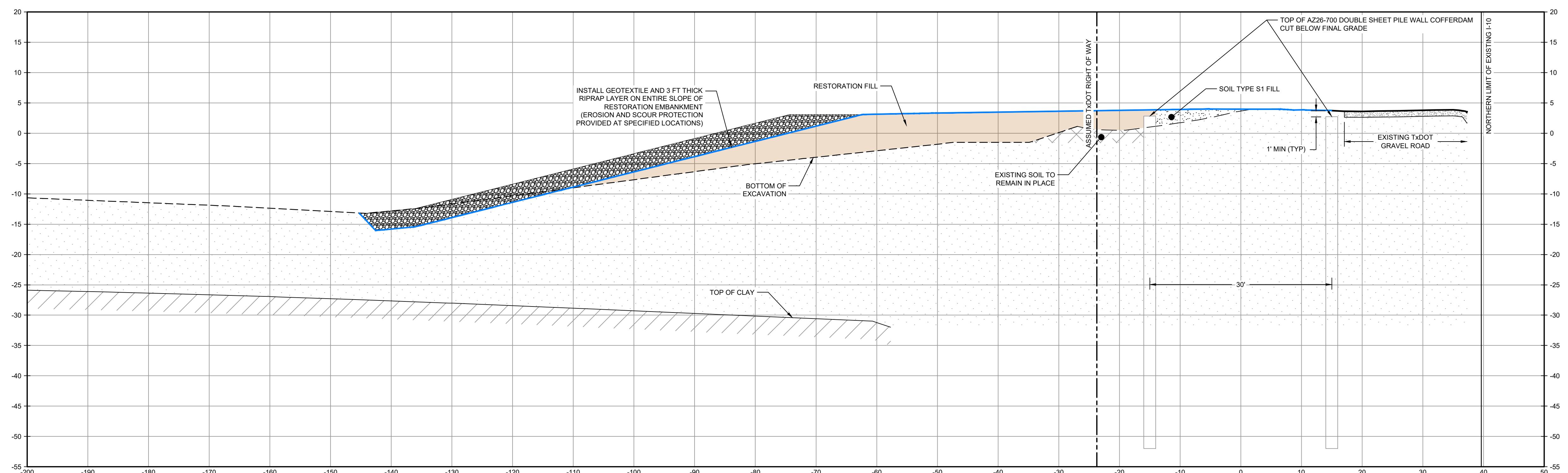
	RESTORED AREA INCLUDING SOIL BACKFILL AND EROSION CONTROL (NOT SHOWN)
	RESTORATION EMBANKMENT RIPRAP



SECTION W STA. 6+00.00

SCALE: 1'-10"

C-22



SECTION X STA. 8+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:

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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**

4 THIRD 100% EPA SUBMITTAL JC CRH 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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Scale AS SHOWN

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

Project No. 11215702

Title
**RESTORATION SECTIONS
2 OF 2**

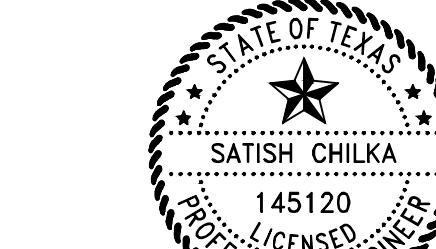
Sheet No.

C-57

<p>GENERAL</p> <p>1. VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS BEFORE COMMENCING WORK. REPORT ANY DISCREPANCIES AND/OR INCONSISTENCIES TO THE OWNER FOR CLARIFICATION.</p> <p>2. TEMPORARILY BRACE PILES AFTER DRIVING UNTIL TIE RODS ARE INSTALLED.</p> <p>CODES AND GUIDELINES</p> <ul style="list-style-type: none"> ASCE MINIMUM DESIGN LOADS AND ASSOCIATED CRITERIA FOR BUILDING AND OTHER STRUCTURES, ASCE 7, 2016 USAEC 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. USAEC 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. <p>MATERIALS</p> <p>STEEL:</p> <ul style="list-style-type: none"> BARS AND C, MC, AND L SHAPES ASTM A36, GALV, UNO SHEET PILE ASTM A572, GRADE 60 PIPE PILES ASTM A252, GRADE 3 MODIFIED TO MEET ASTM A572 GRADE 55 TIE ROD ASSEMBLY <ul style="list-style-type: none"> THREADED BARS GRADE 80 KSI BEARING PLATE ASTM A572/A588 GRADE 50 HARDENED WASHER ASTM F436 HEX NUT WITH JAM NUT ASTM 108/S576 GALVANIZED BOLTS FOR SPLICE CONNECTIONS ASTM A325 WITH A563 NUTS AND HARDENED WASHER <p>STRUCTURAL STEEL AND MISCELLANEOUS METAL</p> <p>1. WELDING SHALL CONFORM TO "STRUCTURAL WELDING CODE - STEEL" (AWS D1.1).</p> <p>2. PROVIDE 1" DIAMETER BLEED HOLES IN WALERS AT 10'-0" ON CENTER MAX, AVOID CONTACT WITH SPLICE PLATE CONNECTION.</p> <p>FRP BARRIER WALL</p> <p>PIPE PILE SPECIFICATION 31 62 23</p> <p>FENDER WALERS SPECIFICATION 06 71 13</p> <p>BOLTS ASTM A193 316L STAINLESS STEEL GRADE B8M</p> <p>NUTS ASTM F594 TYPE 316L STAINLESS STEEL</p> <p>WASHERS 316L STAINLESS STEEL</p>		<p>CONSTRUCTION SEQUENCE</p> <p>SECTION C1</p> <ol style="list-style-type: none"> 1. INSTALL LEFT AND RIGHT SHEET PILE WALL 2. INSTALL FILL UP TO EL. +3 FT UNIFORMLY OVER MIN 10 DAYS 3. INSTALL TIE ROD AT ELEVATION NOTED ON SHEET S-03 4. INSTALL FILL UP TO EL. +9 FT UNIFORMLY OVER MIN 6 DAYS 5. MINIMUM TIME FOR DEWATERING TO EXISTING MUDLINE: 4 DAYS 6. MINIMUM TIME FOR EXCAVATING TO 50% DEPTH: 17 DAYS 7. MINIMUM TIME FOR DEWATERING TO FINAL LEVEL: 3 DAYS 8. MINIMUM TIME FOR EXCAVATING TO 100% DEPTH: 14 DAYS <p>SECTION C2</p> <ol style="list-style-type: none"> 1. INSTALL LEFT AND RIGHT SHEET PILE WALL 2. INSTALL FILL UP TO EL. -7 FT UNIFORMLY OVER MIN 7 DAYS 3. INSTALL TIE ROD AT ELEVATION NOTED ON SHEET S-03 4. INSTALL FILL UP TO EL. -1 FT UNIFORMLY OVER MIN 7 DAYS 5. INSTALL FILL UP TO EL. +5 FT UNIFORMLY OVER MIN 7 DAYS 6. INSTALL FILL UP TO EL. +9 FT UNIFORMLY OVER MIN 7 DAYS 7. INSTALL RAISED BENCH TO EL. -9 FT, SLOPED AT 4H:1V AND WAIT 7 DAYS. 8. 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. 9. MINIMUM TIME FOR DEWATERING TO EXISTING MUDLINE: 4 DAYS 10. MINIMUM TIME FOR EXCAVATING TO 50% DEPTH: 17 DAYS 11. MINIMUM TIME FOR DEWATERING TO FINAL LEVEL: 3 DAYS 12. MINIMUM TIME FOR EXCAVATING TO 100% DEPTH: 14 DAYS <p>SECTION C3</p> <ol style="list-style-type: none"> 1. INSTALL LEFT AND RIGHT SHEET PILE WALL 2. INSTALL FILL UP TO EL. +0 FT UNIFORMLY OVER MIN 10 DAYS 3. INSTALL TIE ROD AT ELEVATION NOTED ON SHEET S-03 4. INSTALL FILL UP TO EL. +3 FT UNIFORMLY OVER MIN 3 DAYS 5. INSTALL FILL UP TO EL. +9 FT UNIFORMLY OVER MIN 10 DAYS 6. MINIMUM TIME FOR DEWATERING TO EXISTING MUDLINE: 4 DAYS 7. MINIMUM TIME FOR EXCAVATING TO 50% DEPTH: 17 DAYS 8. MINIMUM TIME FOR DEWATERING TO FINAL LEVEL: 3 DAYS 9. MINIMUM TIME FOR EXCAVATING TO 100% DEPTH: 14 DAYS <p>SECTION C4A</p> <ol style="list-style-type: none"> 1. INSTALL LEFT AND RIGHT SHEET PILE WALL 2. INSTALL FILL UP TO EL. +0 FT UNIFORMLY OVER MIN 10 DAYS 3. INSTALL TIE ROD AT ELEVATION NOTED ON SHEET S-03 4. INSTALL FILL UP TO EL. +9 FT UNIFORMLY OVER MIN 6 DAYS 5. MINIMUM TIME FOR DEWATERING TO EXISTING MUDLINE: 4 DAYS 6. MINIMUM TIME FOR EXCAVATING TO 50% DEPTH: 17 DAYS 7. MINIMUM TIME FOR DEWATERING TO FINAL LEVEL: 3 DAYS 8. MINIMUM TIME FOR EXCAVATING TO 100% DEPTH: 14 DAYS <p>SECTION C4</p> <ol style="list-style-type: none"> 1. INSTALL LEFT AND RIGHT SHEET PILE WALL 2. INSTALL FILL UP TO EL. -3 FT UNIFORMLY OVER MIN 10 DAYS 3. INSTALL TIE ROD AT ELEVATION NOTED ON SHEET S-03 4. 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MINIMUM TIME FOR EXCAVATING TO 100% DEPTH: 14 DAYS 	<p>ABBREVIATIONS</p> <p>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 W/ WITH</p>																																																																										
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<p>Client SAN JACINTO RIVER WASTE PITS</p> <p>Project NORTHERN IMPOUNDMENT THIRD FINAL 100% REMEDIAL DESIGN HARRIS COUNTY, TEXAS</p> <table border="1"> <tr> <td>6</td> <td>THIRD 100% EPA SUBMITTAL</td> <td>DS</td> <td>SC</td> <td>05/23/2025</td> </tr> <tr> <td>No.</td> <td>Issue</td> <td>Drawn</td> <td>Approved</td> <td>Date</td> </tr> <tr> <td>Drawn</td> <td>DS</td> <td colspan="3">Designer KM</td> </tr> <tr> <td>Drafting</td> <td>Check</td> <td colspan="3">Design Check SC</td> </tr> <tr> <td>Project Coordinator</td> <td>CM</td> <td colspan="3">Date May 22, 2025</td> </tr> <tr> <td colspan="5">This document shall not be used for construction unless signed and sealed for construction.</td> </tr> <tr> <td colspan="5">Scale N.T.S.</td> </tr> <tr> <td colspan="5">Original Size</td> </tr> <tr> <td colspan="5">Bar is one inch on original size drawing</td> </tr> <tr> <td colspan="5">0 1"</td> </tr> <tr> <td colspan="5">Project No. 11215702</td> </tr> <tr> <td colspan="5">Title</td> </tr> <tr> <td colspan="5">STRUCTURAL NOTES</td> </tr> <tr> <td colspan="5">Sheet No.</td> </tr> <tr> <td colspan="5">S-01</td> </tr> </table>			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			This document shall not be used for construction unless signed and sealed for construction.					Scale N.T.S.					Original Size					Bar is one inch on original size drawing					0 1"					Project No. 11215702					Title					STRUCTURAL NOTES					Sheet No.					S-01				
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<p>Plot Date: 22 May 2025 - 4:33 PM Plotted By: Jonathan Compton Filename: 'ghdnetghdusBatonRougeProjects56211215702DigitalDesignACAD2019Sheets11215702-01-DWG-S-001.dwg'</p> <p>Sheet 59 of 83</p>																																																																													



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SATISH CHILKA
145120
LICENSED PROFESSIONAL ENGINEER
Satish Chilka
05/23/2025

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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
■ A228-700 PILE
■ A228-700 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

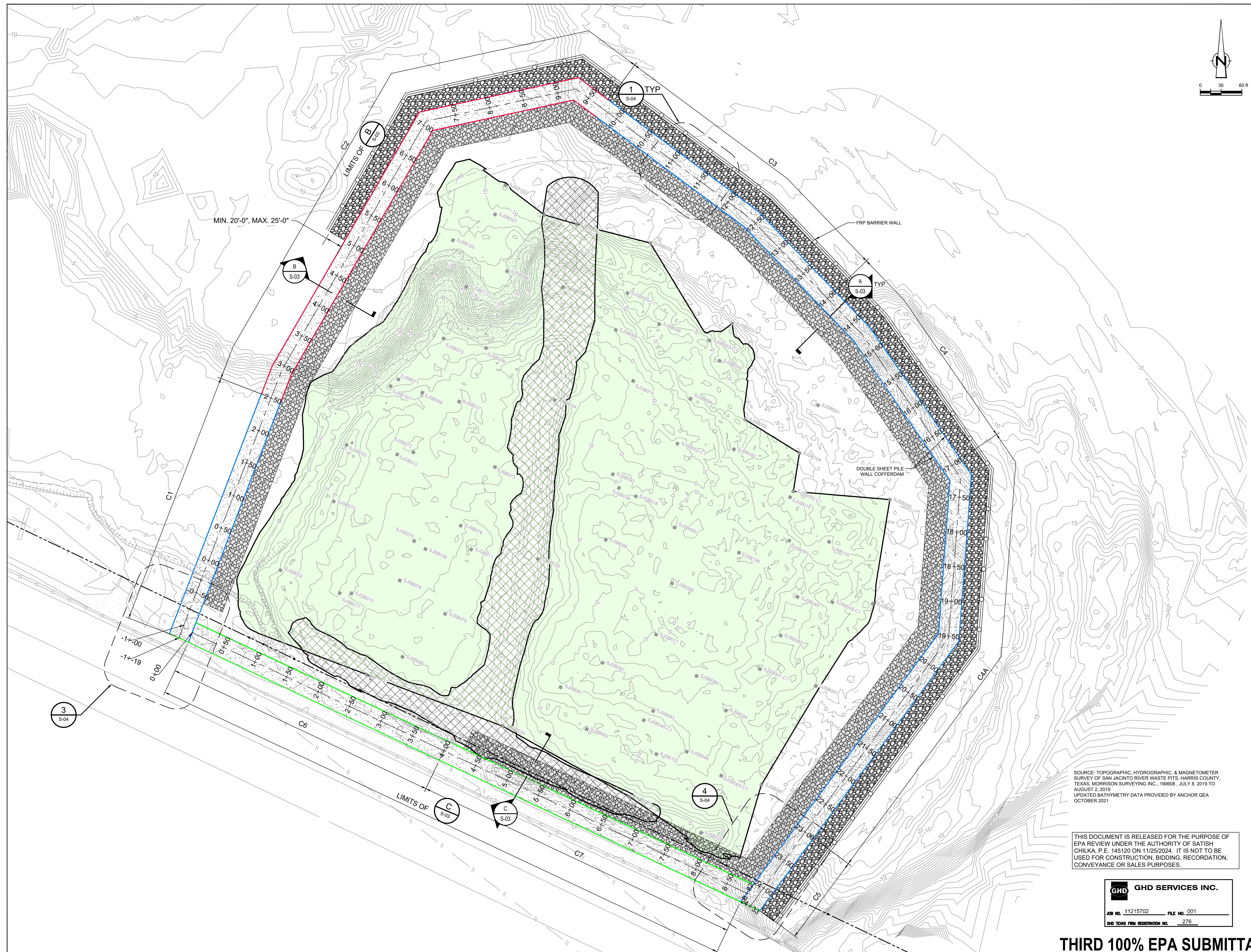
**STRUCTURAL
LAYOUT PLAN**

Sheet No.

S-02

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GHD TEXAS FIRM REGISTRATION NO. 276





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05/23/2025

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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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Arch D 0 1"

Project No. 11215702

Title

STRUCTURAL SECTIONS

Sheet No.

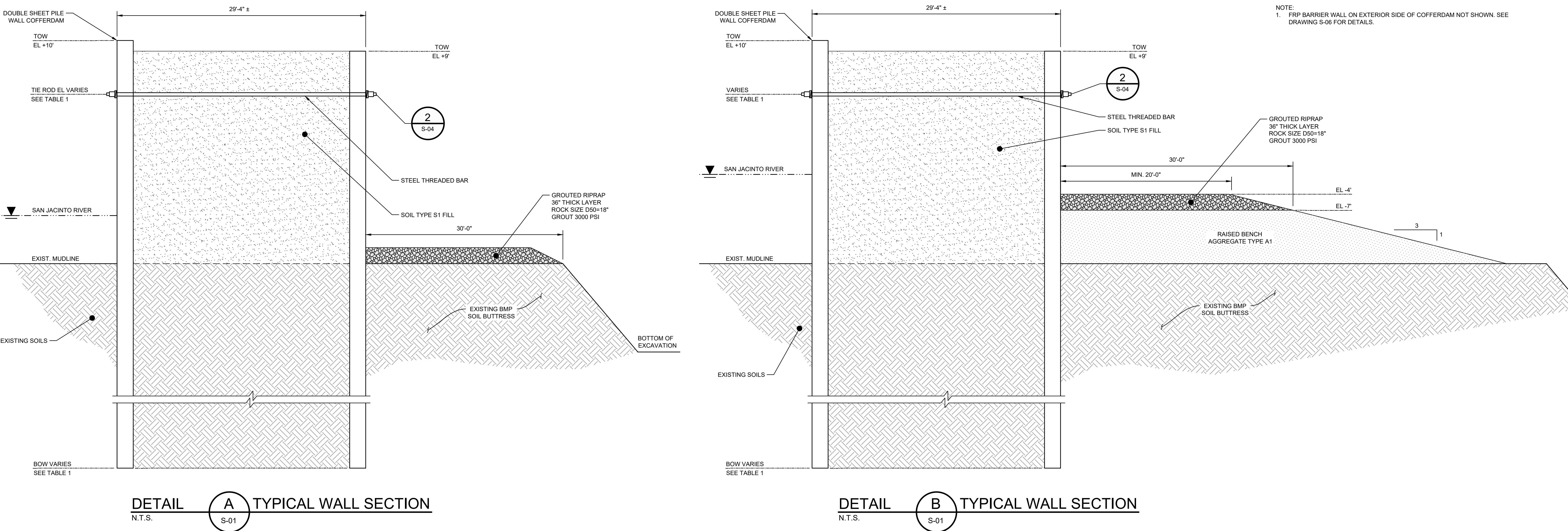
S-03

THIRD 100% EPA SUBMITTAL



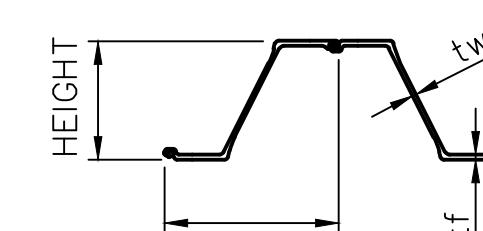
JOB NO. 11215702 FILE NO. 001

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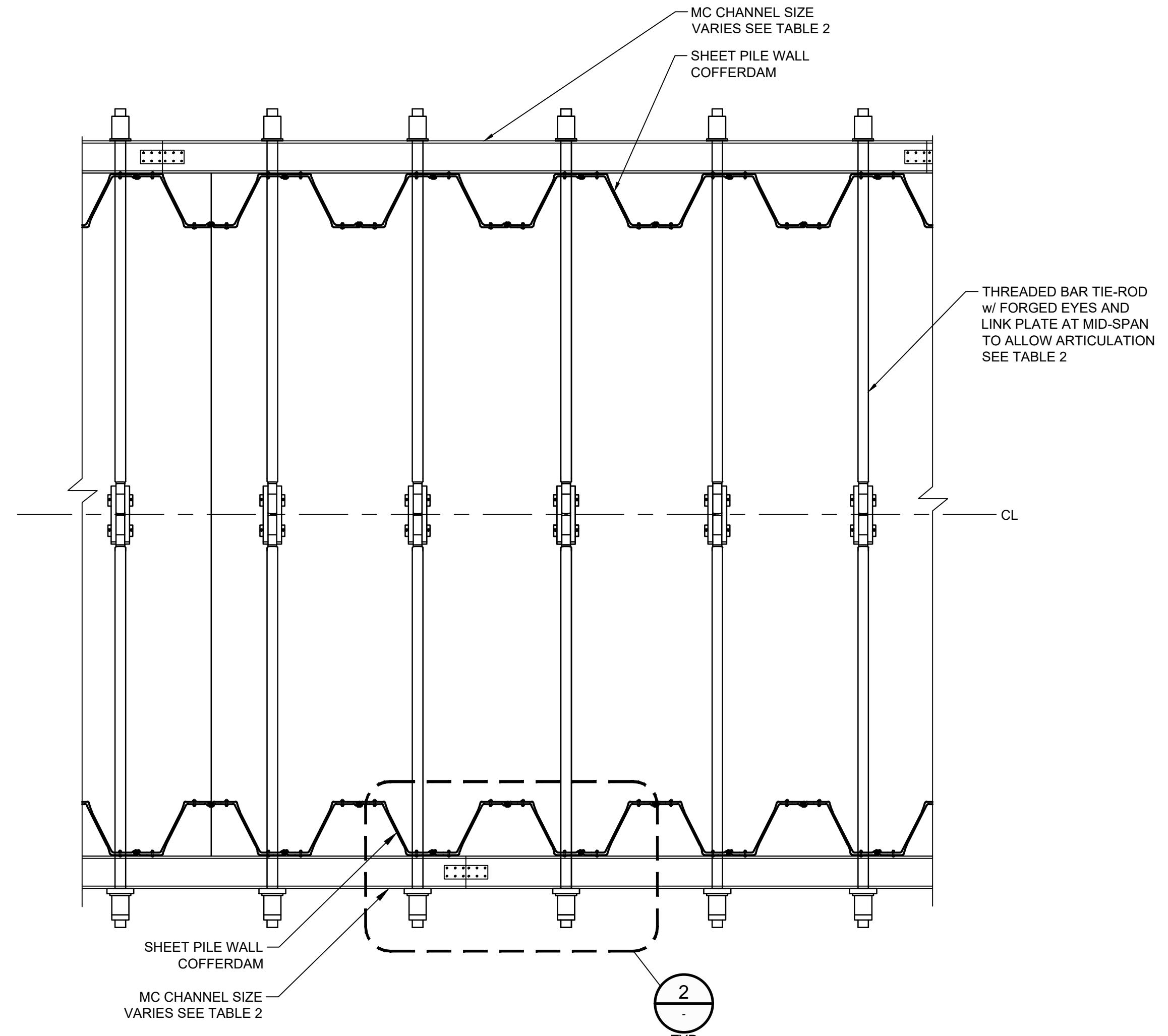


WALL SEGMENT	START STA	END STA	DETAIL	SHEET PILE SECTION	SHEET PILE LENGTH (FT)	TIE ROD NOMINAL DIAMETER (IN)	TIE ROD SPACING (FT)	TIE ROD EL (FT)
C1	-1+10	2+50	A	AZ36-700N	50	SEE TABLE 2 ON S-04	5	3
C2	2+50	9+75	B	AZ42-700N	55		5	3
C3	9+75	14+00	A	AZ36-700N	50		5	3
C4	14+00	17+00	A	AZ36-700N	50		5	3
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			

SSP SECTION	ASTM	YIELD STRENGTH (KSI)	WIDTH w (IN)	HEIGHT h (IN)	THICKNESS (IN)		WEIGHT		ELASTIC MODULUS (IN ³ /FT)
					FLANGE tf	WEB tw	SINGLE PILE (LB/FT)	WALL AREA (LB/FT ²)	
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

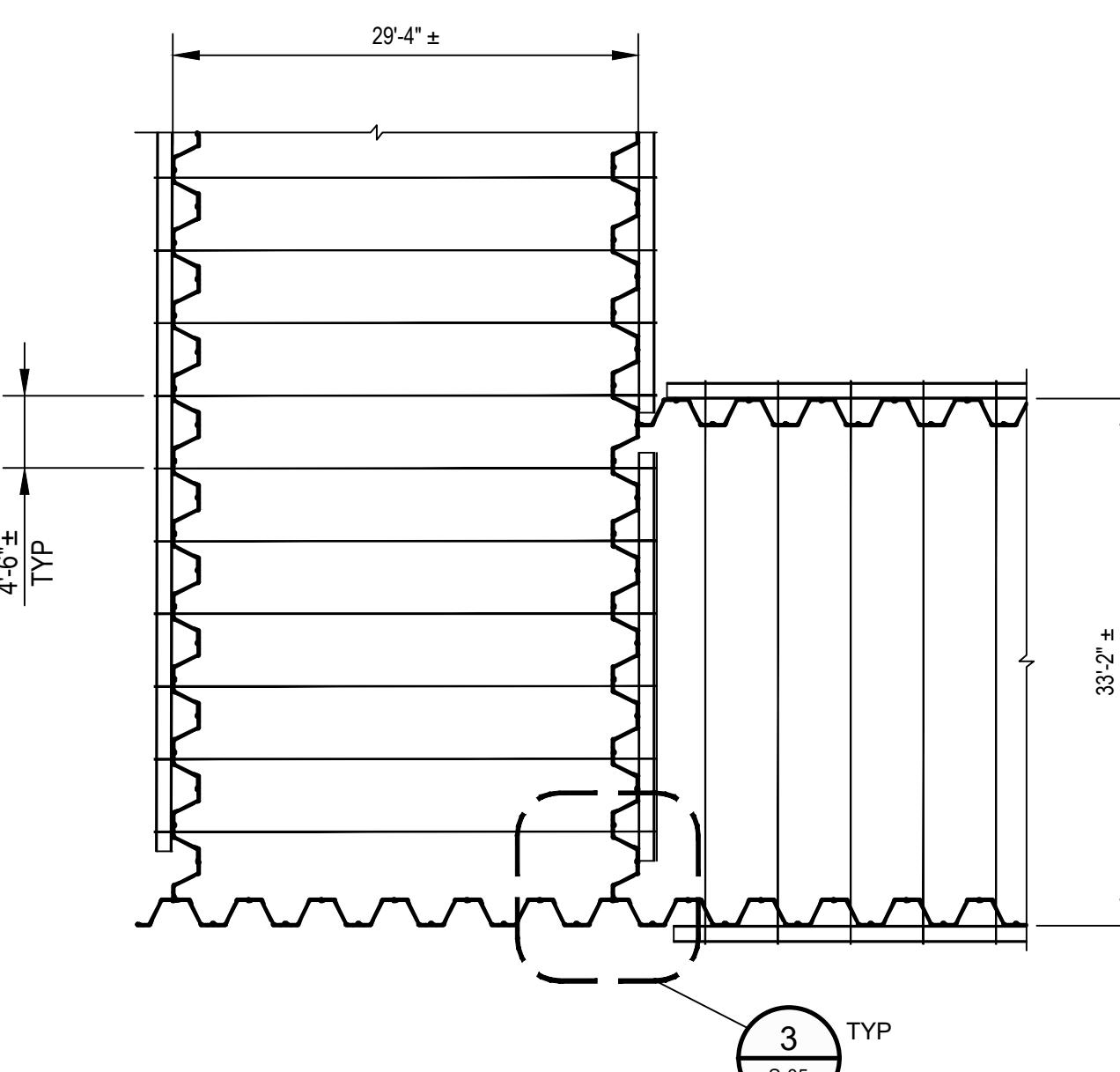


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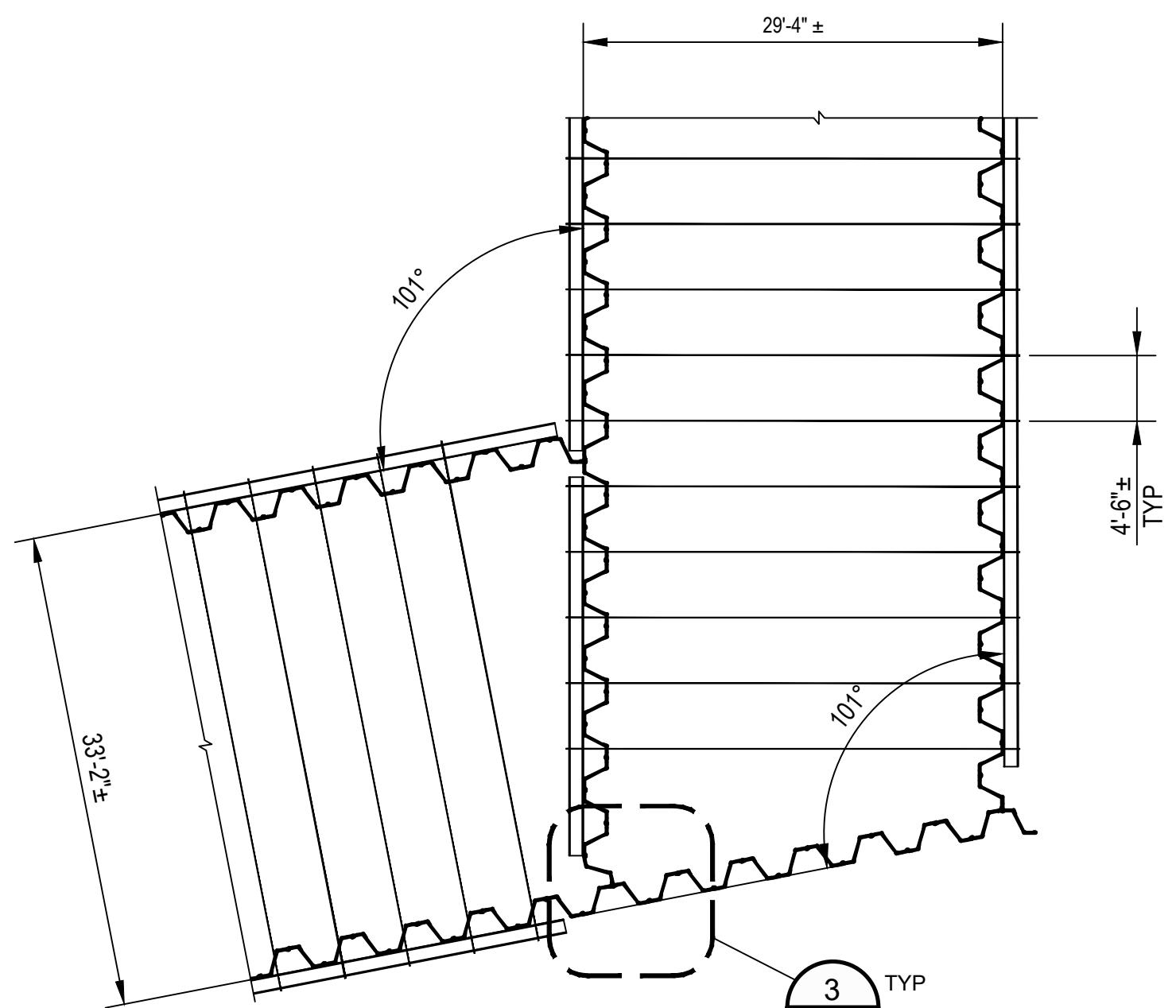
DETAIL 1 PLAN VIEW

SCALE: 1'=3'-0"



DETAIL 3 PLAN VIEW

SCALE: 3/32'=1'-0"

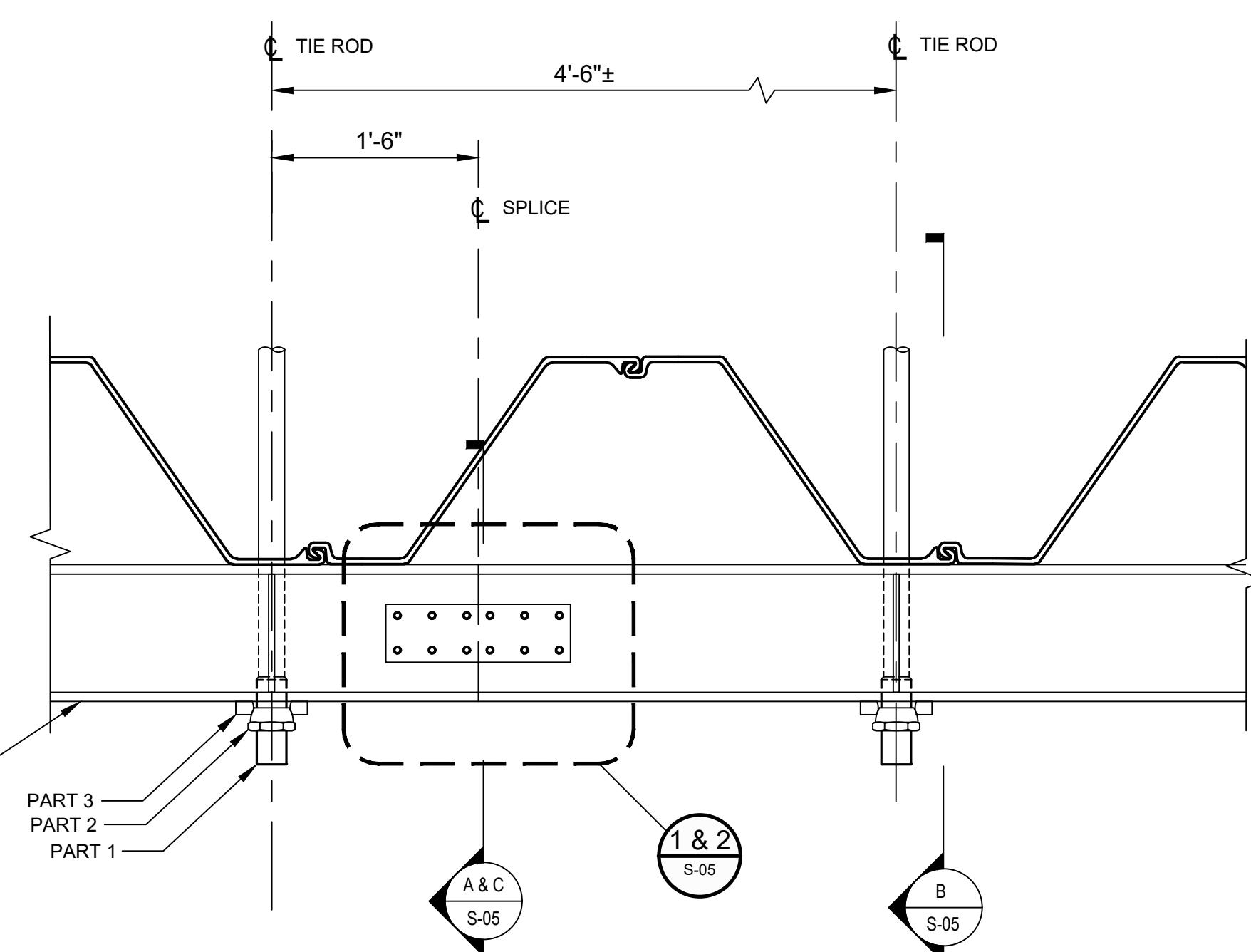


DETAIL 4 PLAN VIEW

SCALE: 3/32'=1'-0"

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



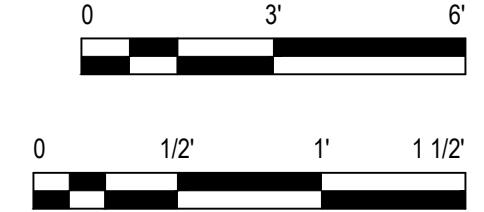
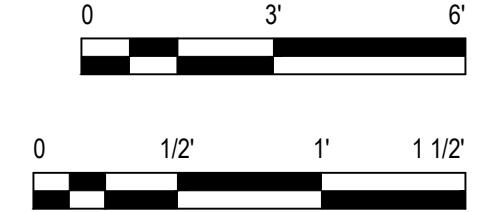
DETAIL 2 PLAN VIEW

SCALE: 1'=1'-0"

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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**

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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0 1"

Project No. 11215702

Title

**STRUCTURAL
DETAILS 1 of 2**

Sheet No.

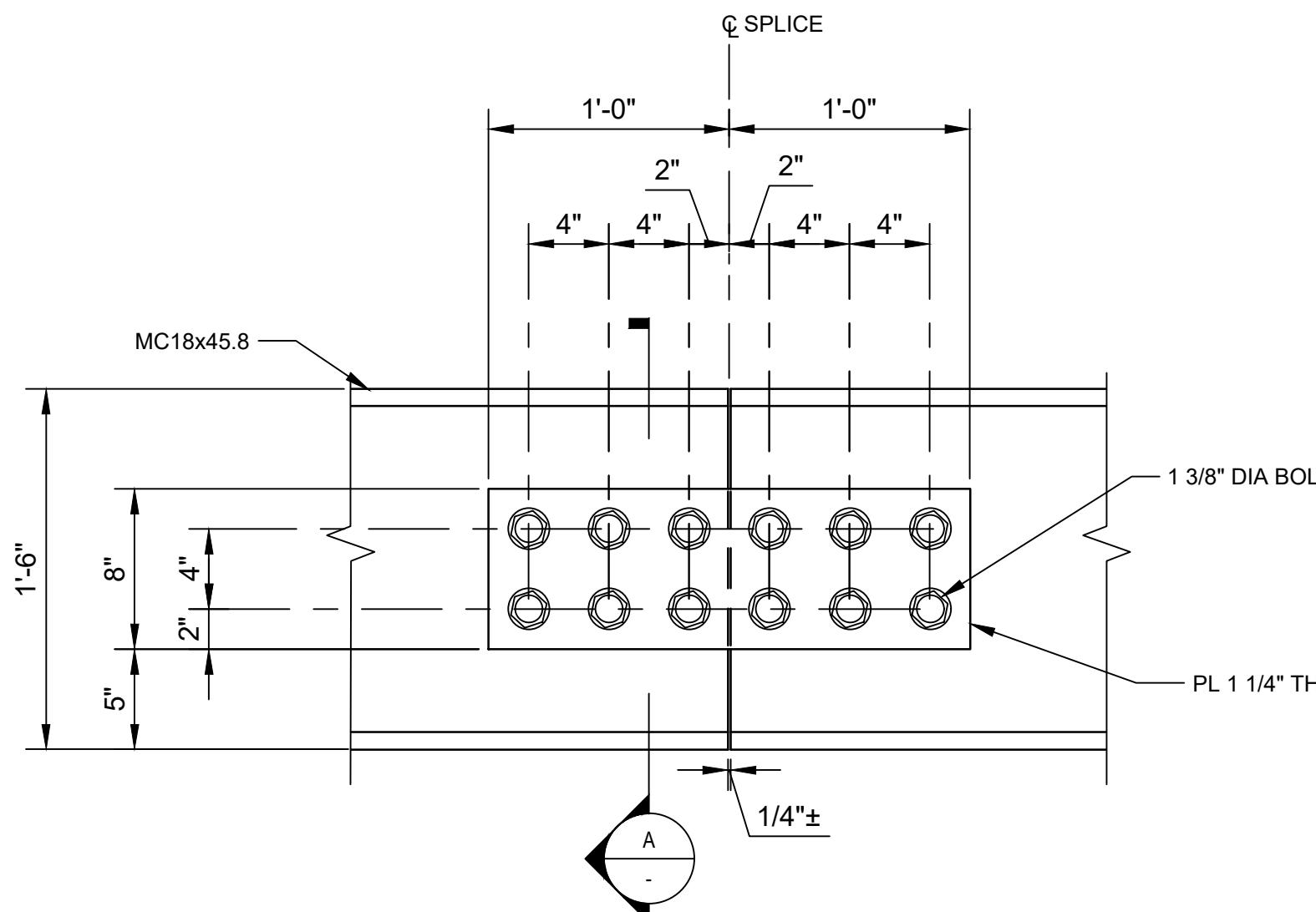
S-04



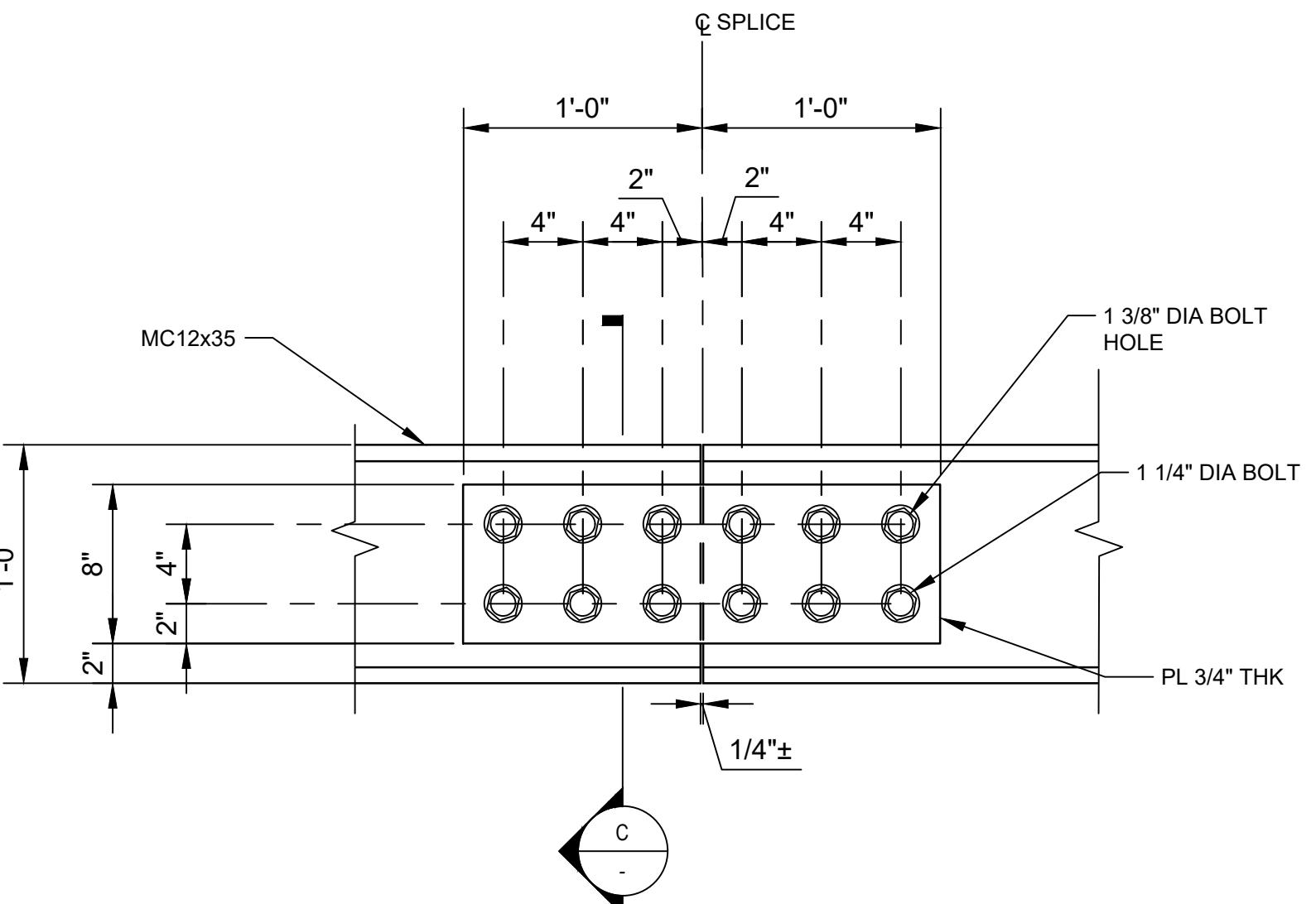
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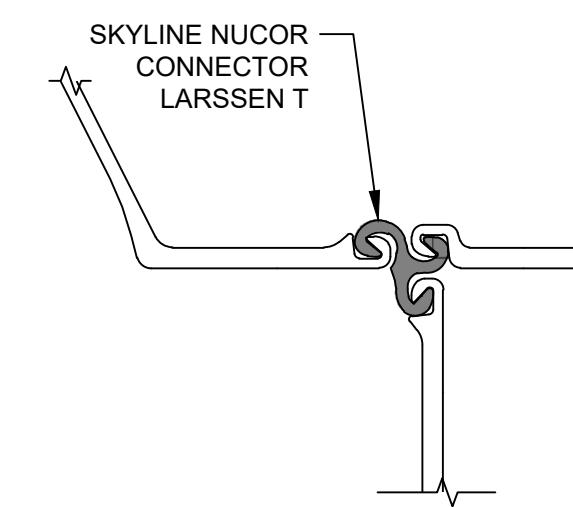
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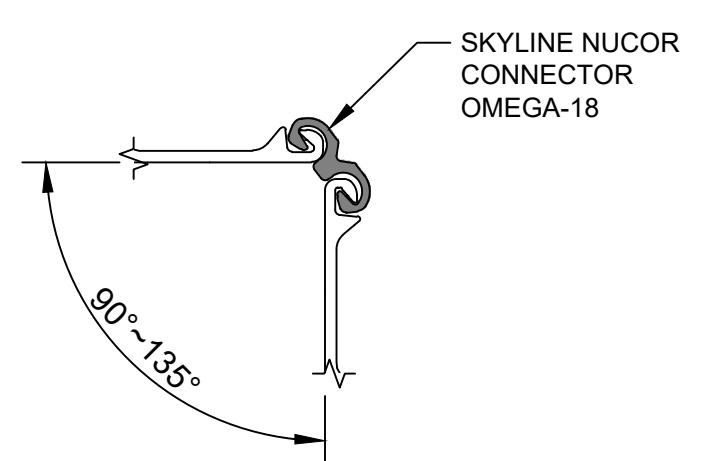
DETAIL 1 PLAN - SPLICE CONNECTION - WALER MC 18X45.8
SCALE: 1 1/2"=1'-0"



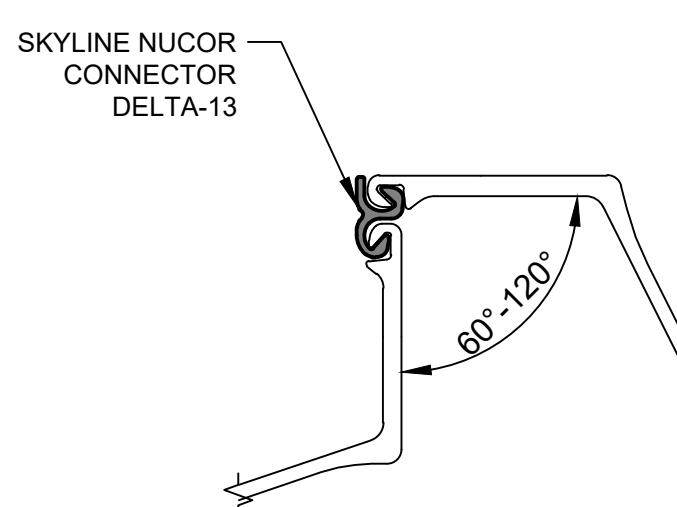
DETAIL 2 PLAN - SPLICE CONNECTION - WALER MC 12X35
SCALE: 1 1/2"=1'-0"



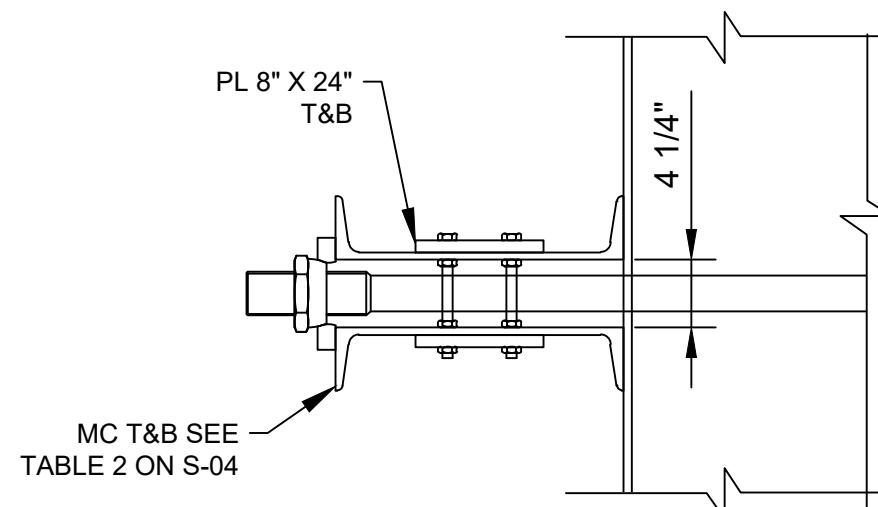
DETAIL 3 THREE SHEET PILE CONNECTOR
SCALE: NTS



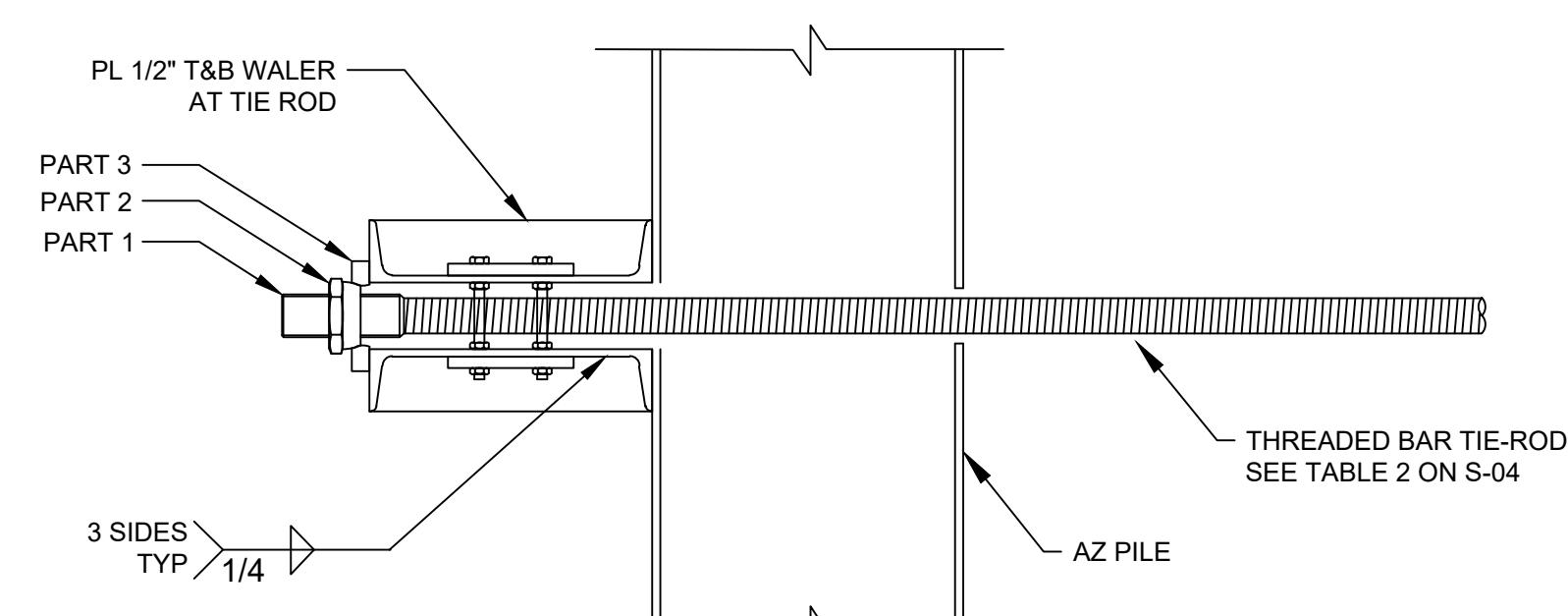
DETAIL 4 CORNER CONNECTOR ALTERNATIVE A
SCALE: NTS



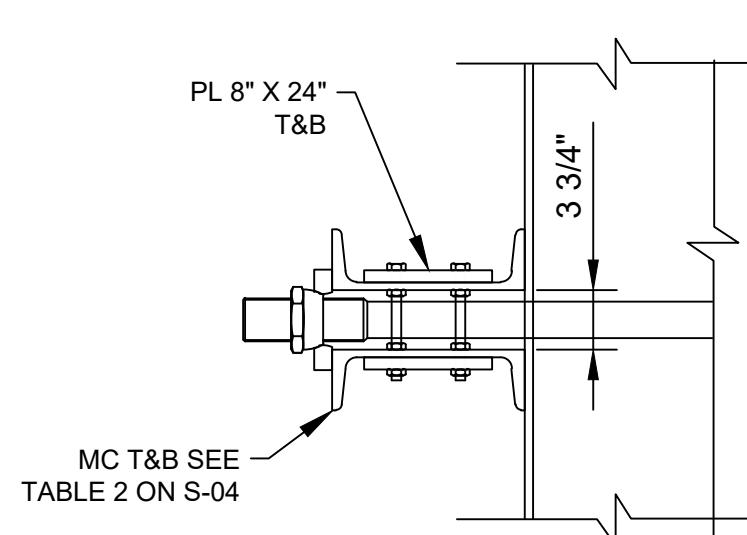
DETAIL 5 CORNER CONNECTOR ALTERNATIVE B
SCALE: NTS



SECTION A SPLICE CONNECTION
SCALE: 1"=1'-0"
S-04

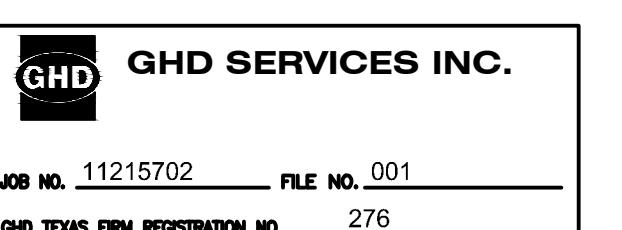


SECTION B TIE ROD CONNECTION
SCALE: 1"=1'-0"
S-04



SECTION C SPLICE CONNECTION
SCALE: 1"=1'-0"
S-04

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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	DS	Designer KM		
Drafting	Check	Design Check SC		
Project	Coordinator CM	Date May 22, 2025		

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Project No. 11215702

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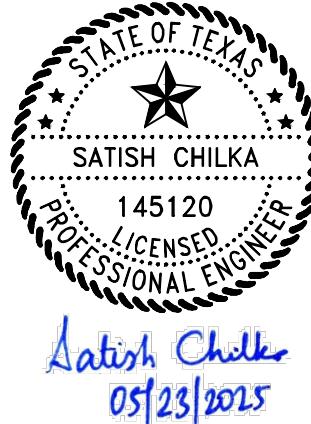
STRUCTURAL
DETAILS 2 OF 2

Sheet No.

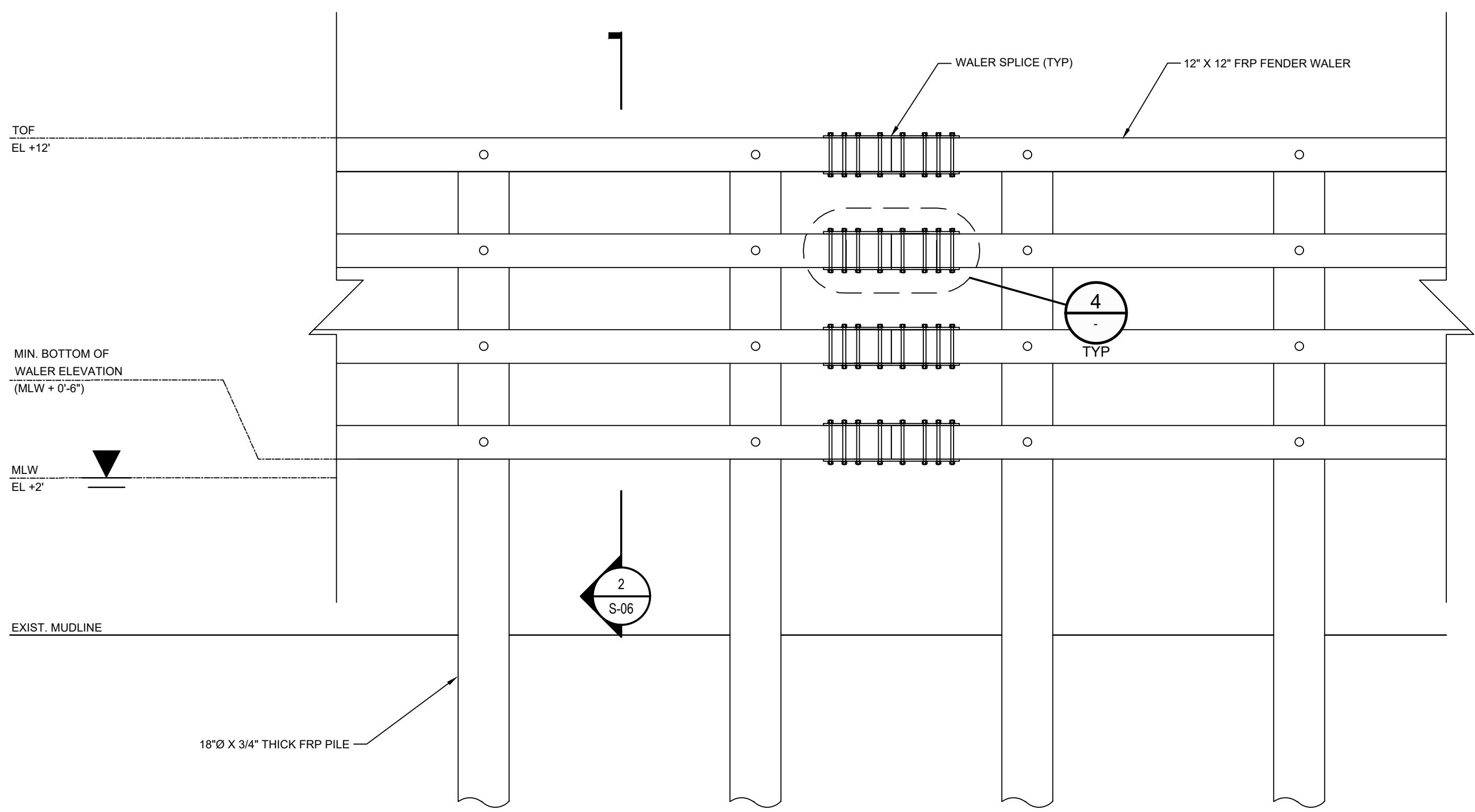
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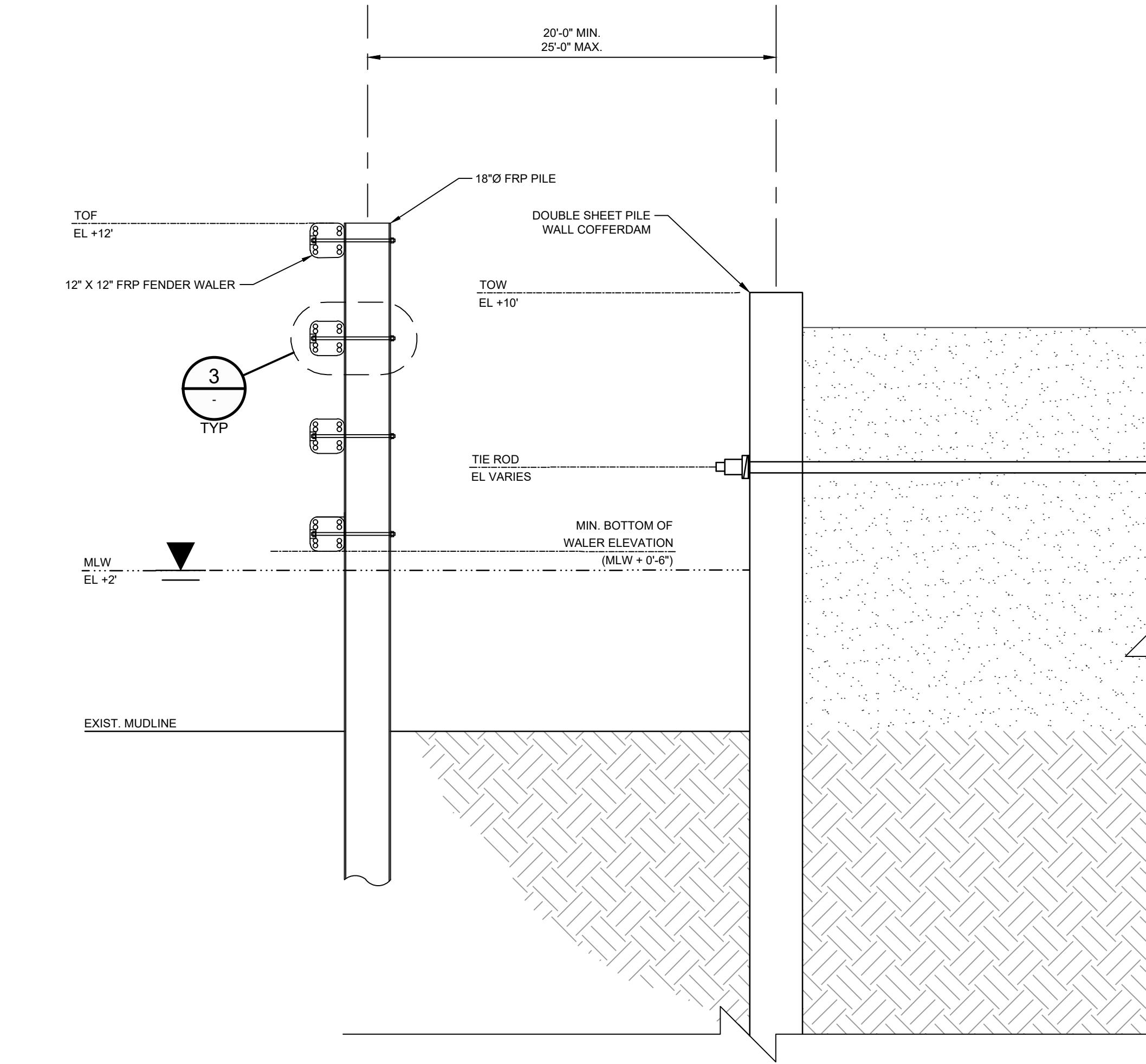
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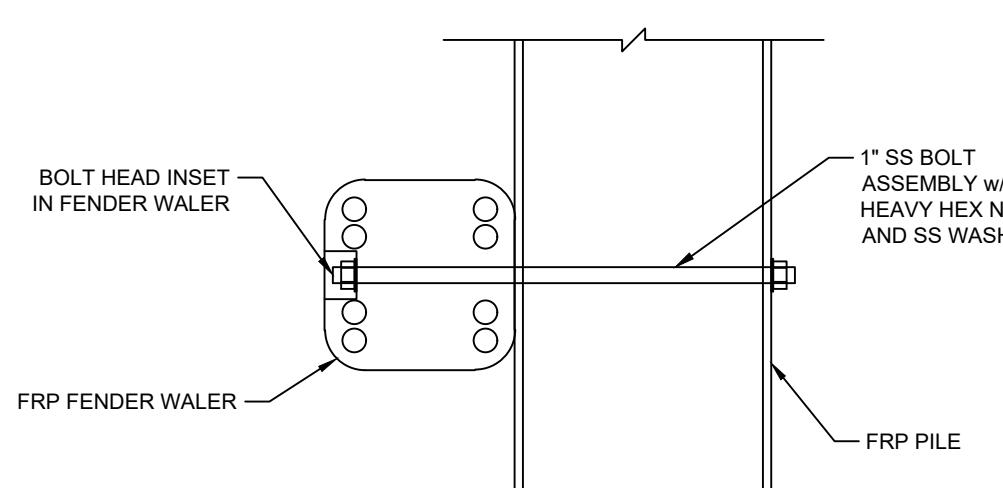
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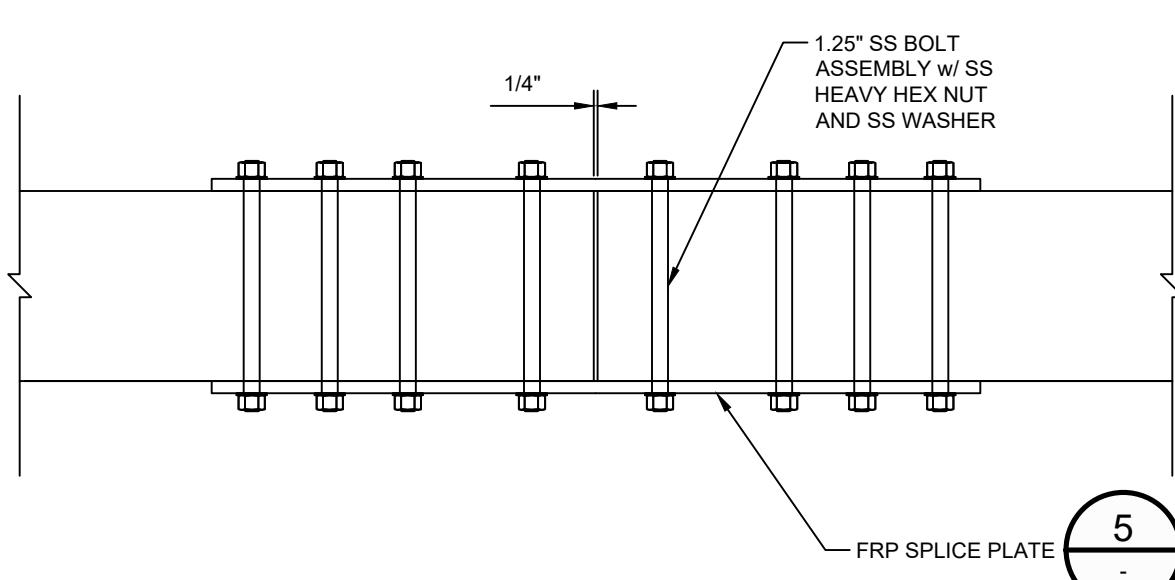
DETAIL **1** TYPICAL FRP BARRIER ELEVATION
SCALE: 1"-3'-0" S-06



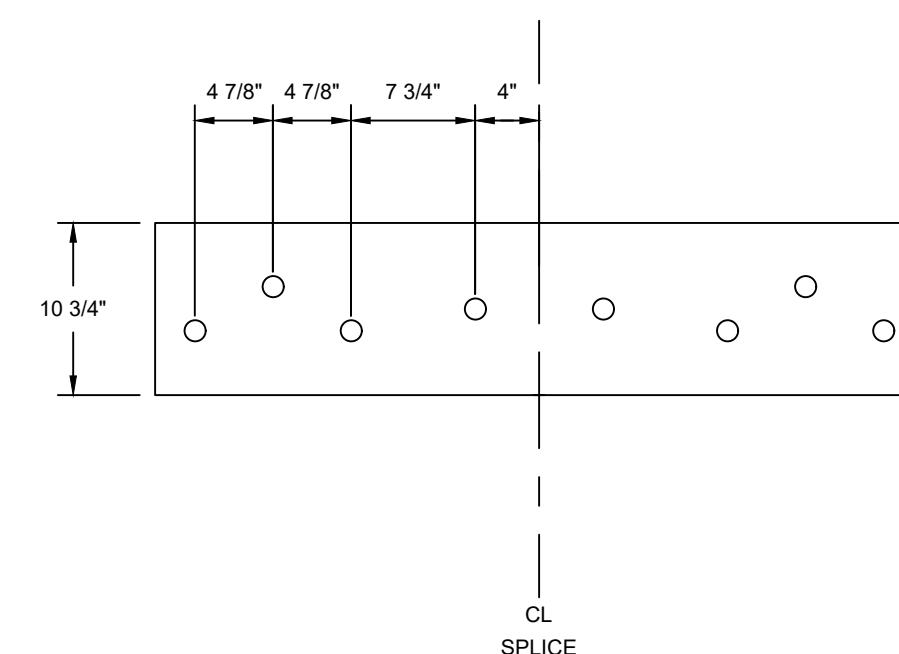
DETAIL **2** TYPICAL FRP BARRIER SECTION
SCALE: 1"-3'-0" S-06



DETAIL **3** TYPICAL WALER SECTION
SCALE: 1"-1'-0" S-06

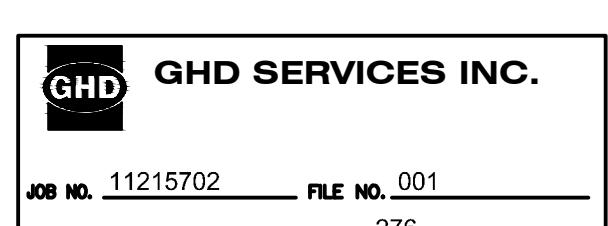


DETAIL **4** TYPICAL WALER SECTION
SCALE: 1"-1'-0" S-06



DETAIL **5** TYPICAL BOLT PATTERN FOR FRP SPLICE PLATE
SCALE: 1"-1'-0" S-06

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**NORTHERN IMPOUNDMENT
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Drafting Check Design Check SC

Project Coordinator CM Date May 22, 2025

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0 1"

Project No. 11215702

Title FRP BARRIER WALL

Sheet No.

S-06

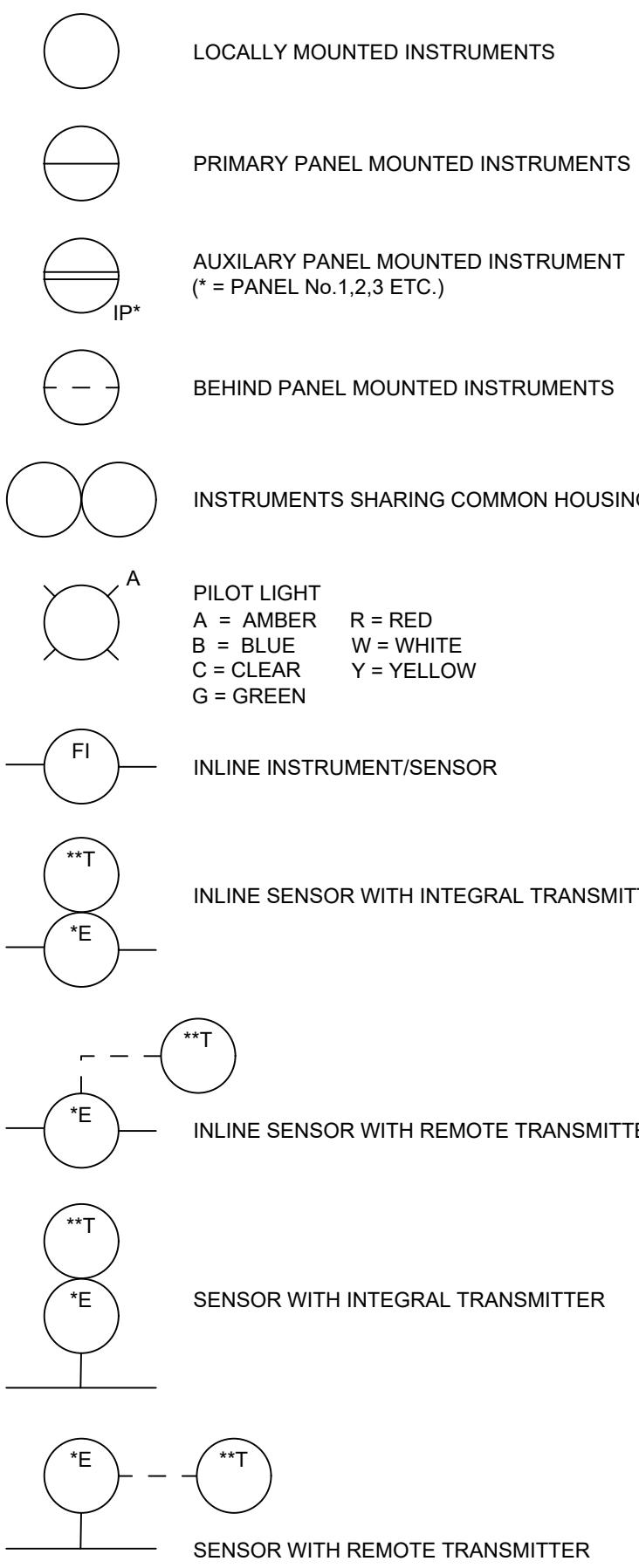


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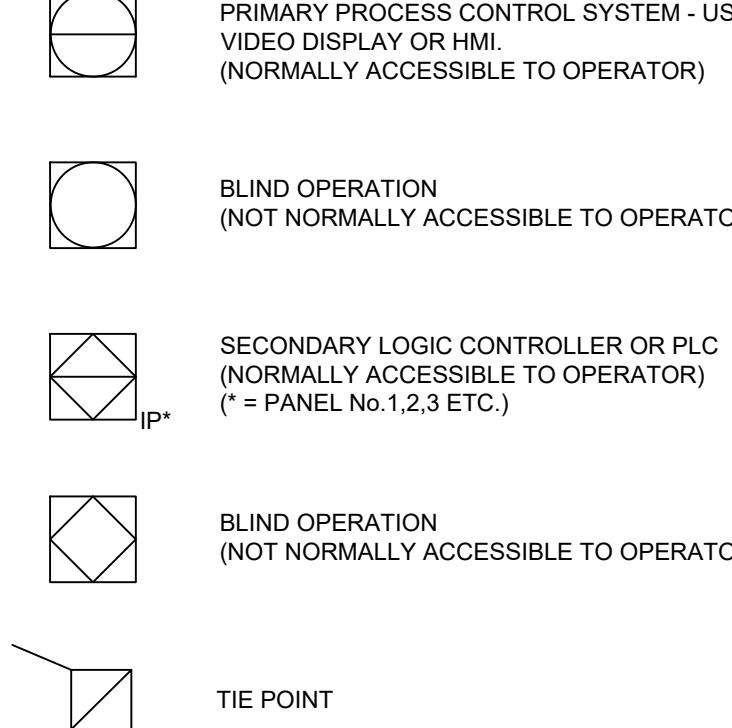


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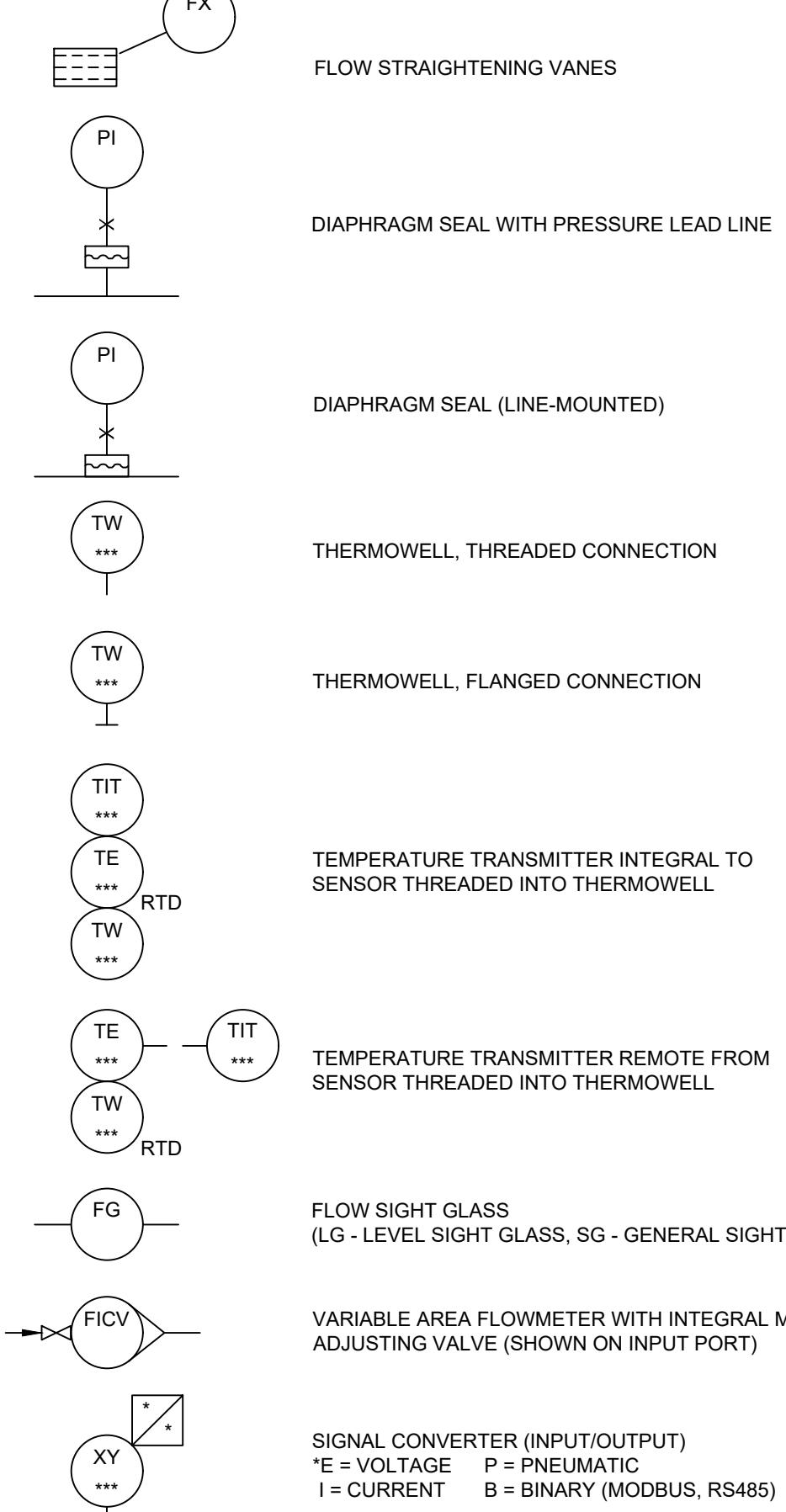
GENERAL INSTRUMENT SYMBOLS



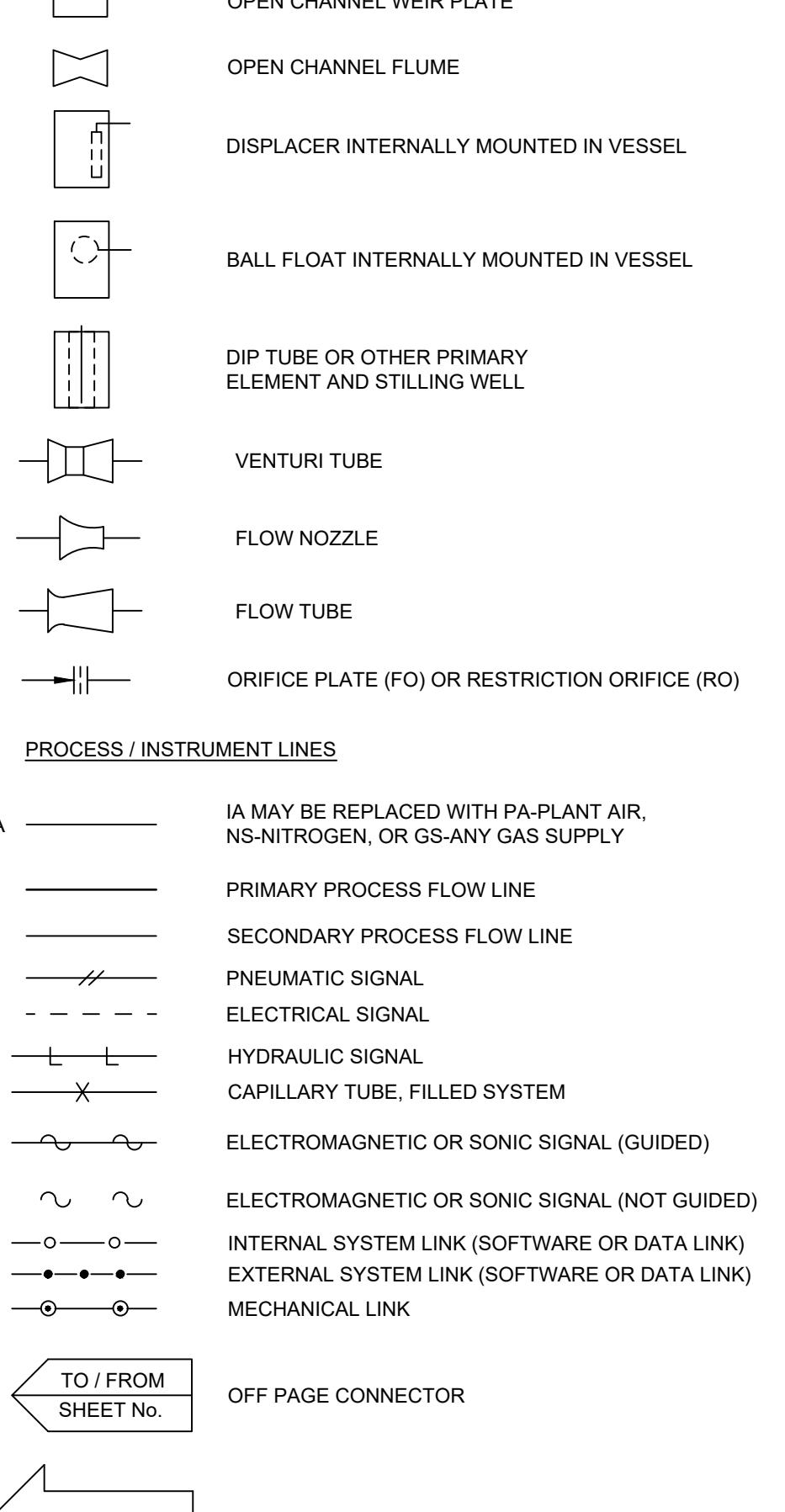
DISTRIBUTED CONTROL / SHARED DISPLAY INSTRUMENTS



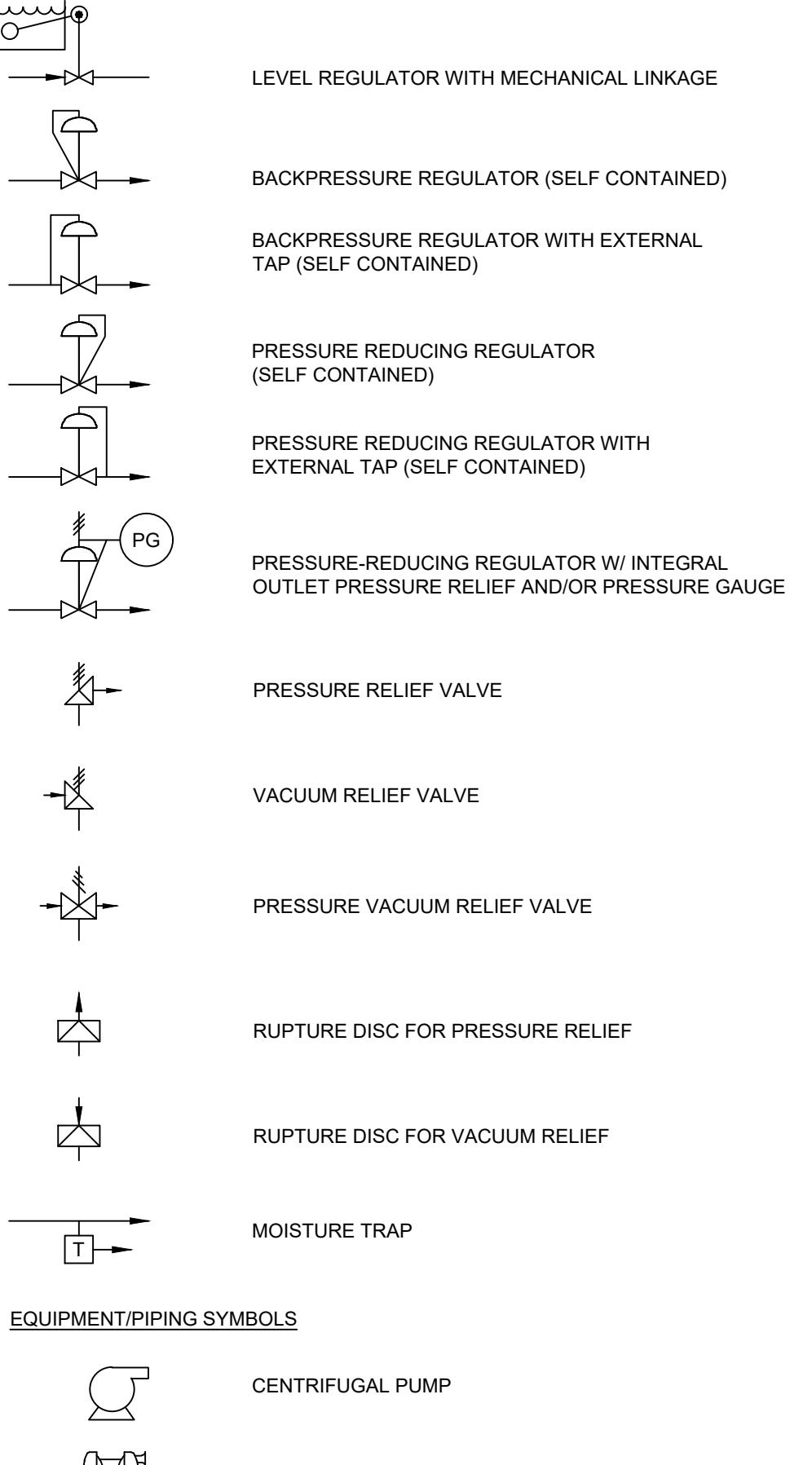
PRIMARY ELEMENT SYMBOLS



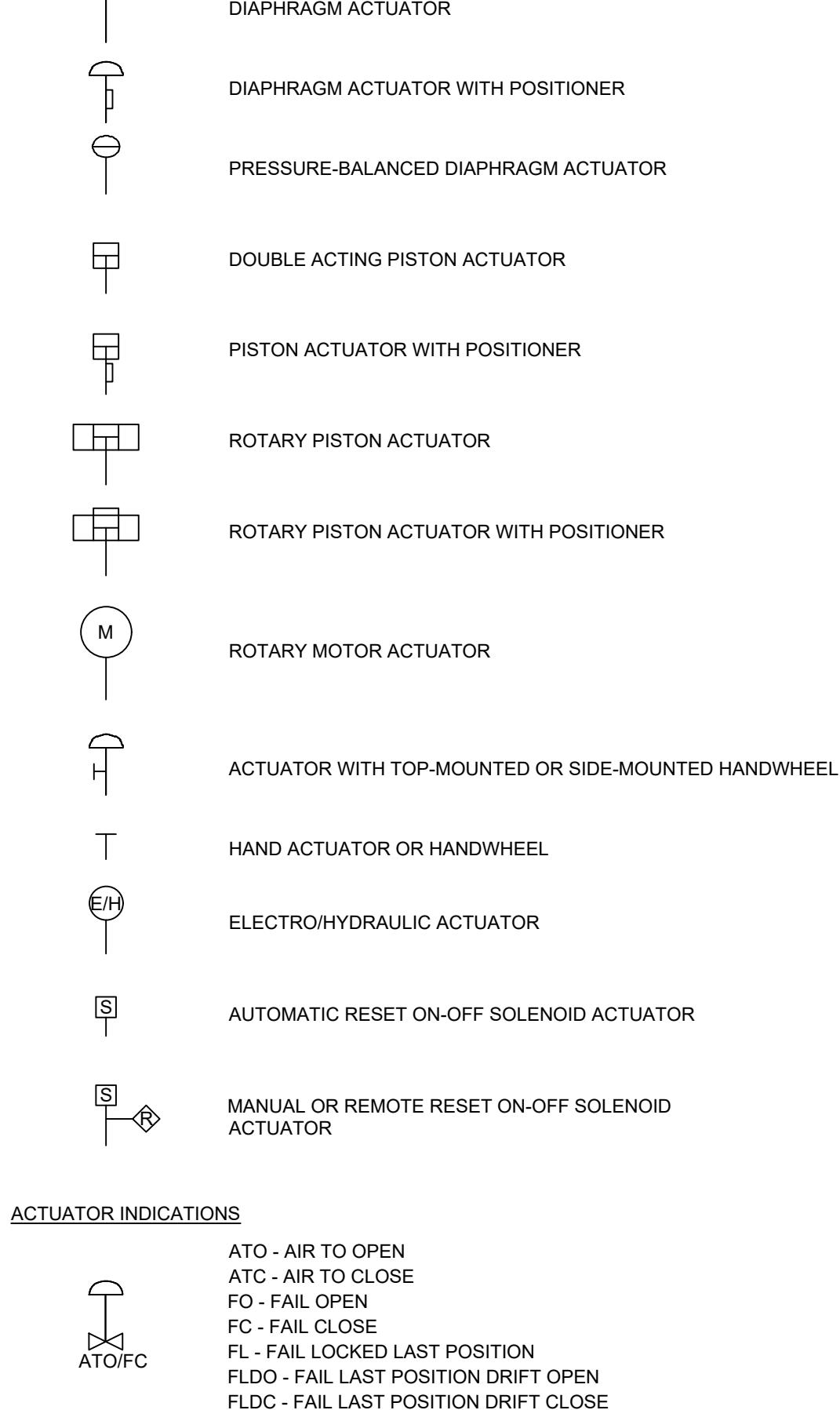
PRIMARY ELEMENT SYMBOLS (CONT'D)



SELF-ACTUATED REGULATORS, VALVES, AND OTHER DEVICES



ACTUATOR SYMBOLS



Client
**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	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

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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		High **	Low	Comb	Recording	Indicating	Blind	Blind							
A	Analysis	ARC	AIC	AC	AR	AI	ASH	ASL	ASHL	ART	AIT	AT	AY	AE	AP	AW	BG	AV
B	Burner/Combustion	BRC	BIC	BC	BR	BI	BSH	BSL	BSHL	BRT	BIT	BT	BY	BE		BW		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	FR	FI	FSH	FSL	FSHL	FRT	FIT	FT	FY	FE	FP		FG	FV
FQ	Flow Quantity	FQRC	FQIC		FQR	FQI	FQSH	FQSL		FQIT	FQTT	FQTY	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				IZ
K	Time	KRC	KIC	KC	KV	KR	KI	KSH	KSL	KSHL	KRT	KIT	KT	KY	KE			JV
L	Level	LRC	LIC	LC	LCV	LR	LI	LSH	LSL	LSHL	LRT	LIT	LT	LY	LE	LW	LG	KV
M	User's Choice																	LV
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	PDC	PDC	PDCV	PDR	PDI	PDSL	PDSL	PDR	PDT	PDT	PDY	PE	PP			PDV
Q	Quantity	QRC	QIC			QR	QI	QSH	QSL	QSHL	QRT	QIT	QT	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	SSH	SRT	SIT	ST	SY	SE			SV
T	Temperature	TRC	TIC	TC	TCV	TR	TI	TSH	TSL	TSHL	TRT	TIT	TT	TY	TE	TP		TV
TD	Temperature, Differential	TDRC	TDIC	TDC	TDCV	TDR	TDI	TDSH	TDSL	TDR	TDIT	TDIT	TDY	TE	TP			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.

FO (RESTRICTION ORIFICE) LLH (LEVEL LIGHT HIGH) KQI (RUNNING TIME INDICATOR) LCH (LEVEL CONTROL HIGH)

FRK, HIK (CONTROL STATIONS) LCL (LEVEL CONTROL LOW) HMS (HAND MOMENTARY SWITCH)

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

ABBREVIATIONS:

INSTRUMENTS

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

PIPE FLUID SERVICE CODE INDEX
SEE PIPING SPECIFICATIONS FOR DETAILS

CODE	SERVICE
CL21	CHLORINE LIQUID OR GAS
CTW1	COOLING TOWER WATER
OW3	PROCESS WATER
CW4	CHILLED WATER
NaOH	CAUSTIC SODA SOLUTION
GCO	GLYCOL
N20	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	INFILTRANT 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

PIPE MATERIAL INDEX
SEE PIPING SPECIFICATIONS FOR DETAILS

MATL	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_PFL	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_CPV	TEFLON TUBING, CPVC CARRIER AND CONTAINMENT PIPE	

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GHD TEXAS FIRM REGISTRATION NO. 276

IDENTIFICATION LETTERS				
FIRST-LETTER	SUCCEEDING-LETTERS			
MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER



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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 NF

Check Project Coordinator LL Date May 22, 2025

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Arch D 0 1"

Project No. 11215702

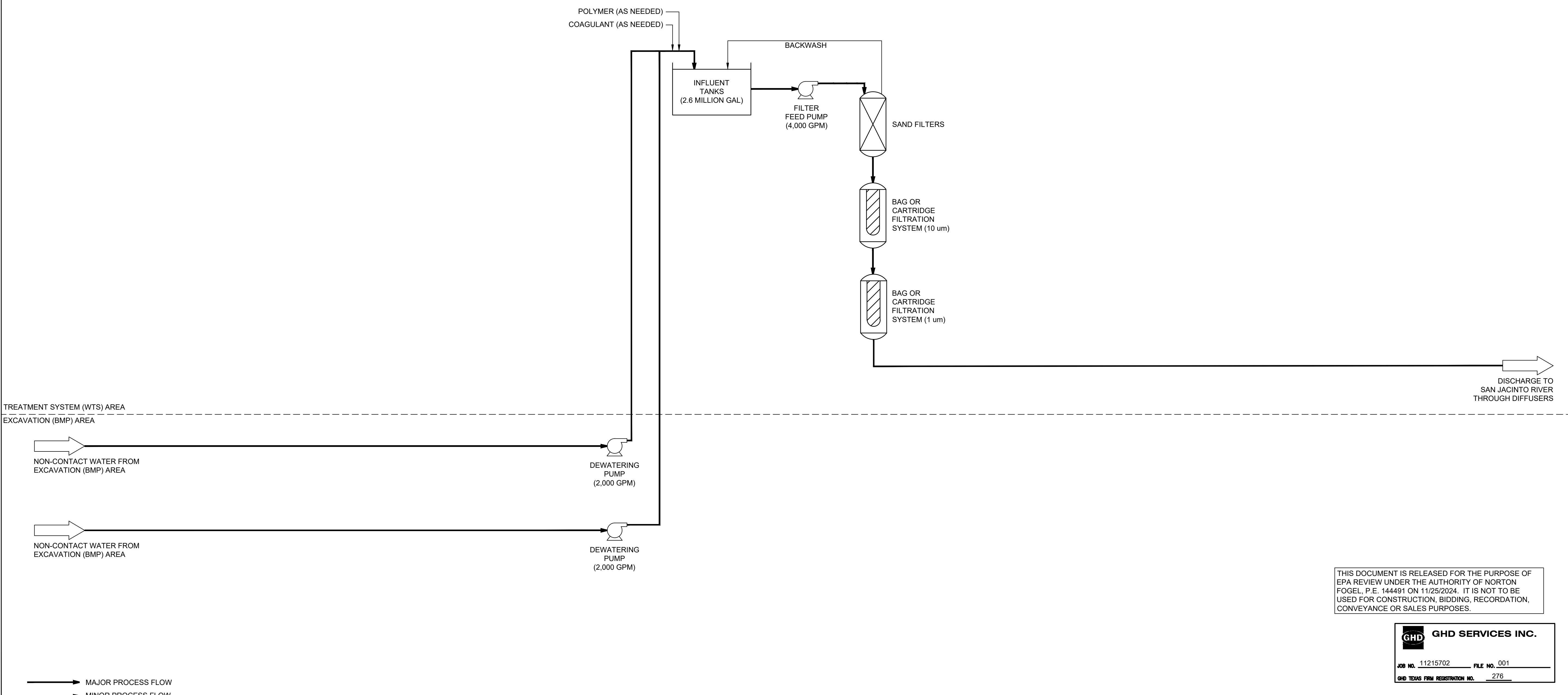
Title

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

Sheet No.

P-001

Sheet 67 of 83





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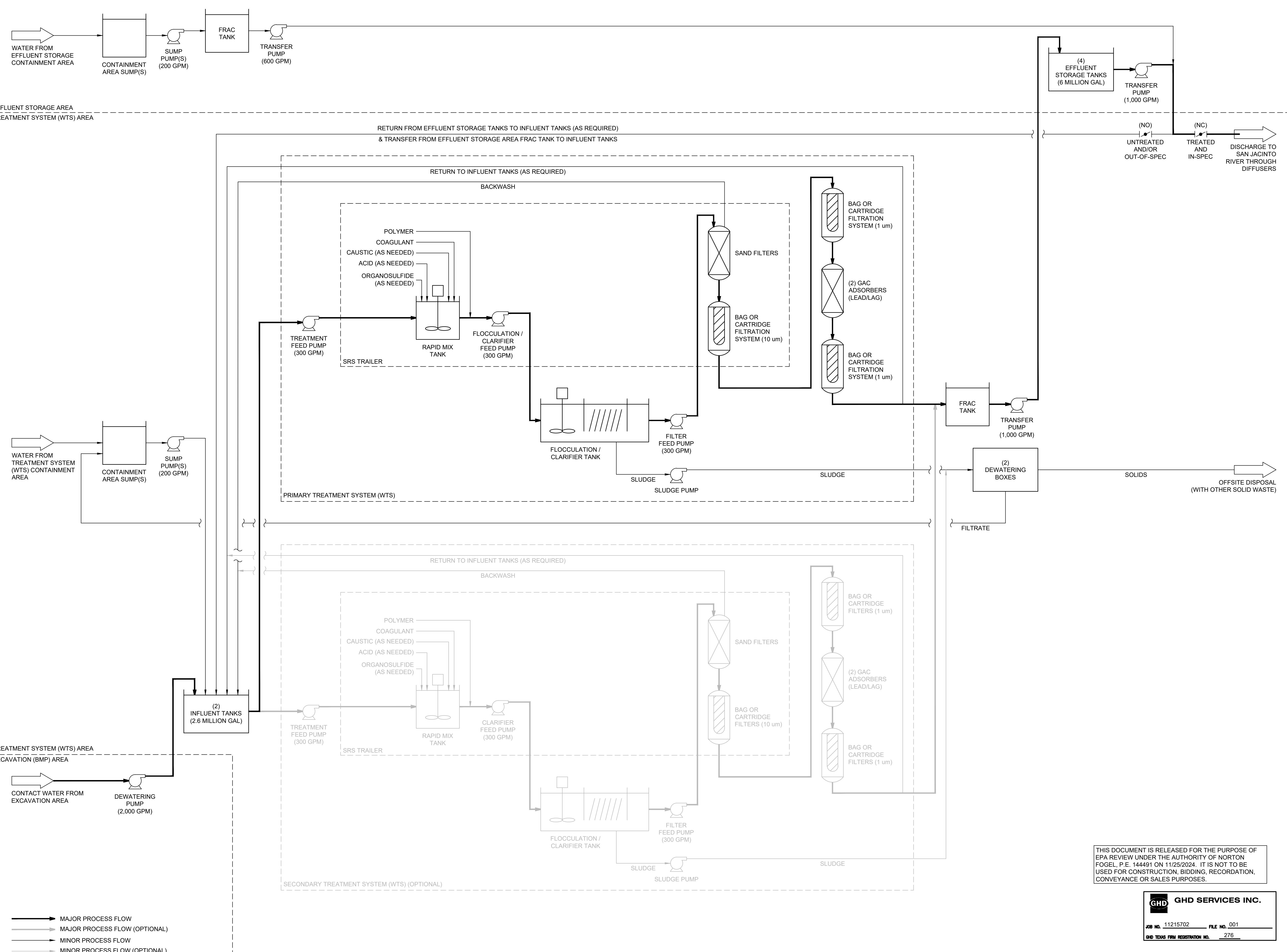
Title

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

Sheet No.

P-002

Sheet 68 of 83



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

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

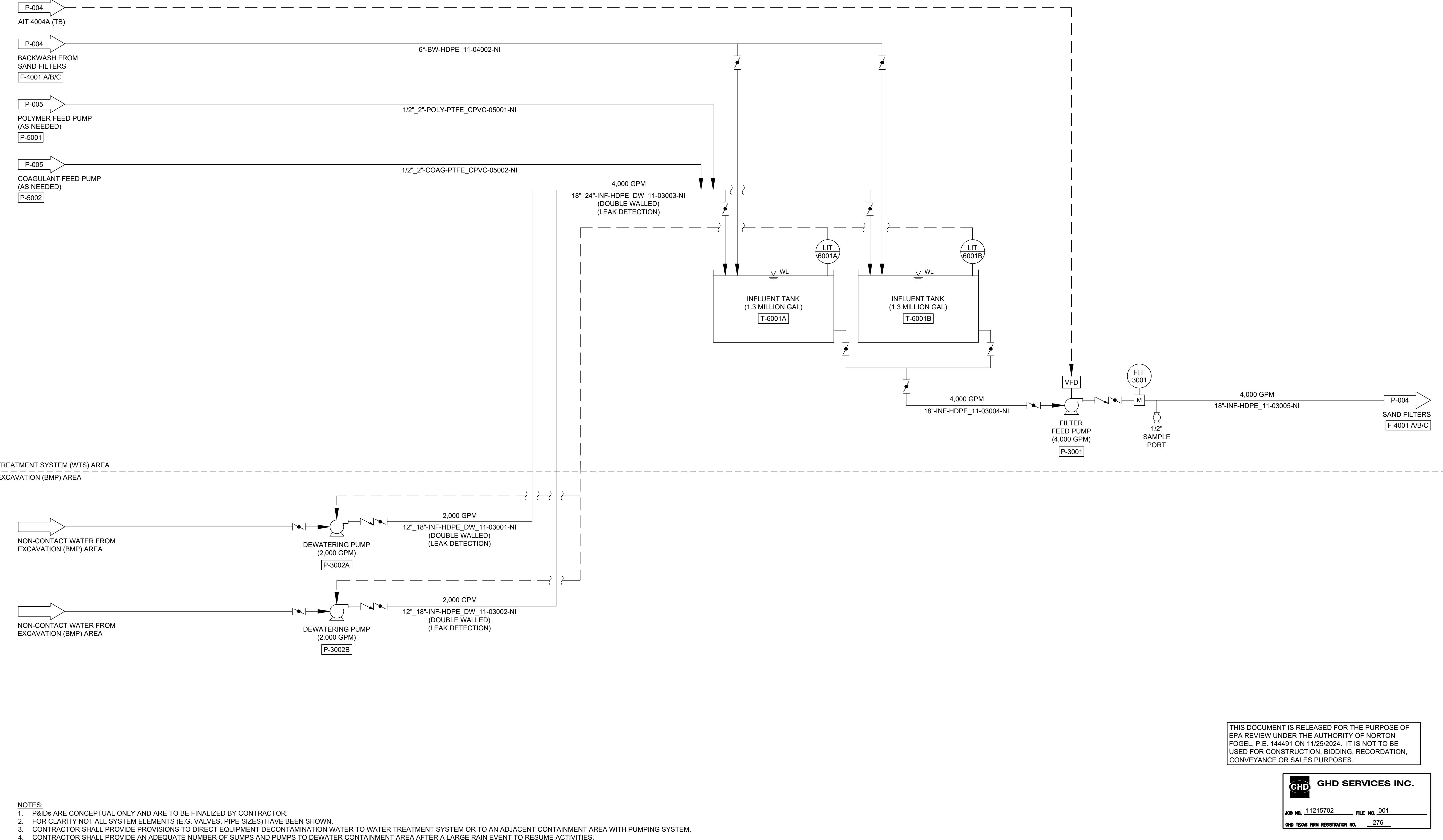
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P-003

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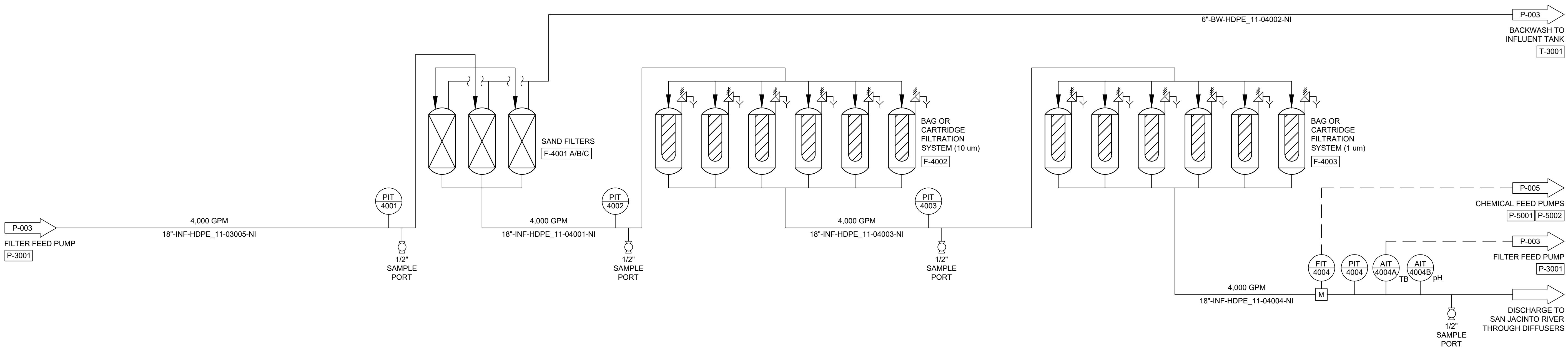




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NORTHERN IMPOUNDMENT
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No.	Issue	Drawn	Approved	Date

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)**

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Sheet No.

P-004

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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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Drawn SH 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
P&ID (NON-CONTACT WATER)
(3 OF 3)**

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P-005

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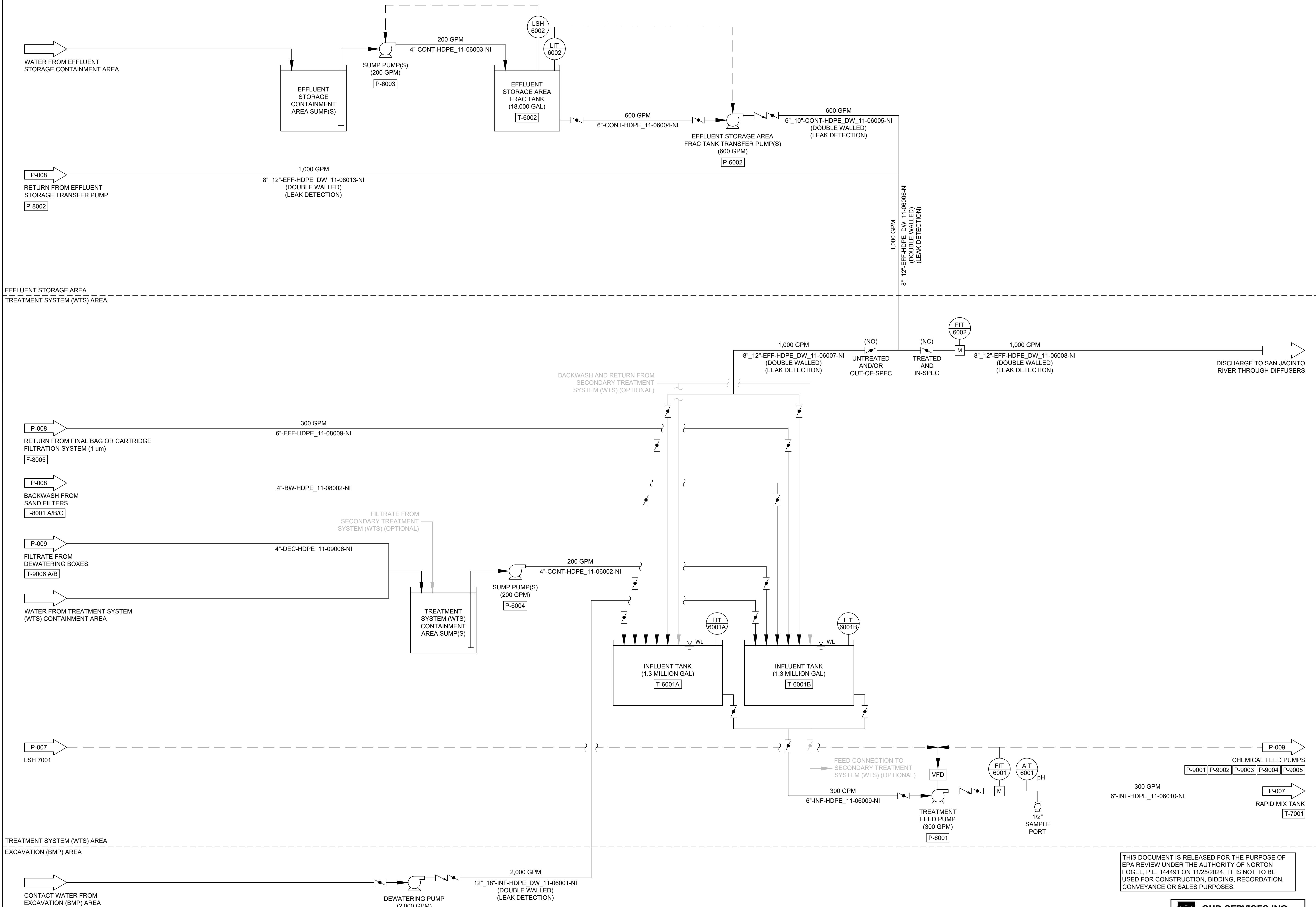


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P-006

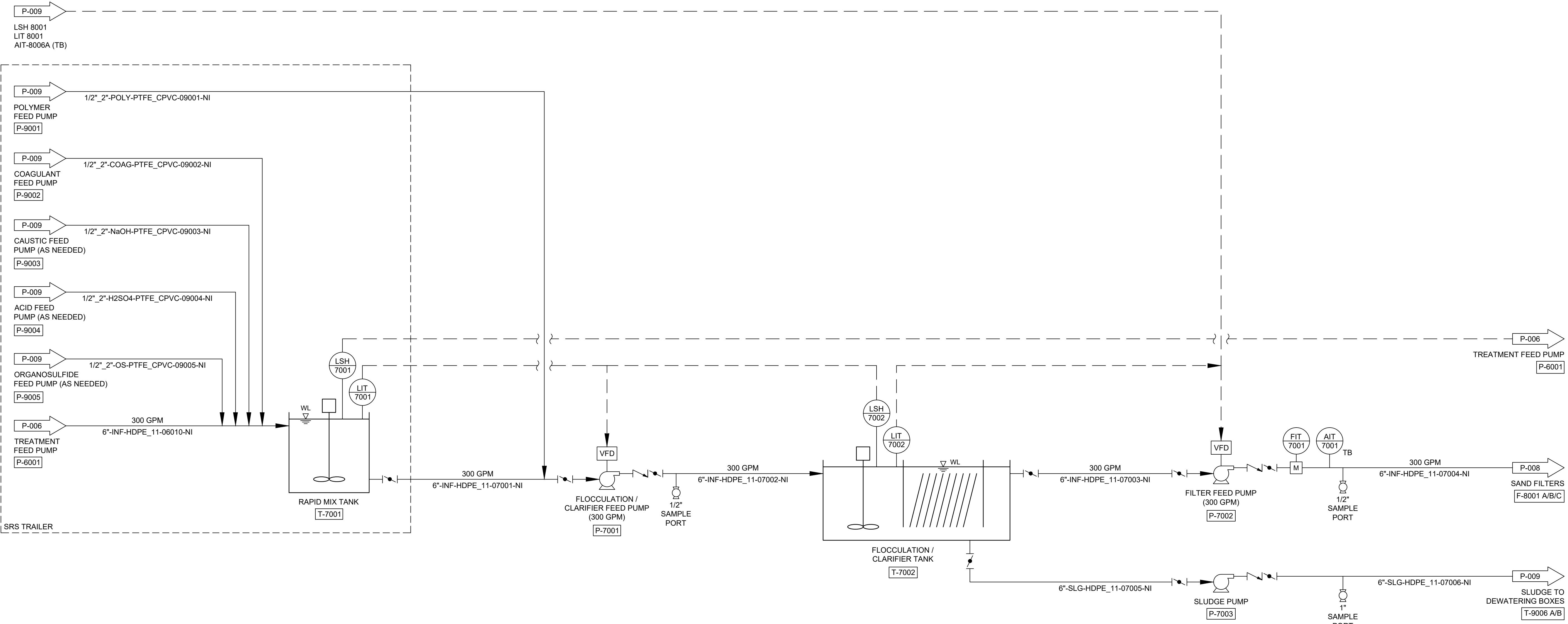


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WASTE PITS**

**Project
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HARRIS COUNTY, TEXAS**

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

Drafting Check Design Check NF

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Project No. 11215702

Title

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

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P-007

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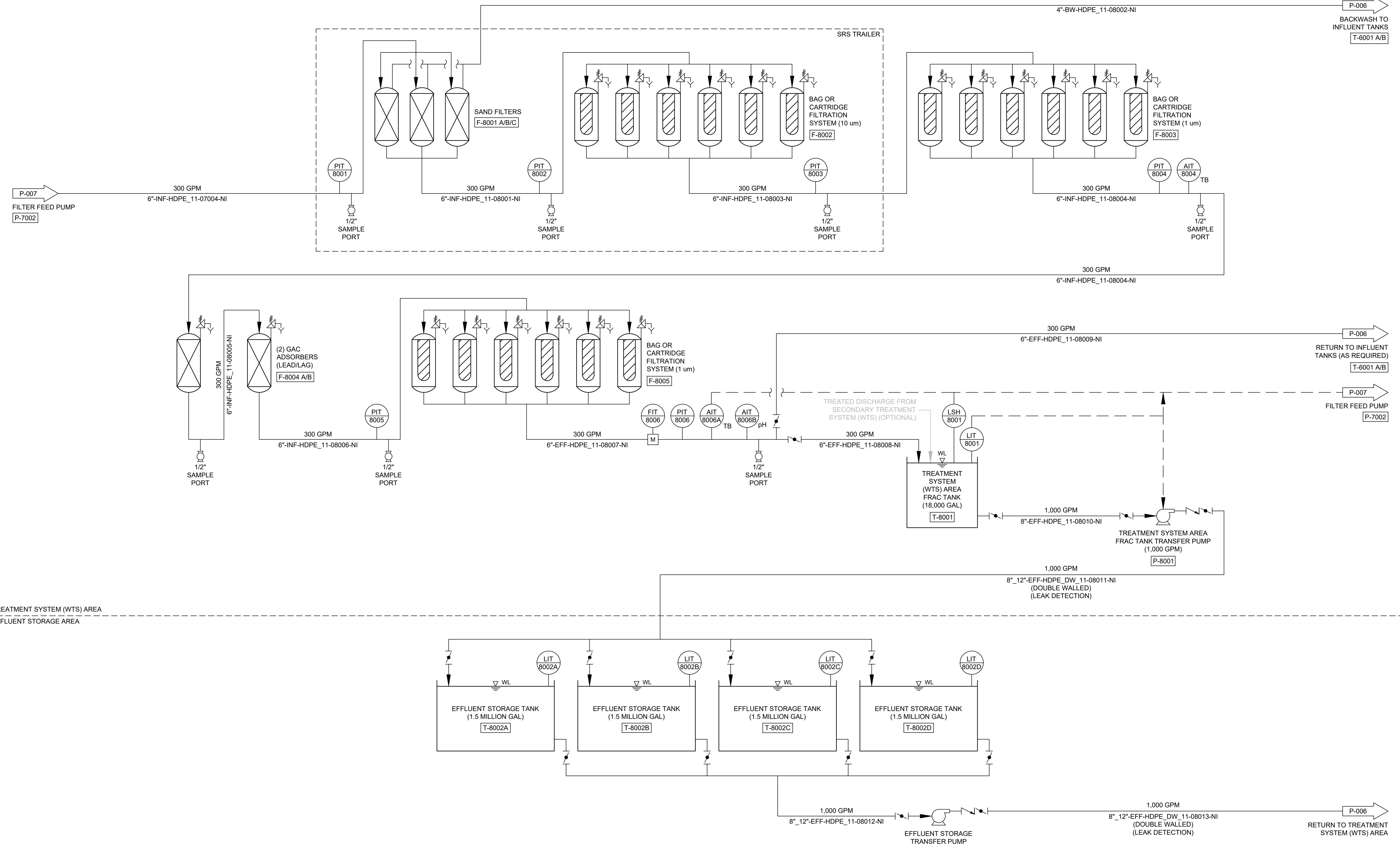
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2. FOR CLARITY NOT ALL SYSTEM ELEMENTS (E.G. VALVES, PIPE SIZES) HAVE BEEN SHOWN.
3. CONTRACTOR SHALL PROVIDE PROVISIONS TO DIRECT EQUIPMENT DECONTAMINATION WATER TO WATER TREATMENT SYSTEM OR TO AN ADJACENT CONTAINMENT AREA WITH PUMPING SYSTEM.
4. 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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P-008

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WASTE PITS**

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

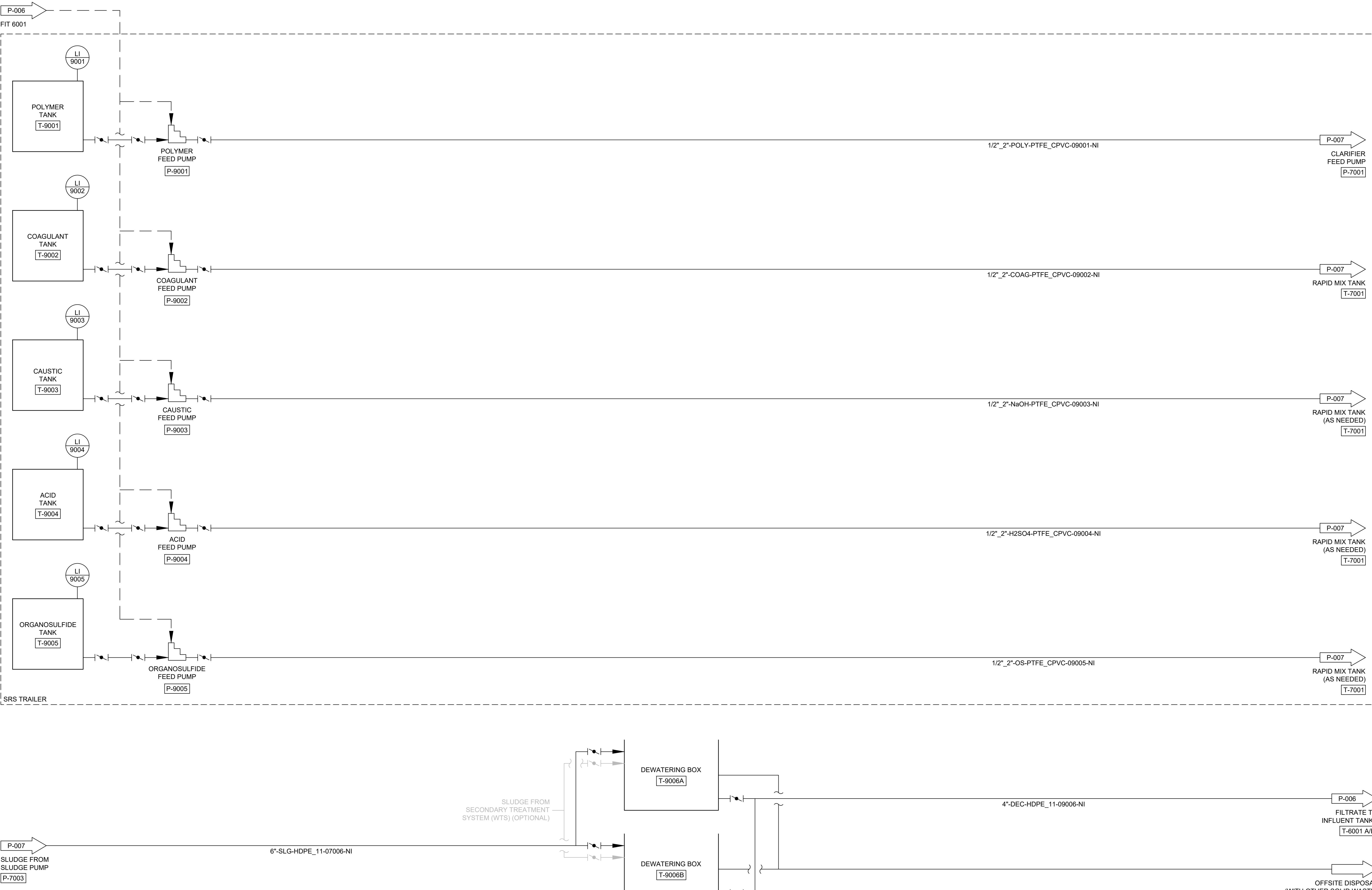
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No.	Issue	Drawn	Approved	Date
Drawn	RH	Designer	NF	
Drafting	Check	Design	Check	NF
Project	Coordinator	LL	Date	May 22, 2025
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Original Size	Scale N.T.S.			
Arch D	Bar is one inch on original size drawing			
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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JOB NO. 11215702 FILE NO. 001
GHD TEXAS FIRM REGISTRATION NO. 276

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 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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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 Bar is one inch on original size drawing 0 1"

Project No. 11215702

Title

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

Sheet No.

P-010

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



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**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 NF

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

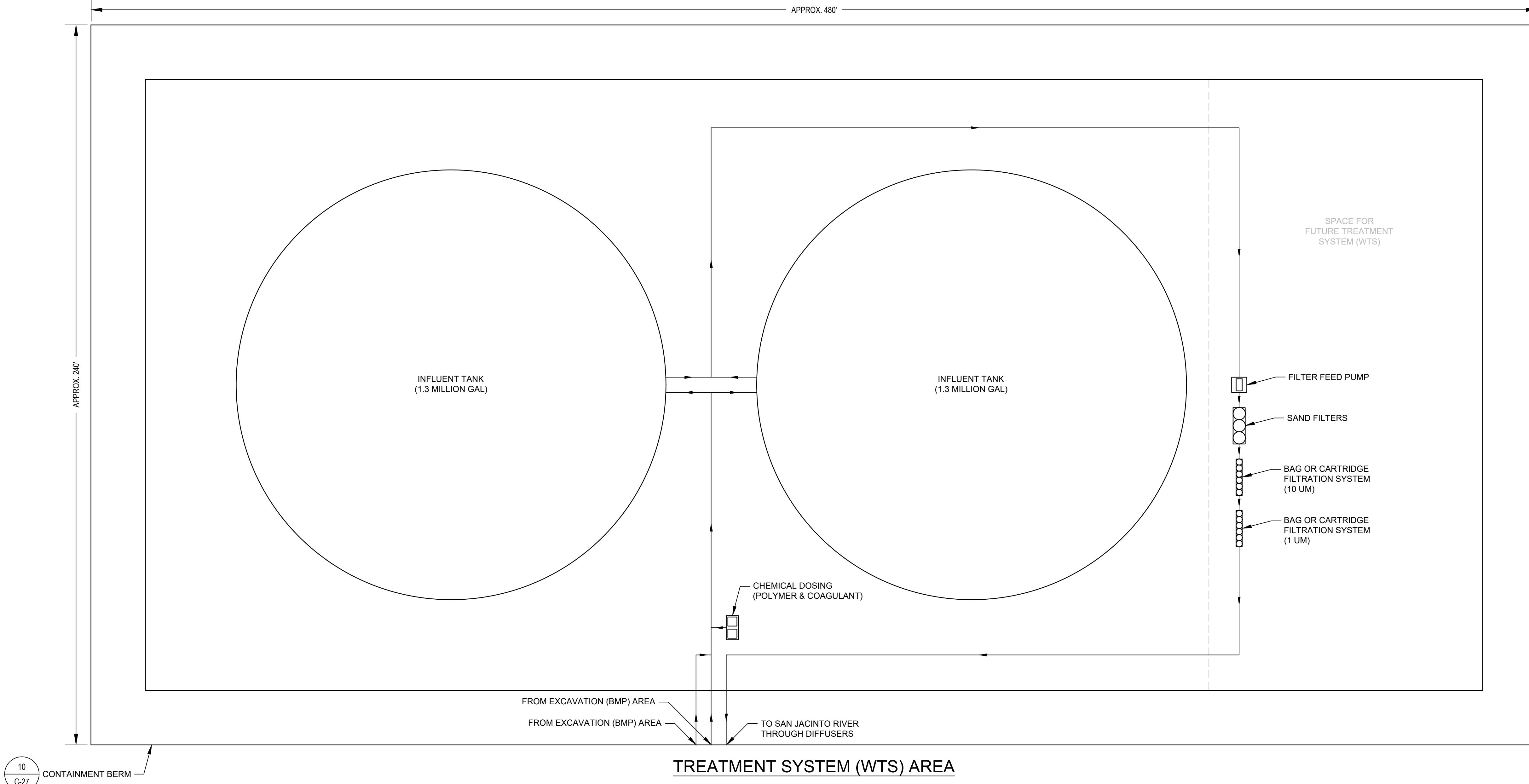
Title

**WATER TREATMENT SYSTEM
EQUIPMENT LAYOUT
(NON-CONTACT WATER)**

Sheet No.

P-011

Sheet 77 of 83



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NOTES:
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**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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Arch D 0 1"

Project No. 11215702

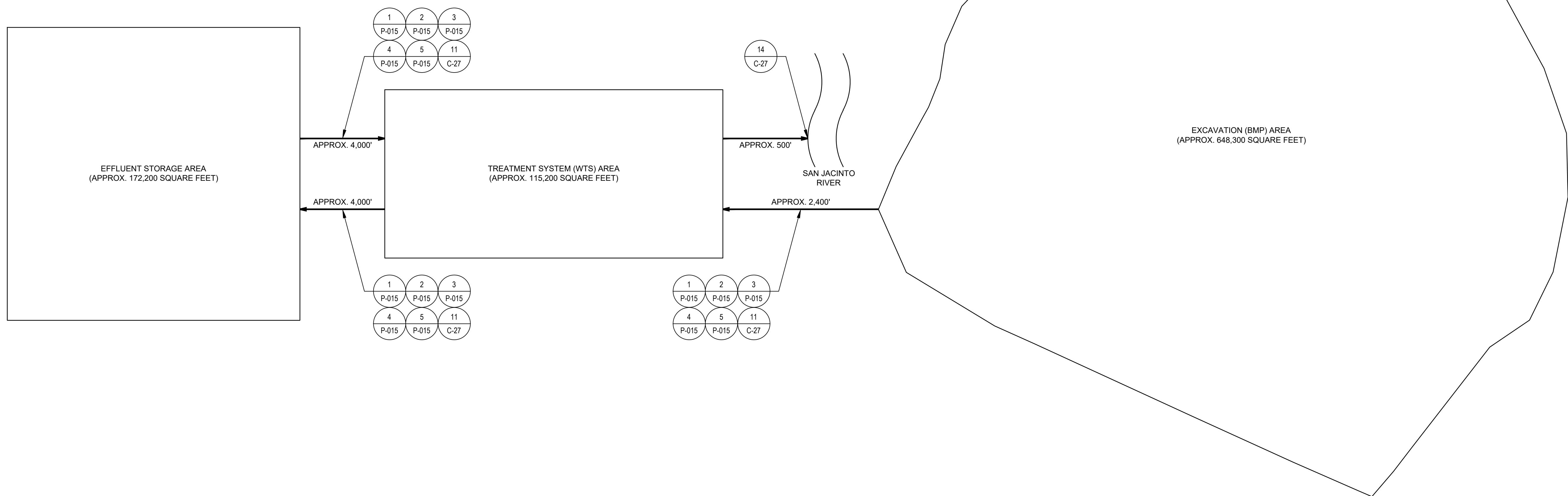
Title

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

Sheet No.

P-012

Sheet 78 of 83



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**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

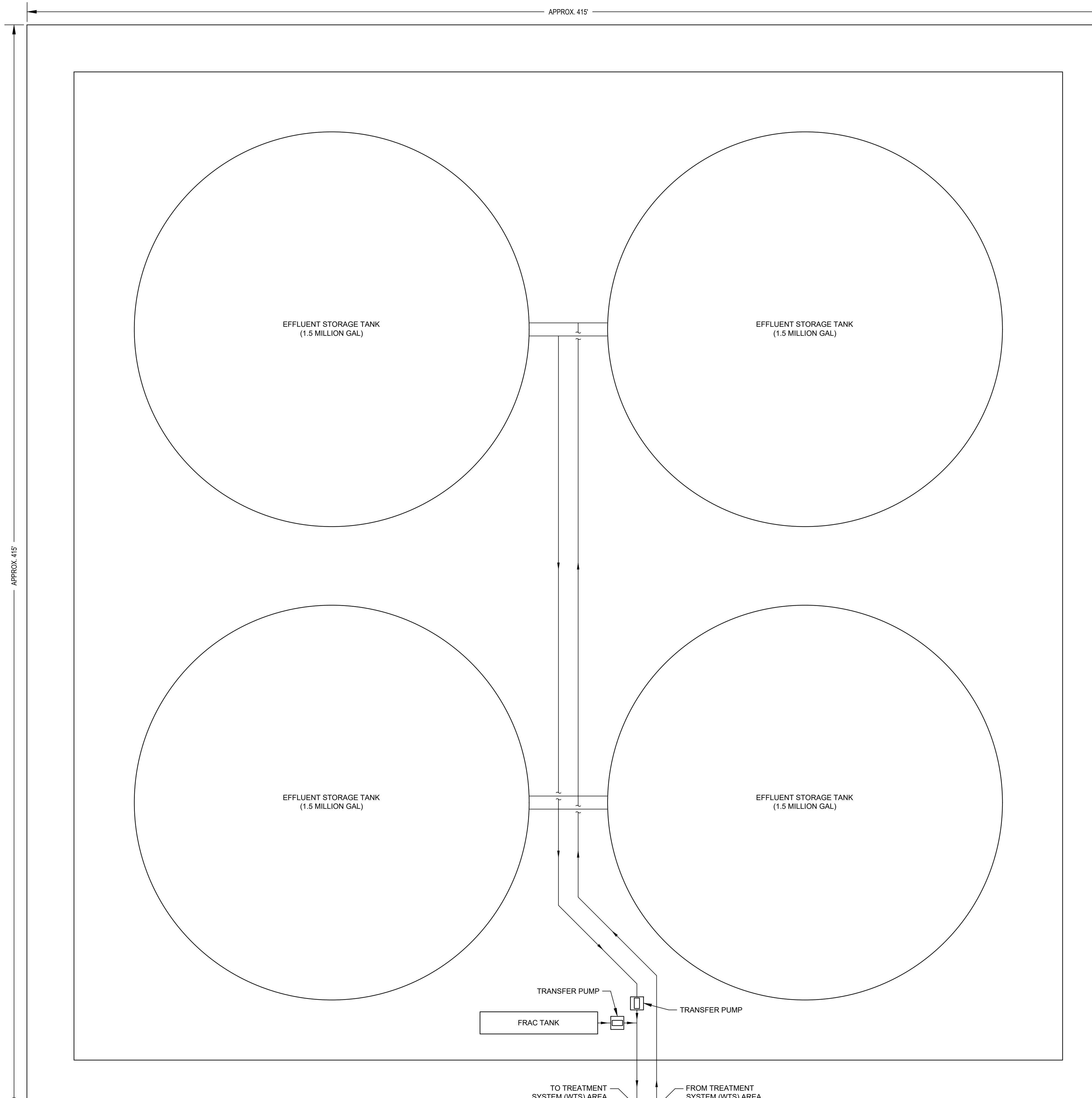
Title

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

Sheet No.

P-013

Sheet 79 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
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Drafting Check	Design Check	NF
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Project Coordinator	LL	Date	May 22, 2025
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Scale 1" = 20'

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

Project No.	11215702
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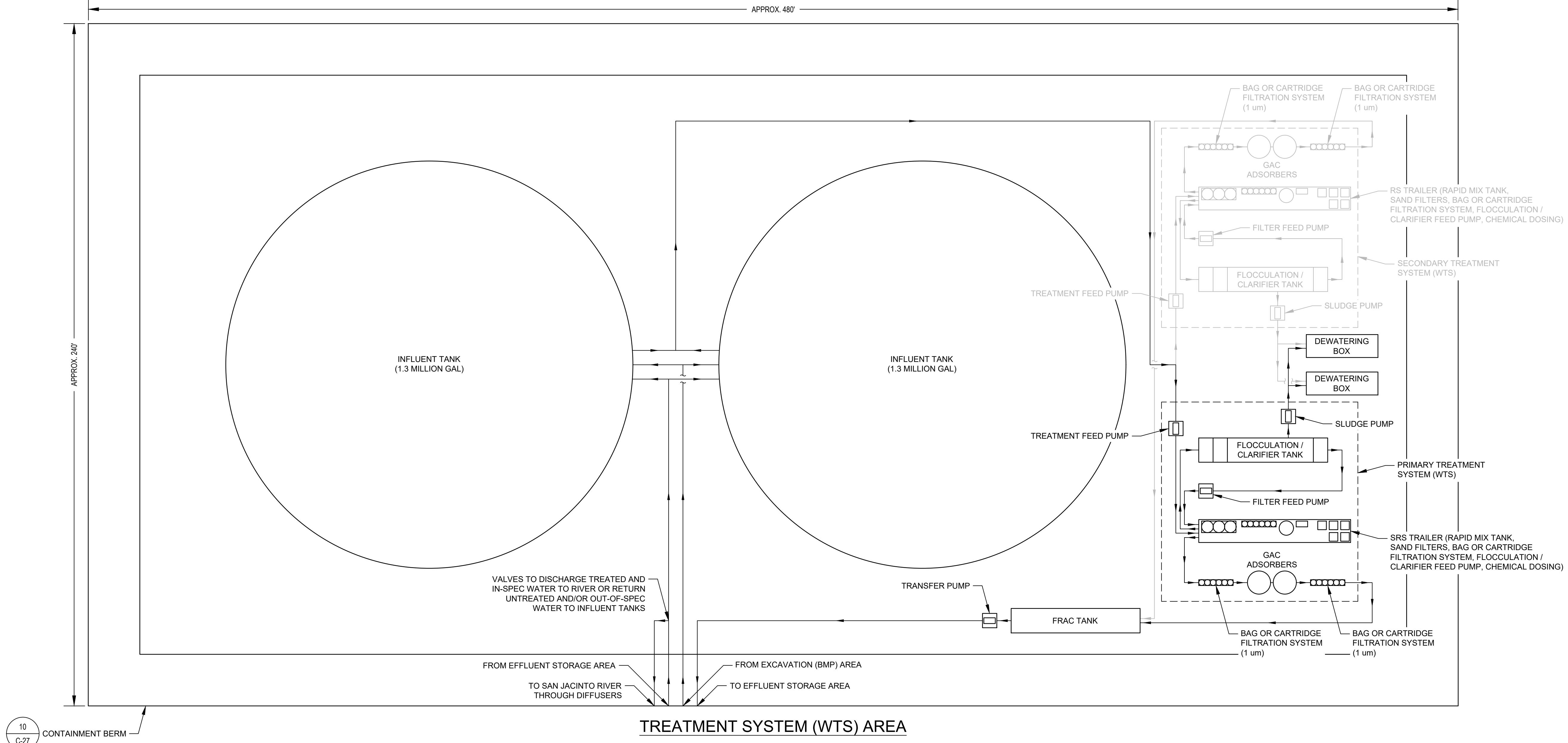
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**WATER TREATMENT SYSTEM
EQUIPMENT LAYOUT
(CONTACT WATER) (2 OF 2)**

Sheet No.

P-014

Sheet 80 of 83



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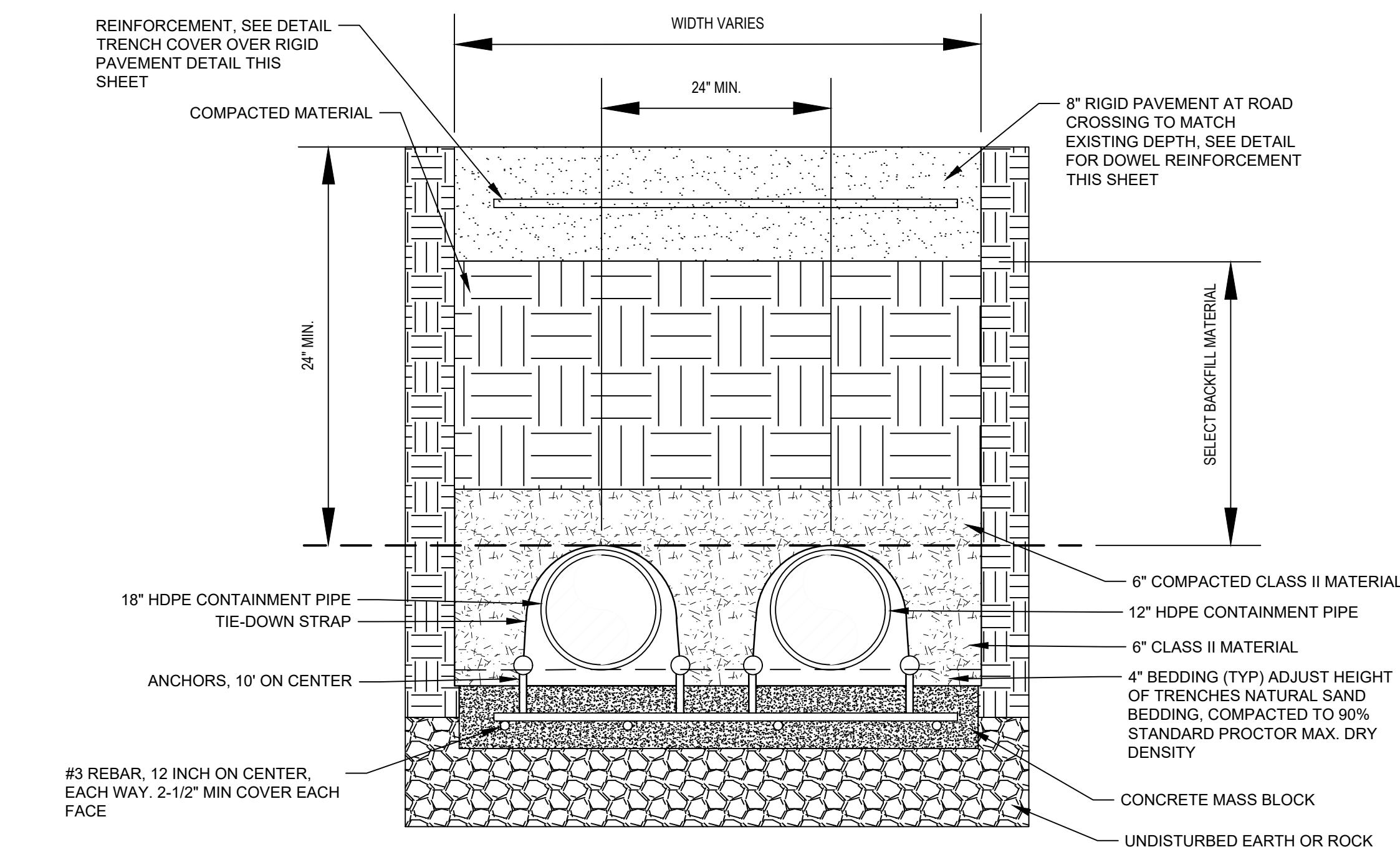
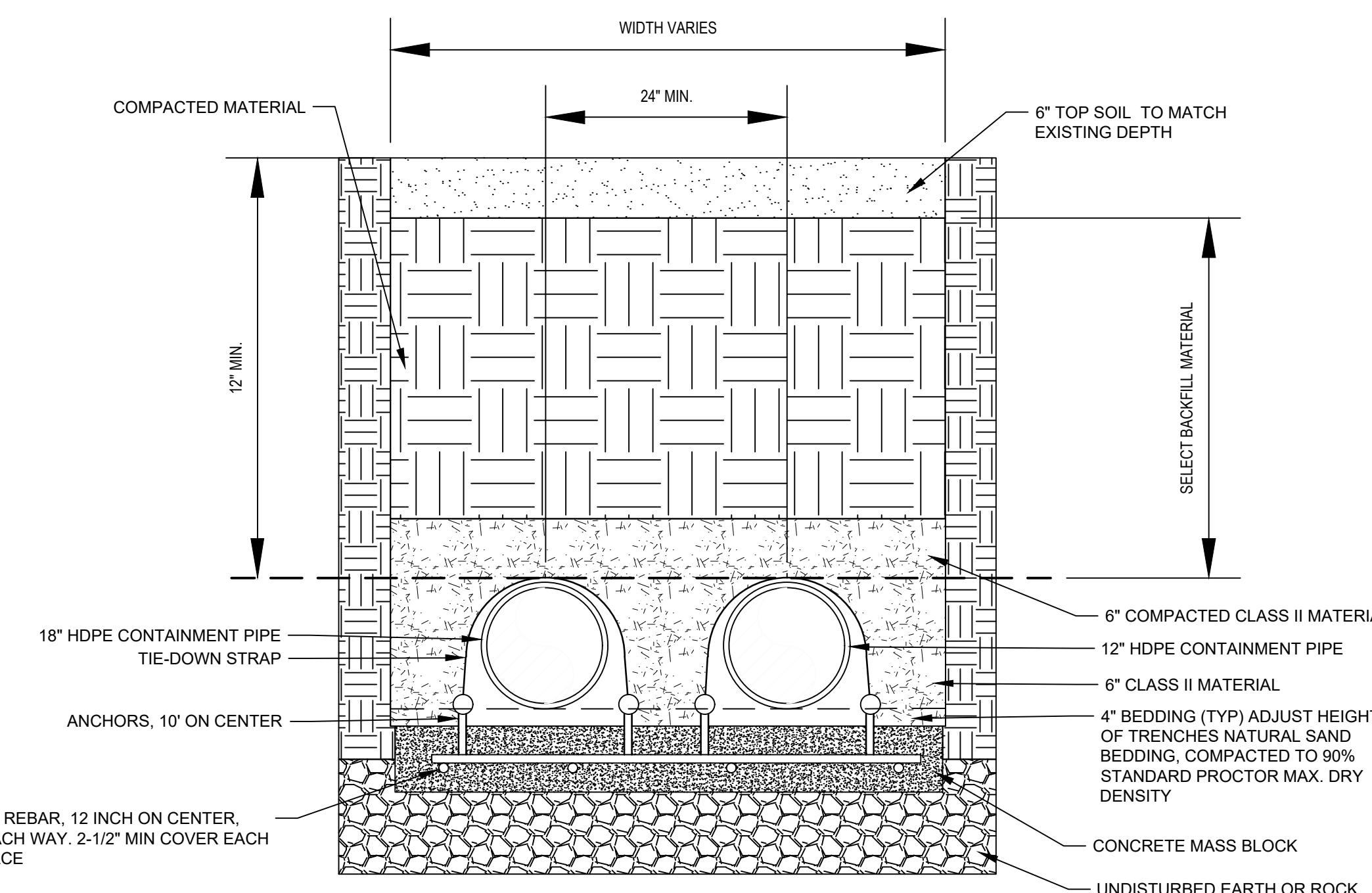
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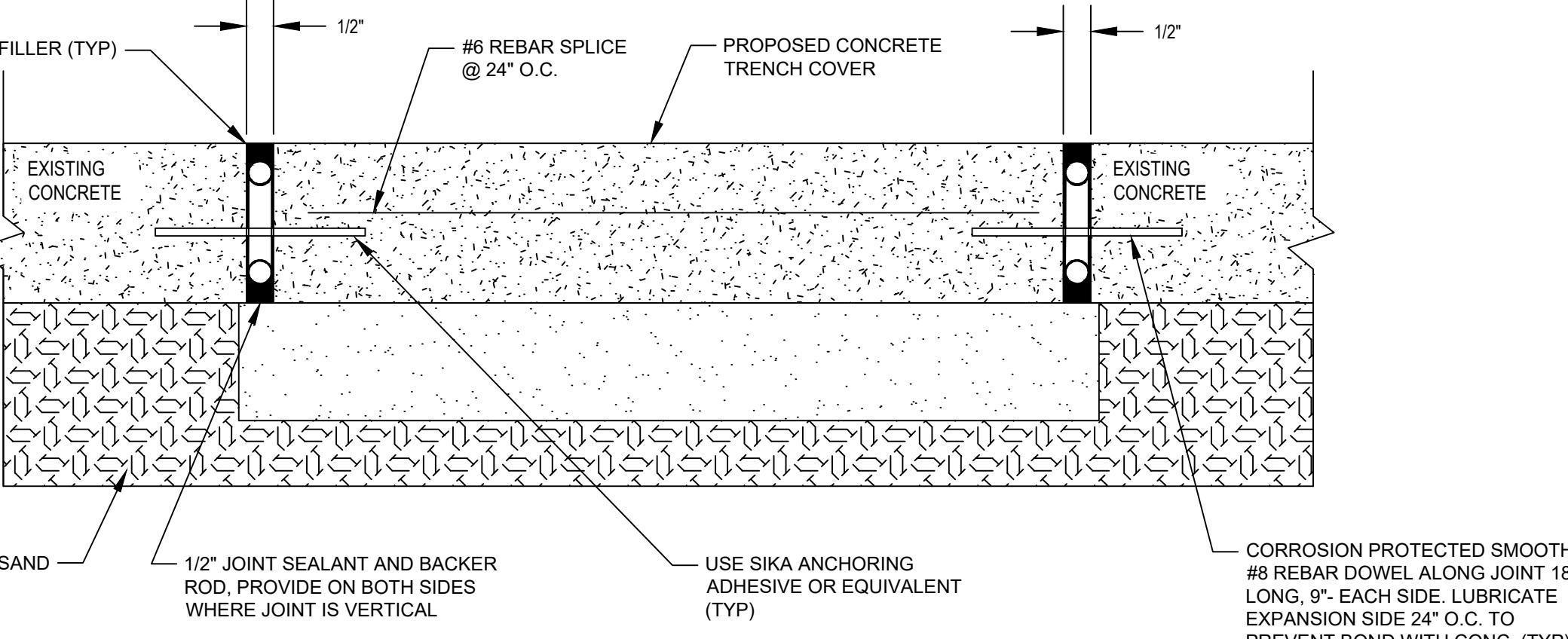
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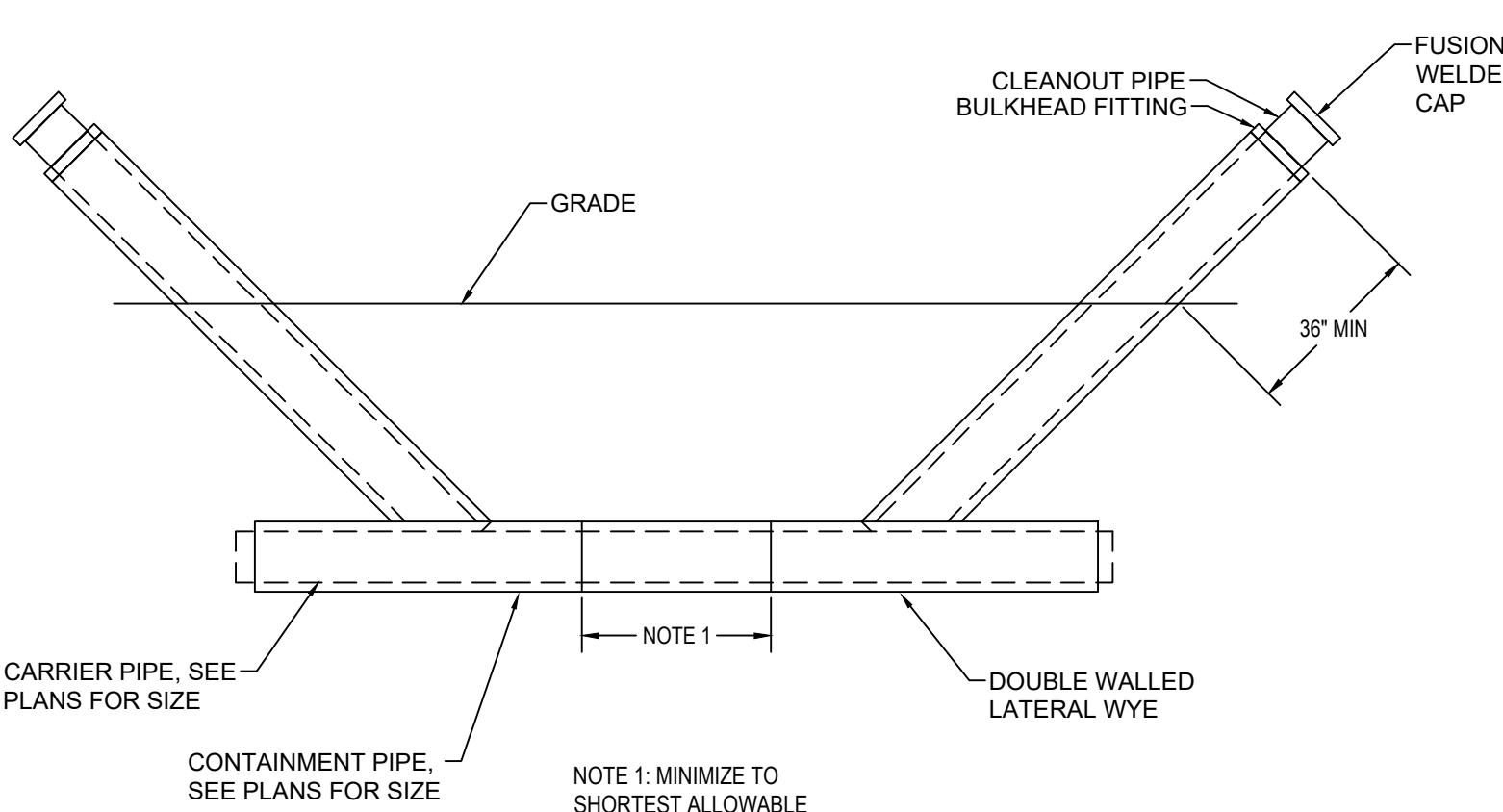
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DETAIL 1 UTILITY TRENCH - GROUND COVER

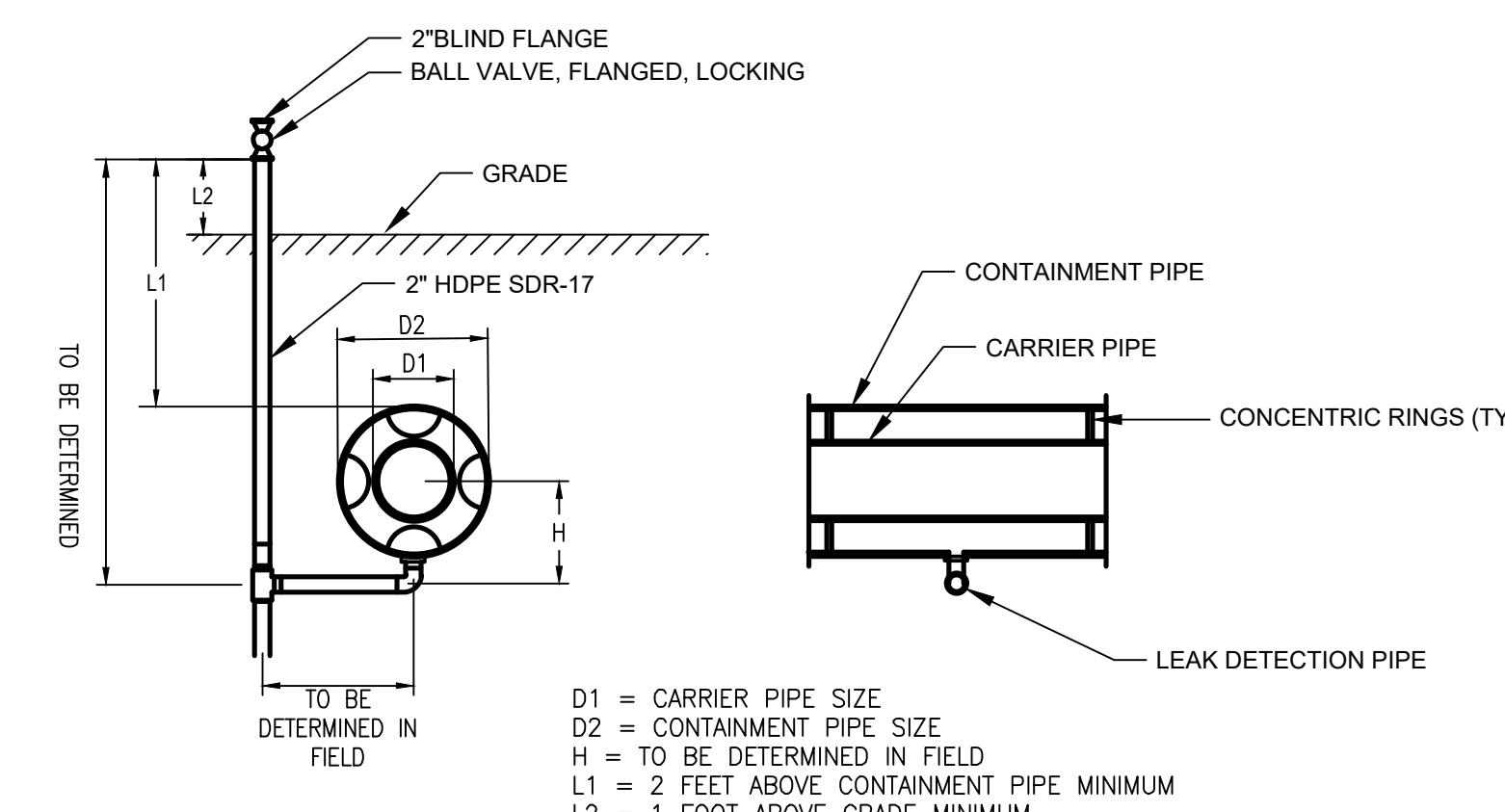


DETAIL 3 TRENCH COVER OVER RIGID PAVEMENT



DETAIL 5 DOUBLE WALLED, DOUBLE CLEANOUT

DETAIL 2 UTILITY TRENCH - RIGID PAVEMENT OR ROADWAY SURFACE



NOTES:
1. FOR ABOVE GROUND INSTALLATIONS, 2" PIPE MUST BE ABOVE GRADE AND CLEAR OF SUPPORTS TO AVOID DAMAGE FROM THERMAL MOVEMENT.

DETAIL 4 LEAK DETECTION

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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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Original Size Arch D Scale AS SHOWN

Bar is one inch on original size drawing 0 1"

Project No. 11215702

Title

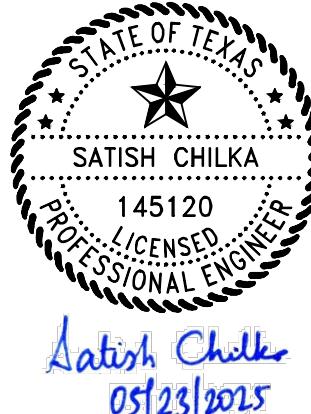
**MECHANICAL
DETAILS 1 OF 1**

Sheet No.

P-015



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145120
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Latish Chilka
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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 Arch D Bar is one inch on original size drawing

0 1"

Project No. 11215702

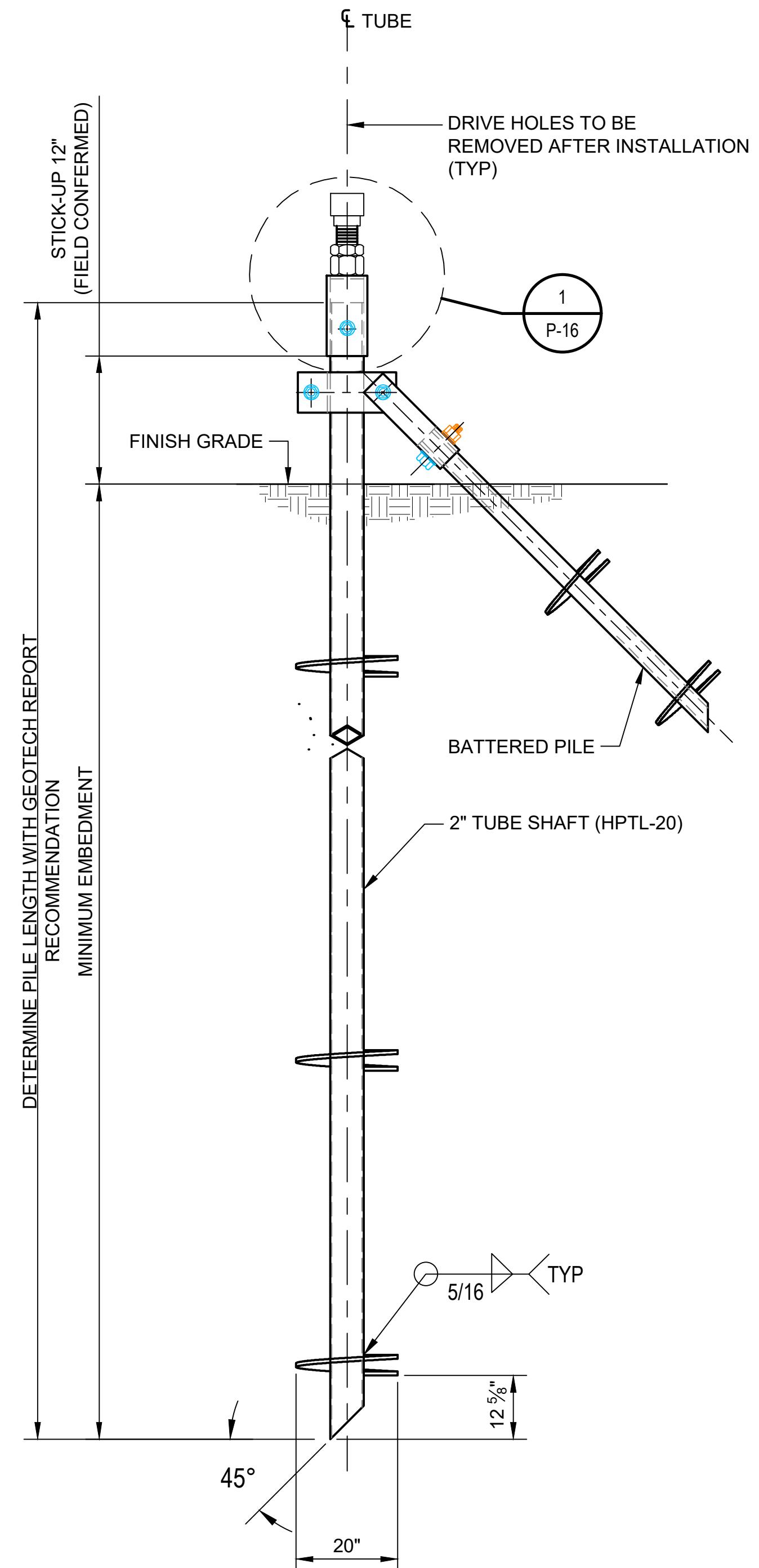
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HELICAL PILE DETAILS

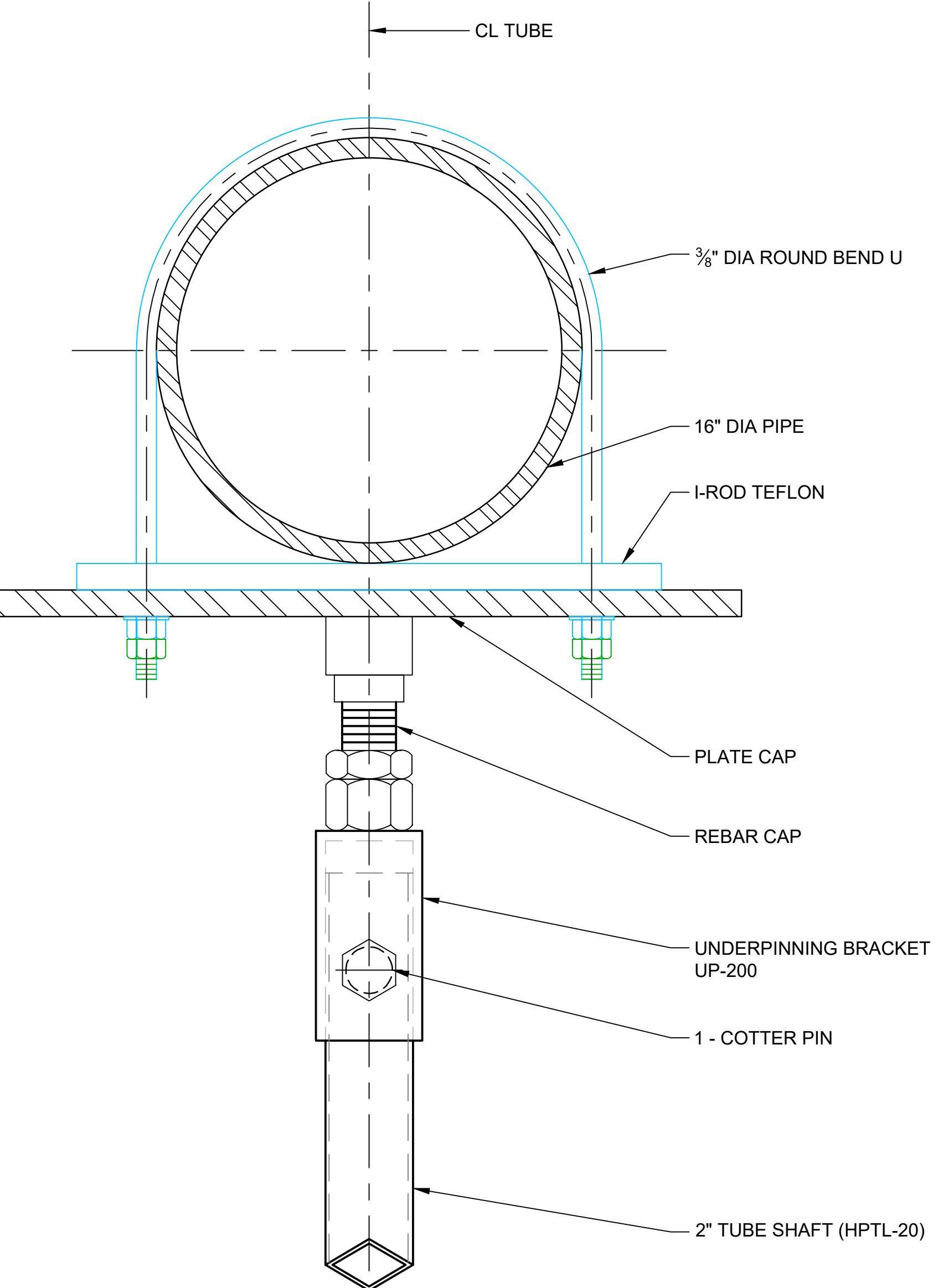
Sheet No.

P-016

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DETAIL A HELICAL COMPOSITE PILE HPTL-20
SCALE: NTS P-16



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

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 lb/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 APPROVED EQUAL.

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

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

THIRD 100% EPA SUBMITTAL



GHD
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PUMP NO.	SERVICE	CAPACITY		ELECTRICITY			MANUFACTURER	POTENTIAL VENDOR	MODEL	REMARKS
		FLOW (GPM)	HEAD (FT)	KW	HP	VOLTS				
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	

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		Design Check WSK
Check		
Project	CM	Date May 22, 2025
Coordinator		
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

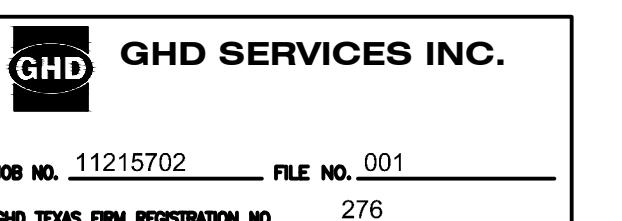
Title

**MECHANICAL
SCHEDULE**

Sheet No.

P-017

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